## SIEMENS



## Industrial Controls

## SIRIUS ACT

3SU1 Pushbuttons and Signaling Devices

## System Manual

## SIEMENS

## Industrial Controls

Command and signaling devices SIRIUS ACT 3SU1 pushbuttons and signaling devices

System Manual

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## Legal information

## Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

## ! DANGER

indicates that death or severe personal injury will result if proper precautions are not taken.

## WARNING

indicates that death or severe personal injury may result if proper precautions are not taken.

## CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

## NOTICE

indicates that property damage can result if proper precautions are not taken.
If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

## Qualified Personnel

The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products
Note the following:

## WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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## Introduction

### 1.1 Responsibility of the user for system configuration and functionality

The products described here have been developed to perform safety-related functions as part of an overall system or machine.

A complete safety-related system generally includes sensors, evaluation units, signaling devices and concepts for safe tripping.

The manufacturer of a system or machine is responsible for ensuring its correct overall function.

Siemens AG, its subsidiaries and affiliated companies (hereinafter referred to as "Siemens") are not able to guarantee all properties of an overall system or machine not designed by Siemens.

Siemens also does not assume any liability for recommendations that are made or implied in the following description. No new guarantee, warranty, or liability claims beyond the scope of the general terms of delivery of Siemens may be derived based on the following description.

## $1.2 \quad$ Target group

This documentation contains information for the following target groups:

- Decision makers
- Technologists
- Project planning engineers
- Commissioning engineers


### 1.3 Purpose of this documentation

This System Manual describes the many different possible uses of the SIRIUS ACT (3SU1) pushbuttons and signaling devices and provides the following information:

- Information regarding integration of the 3SU1 pushbuttons and signaling devices into the system environment
- Information on the principle of operation, selection, installation, and connection of pushbuttons and signaling devices
- Technical information such as dimension drawings

The information in this manual enables you to configure and commission the pushbuttons and signaling devices.

### 1.4 Required knowledge

A general knowledge of the following areas is needed in order to understand this documentation:

- Low-voltage industrial controls
- Digital circuit logic
- Automation systems
- AS-Interface
- IO-Link
- Safety technology


### 1.5 Scope of validity of the system manual

The system manual is valid for the present pushbuttons and signaling devices. It contains a description of the devices that are valid at the time of publication.

### 1.6 Further documentation

Please observe the following Operating Instructions for this system manual.

| Operating Instructions title1) | Article number1) |
| :--- | :--- |
| SIRIUS Complete Units with EMERGENCY STOP 3SU11..-1. | 3ZX1012-0SU11-1AA1 |
| SIRIUS AS-Interface Module (Front Plate Mounting) 3SU14.0-1E..0-.AA0 | $3 Z X 1012-0 S U 14-1 A A 1$ |
| SIRIUS AS-Interface Module (Base Mounting) in accordance with the Machinery Directive | $3 Z X 1012-0 S U 14-1 C A 1$ |
| SIRIUS Enclosures with EMERGENCY STOP 3SU18..-.N | $3 Z X 1012-0 S U 18-1 N A 1$ |
| SIRIUS Two-Hand Operation Consoles 3SU18..-3 in accordance with the Machinery Directive | $3 Z X 1012-0 S U 18-3 A A 1$ |
| SIRIUS Two-Hand Operation Consoles 3SU18..-3 | $3 Z X 1012-0 S U 18-3 N A 1$ |
| SIRIUS AS-Interface Module (Base Element) 3SU14..-.E | $3 Z X 1012-0 S U 14-1 E A 1$ |
| SIRIUS Electronic Module for ID Key-Operated Switches 3SU14..-.G | $3 Z X 1012-0 S U 14-1 G A 1$ |
| SIRIUS Sensor Switches | 3ZX1012-0SU12-1SA1 |

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### 1.7 Siemens Industry Online Support

## Information and Service

In Siemens Industry Online Support, you can obtain up-to-date information from our global support database quickly and simply. To accompany our products and systems, we offer a wealth of information and services that provide support in every phase of the lifecycle of your machine or plant - from planning and implementation, through commissioning, up to maintenance and modernization:

- Product support
- Application examples
- Services
- Forum
- mySupport

Link: Siemens Industry Online Support (https://support.industry.siemens.com/cs/de/en)

## Product support

You will find here all the information and comprehensive know-how covering all aspects of your product:

- FAQs

Our answers to frequently asked questions.

- Manuals/operating instructions

Read online or download, available as PDF or individually configurable.

- Certificates

Clearly sorted according to approving authority, type and country.

- Characteristic curves

For support in planning and configuring your system.

- Product announcements

The latest information and news concerning our products.

## - Downloads

You can find here updates, service packs, HSPs and much more for your product.

- Application examples

Function blocks, background and system descriptions, performance statements, demonstration systems, and application examples, clearly explained and represented.

- Technical data

Technical product data for support in planning and implementing your project.
Link: Product support (https://support.industry.siemens.com/cs/ww/en/ps)

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With "mySupport", your personal workspace, you get the very best out of your Industry Online Support. Everything to enable you to find the right information every time.

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### 1.8 Configurator for SIRIUS ACT command devices and signaling devices

Various configurators are available online to assist you during the configuration process.
The configurator for SIRIUS ACT pushbuttons and signaling devices and matching accessories is an easy-to-use selection and configuration tool. You can select the individual components and plan your system in accordance with your specific requirements. You can save your selection, export it as a text file or order it directly.
The configurator automatically compiles a document list of the information available in Service\&Support for every component. You can use it as the basis for putting together your system documentation.

A further aid to configuring your customized device is the Configuration Identification Number (CIN).

When you finish configuring your customized device, you receive a CIN. With this number, you can retrieve and order your configuration from anywhere in the world. The CINs are also saved with the user login and can be selected on your Start page.
Link: Configurator (https://www.siemens.com/sirius-act/configurator)

### 1.9 Advantages through energy efficiency

## Advantages through energy efficiency

Siemens offers you a unique portfolio for efficient energy management in industry - a process that serves to optimally shape your energy requirement. Operational energy management is subdivided into three phases:

- Identifying
- Evaluating
- Realizing

Siemens supports you with suitable hardware and software solutions in every phase of a project.
More information can be found on the Internet (http://www.automation.siemens.com/mcms/industrial-controls/en/energy-efficiency).

The 3SU1 pushbuttons and signaling devices contribute to energy efficiency throughout the plant as follows:

- Low power consumption as a result of LED technology
- Long service life


Image 1-1 Overview of the energy management process

1. 10 Recycling and disposal

### 1.10 Recycling and disposal

## Recycling and disposal

These devices can be recycled thanks to their low pollutant content. For environmentallyfriendly recycling and disposal of your electronic waste, please contact a company certified for the disposal of electronic waste.

## Safety notes

## ! DANGER

Hazardous voltage. Will cause death or serious injury.

- Turn off and lock out all power supplying this device before working on this device.
- Secure against switching on again.
- Verify that the equipment is not live.
- Ground and short-circuit.
- Erect barriers around or cover adjacent live parts.


## DANGER

Hazardous voltage. Will cause death or serious injury.
Qualified Personnel.
The equipment / system may only be commissioned and operated by qualified personnel. For the purpose of the safety information in this documentation, a "qualified person" is someone who is authorized to energize, ground, and tag equipment, systems, and circuits in accordance with established safety procedures.

## CaUtion

Safe equipment operation
Safe operation of the equipment is only ensured with certified components.

## NOTICE

## Grounding

Grounding is required for voltages higher than safety extra-low voltage!

## NOTICE

## Radio interference

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

## Note

No liability shall be accepted for any damage or injuries sustained as a result of improper use or incorrect dismantling of the equipment (i.e. opening of components other than those specifically designed to be opened by the user). Any improper handling of the equipment can result in very serious physical injury.

## Note

Lamps and LED modules are designed solely for use with SIRIUS pushbuttons and signaling devices. They are not suitable for use in domestic lighting systems.

## Note

Always make sure that the components (particularly those with a holder or actuator) are securely installed (free from vibration). Mount them on a support of at least 1 mm thickness.

## Note

The 3SU1 devices described in this manual may only be installed at temperatures of $>-5^{\circ} \mathrm{C}$.

### 2.1 Intended use

## WARNING

Hazardous Voltage
Can Cause Death, Serious Injury, or Property Damage.
Intended use of hardware products
This equipment is only allowed to be used for the applications described in the catalog and in the technical description, and only in conjunction with non-Siemens equipment and components recommended by Siemens.
Correct transport, storage, installation and assembly, as well as careful operation and maintenance, are required to ensure that the product operates safely and without faults.
EU note: Commissioning is absolutely prohibited until it has been ensured that the machine in which the component described here is to be installed complies with the stipulations of the Directive 2006/42/EC.

## WARNING

## Hazardous Voltage

Can Cause Death, Serious Injury, or Damage to Property. Carry out function test of the system

To ensure the safety of the system, any changes to it or any replacement of defective components must be followed by a thorough and successfully completed function test of the system.

A complete function test consists of the following tests:

- Configuration test (test of the configuration)
- System test (wiring test of the connected sensors and actuators)


### 2.2 Current information about operational safety

## Important note for maintaining operational safety of your system

AWARNING
Hazardous Voltage
Can Cause Death, Serious Injury, or Property Damage.
Please take note of our latest information.
Systems with safety-related characteristics are subject to special operational safety
requirements on the part of the operator. The supplier is also obliged to comply with special
product monitoring measures. For this reason, we publish a special newsletter containing
information on product developments and features that are (or could be) relevant to
operation of safety-related systems. By subscribing to the appropriate newsletter, you will
ensure that you are always up-to-date and able to make changes to your system, when
necessary:
SIEMENS newsletter http://www.industry.siemens.com/newsletter)
Request the following newsletter under "Products and Solutions":

- Industrial Controls - SIRIUS News (en)
- Safety Integrated Newsletter


### 2.3 ATEX for intrinsically safe circuits

The intrinsic safety of a circuit is achieved by limiting the current and voltage. This property limits the "intrinsically safe" protection type to circuits with relatively low power. Suitable applications are found, for example, in measuring and control engineering.

The purpose of pushbuttons and signaling devices is to reliably signal conditions (for example, sources of faults or interference factors) on machinery and installations so that the affected equipment can be controlled and brought into a safe state if a hazardous situation develops.

From our portfolio of pushbuttons and signaling devices, non-illuminated actuators, contact modules, empty enclosures and special accessories (see table below) are categorized in accordance with the ATEX Directive 94/9/EC as simple electrical equipment and are thus suitable for use in intrinsically safe circuits.

The devices listed in the overview below are assigned to Temperature Class T4.

3SU1 pushbuttons and signaling devices

|  | Type | Version | Basis for approval |
| :---: | :---: | :---: | :---: |
| Actuating and signaling elements | $\begin{aligned} & 3 S U 10.0-\ldots . .-\ldots . \\ & 3 S U 10.2-\ldots . . . . . . \\ & 3 S U 11.0-\ldots . . . . . \\ & 3 S U 12.0-\ldots . . . . . . \end{aligned}$ | Plastic or metal version | Simple electrical equipment according to DIN EN 60079-11 |
| Contact modules | 3SU1400-.AA10-..A0 | Spring-loaded terminals or screw terminals |  |
| Holders | 3SU1500-0AA10-0AA0 3SU1550-0AA10-0AA0 | Plastic or metal version |  |
| Empty enclosure | 3SU18..-.AA..-... | Plastic or metal version |  |
| Accessories | $\begin{aligned} & \text { 3SU19.0-0A...-0.. } 0 \\ & \text { 3SU19.0-0B...-0.. } 0 \end{aligned}$ |  |  |

## Setting up an intrinsically safe area

To avoid closing and opening sparks, the capacitance and inductance of an intrinsically safe circuit are also limited depending on the maximum voltage and current values. No sparks and no thermal effects that could result in the ignition of a potentially explosive atmosphere can occur either in standard operation or in the event of a fault. For this reason, intrinsically safe circuits may be connected or disconnected under power during operation because safety is ensured even in the event of short-circuit or interruption.

The circuit principle of the intrinsically safe protection type is shown in the diagram below:

(1) Hazardous area
(2) Safe area
(3) Spark energy limited
(4) Temperature rise limited
$\mathrm{U}_{0}$ Max. output voltage
Io Max. output current
$\mathrm{R}_{\mathrm{i}} \quad$ Internal resistance
$\mathrm{L}_{\mathrm{i}} \quad$ Internal inductance
$\mathrm{C}_{\mathrm{i}}$ Internal capacitance
F Fuse
D Z diode
PA Equipotential bonding
$\mathrm{Ra}_{\mathrm{a}}$ External resistance
La External inductance
Ca External capacitance

### 2.4 Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. With this in mind, Siemens' products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

For the secure operation of Siemens products and solutions, it is necessary to take suitable preventive action (e.g. cell protection concept) and integrate each component into a holistic, state-of-the-art industrial security concept. Third-party products that may be in use should also be considered. You can find more information about industrial security under:
http://www.siemens.com/industrialsecurity
To stay informed about product updates as they occur, sign up for a product-specific newsletter. You can find additional information on this at: http://support.automation.siemens.com.

## Overview

### 3.1 Overview of the device range

## 3SU1 pushbuttons and signaling devices

|  | SIRIUS ACT pushbuttons and signaling devices |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | 3SU10 actuating and signaling elements 3SU11 complete units ${ }^{1)}$ 3SU12 compact units ${ }^{1)}$ | 3SU14 modules without holder 3SU15 modules with holder | 3SU18 enclosures | 3SU18..-3 two-hand operation consoles |
| Description | - Pushbuttons <br> - Mushroom pushbuttons <br> - EMERGENCY STOP mushroom pushbuttons <br> - Sensor switches <br> - Selector switches <br> - Twin pushbuttons <br> - Key-operated switches <br> - Indicator lights <br> - Illuminated pushbuttons <br> - ID key-operated switches <br> - Stop pushbuttons <br> - Toggle switches <br> - Coordinate switches <br> - Potentiometers | - Contact modules <br> - LED modules <br> - LED test modules <br> - AS-Interface module (front plate mounting) <br> - AS-Interface module (base mounting) <br> - IO-Link | - Unequipped enclosures with $1,2,3,4$ or 6 command points <br> - EMERGENCY STOP enclosures <br> - Enclosures with 1, 2 or 3 command points pre-equipped <br> - Customized enclosures on request | - Two-hand operation consoles including EMERGENCY STOP and two mushroom pushbuttons <br> - Additional command devices can be mounted |
| Version | Front ring / Collar: <br> - Metal / Metal <br> - Metal, matte / Metal <br> - Metal, matte / Plastic <br> - Plastic / Plastic | - Plastic, black | - Plastic <br> - Metal | - Plastic <br> - Metal |

3.1 Overview of the device range

|  | SIRIUS ACT pushbuttons and signaling devices |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | 3SU10 actuating and signaling elements 3SU11 complete units ${ }^{1)}$ 3SU12 compact units ${ }^{1)}$ | 3SU14 modules without holder 3SU15 modules with holder | 3SU18 enclosures | 3SU18..-3 two-hand operation consoles |
| Installation / Connection | - One-man installation without special tools <br> - Modular equipping of the actuating elements with contact and/or LED modules <br> - Screw terminal, springloaded terminal, solder pin connection | - Front plate mounting <br> - Base mounting <br> - Mounting on printed-circuit boards <br> - Screw terminals <br> - Spring-loaded terminals <br> - Solder pin connections <br> - Push-in for AS-I <br> - Insulation piercing method for AS-I | - Vertical / Horizontal <br> - AS-I adapter M12 <br> - AS-I cable gland with insulation piercing method <br> - Circular cable glands <br> - Circular cable glands with AS-I cable entry <br> - Enclosure cover monitoring | - Can be mounted on a wall, stand, or directly within the system |
| Degree of protection | - IP66 / IP67 / IP692) (plastic / metal) | Enclosure: IP40 Connecting terminals: IP20 | IP66 / IP67 / IP69 (plastic / metal) | IP66 <br> (plastic / metal) |
| Approval | - UL <br> - CSA <br> - CE <br> - CCC <br> - VDE <br> - NEMA: $1,3,3 R, 4,4 x, 12$ | - UL, CSA, CE <br> - c UL us, CE, CTick, KCC, TÜV, CCC | - UL <br> - CSA <br> - CE <br> - CCC <br> - NEMA: 1, 3, 3R, 4 , $4 \mathrm{x}, 12$ | - UL <br> - CSA <br> - CE <br> - CCC <br> - NEMA: 1, 3, 3R, 4, 4x, 12, 13 |


|  | SIRIUS ACT pushbuttons and signaling devices |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | 3SU10 actuating and signaling elements 3SU11 complete units ${ }^{1)}$ 3SU12 compact units ${ }^{1)}$ | 3SU14 modules without holder 3SU15 modules with holder | $3 \mathrm{SU18}$ enclosures | 3SU18..-3 two-hand operation consoles |
| Relevant standards | - IEC/EN 60947-1 <br> - IEC/EN 60947-5-1 <br> - IEC/EN 60947-5-5 <br> - EN ISO 13850 | - IEC/EN 60947-1 <br> - IEC/EN 60947-5-1 <br> - IEC/EN 61508 <br> - EN ISO 13849-1 | - IEC/EN 60947-5-1 <br> - IEC/EN 60947-5-5 <br> - EN ISO 13850 <br> - IEC/EN 60947-1 <br> - EN ISO 13849-1 | - IEC/EN 60947-5-1 <br> - IEC/EN 60947-5-5 <br> - IEC/EN 61508 <br> - EN ISO 13850 |
| AS-Interface | Fast and easy connection to of direct connection of EME via standard ASi bus with safety-related communicatio | S-Interface. Possibility ENCY STOP devices | - Enclosure with integrated ASInterface <br> - Standard command devices and EMERGENCY STOP can be mounted inside an enclosure. <br> - Modular structure | Metal consoles can be retrofitted with safe ASInterface. |
| Safety | EMERGENCY STOP mushroom pushbuttons for shutdown of systems in an emergency situation The devices can be used up to SIL CL 3 according to IEC 62061 and PL e Cat. 4 according to ISO 13849-1. | Contact module with installation monitoring | EMERGENCY STOP function with latching according to ISO 13850 | EMERGENCY STOP function with latching according to ISO 13850 |

3.1 Overview of the device range

|  | SIRIUS ACT pushbuttons and signaling devices |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | 3SU10 actuating and signaling elements 3SU11 complete units ${ }^{1)}$ 3SU12 compact units ${ }^{1)}$ | 3SU14 modules without holder 3SU15 modules with holder | $3 \mathrm{SU18}$ enclosures | 3SU18..-3 two-hand operation consoles |
| Options | - Link to the configurator for customized enclosures: Configurator (http://www.siemens.com/sirius-act/configurator) |  |  |  |
|  | - Do-it-yourself labeling using Label Designer. <br> Label Designer (http://www.siemens.com/sirius-label-designer) (labels for self-inscription) |  |  |  |

${ }^{1)}$ Holder included in the scope of supply
2) IPX9 - Protection against high pressure and high jet-water temperatures

- a) IPX9 according to EN 60529 The IPX9 test as defined by EN 60529 is carried out under standardized laboratory conditions and certifies resistance of equipment to water penetration during cleaning with high-pressure water.

According to the standard, the IPX9 test must be conducted with the following parameters:

- Water temperature approximately $80^{\circ} \mathrm{C}$
- Pressure approximately 80 bar
- Spray angles $0^{\circ}, 30^{\circ}, 60^{\circ}, 90^{\circ}$, spraying time approximately 30 seconds
- Distance between spray nozzle and equipment approximately 125 mm
- b) High-pressure cleaners in practice
- Laboratory tests carried out in accordance with a standard can generally only approximate a complex reality.
- In order to preserve the service life of the devices, therefore, it is recommended that a significantly larger distance than that specified in the standard for one-time loading is maintained between the spray nozzle and the equipment.


### 3.2 Application areas

## Enclosures

When controllers are at a physically separate location, actuating elements and indicator lights in enclosures serve as manual control devices. Their enclosures are equipped with the actuating elements and the round lens assemblies with a nominal diameter of 22.5 mm .

## EMERGENCY STOP mushroom pushbuttons

- Safe and fast stopping of systems and machines in dangerous situations


## Two-hand operation consoles

The two-hand operation consoles are required for use with machines and systems that have hazardous areas, in order to direct both hands of the operator to one position.

The two-hand operation consoles are used for the following safety requirements:

- Safety at presses and punching machines
- Safety at printing presses
- Safety at paper processing machines
- Safety in the chemical industry
- Safety in the rubber and plastics industries


### 3.3 Media resistance

The devices are suitable for use in any climate (KTW 24) and designed for standard industrial applications.

The use of the resistant material polyamide as standard gives the SIRIUS ACT devices improved resistance to oils and detergents. Most actuating and indicating elements can still be labeled customer-specifically by laser.

## $3.4 \quad$ Failure rates

Using the B10 value, the failure rate of the command and signaling devices is calculated according to the following formula:
$\lambda=[0.1 \times \mathrm{C} / \mathrm{B} 10]$
$\lambda D=[0.1 \times \mathrm{C} / \mathrm{B} 10 \mathrm{~d}]$
$\lambda=$ Total failure rate of a command and signaling device
$\lambda D=$ Failure rate of dangerous failures
$C=$ Operating cycle per hour
B10d $=$ B10 / Proportion of dangerous failures

## SN 31920 standard

The B10 value for devices subject to wear is expressed in the number of operating cycles. This is the number of operating cycles at which during a lifetime test, $10 \%$ of the test objects have failed (or: number of operating cycles after which $10 \%$ of the devices have failed).

## Note

Refer to the respective data sheet for the B10 value and the proportion of dangerous failures.

## 3SU1 range of devices

4.1 Types of 3SU1 actuating elements and signaling elements
4.1.1 Design of a 3SU1 actuating or signaling element

(1) Actuator (in this case: pushbutton)
(2) Front ring
(3) Seal
(4) Collar
4.1 Types of 3SU1 actuating elements and signaling elements

### 4.1.2 3 SU10 actuating and signaling elements

The 3SU10 actuating and signaling elements are available in the following designs:

- Front ring and collar in plastic
- Front ring in metal matte and collar in plastic
- Front ring and collar in metal
- Front ring in metal matte and collar in metal

| Front ring material | Collar material | Examples |
| :--- | :--- | :--- |
| Plastic | Plastic |  |
| Metal, matte | Plastic |  |
| Metal |  |  |

### 4.1.3 3 SU15 holders

Holders are available in plastic and metal versions.
A holder has three slots as standard. Holders with four slots are available for the actuating elements, coordinate switches and selector switches with four switch positions.

| Material | Examples |
| :--- | :--- |
| Plastic |  |
|  |  |

### 4.1.4 3 SU14 modules

The contact modules are equipped with a slow-action contact ( 1 NO contact or 1 NC contact). These ensure a high contact stability even with small voltages and currents (e.g., $5 \mathrm{~V} / 1 \mathrm{~mA}$ ).


Image 4-1 Example: 3SU1400-2AA10-1BA0 contact module

## Connection system

Devices with the following connections are available:

- Screw terminals with open terminal points, captive screws, funnel-shaped cable entries and screwdriver guides
- Spring-loaded terminals for vibration-resistant connection
- Solder pin connection ( $0.8 \mathrm{~mm} \times 0.8 \mathrm{~mm}$ solder pins)


### 4.1.5 Design of a 3SU10 and 3SU11 command point

A modular command point consists of the following elements:

- An actuating or signaling element in front of the control panel
- A holder for securing behind the control panel
- Up to three contact modules in a row and/or two contact modules and one LED module behind the control panel
- A maximum of $3 \times 2$ (1-pole) contact modules can be stacked with a 3-slot holder
- A maximum of $4 \times 2$ (1-pole) contact modules can be stacked with a 4-slot holder
- A comprehensive range of accessories for labeling


## Stackability

With SIRIUS ACT, the modules are mounted on the holder without any further accessories. The modules can be stacked without needing to use a tool (max. $2 \times 1$-pole modules behind one other).

The following picture is an example of the mounting and stacking of the modules on a holder.


A
Holder
B1 / B2
C
Contact module 1-pole
LED module
Contact module 2-pole

(1) Actuating element (here: EMERGENCY STOP mushroom pushbutton)
(2) Holder
(3) Module 1
(4) Module 2

## $4.2 \quad$ Holders

The holders are used to secure the actuating or signaling elements and the contact module or LED module. The holders are designed for mounting in front plates with a plate thickness of 1 to 6 mm .

When delivered, the holders are set to a control panel thickness of approximately 4.5 mm . They are placed in the $\uparrow$ arrow direction from the rear onto the actuating and signaling elements. The fastening screw is located at the top. If they are to be mounted on a control panel that is $>4.5 \mathrm{~mm}$ thick, you must adjust the fastening screw of the holder before you install the holder.

## Note

Note the maximum permissible front plate thickness!
When label holders, protective caps or similar accessories are used, it is important to remember that the maximum permissible front plate thickness must be reduced by the plate thickness of the relevant accessory.

## Tool

For securing, we recommend a size 2 screwdriver (cross-tip DIN ISO 87641PZD1 or flathead DIN ISO $2380-1$ A/B $1 \times 4.5$ ). The tightening torque is 1.0 to 1.2 Nm .

## Grounding of the front plate

If you mount a metal actuator on a metal front plate using a metal holder, the actuator is grounded via the tip of the fastening screw. This enables grounding via the connection on the front plate.

If the metal holder is to be used several times, grounding via the grounding stud is recommended!

(1) Hole for grounding stud (accessory: 3SU1950-0KK80-0AA0)
(2) Fastening screw

## NOTICE

Mounting in front plates / enclosures made of electrically non-conductive material
If you use an enclosure made of plastic, you must loop a grounding cable © $\mathbb{1}$ through the metal holders, and connect it to ground by means of a grounding stud (3SU1950-0KK80OAAO).

## CAUTION

## Risk of injury

To ensure secure connection of the grounding cable, the grounding studs (3SU1950-OKK80-0AA0) must be fastened with ring cable lugs.

The grounding stud is not included in the scope of supply and must be ordered separately. For information, please refer to Chapter "Accessories (Page 331)".

## Note

The operator is responsible for checking that the protective measure (grounding) is effective.

## Procedure



1. Attach the holder (b) to the actuating element from behind.
2. Tighten the holder screw (c).
3. Secure the grounding cable (a) with ring cable lugs to the grounding stud (3SU1950-OKK80-0AA0), tightening torque: $0.8-1.0 \mathrm{Nm}$.

## Module slot position

Holders made of metal or plastic and with 3 or 4 slots for contact or LED modules are available.

The module slot positions (contact or LED modules) are indicated on top of the holder. The large digits designate the modules that are snapped directly onto the holder. The small digits indicate the position of stacked modules.


Image 4-2 Marking of slot positions on the 3-slot holder


Image 4-3 Marking of slot positions on the 4-slot holder

Assignment of the holders to the actuating and signaling elements
The following assumptions apply when assigning holders to the actuating elements and signaling elements:

| Front ring material | Collar material | Bore diameter | Holder (plastic) | Holder (metal) |
| :--- | :--- | :---: | :---: | :---: |
| Plastic | Plastic | 22.5 mm | $\checkmark$ | $\checkmark$ |
| Metal, matte | Plastic | 22.5 mm | $\checkmark$ | $\checkmark$ |
| Metal | Metal | 22.5 mm | --- | $\checkmark$ |
| Metal, matte | Metal | 30.5 mm | --- | $\checkmark$ |

## Overview of holders without modules

| Material | 3-slot holder | 4-slot holder |
| :---: | :---: | :---: |
|  | (http://mall.industry.siemens.com/mall/en/en/ | (http://mall.industry.siemens.com/mall/en/en/Catalog/ |
|  | Catalog/Products/10221520) | Products/10221520) |
| Plastic |  |  |
|  | 3SU1500-0AA10-0AA0 | 3SU1500-0BA10-0AA0 |
| Metal |  |  |
|  | 3SU1550-0AA10-0AA0 | 3SU1550-0BA10-0AA0 |

You can find information on the pre-assembled holders with modules in Chapter "Holders with modules (Page 175)".

### 4.3 3SU10 devices for use on 3-slot holder

### 4.3.1 $\quad 22.5 \mathrm{~mm}$ pushbuttons

Pushbuttons are used to actuate contact modules and allow short-time contact or permanent closing / opening of a contact element. The buttons can be replaced from the front by the user.

Pushbuttons are available in different variants according to the following features:

- Height of button
- Height of front ring
- Collar and front ring material
- Colors of the buttons
- Switching function: momentary contact variants and latching variants

For further information, refer to Chapters "Mounting (Page 97)", "22.5 mm pushbuttons with standard inscription (Page 89)" and "Accessories (Page 293)"

|  | Pushbuttons |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |

## Plastic / Metal, matte

Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226610)

| - Black | 3SU1030-0Ax10-0AA0 | 3SU1030-0Bx10-0AA0 | 3SU1030-0Cx10-0AA0 | - |
| :---: | :---: | :---: | :---: | :---: |
| - Red | 3SU1030-0Ax20-0AA0 | 3SU1030-0Bx20-0AA0 | 3SU1030-0Cx20-0AA0 | - |
| - Yellow | 3SU1030-0Ax30-0AA0 | 3SU1030-0Bx30-0AA0 | 3SU1030-0Cx30-0AA0 | - |
| - Green | 3SU1030-0Ax40-0AA0 | 3SU1030-0Bx40-0AA0 | 3SU1030-0Cx40-0AA0 | - |
| - Blue | 3SU1030-0Ax50-0AA0 | 3SU1030-0Bx50-0AA0 | 3 UU1030-0Cx50-0AA0 | - |
| - White | 3SU1030-0Ax60-0AA0 | 3SU1030-0Bx60-0AA0 | 3SU1030-0Cx60-0AA0 | - |
| - Clear | 3SU1030-0AB70-0AA0 | - | - | - |

Metal / Metal
Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221476)

| - Black | 3SU1050-0Ax10-0AA0 | 3SU1050-0Bx10-0AA0 | 3SU1050-0Cx10-0AA0 | - |
| :---: | :---: | :---: | :---: | :---: |
| - Red | 3SU1050-0Ax20-0AA0 | 3SU1050-0Bx20-0AA0 | 3 UU1050-0Cx20-0AA0 | - |
| - Yellow | 3SU1050-0Ax30-0AA0 | 3SU1050-0Bx30-0AA0 | 3 UU1050-0Cx30-0AA0 | - |
| - Green | 3SU1050-0Ax40-0AA0 | 3SU1050-0Bx40-0AA0 | 3SU1050-0Cx40-0AA0 | - |
| - Blue | 3SU1050-0Ax50-0AA0 | 3SU1050-0Bx50-0AA0 | 3SU1050-0Cx50-0AA0 | - |
| - White | 3SU1050-0Ax60-0AA0 | 3 SU1050-0Bx60-0AA0 | 3SU1050-0Cx60-0AA0 | - |
| - Clear | 3SU1050-0AB70-0AA0 | - | - | - |

$x: A=$ latching (push to unlatch)
$x: B=$ momentary contact

## Note

Not all combinations listed in the tables are available. In the case of special versions, please consult Technical Assistance, or initiate a PI1000 request.

### 4.3.2 $\quad 22.5 \mathrm{~mm}$ illuminated pushbuttons

Illuminated pushbuttons are used to actuate contact modules and can also function as display devices by means of an LED module. A variant with a fixed pushbutton can be used as an indicator light. The buttons can be replaced from the front by the user.

The illuminated pushbuttons are available in different variants according to the following features:

- Height of button
- Collar and front ring material
- Colors of the buttons
- Switching function: momentary contact variants and latching variants.
- Illumination

For further information, refer to Chapters "Mounting (Page 97)" and "Accessories (Page 293)"

|  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |

## Plastic / Metal, matte

Siemens Industry Mall (https://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221475)

| - Amber | $3 S U 1031-0 A x 00-0 A A 0$ | $3 S U 1031-0 B x 00-0 A A 0$ | - | - |
| :--- | :--- | :--- | :--- | :--- | :--- |
| - Red | $3 S U 1031-0 A x 20-0 A A 0$ | $3 S U 1031-0 B x 20-0 A A 0$ | $3 S U 1031-0 B B 20-0 A A 0$ | - |
| - Yellow | $3 S U 1031-0 A x 30-0 A A 0$ | $3 S U 1031-0 B x 30-0 A A 0$ | $3 S U 1031-0 B B 30-0 A A 0$ | - |
| - Green | $3 S U 1031-0 A x 40-0 A A 0$ | $3 S U 1031-0 B x 40-0 A A 0$ | $3 S U 1031-0 B B 40-0 A A 0$ | - |
| - Blue | $3 S U 1031-0 A x 50-0 A A 0$ | $3 S U 1031-0 B x 50-0 A A 0$ | $3 S U 1031-0 B B 50-0 A A 0$ | - |
| - White | $3 S U 1031-0 A x 60-0 A A 0$ | $3 S U 1031-0 B x 60-0 A A 0$ | - | - |
| - Clear | $3 S U 1031-0 A x 70-0 A A 0$ | $3 S U 1031-0 B x 70-0 A A 0$ | $3 S U 1031-0 B B 70-0 A A 0$ | - |

## Metal / Metal

Siemens Industry Mall (https://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221475)

| - | Amber | $3 S U 1051-0 A x 00-0 A A 0$ | $3 S U 1051-0 B x 00-0 A A 0$ | - | - |
| :--- | :--- | :--- | :--- | :--- | :--- |
| - Red | $3 S U 1051-0 A x 20-0 A A 0$ | $3 S U 1051-0 B x 20-0 A A 0$ | $3 S U 1051-0 B B 20-0 A A 0$ | - |  |
| - Yellow | $3 S U 1051-0 A x 30-0 A A 0$ | $3 S U 1051-0 B x 30-0 A A 0$ | $3 S U 1051-0 B B 30-0 A A 0$ | - |  |
| - Green | $3 S U 1051-0 A x 40-0 A A 0$ | $3 S U 1051-0 B x 40-0 A A 0$ | $3 S U 1051-0 B B 40-0 A A 0$ | - |  |
| - Blue | $3 S U 1051-0 A x 50-0 A A 0$ | $3 S U 1051-0 B x 50-0 A A 0$ | $3 S U 1051-0 B B 50-0 A A 0$ | - |  |
| - White | $3 S U 1051-0 A x 60-0 A A 0$ | $3 S U 1051-0 B x 60-0 A A 0$ | - | - |  |
| - Clear | $3 S U 1051-0 A x 70-0 A A 0$ | $3 S U 1051-0 B x 70-0 A A 0$ | $3 S U 1051-0 B B 70-0 A A 0$ | - |  |

$x: A=$ latching (push to unlatch)
$x: B=$ momentary contact

## Note

Not all combinations listed in the table are available. In the case of special versions, please consult Technical Assistance, or initiate a PI1000 request.

### 4.3 3SU10 devices for use on 3-slot holder

### 4.3.3 $\quad 30.5 \mathrm{~mm}$ pushbuttons

Pushbuttons and illuminated pushbuttons in the 30.5 mm diameter size are intended for flat mounting. The series is available in metal and metal matte versions. The 30.5 mm pushbuttons are suitable for installation on front plates with a maximum thickness of 4 mm . You must use the metal holder (3SU1550-0AA10-0AAO) for mounting. In addition, the adapter (3SU1950-OKJ80-0AAO) for actuators and indicators for flat mounting must be mounted between the front plate and the holder. The adapter is included in the scope of delivery, but can also be ordered as a separate item.

## Pushbuttons

|  | Collar / Front ring material | Article number |
| :---: | :---: | :---: |
|  | Metal / Metal, matte <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226911) |  |
|  | - Black | 3SU1060-0Jx10-0AA0 |
|  | - Red | 3SU1060-0Jx20-0AA0 |
|  | - Yellow | 3SU1060-0Jx30-0AA0 |
|  | - Green | 3SU1060-0Jx40-0AA0 |
|  | - Blue | 3SU1060-0Jx50-0AA0 |
|  | - White | 3SU1060-0Jx60-0AA0 |

$\mathrm{x}: \mathrm{A}=$ latching (push to unlatch)
$\mathrm{x}: \mathrm{B}=$ momentary contact

## Illuminated pushbuttons

| Typical diagram | Collar / Front ring material | Article number |
| :---: | :---: | :---: |
|  | Metal / Metal, matte <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10228067) |  |
|  | - Red | 3SU1061-0Jx20-0AA0 |
|  | - Yellow | 3SU1061-0Jx30-0AA0 |
|  | - Green | 3SU1061-0Jx40-0AA0 |
|  | - Blue | 3SU1061-0Jx50-0AA0 |
|  | - Clear | 3SU1061-0Jx70-0AA0 |

$\mathrm{x}: \mathrm{A}=$ latching (push to unlatch)
$x: B=$ momentary contact

## Note

Not all combinations listed in the tables are available. In the case of special versions, please consult Technical Assistance, or initiate a PI1000 request.

### 4.3.4 Twin pushbuttons

Twin pushbuttons are used to actuate contact modules and can also function as display devices. Thanks to separate actuating surfaces, it is possible to switch up to 2 independent module positions separately using only one command point. The switching function of all versions of the twin pushbuttons is latching.

Twin pushbuttons are available in different variants according to the following features:

- Height of button (flat or raised) with 2 different button combinations:
- Flat / flat
- Flat / raised
- Collar and front ring material
- Colors of the buttons

Twin pushbuttons are supplied as standard with pressure plates ①


The diagram above is an example of the pressure plates on a selector switch. The procedure for a twin pushbutton corresponds to that for a selector switch.

Each pressure plate can be individually removed and reinstalled.
The twin pushbuttons are designed in such a way that, by using an LED module, the center surface of the twin pushbutton can be illuminated.

The pressure plates must be removed before the LED module is installed.
In the case of illuminated twin pushbuttons, this step is not necessary. They are already prepared for illumination at the factory.
For further information, refer to Chapters "Mounting (Page 97)" and "Twin pushbuttons with standard inscription (Page 90)"

With standard installation (arrow on collar at the top), the upper button always has the first specified color and the lower button the second specified color. The same principle is used with the button heights. The first specified height refers to the top button, and the second specified height to the lower button.

Example: 3SU1051-3BB42-0AA0
Top button = green and flat
Lower button = red and raised

### 4.3 3SU10 devices for use on 3-slot holder

|  |  | Twin pushbuttons |
| :--- | :--- | :--- |
|  |  |  | Typical diagraminated twin pushbuttons

$x: A=$ twin pushbutton with flat / flat button
$x: B=$ twin pushbutton with flat / raised button

## Note

Not all combinations listed in the table are available. In the case of special versions, please consult Technical Assistance, or initiate a PI1000 request.

### 4.3.5 Mushroom pushbuttons

Mushroom pushbuttons are used to actuate contact modules. Their large, easily accessible button surface makes them easy to operate with the whole palm of the hand. By pressing or pulling these buttons, it is possible to generate up to 3 signals with just a single device.
They are available with actuators in diameter $30 \mathrm{~mm}, 40 \mathrm{~mm}$ or 60 mm .
Mushroom pushbuttons are available in different variants according to the following features:

- Collar and front ring material
- Color of actuators
- Switching functions: latching / momentary contact
- Switch positions 2 (all mushroom pushbuttons) or 3 positions (only mushroom pushbuttons in diameter 40 mm )
For further information, refer to Chapter "Mounting (Page 97)".


### 4.3 3SU10 devices for use on 3-slot holder

## Overview of mushroom pushbuttons

|  |  | Diameter 30 mm |  |
| :---: | :---: | :---: | :---: |
|  |  | Latching (pull to unlatch) | Momentary contact |
| Collar / Front ring material | Switch positions | Article number |  |
| Plastic / Plastic |  |  |  |
| Siemens Industry Mall (http | mall.industry.siem | com/mall/en/en/Catalog | 1478) |
| - Black | 2-position | 3SU1000-1AA10-0AA0 | 3SU1000-1AD10-0AA0 |
| - Red | 2-position | 3SU1000-1AA20-0AA0 | 3SU1000-1AD20-0AA0 |
| - Yellow | 2-position | 3SU1000-1AA30-0AA0 | 3SU1000-1AD30-0AA0 |
| - Green | 2-position | - | 3SU1000-1AD40-0AA0 |

Plastic / Metal, matte
Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226614)

| - Black | 2-position | 3SU1030-1AA10-0AA0 | 3SU1030-1AD10-0AA0 |
| :--- | :--- | :--- | :--- |
| - Red | 2-position | 3SU1030-1AA20-0AA0 | 3SU1030-1AD20-0AA0 |
| - Yellow | 2-position | - | $3 S U 1030-1 A D 30-0 A A 0$ |
| - Green | 2-position | - | $3 S U 1030-1 A D 40-0 A A 0$ |

## Metal / Metal

Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221477)

| - Black | 2-position | 3SU1050-1AA10-0AA0 | 3SU1050-1AD10-0AA0 |
| :--- | :--- | :--- | :--- |
| - Red | 2-position | 3SU1050-1AA20-0AA0 | 3SU1050-1AD20-0AA0 |
| - Yellow | 2-position | - | $3 S U 1050-1 A D 30-0 A A 0$ |
| - Green | 2-position | - | $3 S U 1050-1 A D 40-0 A A 0$ |


|  |  | Diameter 40 mm |  |
| :---: | :---: | :---: | :---: |
|  |  | Latching (pull to unlatch) | Momentary contact |
| Collar / Front ring material | Switch positions | Article number |  |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221478) |  |  |  |
| - Black | 2-position | 3SU1000-1BA10-0AA0 | 3SU1000-1BD10-0AA0 |
| - Red | 2-position | 3SU1000-1BA20-0AA0 | 3SU1000-1BD20-0AA0 |
| - Yellow | 2-position | 3SU1000-1BA30-0AA0 | 3SU1000-1BD30-0AA0 |
| - Green | 2-position | 3SU1000-1BA40-0AA0 | 3SU1000-1BD40-0AA0 |
| Plastic / Metal, matte <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226614) |  |  |  |
| - Black | 2-position | 3SU1030-1BA10-0AA0 | 3SU1030-1BD10-0AA0 |
| - Red | 2-position | 3SU1030-1BA20-0AA0 | 3SU1030-1BD20-0AA0 |
| - Yellow | 2-position | 3SU1030-1BA30-0AA0 | 3SU1030-1BD30-0AA0 |
| - Green | 2-position | 3SU1030-1BA40-0AA0 | 3SU1030-1BD40-0AA0 |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221477) |  |  |  |
| - Black | 2-position | 3SU1050-1BA10-0AA0 | 3SU1050-1BD10-0AA0 |
|  | 3-position | 3SU1050-1EA20-0AA0 | 3SU1050-1ED10-0AA0 |
| - Red | 2-position | 3SU1050-1BA20-0AA0 | 3SU1050-1BD20-0AA0 |
|  | 3-position | 3SU1050-1EA20-0AA0 | 3SU1050-1ED20-0AA0 |
| - Yellow | 2-position | 3SU1050-1BA30-0AA0 | 3SU1050-1BD30-0AA0 |
| - Green | 2-position | 3SU1050-1BA40-0AA0 | 3SU1050-1BD40-0AA0 |

### 4.3 3SU10 devices for use on 3-slot holder

|  |  | Diameter 60 mm |  |
| :---: | :---: | :---: | :---: |
|  |  | Latching (pull to unlatch) | Momentary contact |
| Collar / Front ring material | Switch positions | Article number |  |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221478) |  |  |  |
| - Black | 2-position | 3SU1000-1CA10-0AA0 | 3SU1000-1CD10-0AA0 |
| - Red | 2-position | 3SU1000-1CA20-0AA0 | 3SU1000-1CD20-0AA0 |
| - Yellow | 2-position | - | 3SU1000-1CD30-0AA0 |
| - Green | 2-position | - | 3SU1000-1CD40-0AA0 |
| Plastic / Metal, matte <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221478) |  |  |  |
| - Black | 2-position | 3SU1030-1CA10-0AA0 | 3SU1030-1CD10-0AA0 |
| - Red | 2-position | 3SU1030-1CA20-0AA0 | 3SU1030-1CD20-0AA0 |
| - Yellow | 2-position | - | 3SU1030-1CD30-0AA0 |
| - Green | 2-position | - | 3SU1030-1CD40-0AA0 |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221477) |  |  |  |
| - Black | 2-position | 3SU1050-1CA10-0AA0 | 3SU1050-1CD10-0AA0 |
| - Red | 2-position | 3SU1050-1CA20-0AA0 | 3SU1050-1CD20-0AA0 |
| - Yellow | 2-position | - | 3SU1050-1CD30-0AA0 |
| - Green | 2-position | - | 3SU1050-1CD40-0AA0 |

### 4.3.6 Special variants of mushroom pushbuttons

These mushroom pushbuttons have a tamper-proof latching function
For further information, refer to Chapter "Mounting (Page 97)". Please also note the information (on equipping) in Chapter "3SU14 contact modules and LED modules (Page 147)".

Overview of special versions of mushroom pushbuttons

| Typical diagram |  |
| :---: | :---: |
| Collar / Front ring material | Article number |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221479) |  |
| - Black | 3SU1000-1HB10-0AA0 |
| - Blue | 3SU1000-1HB50-0AA0 |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221480) |  |
| - Black | 3SU1050-1HB10-0AA0 |
|  | 3SU1050-1HU10-0AA0 |
| - Yellow | 3SU1050-1HB30-0AA0 |

### 4.3.7 Illuminated mushroom pushbuttons

Illuminated mushroom pushbuttons are used to actuate contact modules and can also function as display devices by means of an LED module. Their large, easily accessible button surface makes them easy to operate with the whole palm of the hand. By pressing or pulling these buttons, it is possible to generate up to 3 signals with just a single device.

They are available with actuators in diameter $30 \mathrm{~mm}, 40 \mathrm{~mm}$ or 60 mm .
Illuminated pushbuttons are available in different variants according to the following features:

- Collar and front ring material
- Color of actuators
- Switching functions: latching / momentary contact
- Switch positions: 2 (all illuminated mushroom pushbuttons) or 3 positions (only illuminated mushroom pushbuttons in diameter 40 mm )
- Illumination

For further information, refer to Chapter "Mounting (Page 97)".

### 4.3 3SU10 devices for use on 3-slot holder

## Overview of illuminated mushroom pushbuttons

|  |  | Diameter 30 mm |  |
| :---: | :---: | :---: | :---: |
|  |  | Latching (pull to unlatch) | Momentary contact |
| Collar / Front ring material | Switch positions | Article number |  |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221478) |  |  |  |
| - Red | 2-position | 3SU1001-1AA20-0AA0 | 3SU1001-1AD20-0AA0 |
| - Yellow | 2-position | 3SU1001-1AA30-0AA0 | 3SU1001-1AD30-0AA0 |
| - Green | 2-position | 3SU1001-1AA40-0AA0 | 3SU1001-1AD40-0AA0 |
| - Blue | 2-position | 3SU1001-1AA50-0AA0 | 3SU1001-1AD50-0AA0 |
| - White | 2-position | 3SU1001-1AA60-0AA0 | 3SU1001-1AD60-0AA0 |
| - Clear | 2-position | - | 3SU1001-1AD70-0AA0 |

## Plastic / Metal, matte

Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226614)

| - Red | 2-position | 3SU1031-1AA20-0AA0 | 3SU1031-1AD20-0AA0 |
| :--- | :--- | :--- | :--- |
| - Yellow | 2-position | 3SU1031-1AA30-0AA0 | 3SU1031-1AD30-0AA0 |
| - Green | 2-position | 3SU1031-1AA40-0AA0 | 3SU1031-1AD40-0AA0 |
| - Blue | 2-position | 3SU1031-1AA50-0AA0 | 3SU1031-1AD50-0AA0 |
| - White | 2-position | 3SU1031-1AA60-0AA0 | 3SU1031-1AD60-0AA0 |
| - Clear | 2-position | - | 3SU1031-1AD70-0AA0 |

## Metal / Metal

Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221477)

| - Red | 2-position | 3SU1051-1AA20-0AA0 | 3SU1051-1AD20-0AA0 |
| :--- | :--- | :--- | :--- |
| - Yellow |  | 3SU1051-1AA30-0AA0 | 3SU1051-1AD30-0AA0 |
| - Green | 2-position | 3SU1051-1AA40-0AA0 | 3SU1051-1AD40-0AA0 |
| - Blue | 2-position | 3SU1051-1AA50-0AA0 | 3SU1051-1AD50-0AA0 |
| - White | 2-position | 3SU1051-1AA60-0AA0 | 3SU1051-1AD60-0AA0 |
| - Clear | 2-position | - | 3SU1051-1AD70-0AA0 |


|  |  | Diameter 40 mm |  |
| :---: | :---: | :---: | :---: |
|  |  | Latching (pull to unlatch) | Momentary contact |
| Collar / Front ring material | Switch positions | Article number |  |
| Plastic / Plastic <br> Siemens Industry Mall (http | mall.industry.siem | com/mall/en/en/Catalog | 1478) |
| - Red | 2-position | 3SU1001-1BA20-0AA0 | 3SU1001-1BD20-0AA0 |
| - Yellow | 2-position | 3SU1001-1BA30-0AA0 | 3SU1001-1BD30-0AA0 |
| - Green | 2-position | 3SU1001-1BA40-0AA0 | 3SU1001-1BD40-0AA0 |
| - Blue | 2-position | 3SU1001-1BA50-0AA0 | 3SU1001-1BD50-0AA0 |
| - White | 2-position | 3SU1001-1BA60-0AA0 | 3SU1001-1BD60-0AA0 |
| - Clear | 2-position | - | 3SU1001-1BD70-0AA0 |
| Plastic / Metal, matte <br> Siemens Industry Mall (http | all.industry.sie | com/mall/en/en/Catalo | 6614) |
| - Red | 2-position | 3SU1031-1BA20-0AA0 | 3SU1031-1BD20-0AA0 |
| - Yellow | 2-position | 3SU1031-1BA30-0AA0 | 3SU1031-1BD30-0AA0 |
| - Green | 2-position | 3SU1031-1BA40-0AA0 | 3SU1031-1BD40-0AA0 |
| - Blue | 2-position | 3SU1031-1BA50-0AA0 | 3SU1031-1BD50-0AA0 |
| - White | 2-position | 3SU1031-1BA60-0AA0 | 3SU1001-1BD60-0AA0 |
| - Clear | 2-position | - | 3SU1031-1BD70-0AA0 |
| Metal / Metal <br> Siemens Industry Mall (http | mall.industry.siem | s.com/mall/en/en/Catalog | 21477) |
| - Red | 2-position | 3SU1051-1BA20-0AA0 | 3SU1051-1BD20-0AA0 |
|  | 3-position | 3SU1051-1EA20-0AA0 | 3SU1051-1ED20-0AA0 |
| - Yellow |  | 3SU1051-1BA30-0AA0 | 3SU1051-1BD30-0AA0 |
| - Green | 2-position | 3SU1051-1BA40-0AA0 | 3SU1051-1BD40-0AA0 |
|  | 3-position | 3SU1051-1EA40-0AA0 | - |
| - Blue | 2-position | 3SU1051-1BA50-0AA0 | 3SU1051-1BD50-0AA0 |
| - White | 2-position | 3SU1051-1BA60-0AA0 | 3SU1051-1BD60-0AA0 |
|  | 3-position | - | 3SU1051-1ED60-0AA0 |
| - Clear | 2-position | - | 3SU1051-1BD70-0AA0 |


|  |  | Diameter 60 mm |  |
| :---: | :---: | :---: | :---: |
|  |  | Latching (pull to unlatch) | Momentary contact |
| Collar / Front ring material | Switch positions | Article number |  |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221478) |  |  |  |
|  |  |  |  |
| - Black | 2-position | 3SU1001-1CA10-0AA0 | 3SU1001-1CD10-0AA0 |
| - Red | 2-position | 3SU1001-1CA20-0AA0 | 3SU1001-1CD20-0AA0 |
| - Yellow | 2-position | - | 3SU1001-1CD30-0AA0 |
| - Green | 2-position | - | 3SU1001-1CD40-0AA0 |

Plastic / Metal, matte
Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226614)

| - Black | 2-position | 3SU1031-1CA10-0AA0 | 3SU1031-1CD10-0AA0 |
| :--- | :--- | :--- | :--- |
| - Red | 2-position | 3SU1031-1CA20-0AA0 | 3SU1031-1CD20-0AA0 |
| - Yellow | 2-position | - | 3SU1031-1CD30-0AA0 |
| - Green | 2-position | - | 3SU1031-1CD40-0AA0 |

Metal / Metal
Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221477)

| - Black | 2-position | 3SU1051-1CA10-0AA0 | 3SU1051-1CD10-0AA0 |
| :--- | :--- | :--- | :--- |
| - Red | 2-position | 3SU1051-1CA20-0AA0 | 3SU1051-1CD20-0AA0 |
| - Yellow | 2-position | - | 3SU1051-1CD30-0AA0 |
| - Green | 2-position | - | $3 S U 1051-1 C D 40-0 A A 0$ |

### 4.3.8 EMERGENCY STOP mushroom pushbuttons

EMERGENCY STOP mushroom pushbuttons are devices for actuating contact modules, and they are used in conjunction with a safety relay to bring a machine / plant to a safe state.

The EMERGENCY STOP mushroom pushbuttons are equipped with tamper protection (trigger action). The EMERGENCY STOP mushroom pushbutton does not latch without generating an EMERGENCY STOP signal. The EMERGENCY STOP signal is maintained until the EMERGENCY STOP device is reset (unlatched). All SIRIUS ACT EMERGENCY STOP mushroom pushbuttons comply with DIN EN ISO 13850.

These pushbuttons are operated by pressure applied by the whole palm of the hand. EMERGENCY STOP mushroom pushbuttons are available with actuators in diameter 30 $\mathrm{mm}, 40 \mathrm{~mm}$ or 60 mm .

EMERGENCY STOP mushroom pushbuttons are available in different variants according to the following features:

- Collar and front ring material
- Switching function: latching
- Illumination
- Rotate to unlatch
- Pull to unlatch
- Key-operated release (tamper-proof)

For further information refer to Chapter "Installation (Page 97)". Please also note the information (on equipping) in Chapter "3SU14 contact modules and LED modules (Page 147)".

Overview of EMERGENCY STOP mushroom pushbuttons, rotate-to-unlatch type

|  | Diameter 30 mm | mm | Diameter 60 mm |
| :--- | :--- | :--- | :--- |

Overview of EMERGENCY STOP mushroom pushbuttons, pull-to-unlatch type

|  |  |
| :--- | :--- |
| Typical diagram |  |
| Collar / Front ring material | Article number |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221479 |  |
| - Red | 3 3SU1000-1HA20-0AAO |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221480) |  |
| Red | 3SU1050-1HA20-0AA0 |

## Overview of EMERGENCY STOP mushroom pushbuttons, key-operated release (key-operated switch)

| Typical diagram |  | Diameter 40 mm |
| :---: | :---: | :---: |
| Collar / Front ring material | Version | Article number |
| Plastic / Plastic <br> Siemens Industry Mall (http:/ | ll.industry.siemen | m/mall/en/en/Catalog/Products/10221479) |
| - Red | RONIS, SB30 | 3SU1000-1HF20-0AA0 |
|  | RONIS, 455 | 3SU1000-1HG20-0AA0 |
|  | CES, SSG10 | 3SU1000-1HR20-0AA0 |
|  | CES, SSP9 | 3SU1000-1HS20-0AA0 |
|  | CES, SMS1 | 3SU1000-1HT20-0AA0 |
|  | BKS, S1 | 3SU1000-1HK20-0AA0 |
|  | BKS, E71) | 3SU1000-1HM20-0AA0 |
|  | BKS, E91) | 3SU1000-1HN20-0AA0 |
|  | O.M.R 73037, red | 3SU1000-1HQ20-0AA0 |
| Metal / Metal <br> Siemens Industry Mall (http:// | mall.industry.siemen | m/mall/en/en/Catalog/Products/10221480) |
| - Red | RONIS, SB30 | 3SU1050-1HF20-0AA0 |
|  | RONIS, 455 | 3SU1050-1HG20-0AA0 |
|  | RONIS, 421 | 3SU1050-1HH20-0AA0 |
|  | CES, SSG10 | 3SU1050-1HR20-0AA0 |
|  | CES, SSP9 | 3SU1050-1HS20-0AA0 |
|  | CES, VL5 | 3SU1050-1HU20-0AA0 |
|  | CES, VL1 | 3SU1050-1HV20-0AA0 |
|  | BKS, S1 | 3SU1050-1HK20-0AA0 |
|  | BKS, E7 ${ }^{1)}$ | 3SU1050-1HM20-0AA0 |
|  | BKS, E91) | 3SU1050-1HN20-0AA0 |
|  | O.M.R 73037, red | 3SU1050-1HQ20-0AA0 |
|  | IKON, 360012K1 | 3SU1050-1HX20-0AA0 |
| - Black | CES, VL5 | 3SU1050-1HU10-0AA0 |

1) Key not included in the scope of supply

For further information about keys, please refer to paragraph "Special locks for key-operated switches" in Chapter "Key-operated switches 22.5" (Page 75).

Overview of illuminated EMERGENCY STOP mushroom pushbuttons

| Typical diagram | Diameter 30 mm | Diameter 40 mm | Diameter 60 mm |
| :---: | :---: | :---: | :---: |
| Collar / Front ring material | Article number |  |  |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221479) |  |  |  |
| - Red | 3SU1001-1GB20-0AA0 | 3SU1001-1HB20-0AA0 | 3SU1001-1JB20-0AA0 |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221480) |  |  |  |
| - Red | 3SU1051-1GB20-0AA0 | 3SU1051-1HB20-0AA0 | 3SU1051-1JB20-0AA0 |

### 4.3.9 $\quad 22.5 \mathrm{~mm}$ indicator lights

Indicator lights function as indicators and signaling devices. They are equipped with a smooth-surfaced lens that cannot be replaced by the user.

Indicator lights are available in different variants according to the following features:

- Collar and front ring material
- Color of the lenses

For further information, refer to Chapter "Mounting (Page 97)".

|  | Indicator lights |
| :---: | :---: |
| Collar / Front ring material | Article number |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221491) |  |
| - Amber | 3SU1001-6AA00-0AA0 |
| - Red | 3SU1001-6AA20-0AA0 |
| - Yellow | 3SU1001-6AA30-0AA0 |
| - Green | 3SU1001-6AA40-0AA0 |
| - Blue | 3SU1001-6AA50-0AA0 |
| - White | 3SU1001-6AA60-0AA0 |
| - Clear | 3SU1001-6AA70-0AA0 |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221492) |  |
| - Amber | 3SU1051-6AA00-0AA0 |
| - Red | 3SU1051-6AA20-0AA0 |
| - Yellow | 3SU1051-6AA30-0AA0 |
| - Green | 3SU1051-6AA40-0AA0 |
| - Blue | 3SU1051-6AA50-0AA0 |
| - White | 3SU1051-6AA60-0AA0 |
| - Clear | 3SU1051-6AA70-0AA0 |

### 4.3.10 $\quad 30.5 \mathrm{~mm}$ indicator lights

Indicator lights in the 30.5 mm diameter size are intended for flat mounting. These are pushbuttons in which the button has been locked (fixed button). The series is available in the metal matte version. The 30.5 mm indicator lights are suitable for installation on front plates with a maximum thickness of 4 mm .

The metal holder (3SU1550-0AA10-0AA0) must be used when mounting.
In addition, the adapter (3SU1950-0KJ80-0AAO) for actuators and indicators for flat mounting must be mounted between the front plate and the holder. The adapter is included in the scope of delivery, but can also be ordered as a separate item.


### 4.3.11 $\quad 22.5 \mathrm{~mm}$ selector switches

The selector switch is an actuator with 2 or 3 switch positions. Thanks to the rotary actuation, up to 3 contact modules can be operated with momentary contact or latching operation. The fiber-optic conductor integrated into the actuator can be illuminated using an LED module.

Selector switches are available in different variants according to the following features:

- Actuators (short / long selector or rotary knob)
- Switch positions
- Collar and front ring material
- Color of actuators
- Switching functions: latching / momentary contact
- Illumination

In the delivery state, selector switches are equipped with two pressure plates (1).


## Typical diagram

Each pressure plate can be individually removed and reinstalled. A pressure plate always actuates the contact modules mounted on the holder at position $3 / 6$ (center position), and the corresponding outer contact modules at position $1 / 4$ or $2 / 5$.

If a pressure plate is not used, only the corresponding outer contact at position $1 / 4$ or $2 / 5$ is actuated.

Note about installation of LED modules: The pressure plates must be removed before the LED module is installed.
For further information, refer to Chapter "Installation (Page 97)".

The table shows the contact module / LED module actuation with differently mounted pressure plates using the example of a selector switch with 3 switch positions and equipped contact modules and LED modules.

|  | Switch position left |  |  | Switch position right |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |
| Pressure plate <br> (1) | Contact module Position 1/4 | Contact / LED <br> module Position 3/6 | Contact module Position 2/5 | Contact module Position 1/4 | Contact / LED <br> module <br> Position 3/6 | Contact module Position 2/5 |
| 2 pressure plates mounted | $\begin{aligned} & 3 \\ & 4 \end{aligned}$ | $\begin{aligned} & 3 \\ & 4 \end{aligned}$ | $\left.\begin{aligned} & 3 \\ & 4 \end{aligned} \right\rvert\,$ | $\left.\begin{aligned} & 3 \\ & 4 \end{aligned} \right\rvert\,$ | $\begin{aligned} & 3 \\ & 4 \end{aligned}$ | $\begin{aligned} & 31 \\ & 4 \end{aligned}$ |
| 1 pressure plate mounted on the right | $\begin{aligned} & 3 \\ & 4 \end{aligned}$ | $\begin{aligned} & 3 \\ & 4 \end{aligned}$ | $\left.\begin{aligned} & 3 \\ & 4 \end{aligned} \right\rvert\,$ | $\left.\begin{aligned} & 3 \\ & 4 \end{aligned} \right\rvert\,$ | $\begin{aligned} & 31 \\ & 4 \end{aligned}$ | $\begin{aligned} & 31 \\ & 4 \end{aligned}$ |
| 1 pressure plate mounted on the left | $\begin{aligned} & 3 \\ & 4 \end{aligned}$ | $\begin{aligned} & 3 \\ & 4 \end{aligned}$ | $\begin{aligned} & 3 \\ & 4 \end{aligned}$ | $\begin{aligned} & 3 \\ & 4 \end{aligned}$ | $\left.\begin{aligned} & 3 \\ & 4 \end{aligned} \right\rvert\,$ | $\begin{aligned} & 31 \\ & 4 \end{aligned}$ |
| No pressure plate mounted | $\begin{aligned} & 3 \\ & 4 \end{aligned}$ |  | $\begin{aligned} & 3 \\ & 4 \end{aligned}$ | $\begin{aligned} & 3 \\ & 4 \end{aligned}$ |  | $\begin{aligned} & 3 \\ & 4 \end{aligned}$ |

## Selector switches with short selector

|  | 2 switch positions |  |
| :---: | :---: | :---: |
|  | Latching, $90^{\circ}$ (10:30/1:30 o'clock) | Momentary contact $45^{\circ}$ (10:30/12 o'clock), reset from center to left |
| Collar / Front ring material | Article number |  |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221483) |  |  |
| - Red | 3SU1002-2BF20-0AA0 | 3SU1002-2BC20-0AA0 |
| - Yellow | 3SU1002-2BF30-0AA0 | 3 UU1002-2BC30-0AA0 |
| - Green | 3SU1002-2BF40-0AA0 | 3SU1002-2BC40-0AA0 |
| - Blue | 3SU1002-2BF50-0AA0 | 3SU1002-2BC50-0AA0 |
| - Black / White | 3SU1002-2BF60-0AA0 | 3SU1002-2BC60-0AA0 |
| Plastic / Metal, matte <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226611) |  |  |
| - Red | 3SU1032-2BF20-0AA0 | 3SU1032-2BC20-0AA0 |
| - Yellow | 3SU1032-2BF30-0AA0 | 3SU1032-2BC30-0AA0 |
| - Green | 3SU1032-2BF40-0AA0 | 3SU1032-2BC40-0AA0 |
| - Blue | 3SU1032-2BF50-0AA0 | 3SU1032-2BC50-0AA0 |
| - Black / White | 3SU1032-2BF60-0AA0 | 3SU1032-2BC60-0AA0 |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221484) |  |  |
| - Red | 3SU1052-2BF20-0AA0 | 3SU1052-2BC20-0AA0 |
| - Yellow | --- | 3SU1052-2BC30-0AA0 |
| - Green | 3SU1052-2BF40-0AA0 | 3SU1052-2BC40-0AA0 |
| - Blue | --- | 3SU1052-2BC50-0AA0 |
| - Black / White | 3SU1052-2BF60-0AA0 | 3SU1052-2BC60-0AA0 |

### 4.3 3SU10 devices for use on 3-slot holder

|  | 3 switch positions |
| :---: | :---: |
| Collar / Front ring material | Article number |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221483) |  |
| - Red | 3SU1002-2Bx20-0AA0 |
| - Yellow | 3 SU1002-2Bx30-0AA0 |
| - Green | 3 SU1002-2Bx40-0AA0 |
| - Blue | 3 UU1002-2Bx50-0AA0 |
| - Black / White | 3 SU1002-2Bx60-0AA0 |
| Plastic / Metal, matte <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226611) |  |
| - Red | $3 \mathrm{SU1032-2B} \mathrm{\times 20-0AA0}$ |
| - Yellow | 3 UU1032-2Bx30-0AA0 |
| - Green | $3 \mathrm{SU1032-2Bx40-0AA0}$ |
| - Blue | 3SU1032-2Bx50-0AA0 |
| - Black / White | 3SU1032-2Bx60-0AA0 |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221484) |  |
| - Red | 3SU1052-2Bx20-0AA0 |
| - Yellow | 3 UU1052-2Bx30-0AA0 |
| - Green | 3SU1052-2Bx40-0AA0 |
| - Blue | 3 UU1052-2Bx50-0AA0 |
| - Black / White | 3SU1052-2Bx60-0AA0 |

$\mathrm{x}: \mathrm{L}=$ selector switch latching, $2 \times 45^{\circ}$
(10:30/12/1:30 o'clock)
$\mathrm{x}: \mathrm{M}=$ selector switch momentary contact, $2 \times 45^{\circ}$
(10:30/12/1:30 o'clock), reset from left + right
$\mathrm{x}: \mathrm{N}=$ selector switch latching/momentary contact, $2 \times 45^{\circ}$ (10:30/12/1:30 o'clock), reset from right, latching to the left

$\mathrm{x}: \mathrm{P}=$ selector switch momentary contact/latching, $2 \times 45^{\circ}$ (10:30/12/1:30 o'clock), reset from left, latching to the right


## Note

Not all combinations listed in the tables are available. In the case of special versions, please consult Technical Assistance, or initiate a PI1000 request.

## Selector switches with long selector

|  | 2 switch positions |  |
| :---: | :---: | :---: |
| Typical diagram | Latching, $90^{\circ}$ (10:30/1:30 o'clock) | Momentary contact $45^{\circ}$ (10:30/12 o'clock), reset from center to left |
| Collar / Front ring material | Article number |  |
| Plastic / PlasticSiemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221483) |  |  |
| - Red | 3SU1002-2CF20-0AA0 | 3SU1002-2CC20-0AA0 |
| - Yellow | 3SU1002-2CF30-0AA0 | 3SU1002-2CC30-0AA0 |
| - Green | 3SU1002-2CF40-0AA0 | 3SU1002-2CC40-0AA0 |
| - Blue | 3SU1002-2CF50-0AA0 | 3SU1002-2CC50-0AA0 |
| - Black / White | 3SU1002-2CF60-0AA0 | 3SU1002-2CC60-0AA0 |
| Plastic / Metal, matte <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226611) |  |  |
| - Red | 3SU1032-2CF20-0AA0 | 3SU1032-2CC20-0AA0 |
| - Yellow | 3SU1032-2CF30-0AA0 | 3SU1032-2CC30-0AA0 |
| - Green | 3SU1032-2CF40-0AA0 | 3SU1032-2CC40-0AA0 |
| - Blue | 3SU1032-2CF50-0AA0 | 3SU1032-2CC50-0AA0 |
| - Black / White | 3SU1032-2CF60-0AA0 | 3SU1032-2CC60-0AA0 |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221484) |  |  |
| - Red | 3SU1052-2CF20-0AA0 | 3SU1052-2CC20-0AA0 |
| - Yellow | 3SU1052-2CF30-0AA0 | 3SU1052-2CC30-0AA0 |
| - Green | 3SU1052-2CF40-0AA0 | 3SU1052-2CC40-0AA0 |
| - Blue | 3SU1052-2CF50-0AA0 | 3SU1052-2CC50-0AA0 |
| - Black / White | 3SU1052-2CF60-0AA0 | 3SU1052-2CC60-0AA0 |


|  | 3 switch positions |
| :--- | :--- |
| Collar / Front ring material | Article number |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221484) <br> - Red | 3SU1052-2Cx20-0AA0 |
| - Yellow | 3SU1052-2Cx30-0AA0 |
| - Green | 3SU1052-2Cx40-0AA0 |
| - Blue | 3SU1052-2Cx50-0AA0 |
| - Black / White | 3SU1052-2Cx60-0AA0 |

$x: L=$ selector switch latching, $2 \times 45^{\circ}$ (10:30/12/1:30 o'clock)
$x: M=$ selector switch momentary contact, $2 \times 45^{\circ}$ (10:30/12/1:30 o'clock), reset from left + right
$\mathrm{x}: \mathrm{N}=$ selector switch latching/momentary contact, $2 \times 45^{\circ}$ (10:30/12/1:30 o'clock), reset from right, latching to the left

$x: P=$ selector switch momentary contact/latching, $2 \times 45^{\circ}$ (10:30/12/1:30 o'clock), reset from left, latching to the right


## Selector switches with rotary knob

| Typical diagram | 2 switch positions Latching, $90^{\circ}$ (10:30/1:30 o'clock) |
| :---: | :---: |
| Collar / Front ring material | Article number |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221483) |  |
| - Red | 3SU1002-2AF20-0AA0 |
| - Black / White | 3SU1002-2AF60-0AA0 |
| Plastic / Metal, matte <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226611) |  |
| - Red | 3SU1002-2AF20-0AA0 |
| - Black / White | 3SU1032-2AF60-0AA0 |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221484) |  |
| - Red | 3SU1002-2AF20-0AA0 |
| - Black / White | 3SU1052-2AF60-0AA0 |

### 4.3.12 $\quad 30.5 \mathrm{~mm}$ selector switches

The selector switch is an actuator with 2 or 3 switch positions. Thanks to the rotary actuation, up to 3 contact modules can be operated with momentary contact or latching operation. The fiber-optic conductor integrated into the actuator can be illuminated using an LED module.

Selector switches in the 30.5 mm size are intended for flat mounting. The 30.5 mm selector switches are suitable for installation on front plates with a maximum thickness of 4 mm . The series is available in metal and metal matte versions.

Selector switches are available in different variants according to the following features:

- Actuators (short / long selector)
- Switch positions
- Collar and front ring material
- Color of actuators
- Switching functions: latching / momentary contact
- Illumination

Note about installation:
The metal holder (3SU1550-0AA10-0AAO) must be used when mounting.
In addition, the adapter (3SU1950-0KJ80-OAA0) for actuators and indicators for flat mounting must be mounted between the front plate and the holder. The adapter is included in the scope of delivery, but can also be ordered as a separate item.
The pressure plates (standard scope of supply) must be removed before the LED module is installed.

## Selector switches with short selector

|  |  | 2 switch positions |
| :--- | :--- | :--- |


|  |  |
| :--- | :--- |
| Typical diagram |  |

$x: L=$ selector switch latching, $2 \times 45^{\circ}$ (10:30/12/1:30 o'clock)

x : $\mathrm{M}=$ selector switch momentary contact, $2 \times 45^{\circ}$ (10:30/12/1:30 o'clock), reset from left + right


## Note

Not all combinations listed in the tables are available. In the case of special versions, please consult Technical Assistance, or initiate a PI1000 request.

### 4.3 3SU10 devices for use on 3-slot holder

## Selector switches with long selector



| Typical diagram | 3 switch positions |
| :---: | :---: |
| Collar / Front ring material | Article number |
| Metal / Metal, matte <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226912) |  |
| - Red | 3SU1062-2Ex20-0AA0 |
| - Green | 3SU1062-2Ex40-0AA0 |
| - Black / White | 3SU1062-2Ex60-0AA0 |

$x: L=$ selector switch latching, $2 \times 45^{\circ}$ (10:30/12/1:30 o'clock)
x : $\mathrm{M}=$ selector switch momentary contact, $2 \times 45^{\circ}$ (10:30/12/1:30 o'clock), reset from left + right


## Note

Not all combinations listed in the tables are available. In the case of special versions, please consult Technical Assistance, or initiate a PI1000 request.

### 4.3.13 Toggle switches

Toggle switches are used to actuate contact modules and allow short-time contact or permanent closing / opening of a contact element. They are operated by a vertical linear movement using several fingers.

Toggle switches are available in different variants according to the following features:

- Collar and front ring material
- Switching function: momentary contact and latching

You will find additional information in Chapters "Mounting (Page 97)" and "Accessories (Page 293)"

|  | Toggle switch 2 switch positions |  |
| :---: | :---: | :---: |
|  | Article number |  |
| Collar / Front ring material |  |  |
|  | Latching | Momentary contact |
| Plastic / Plastic |  |  |
|  | 3SU1000-3EA10-0AA0 | 3SU1000-3EC10-0AA0 |
| Plastic / Metal, matte |  |  |
|  | 3SU1030-3EA10-0AA0 | 3SU1030-3EC10-0AA0 |
| Metal / Metal |  |  |
|  | 3SU1050-3EA10-0AA0 | 3SU1050-3EC10-0AA0 |

### 4.3.14 STOP buttons

STOP buttons are used to actuate contact modules and allow short-time contact or permanent closing / opening of a contact element. 2 functionalities (momentary contact, latching) are combined in the STOP buttons. The STOP button is operated by pressing and rotating the actuating element with several fingers. A contact element is briefly closed / opened by pressing the STOP button. After pressing, locking is effected by turning the actuating element to the right. This effects permanent closing / opening of a contact element. The STOP button is unlocked again by turning the actuating element to the left.

The STOP buttons are available in different variants according to the following features:

- Colors

You will find additional information in Chapters "Mounting (Page 97)" and "Accessories (Page 293)"

|  |  |
| :--- | :--- |
| Typical diagram |  |
| Collar / Front ring material | Article number |
| Plastic / Plastic | 3 3SU1000-0HC10-0AA0 |
| Black | $3 S U 1000-0 H C 20-0 A A 0$ |

### 4.3.15 $\quad 22.5 \mathrm{~mm}$ key-operated switches

Key-operated switches are equipped with a lock for safety reasons. Only an authorized group of persons who have access to the relevant key can perform a switching operation (in this case, actuation of contact modules). Up to 3 switch positions can be temporarily or permanently selected using a key-operated switch.

Key-operated switches are available in different variants according to the following features:

- Key-operated switch manufacturer
- Key removal positions
- Switch positions
- Collar and front ring material
- Switching functions: latching / momentary contact

For further information, refer to Chapter "Mounting (Page 97)".

Key-operated switches 2 switch positions (0-I)

| Typical diagram | Version | Article number |
| :---: | :---: | :---: |
| Momentary contact <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221489) |  |  |
| Momentary contact $45^{\circ}$ (10:30/12 o'clock), reset from center to left | Ronis, SB30 | $3 \mathrm{SU10x0-4BCy1-0AA0}$ |
|  | Ronis, 455 | $3 \mathrm{SU10x0-4CCy1-0AA0}$ |
|  | O.M.R. 73037, red | $3 \mathrm{SU10x0-4FCy1-0AA0}$ |
|  | O.M.R. 73038, light blue | 3SU10x0-4GCy1-0AA0 |
|  | O.M.R. 73034, black | $3 \mathrm{SU10x0} 4 \mathrm{4HCy} 1-0 \mathrm{AA} 0$ |
|  | O.M.R. 73033, yellow | 3SU10x0-4JCy1-0AA0 |
|  | CES, SSG10 | $3 \mathrm{SU10x0-5BCy1-0AA0}$ |
|  | CES, LSG1 | $3 \mathrm{SU10x0-5HCy1-0AA0}$ |
|  | BKS, S1 | $3 \mathrm{SU10x0-5PCy1-0AA0}$ |
|  | IKON, 360012K1 | $3 \mathrm{SU10x0-5XCy1-0AA0}$ |

### 4.33 SU10 devices for use on 3-slot holder

## Latching

Siemens Industry Mall (https://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221489)

| Latching, $90^{\circ}$ (10:30/1:30 o'clock) | Ronis, SB30 | $3 \mathrm{SU10x0} 0$-4BFy1-0AA0 |
| :---: | :---: | :---: |
|  | Ronis, 455 | $3 \mathrm{SU10x0-4CFy1-0AA0}$ |
|  | Ronis, 421 | 3SU10x0-4DFy1-0AA0 |
|  | O.M.R. 73037, red | 3SU10x0-4FFy1-0AA0 |
|  | O.M.R. 73038, light blue | $3 \mathrm{SU10x0-4GFy1-0AA0}$ |
|  | O.M.R. 73034, black | $3 \mathrm{SU10x0-4HFy1-0AA0}$ |
|  | O.M.R. 73033, yellow | 3SU10x0-4JFy1-0AA0 |
|  | CES, SSG10 | $3 \mathrm{SU10x0-5BFy1-0AA0}$ |
|  | CES, LSG1 | $3 \mathrm{SU10x0-5HFy1-0AA0}$ |
|  | CES, SSG10 with key monitoring | 3SU10x0-5JFy1-0AA0 |
|  | BKS, S1 | $3 \mathrm{SU10x0-5PFy1-0AA0}$ |
|  | BKS, E11) | 3SU10x0-5QFy1-0AA0 |
|  | BKS, E21) | $3 \mathrm{SU10x0-5RFy1-0AA0}$ |
|  | BKS, E71) | $3 \mathrm{SU10x0-5SFy1-0AA0}$ |
|  | BKS, E91) | $3 \mathrm{SU10x0-5TFy1-0AA0}$ |
|  | IKON, 360012K1 | 3SU10x0-5XFy1-0AA0 |

$\mathrm{x}: 0=$ Material plastic
x : 3 = Material metal matte
x: $5=$ Material metal
$y$ : $0=$ Key can be removed in position $O$
y: $1=$ Key can be removed in any position
y: $2=$ Key can be removed in position I

1) Key not included in the scope of supply

## Key-operated switches 3 switch positions (I-0-II)

|  | Version | Article number |
| :---: | :---: | :---: |
| Momentary contact <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221489) |  |  |
| Momentary contact $2 \times 45^{\circ}$ (10:30/12/1:30 o'clock), 3 switch positions, momentary contact, reset from left + right | Ronis, SB30 | $3 \mathrm{SU10x0-4BMy1-0AA0}$ |
|  | O.M.R. 73037, red | $3 \mathrm{SU10x0-4FMy1-0AA0}$ |
|  | O.M.R. 73034, black | $3 \mathrm{SU10x0} 4 \mathrm{HMy1} 1-0 \mathrm{AA} 0$ |
|  | CES, SSG10 | $3 \mathrm{SU10x0-5BMy1-0AA0}$ |
|  | BKS, S1 | $3 \mathrm{SU10x0-5PMy1-0AA0}$ |
|  | IKON, 360012K1 | $3 \mathrm{SU10x0-5XMy1-0AA0}$ |
| Latching <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221489) |  |  |
| Latching, $2 \times 45^{\circ}$ <br> (10:30/12/1:30 o'clock) | Ronis, SB30 | 3SU10x0-4BLy1-0AA0 |
|  | Ronis, 455 | $3 \mathrm{SU10x0-4CLy1-0AA0}$ |
|  | O.M.R. 73037, red | $3 \mathrm{SU10x0-4FLy1-0AA0}$ |
|  | O.M.R. 73038, light blue | 3SU10x0-4GLy1-0AA0 |
|  | O.M.R. 73034, black | $3 \mathrm{SU10x0} 4 \mathrm{HLLy1} 1-0 \mathrm{AA} 0$ |
|  | O.M.R. 73033, yellow | 3SU10x0-4JLy1-0AA0 |
|  | CES, SSG10 | $3 \mathrm{SU10x0-5BLy1-0AA0}$ |
|  | CES, SSG10 with key monitoring | 3SU10x0-5JLy1-0AA0 |
|  | BKS, S1 | 3SU10x0-5PLy1-0AA0 |
|  | BKS, E2 ${ }^{1)}$ | 3SU10x0-5RLy1-0AA0 |
|  | BKS, E91) | 3SU10x0-5TLy1-0AA0 |
|  | IKON, 360012K1 | 3SU10x0-5XLy1-0AA0 |
| Momentary contact / latching <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221489) |  |  |
| Momentary contact / latching, $2 \times 45^{\circ}$ (10:30/12/1:30 o'clock), reset from left, latching to the right | Ronis, SB30 | $3 \mathrm{SU10x0-4BPy1-0AA0}$ |
|  | CES, SSG10 | $3 \mathrm{SU10x0-5BPy1-0AA0}$ |
|  | BKS, S1 | $3 \mathrm{SU10x0-5PPy1-0AA0}$ |
|  |  |  |

### 4.3 3SU10 devices for use on 3-slot holder

| Momentary contact / latching |  |  |
| :---: | :---: | :---: |
| Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221489) |  |  |
| Latching / momentary contact, | Ronis, SB30 | $3 \mathrm{SU10x0} 0-4 \mathrm{BNy} 1-0 \mathrm{AA} 0$ |
| $2 \times 45^{\circ}$ (10:30/12/1:30 o'clock), | O.M.R. 73038, light blue | $3 \mathrm{SU10x0} 0$-4GNy1-0AA0 |
| reset from right, latching to the left | O.M.R. 73034, black | $3 \mathrm{SU10x0} 04 \mathrm{HNy} 1-0 \mathrm{AA} 0$ |
|  | CES, SSG10 | $3 \mathrm{SU10x0-5BNy1-0AA0}$ |
| ' | BKS, S1 | $3 \mathrm{SU10x0-5PNy1-0AA0}$ |
|  | IKON, 360012K1 | $3 \mathrm{SU10x0-5XNy1-0AA0}$ |

$\mathrm{x}: 0=$ Material plastic
$x: 3=$ Material metal matte
x: $5=$ Material metal
y: $0=$ Key can be removed in position $O$,
y: $1=$ Key can be removed in any position
y: $2=$ Key can be removed in position I
y: $3=$ Key can be removed in position II (right, with 3 positions only)
y: 4 = Key can be removed in positions I + II (left, right, with 3 positions only)
y: $5=$ Key can be removed in positions $\mathrm{O}+\mathrm{I}$ (center, left, with 3 positions only)

1) Key not included in the scope of supply

## Note

Not all combinations listed in the tables are available. In the case of special versions, please consult Technical Assistance, or initiate a PI1000 request.

## Special locks for key-operated switches

The plastic and metal key-operated switches of type Ronis, BKS, CES and IKON can be optionally ordered with additional locks.

## Please note:

- For applications in which access security is important and several lock numbers are used, we recommend the use of BKS or CES key-operated switches.
- Special locks for VW (E1, E2, E7, E9) are supplied without keys. All other key-operated switches are supplied with 2 keys.
- With Ronis, the special locks SB31, 421 and 455 are possible.


## Master and master-pass key systems

The following key systems can be supplied with BKS, CES or IKON key-operated switches:

- Central lock systems
- Master key systems
- Central master key systems
- Master-pass key systems

A security certificate is required when ordering key systems.

### 4.3.16 $\quad 30.5 \mathrm{~mm}$ key-operated switches

Key-operated switches are equipped with a lock for safety reasons. Only an authorized group of persons who have access to the relevant key can perform a switching operation (in this case, actuation of contact modules). Up to 3 switch positions can be temporarily or permanently selected using a key-operated switch. The 30.5 mm key-operated switches are suitable for installation on front plates with a maximum thickness of 4 mm .

The metal holder (3SU1550-0AA10-0AA0) must be used when mounting.
In addition, the adapter (3SU1950-0KJ80-0AA0) for actuators and indicators for flat mounting must be mounted between the front plate and the holder. The adapter included in the scope of delivery, but can also be ordered as a separate item.

Key-operated switches are available in different variants according to the following features:

- Switch positions
- Key removal positions
- Color of actuators


## 30.5 mm diameter key-operated switches

|  | Version | Article number |
| :--- | :--- | :--- | :--- |
|  | Latching <br> Siemens Industry Mall | (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226917) |

y: $0=$ Key can be removed in position O ,
y: $1=$ Key can be removed in any position
y: 2 = Key can be removed in position I

### 4.3.17 ID key-operated switches

The ID key-operated switch is an electronic key-operated switch and has four switch positions that are selected by keys with different codes. Using the four ID keys with different codes, it is possible to select 1 to 4 positions. The ID keys are color-coded (yellow, blue, red, green, white) so that they can be clearly differentiated at a glance. The ID key-operated switch is intended primarily to replace the mechanical locks on different machines.
You will find additional information in Chapters "Installation (Page 97)" and "Application examples ID key-operated switches (Page 448)".

For the ID key-operated switches, two different versions of the electronic modules for ID keyoperated switches without / with IO-Link communications interface are available. You will find information on the electronic modules in Chapters: 3SU14 contact modules and LED modules "Electronic module for ID key-operated switches (Page 163)", "Technical data (Page 335)".
You can find information on using the ID key-operated switch with IO-Link in Chapter 'IOLink (Page 243)".

|  | Collar / Front ring material <br> Plastic / Plastic <br> Siemens Industry Mall <br> (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221495) |
| :--- | :--- | :--- |
|  | Black Article number <br>  Plastic / Metal, matte <br> Siemens Industry Mall <br> (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226617)  <br>  Black |

You can find the appropriate ID keys in Chapter ID keys (Page 323).

### 4.3.17.1 Design of a command point with ID key-operated switch

## Command point with ID key-operated switch on front plate

A modular command point with ID key-operated switch on a front plate consists of the following elements:

(1) Electronic module for ID key-operated switches 3SU1400-1Gx10-1AA0 (Page 163)
(2) 3-slot holder 3SU1500-0AA10-0AA0 (Page 38) for securing behind the control panel
(3) ID key-operated switch 3 SU10x0-4WS10-0AA0 (Page 80 ) in front of the control panel
(4) ID key 3SU1900-0Fxy0-0AA0 (Page 323)
(5) Front plate

## Note

The minimum clearance between two command points when mounted on the front plate is 10 cm in all directions.

## Command point with ID key-operated switch in an enclosure

A modular command point with ID key-operated switch in an enclosure consists of the following elements:

(1) Electronic module for ID key-operated switches 3SU1400-1Gx10-1AA0 (Page 163)
(2) 3-slot holder 3SU1500-0AA10-0AA0 (Page 38) for securing in the enclosure
(3) ID key-operated switch 3SU10x0-4WS10-0AA0 (Page 80)
(4) ID key 3SU1900-0Fxy0-0AA0 (Page 323)
(5) Enclosure with raised cover, command point in center 3 SU18x1-1AA00-1AA1 (Page 178)

### 4.3.17.2 Operating principle of the command point with ID key-operated switch

The ID key-operated switch is used primarily to set the current key position by rotation. To set the current key position, the rotary knob of the ID key-operated switch is turned clockwise or counter-clockwise. There is an opening in the rotary knob into which the ID key is inserted. Actuation is only possible if a valid ID key has been recognized, and the authorization level of the relevant ID key corresponds to, or is higher than, the current key position. The rotary knob can be turned clockwise and counter-clockwise through $360^{\circ}$ in 45-degree steps.

The switch position delay is started and the temporary key position is incremented by turning clockwise.

The temporary key position is indicated by the illuminated surfaces in the ID key-operated switch flashing green. During the switch position delay, the temporary key position can be changed by turning the knob clockwise or counter-clockwise. The switch position delay is restarted by turning the knob clockwise. During the switch position delay, the outputs are not yet affected by the temporary key position. After the delay has expired, the temporary key position is adopted as the current key position, and the outputs are switched in accordance with this position.

By turning counter-clockwise, the current key position is changed to 0 , and the outputs are switched immediately in accordance with this position.

## Note

In a configuration with electronic module for ID key-operated switches for IO-Link, the parameters can be set via IO-Link.

You will find additional information in Chapter "Configuring IO-Link (Page 243)".

## Settings on the electronic module for ID key-operated switches

The electronic modules for ID key-operated switches have five digital outputs. Setting of outputs 0 to 3 depends on the current key position and the module settings. If a valid ID key has been recognized, output 4 is active; otherwise output 4 is inactive.

Table 4-1 Individual method

| Key position | Output |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  | 0 | 1 | 2 | 3 |
| 0 | Inactive | Inactive | Inactive | Inactive |
| 1 | Active | Inactive | Inactive | Inactive |
| 2 | Inactive | Active | Inactive | Inactive |
| 3 | Inactive | Inactive | Active | Inactive |
| 4 | Inactive | Inactive | Inactive | Active |

Table 4-2 Addition method (incremental method)

| Key position | Output |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  | 0 | 1 | 2 | 3 |
| 0 | Inactive | Inactive | Inactive | Inactive |
| $\mathbf{1}$ | Active | Inactive | Inactive | Inactive |
| 2 | Active | Active | Inactive | Inactive |
| $\mathbf{3}$ | Active | Active | Active | Inactive |
| 4 | Active | Active | Active | Active |

## Note

The addition method (incremental method) can only be set on the electronic modules for ID key-operated switches for IO-Link.

## Short-circuit protection

If a short-circuit occurs at one or more outputs, the occurrence of a fault event is sent and the fault flag is set. All outputs are deactivated for one second. Then the relevant outputs are re-activated to monitor whether the short-circuit is still active. This temporary state exists for approximately 0.1 seconds. If no short-circuit is determined during this period, the fault event is revoked, and the fault flag is deleted. However, if a short-circuit is detected during this time, all outputs are deactivated again, and the short-circuit device fault remains.

## Function of the LEDs in the ID key-operated switch

In the enclosure of the ID key-operated switch are four illuminated surfaces that can assume the following states:

- Showing a green light: Indication of the current key position and the switched outputs.
- Flashing green: Indication of the temporary key position.
- Showing a yellow light: Indication of the associated authorization level (key position that can be reached by turning the rotary knob).
- Flashing yellow (all 4 illuminated surfaces): Indication for the individually codable ID key used that has not yet been configured.
- Showing a red light: Indicates that the relevant key position is higher than permissible for the relevant authorization level. (This key position cannot be reached by turning the rotary knob.) The indicator also shows a red light when there is no ID key plugged in.
- Flashing red (all 4 illuminated surfaces): When using a colored ID key with permanently encoded authorization level (ID group 1 to 4), this indicates when the parameter "Individually codable ID keys only" is enabled.
- Not illuminated: The electronic module is switched off.


## Displayed colors



## Selected position

## Selectable positions dependent on ID key using the adjustment method

In this case, "DS 131 Incremental switching mode" must be set to "disabled" on the electronic modules for ID key-operated switches for IO-Link.


## Selectable positions dependent on ID key using the adjustment method

In this case, "DS 131 Incremental switching mode" must be set to "disabled" on the electronic modules for ID key-operated switches for IO-Link.

| Key <br> color | Output 4 <br> (DQ.4) active | Outputs 0 and 4 <br> (DQ.0 and DQ.4) <br> active | Outputs 1 and 4 <br> (DQ.1 and DQ.4) <br> active | Outputs 2 and 4 <br> (DQ.2 and DQ.4) <br> active | Outputs 3 and 4 <br> (DQ.3 and DQ.4) <br> active |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Green |  |  |  |  |  |

Selectable positions dependent on ID key using the addition method (only for electronic modules for ID key-operated switches for IO-Link).

With this method, "DS 131 Incremental switching mode" must be set to "Unlocked" on the electronic modules for ID key-operated switches for IO-Link.


Selectable positions dependent on ID key using the addition method (only for electronic modules for ID key-operated switches for IO-Link).
With this method, "DS 131 Incremental switching mode" must be set to "Unlocked" on the electronic modules for ID key-operated switches for IO-Link.

| Key color | Output 4 (DQ.4) active | $\begin{aligned} & \text { Outputs } 0,4 \\ & \text { (DQ. } 0 \text { and DQ.4) } \\ & \text { active } \end{aligned}$ | $\begin{gathered} \text { Outputs } 0,1,4 \\ \text { (DQ.0, DQ.1, DQ.4) } \\ \text { active } \end{gathered}$ | $\begin{gathered} \text { Outputs } 0,1,2,4 \\ \text { (DQ.0, DQ.1, DQ.2, } \\ \text { DQ.4) } \\ \text { active } \end{gathered}$ | ```Outputs 0, 1, 2, 3, 4 (DQ.0, DQ.1, DQ.2, DQ.3, DQ.4) active``` |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Green |  |  |  |  |  |
| Yellow |  |  |  |  |  |
| Red |  |  |  |  |  |
| Blue |  |  |  |  |  |
| You can find more information about data sets in Section "Electronic modules for ID keyoperated switches (Page 163)" in Chapter "Process data and data sets" in the appendix. |  |  |  |  |  |

### 4.3.18 Devices with inscription

### 4.3.18.1 $\quad 22.5 \mathrm{~mm}$ pushbuttons with standard inscription

Pushbuttons with standard inscription are available in the design with flat button and flat front ring.
For further information refer to Chapters "22.5 mm pushbuttons (Page 42)" and "Mounting (Page 97)".

## Overview of pushbuttons

| Collar / Front ring material | Inscription | Article number |
| :---: | :---: | :---: |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221475) |  |  |
| - Black | O | 3SU1000-0AB10-0AD0 |
| - Red | 0 | 3SU1000-0AB20-0AD0 |
| - Green | 1 | 3SU1000-0AB40-0AC0 |
| - Blue | R | 3SU1000-0AB50-0AR0 |
| - White | 1 | 3SU1000-0AB60-0AC0 |
| - Black | Auto (at $90^{\circ}$ angle) | 3SU1001-0AB10-0AQ01) |
| Plastic / Metal, matte <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226610) |  |  |
| - Black | O | 3SU1030-0AB10-0AD0 |
| - Red | O | 3SU1030-0AB20-0AD0 |
| - Green | I | 3SU1030-0AB40-0AC0 |
| - Blue | R | 3SU1030-0AB50-0AR0 |
| - White | I | 3SU1030-0AB60-0AC0 |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221476) |  |  |
| - Black | O | 3SU1050-0AB10-0AD0 |
| - Red | 0 | 3SU1050-0AB20-0AD0 |
| - Green | 1 | 3SU1050-0AB40-0AC0 |
| - Blue | R | 3SU1050-0AB50-0AR0 |
| - White | 1 | 3SU1050-0AB60-0AC0 |

[^1]
### 4.3.18.2 Twin pushbuttons with standard inscription

Twin pushbuttons are used to actuate contact modules and can also function as display devices. Thanks to separate actuating surfaces, it is possible to switch up to 2 independent module positions separately using only one command point. The switching function of all versions of the twin pushbuttons is latching.
For further information refer to Chapters "Twin pushbuttons (Page 47)" and "Mounting (Page 97)".

With standard installation (arrow on collar at the top), the upper button always has the first specified color and the lower button the second specified color. The same principle is used with the button heights. The first specified height refers to the top button, and the second specified height to the lower button.
Example: 3SU1051-3BB42-0AA0
Top button = green and flat
Lower button = red and raised

| Typical diagram |  | Twin pushbuttons flat / flat | Twin pushbuttons flat / raised |
| :---: | :---: | :---: | :---: |
| Collar / Front ring material | Inscription | Article number |  |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221485) |  |  |  |
| - Black / Black | Symbol No. 5264 / 5265 (IEC 60417) | 3SU1000-3AB11-0AQ0 | --- |
| - Green / Red | $1 / 0$ | 3SU1000-3AB42-0AK0 | 3SU1000-3BB42-0AK0 |
| - White / Black | $1 / 0$ | 3SU1000-3AB61-0AK0 | 3SU1000-3BB61-0AK0 |
| - White / White | - / + | 3SU1000-3AB66-0AL0 | --- |
|  | Arrows, horizontal | 3SU1000-3AB66-0AM0 | --- |
|  | Arrows, vertical | 3SU1000-3AB66-0AN0 | --- |
| Plastic / Metal, matte <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226612) |  |  |  |
| - Black / Black | Symbol No. 5264 / 5265 <br> (IEC 60417) | 3SU1030-3AB11-0AQ0 | --- |
| - Green / Red | $1 / 0$ | 3SU1030-3AB42-0AK0 | 3SU1030-3BB42-0AK0 |
| - White / Black | $1 / 0$ | 3SU1030-3AB61-0AK0 | 3SU1030-3BB61-0AK0 |
| - White / White | - / + | 3SU1030-3AB66-0AL0 | --- |
|  | Arrows, horizontal | 3SU1030-3AB66-0AM0 | --- |
|  | Arrows, vertical | 3SU1030-3AB66-0AN0 | --- |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221486) |  |  |  |
| - Black / Black | Symbol No. 5264 / 5265 <br> (IEC 60417) | 3SU1050-3AB11-0AQ0 | --- |
| - Green / Red | $1 / 0$ | 3SU1050-3AB42-0AK0 | 3SU1030-3BB42-0AK0 |
| - White / Black | $1 / 0$ | 3SU1050-3AB61-0AK0 | 3SU1030-3BB61-0AK0 |
| - White / White | - / + | 3SU1050-3AB66-0AL0 | --- |
|  | Arrows, horizontal | 3SU1050-3AB66-0AM0 | --- |
|  | Arrows, vertical | 3SU1050-3AB66-0AN0 | --- |

### 4.3 3SU10 devices for use on 3-slot holder

|  |  | Twin pushbuttons illuminated flat / flat | Twin pushbuttons illuminated flat / raised |
| :---: | :---: | :---: | :---: |
| Collar / Front ring material | Inscription | Article number |  |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221485) |  |  |  |
| - Green / Red | $1 / 0$ | 3SU1001-3AB42-0AK0 | 3SU1001-3BB42-0AK0 |
|  | Arrows, horizontal | 3SU1001-3AB42-0AN0 | --- |
| - White / Black | $1 / 0$ | 3SU1001-3AB61-0AK0 | 3SU1001-3BB61-0AK0 |
| - White / White | - / + | 3SU1001-3AB66-0AL0 | --- |
|  | Arrows, horizontal | 3SU1001-3AB66-0AN0 | --- |
|  | Symbols "Circular saw blade" / "Tilt tipper" | 3SU1001-3AB66-0AP0 | --- |
| Plastic / Metal, matte <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226612) |  |  |  |
| - Green / Red | $1 / 0$ | 3SU1031-3AB42-0AK0 | 3SU1031-3BB42-0AK0 |
|  | Arrows, horizontal | 3SU1031-3AB42-0AN0 | --- |
| - White / Black | $1 / 0$ | 3SU1031-3AB61-0AK0 | 3SU1031-3BB61-0AK0 |
| - White / White | - / + | 3SU1031-3AB66-0AL0 | --- |
|  | Arrows, horizontal | 3SU1031-3AB66-0AN0 | --- |
|  | Symbols "Circular saw blade" / "Tilt tipper" | 3SU1031-3AB66-0AP0 | --- |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221486) |  |  |  |
| - Green / Red | $1 / 0$ | 3SU1051-3AB42-0AK0 | 3SU1051-3BB42-0AK0 |
|  | Arrows, horizontal | 3SU1051-3AB42-0AN0 | --- |
| - White / Black | $1 / 0$ | 3SU1051-3AB61-0AK0 | 3SU1051-3BB61-0AK0 |
| - White / White | - / + | 3SU1051-3AB66-0AL0 | --- |
|  | Arrows, horizontal | 3SU1051-3AB66-0AN0 | --- |
|  | Symbols "Circular saw blade" / "Tilt tipper" | 3SU1051-3AB66-0AP0 | --- |

### 4.3.18.3 Inscription of actuating and signaling elements

## Direct inscription

Actuating and signaling elements of all design lines can be optionally inscribed with a laser. The laser inscription is applied to the actuator, or to the front ring in the case of the selector switch and the key-operated switch.

The following types of device can be inscribed:

- Pushbuttons
- Illuminated pushbuttons
- Twin pushbuttons
- Illuminated twin pushbuttons
- Mushroom pushbuttons
- Illuminated mushroom pushbuttons
- EMERGENCY STOP buttons
- Illuminable EMERGENCY STOP buttons
- Indicator light lenses
- Selector switches
- Key-operated switches

Certain pushbuttons and twin pushbuttons with printed characters are available as standard.


Image 4-5 Example of laser inscription

## Inscription version

A letter height of 4 mm is used as standard for text inscriptions:
The typeface used is Arial. Other letter heights and typefaces are possible, but must be specified when ordering.
The maximum possible number of characters per line is as follows:

- 10 characters for one line of text
- 8 characters for 2 lines of text
- 6 characters for 3 lines of text, but 10 characters in the middle line.


## Ordering notes

To order, the inscribed actuating and signaling elements can be selected via the SIRIUS ACT Configurator. An electronic order form is then generated.

- See Internet (http://www.siemens.en/sirius-act/konfigurator) for Configurator
- Electronic Catalog CA 01 on DVD or
- Industry Mall: Internet (http://www.siemens.com/industrymall)

When ordering, supplement the Article No. of the actuating element or the indicator light with
"-Z" and an order code:
Text line in upper/lower case, always upper case for beginning of line (e.g. "Lift / Off"): Y10
Text in upper case (e.g. "LIFT"): Y11
Text in lower case (e.g. "lift / off / lower"): Y12
Text in upper/lower case, all words begin with upper case letters (e.g. "On Off"): Y15
Symbol with number according to ISO 7000 or IEC 60417: Y13
Any inscription or symbol according to order form supplement: Y19
When ordering, specify the required inscription in plain text in addition to the Article No. and order code. In the case of special inscriptions with words in languages other than German, give the exact spelling and specify the language. In the case of symbols with number, quote the corresponding standard (see ordering example 1).
In the case of multi-line inscriptions, the text must be assigned to the respective line, e.g. "Z1 = Lift, Z2 =Lower". For long words you can also specify the end-of-line division.
Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417 (see ordering examples 2 and 3 ).
The SIRIUS ACT Configurator must be used to select special inscriptions and symbols (order code Y19). In this case a "CIN" (Configuration Identification Number) is generated for placement of future orders. It is then possible to place an order directly using the CIN and the SIRIUS ACT Configurator (Mall shopping cart) or via the standard order channels.

Ordering example 1 A round pushbutton with the inscription "Reset" is required:
3SU1030-0AD20-0AZ0
Y10 Z = Reset (English)
Ordering example 2 A square pushbutton inscribed with symbol No. 5389 according to ISO 60417:
3SU1030-0AD20-0AZ0
$\mathrm{Y} 13 \mathrm{Z}=5389 \mathrm{IEC}$ is required:
Ordering example 3 A round pushbutton inscribed with symbol No. 1118 according to ISO 7000:
3SU1030-0AD20-0AZ0
$\mathrm{Y} 13 \mathrm{Z}=1118$ ISO is required:

## Insert labels

You can use insert labels for labeling your devices.
You will find insert labels with standard inscriptions in Chapter "Accessories (Page 293)".

### 4.4 3SU10 devices for use on 4-slot holder

### 4.4.1 Coordinate switches

Coordinate switches are used to temporarily or permanently select up to 4 positions. They are operated by a vertical and horizontal movement using several fingers. Only one position on the holder is actuated in each case. The coordinate switch is suitable for simple navigation tasks thanks to its 4 selectable directions.

Coordinate switches are available in different variants according to the following features:

- Switch positions
- Collar and front ring material
- Locking (in the middle position)

A holder for 4 modules (3SU15.0-0BA10-0AA0) is required to install any of the devices listed below (see also Chapter "Holders (Page 38)"). For further information, refer to Chapter 'Mounting (Page 97)".

## Without mechanical interlock

|  |  |  | 2 switch positions | 4 switch positions |
| :---: | :---: | :---: | :---: | :---: |
| Collar / Front ring material | Operating principle | Direction of actuation | Article number |  |
| Plastic / Plastic | Momentary contact | Horizontal | 3SU1000-7AC10-0AA0 | 3SU1000-7AF10-0AA0 |
|  |  | Vertical | 3SU1000-7AD10-0AA0 |  |
| Plastic / Metal, matte | Momentary contact | Horizontal | 3SU1030-7AC10-0AA0 | 3SU1030-7AF10-0AA0 |
|  |  | Vertical | 3SU1030-7AD10-0AA0 |  |

With mechanical interlock

|  |  |  | 2 switch positions | 4 switch positions |
| :---: | :---: | :---: | :---: | :---: |
| Collar / Front ring material | Operating principle | Direction of actuation | Article number |  |
| Plastic / Plastic | Momentary contact | Horizontal | 3SU1000-7BC10-0AA0 | 3SU1000-7BF10-0AA0 |
|  |  | Vertical | 3SU1000-7BD10-0AA0 |  |
| Plastic / Metal, matte | Momentary contact | Horizontal | 3SU1030-7BC10-0AA0 | 3SU1030-7BF10-0AA0 |
|  |  | Vertical | 3SU1030-7BD10-0AA0 |  |

### 4.4.2 Selector switches 4 switch positions

Selector switches are used to actuate contact modules. No more than 2 contact modules can be actuated at once. The selector switch has 4 defined switch positions. When changing these switch positions, the current operation is concluded before the new one is activated.

These devices are available in different variants according to the following features:

- Collar and front ring material

Note about installation:
A holder for 4 modules (3SU15.0-0BA10-0AA0) is required for all the devices listed below (see also Chapter "Holders (Page 38)").
You can find additional information in Chapter "Mounting (Page 97)".

## Selector switches 4 switch positions (rotary knob)

|  | 4 switch positions |
| :---: | :---: |
| Collar / Front ring material |  |
| Plastic / Plastic |  |
| - Black / White | 3SU1000-2AS60-0AA0 |
| Plastic / Metal, matte |  |
| - Black / White | 3SU1030-2AS60-0AA0 |
| Metal / Metal |  |
| - Black / White | 3SU1050-2AS60-0AA0 |

### 4.5 Mounting

### 4.5.1 Front plate mounting

## Requirement

You need at least the following elements in order to construct a command point:

- An actuating or signaling element (3SU1) in front of the control panel
- A holder (3SU15) for securing behind the control panel
- Contact modules and / or an LED module (3SU14) behind the control panel


Typical diagram
A Actuating or signaling element
B Front plate
C Holder
D Contact module
E LED module (only possible with 3 -slot holder)

## Procedure

1. Insert the actuating or signaling element (A) from the front through the mounting opening of the front plate (B).
2. Fit the holder (C) from behind (wiring side) onto the actuating or signaling element and lock it into place.
3. The unit must be aligned before it is finally tightened and secured against twisting (see Chapter Alignment (Page 104)).
4. Turn the screw at the holder until the actuating or signaling element is fixed securely and cannot vibrate or twist (tightening torque 1.0... 1.2 Nm).
5. Snap the contact module(s) (D) from behind onto the holder. To do this, hold the modules so that they are tilted downwards slightly and place them onto the holder from behind and then press them upwards until you feel the module latch in the holder. Single- or two-pole contact modules can be mounted on the holder. The modules can be stacked (max. 2 modules behind one another).
6. Mount an LED module (E), if necessary. You can mount the LED module on the holder only in position 3/6 (center position).

### 4.5.2 Mounting on printed-circuit boards

Mounting on PCBs is only possible with 3-slot holders.


Typical diagram
A Actuating or signaling element (in this case: indicator light)
B Front plate
C Holder
D PCB carrier
E LED
F Printed-circuit board

## Procedure

1. Insert the actuating or signaling element (A) from the front through the mounting opening of the front plate (B).
2. Fit the holder (C) from behind onto the actuating or signaling element and lock it into place.
3. The unit must be aligned before it is finally tightened and secured against twisting (see Chapter "Alignment" (Page 104)).
4. Turn the screw at the holder until the actuating or signaling element is fixed securely and cannot vibrate or twist (tightening torque 1.0 ... 1.2 Nm ).
5. Snap the PCB carrier (D) from behind onto the holder. To do this, hold the PCB carrier so that it is tilted downwards slightly and place it onto the holder from behind and then press it upwards until you feel the PCB carrier latch in the holder.
6. Equip the printed-circuit board $(\mathrm{F})$ with the components.
7. Screw the PCB securely onto the PCB carrier.

## Note

## Number of PCB carriers

Make sure there is sufficient stability. Use several PCB carriers if necessary.

### 4.5.3 Base mounting for the enclosure

You can find information on base mounting in the section "3SU18 enclosures" in Chapter "Installation (Page 182)"

### 4.5.4 Installation sequence illustrated by example of EMERGENCY STOP mushroom pushbutton



## Procedure

(1) Hold the backing plate (optional accessory) onto the front plate.
(2) Insert the actuating/signaling element (EMERGENCY STOP mushroom pushbutton in this example) from the front into the opening of the backing plate and the front plate.
(3) Fit the holder from behind.
(4) Tighten the screw on the holder (tightening torque 1.0 to 1.2 Nm ).
(5) Snap the contact module(s) / LED module from behind onto the holder.

Fit the narrow snap hook (b) into the associated contour on the holder.
(6) Engage the broad snap hook (a) into the associated contour on the holder.

Ensure secure latching

a Broad snap hook
b Narrow snap hook

### 4.5.5 Installation steps for 30.5 mm devices



## Procedure

(1) Insert the 30.5 mm actuating / signaling element from the front into the opening of the front plate.
(2) Fit the adapter from behind.
(3) Fit the holder from behind.
(4) Tighten the screw on the holder (tightening torque 1.0 to 1.2 Nm ).
(5) Snap the contact module(s) / LED module from behind onto the holder. Fit the narrow snap hook into the associated contour on the holder.
(6) Engage the broad snap hook into the associated contour on the holder.

Ensure secure latching.

### 4.5.6 Mounting a command point with ID key-operated switch



## Procedure

(1) Insert the ID key-operated switch from the front into the opening of the front plate.
(2) Place the holder from behind onto the ID key-operated switch.
(3) Tighten the screw on the holder (tightening torque 1.0 to 1.2 Nm ).
(4) Snap the electronic module for ID key-operated switch onto the back of the holder.

Fit the narrow snap hook into the associated contour on the holder.
(5) Engage the broad snap hook into the associated contour on the holder.

Ensure secure latching


Snapping an electronic module onto the holder (4) / (5)

### 4.5.7 Alignment

You must align the SIRIUS ACT devices before you finally tighten and secure them against twisting. You can do this in 4 different ways:

1. Alignment on horizontal guide line
2. Alignment with guide line on the arrow of the holder
3. Alignment with spirit level/ruler
4. Alignment on the fixing point

## Procedure

## Alignment on horizontal guide line

For this purpose, a horizontal line is drawn 18.5 mm above the center point of the 22.5 mm fixing hole. The holder can be aligned with this line when tightening the fixing screw.

## Alignment with guide line on the arrow of the holder

In vertical alignment of the fixing hole, a vertical line is drawn to which the holder is aligned with the help of the printed arrow.

## Alignment with spirit level/ruler

The spirit level is placed on an even surface of the holder. After alignment on the horizontal, the fixing screw is tightened. Alternatively, a ruler can be used with a range of devices. For this purpose, all holders must first be roughly aligned under the ruler. Then one holder after another is precisely aligned with the help of the applied ruler, and fixed with the fixing screw.

After the device has been aligned, you must tighten the fastening screw with a torque of between 1.0 and 1.2 Nm . The high transformation ratio of the fixing mechanism and the pointed teeth of the fixing collar provide rugged and long-lasting protection against twisting. You can then install the contact module and/or LED module(s) as required.

### 4.5.8 Disassembly sequence illustrated by example of EMERGENCY STOP mushroom pushbutton



## Procedure

(1) Insert a screwdriver into the opening of the latches (broad snap hook) of the contact modules or LED modules.
(2) Press the screwdriver down to open the latches of the modules.

(3) Remove the modules.

(4) Remove the fastening screw from the holder.

(5) Unlock the holder.

(6) Remove the holder to the rear from the EMERGENCY STOP mushroom pushbutton (or any other actuating or signaling element).
(7) Remove the EMERGENCY STOP mushroom pushbutton.
(8) Remove the backing plate (optional step).

### 4.5.9 Disassembly steps for 30.5 mm devices



## Procedure

(1) Insert a screwdriver into the opening of the latches (broad snap hook) of the contact modules or LED modules.
Press the screwdriver down to open the latches of the modules.
(2) Remove the modules.
(3) Remove the fastening screw from the holder.
(4) Unlock the holder.

Remove the holder to the rear from the actuating or signaling element.
(5) Remove the adapter to the rear from the actuating or signaling element.
(6) Remove the actuator or signaling element.

### 4.5.10 Disassembly of buttons

The buttons of the pushbuttons and illuminated pushbuttons can be replaced from the front by the user.

## Procedure:

Insert a precision screwdriver into the gap between the button and the front ring and lever the button out.


## Mounting the button



Procedure:

1. Place the button on the device (1). Make sure the insert label is correctly mounted (aligned).
2. To prevent incorrect mounting when reattaching the button, coding lugs are positioned at $90^{\circ}$ intervals. For this reason, turn the button to the left or right (2) until it engages (3).

## 3SU11 complete units

### 5.1 Product description

The 3SU11 complete units are a modular range of devices for front plate mounting and rear cable connection. Complete units made up of an actuating or signaling element and contact modules and/or LED modules are offered for the most common applications.

The 3SU11 complete units are available in the following versions:

| Material | Article number |
| :--- | :--- |
| Plastic | 3 SU110 |
| Plastic / Metal, matte | 3 SU113 |
| Metal | 3 SU115 |

3SU11 complete units are supplied with the following components:

- An actuating or signaling element in front of the control panel
- A holder for securing behind the control panel
- Up to two contact modules and / or one LED module

The complete units are supplied without the individual components installed.
You can find information on installing in Chapter "Installation (Page 129)".
For further information about contact modules refer to Chapter "3SU14 contact modules and LED modules (Page 147)"

### 5.2 3SU11 devices for use on 3-slot holder

### 5.2.1 Pushbuttons

Pushbuttons are used to actuate contact modules and allow short-time contact or permanent closing / opening of a contact element. The button caps can be replaced from the front by the user.

Pushbuttons are available in different variants according to the following features:

- Height of button
- Height of front ring
- Collar and front ring material
- Colors of the buttons
- Quantity and type of modules included in the scope of supply

|  |  |  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :---: | :---: |

5.23 SU11 devices for use on 3-slot holder

## Metal / Metal

Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221497)

|  | Number of modules | Number of NO contacts | Number of NC contacts | Flat button | Raised button |
| :---: | :---: | :---: | :---: | :---: | :---: |
| - Black | 1 | 1 | 0 | 3SU1150-0AB10-xBA0 | - |
|  | 1 | 0 | 1 | 3SU1150-0AB10-xCA0 | 3SU1150-0BB10-1CA0 ${ }^{1}$ ) |
| - Red | 1 | 1 | 0 | 3SU1150-0AB20-xBA0 | --- |
|  | 1 | 0 | 1 | 3SU1150-0AB20-xCA0 | 3SU1150-0BB20-1CA0 ${ }^{1)}$ |
| - Yellow | 1 | 1 | 0 | 3SU1150-0AB30-xBA0 | - |
| - Green | 1 | 1 | 0 | 3SU1150-0AB40-xBA0 | - |
| - Blue | 1 | 1 | 0 | 3SU1150-0AB50-xBA0 | - |
| - White | 1 | 1 | 0 | 3SU1150-0AB60-xBA0 | - |

x : 1 = screw terminals
x : 3 = spring-loaded terminals

1) Available only with screw terminals

### 5.2.2 Illuminated pushbuttons

Illuminated pushbuttons are used to actuate contact modules and can also function as display devices by means of an LED module. The buttons can be replaced from the front by the user.

The illuminated pushbuttons are available in different variants according to the following features:

- Height of button
- Collar and front ring material
- Colors of the buttons
- Illumination
- Quantity and type of modules included in the scope of supply

| Typical diagram |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Illuminated pushbuttons (momentary contact type) |  |  |  |  |
| Collar / Front ring material | Number of modules | Number of NO contacts | Number of NC contacts | Article number |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221496) |  |  |  |  |
| - Red | 1 | 1 | 0 | 3SU110y-0AB20-xBA0 |
|  | 1 | 0 | 1 | 3SU110y-0AB20-xCA0 |
| - Yellow | 1 | 1 | 0 | 3SU110y-0AB30-xBA0 |
| - Green | 1 | 1 | 0 | 3SU110y-0AB40-xBA0 |
| - Blue | 1 | 1 | 0 | 3SU110y-0AB50-xBA0 |
| - White | 1 | 1 | 0 | 3 SU110y-0AB60-xBA0 |
| - Clear | 1 | 1 | 0 | 3SU1100-0AB70-xBA0 |

## Plastic / Metal, matte

Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226606)

|  | Number of <br> modules | Number of <br> NO contacts | Number of <br> NC contacts | Article number |
| :--- | :--- | :--- | :--- | :--- |
| - Red | 1 | 1 | 0 | 3 3U113y-0AB20-xBA0 |
|  | 1 | 0 | 1 | 3 (113y-0AB20-xCA0 |
| - Green | 1 | 1 | 0 | $3 S U 113 y-0 A B 30-x B A 0$ |
| - Blue | 1 | 1 | 0 | $3 S U 113 y-0 A B 40-x B A 0$ |
| - White | 1 | 1 | 0 | $3 S U 113 y-0 A B 50-x B A 0$ |
| - Clear | 1 | 1 | 0 | $3 S U 113 y-0 A B 60-x B A 0$ |

## Metal / Metal

Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221497)

|  | Number of <br> modules | Number of <br> NO contacts | Number of <br> NC contacts | Article number |
| :--- | :--- | :--- | :--- | :--- |
| - Amber | 1 | 1 | 0 | 3 (115y-0AB00-xBA0 |
| - Red | 1 | 1 | 0 | $3 S U 115 y-0 A B 20-x B A 0$ |
| - Yellow | 1 | 0 | 1 | $3 S U 115 y-0 A B 20-x C A 0$ |
| - Green | 1 | 1 | 0 | $3 S U 115 y-0 A B 30-x B A 0$ |
| - Blue | 1 | 1 | 0 | $3 S U 115 y-0 A B 40-x B A 0$ |
| - White | 1 | 1 | 0 | $3 S U 115 y-0 A B 50-x B A 0$ |
| - Clear | 1 | 1 | 0 | $3 S U 115 y-0 A B 60-x B A 0$ |

x : 1 = screw terminals
x : 3 = spring-loaded terminals
$y: 2=24 \mathrm{~V}$ AC/DC LED
y: $3=110 \mathrm{~V}$ AC LED
y: $6=230 \vee$ AC LED

## Note

Not all combinations listed in the tables are available. In the case of special versions, please consult Technical Assistance, or initiate a PI1000 request.

### 5.2.3 Mushroom pushbuttons

## Overview of mushroom pushbuttons, $\varnothing 40 \mathrm{~mm}$

Mushroom pushbuttons are used to actuate contact modules.
Their large, easily accessible button surface makes them easy to operate with the whole palm of the hand.
The actuator is available in diameter 40 mm .
Mushroom pushbuttons are available in different variants according to the following features:

- Collar and front ring material
- Quantity and type of modules included in the scope of supply

|  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Collar / Front ring material | Number of modules | Number of NO contacts | Number of NC contacts | Article number |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221498) |  |  |  |  |
| - Red | 1 | 0 | 1 | 3SU1100-1BA20-xCA0 |
| Plastic / Metal, matte <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226607) |  |  |  |  |
| - Red | 1 | 0 | 1 | 3SU1130-1BA20-1CA0 |
| Metal / MetalSiemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221499) |  |  |  |  |
| - Red | 1 | 0 | 1 | 3SU1150-1BA20-xCA0 |

x: 1 = screw terminals
x: 3 = spring-loaded terminals

### 5.2.4 EMERGENCY STOP mushroom pushbuttons

EMERGENCY STOP mushroom pushbuttons are devices for actuating contact modules, and they are used in conjunction with a safety relay to bring a machine / plant to a safe state.
The EMERGENCY STOP mushroom pushbuttons are equipped with tamper protection (trigger action). The EMERGENCY STOP mushroom pushbutton does not latch without generating an EMERGENCY STOP signal. The EMERGENCY STOP signal is maintained until the EMERGENCY STOP device is reset (unlatched).
All SIRIUS ACT EMERGENCY STOP mushroom pushbuttons comply with DIN EN ISO 13850.

These pushbuttons are operated by pressure applied by the whole palm of the hand.
The actuators are available in diameter 40 mm .
EMERGENCY STOP mushroom pushbuttons are available in different variants according to the following features:

- Collar and front ring material
- Colors (special variants)
- Switching function: latching
- Rotate to unlatch
- Pull to unlatch
- Quantity and type of modules included in the scope of supply

Overview of 40 mm diameter EMERGENCY STOP mushroom pushbuttons, rotate-to-unlatch type


$\mathrm{x}: 1$ = screw terminals
x: 3 = spring-loaded terminals
$y: F=$ without backing plate
y: $\mathrm{G}=$ backing plate: EMERGENCY STOP
y: $\mathrm{H}=$ backing plate: NOT-HALT
$y: J=$ backing plate: ARRET D'URGENCE

Overview of 40 mm diameter EMERGENCY STOP mushroom pushbuttons, pull-to-unlatch type

|  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Collar / Front ring material | Number of modules | Number of NO contacts | Number of NC contacts | Article number |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221500) |  |  |  |  |
| - Red | 1 | 0 | 1 | 3SU1100-1HA20-xCy0 |
|  | 1 | 1 | 1 | 3SU1100-1HA20-xFy0 |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221501) |  |  |  |  |
| - Red | 1 | 0 | 1 | 3SU1150-1HA20-xCy0 |
|  | 1 | 1 | 1 | 3SU1150-1HA20-xFy0 |

x : 1 = screw terminals
x : 3 = spring-loaded terminals
$y$ : $F=$ without backing plate
y: $\mathrm{G}=$ backing plate: EMERGENCY STOP
y: $\mathrm{H}=$ backing plate: NOT-HALT
$y: J=$ backing plate: ARRET D'URGENCE

## Note

Not all combinations listed in the tables are available. In the case of special versions, please consult Technical Assistance, or initiate a PI1000 request.

### 5.2.5 Indicator lights

Indicator lights function as indicators and signaling devices. They are equipped with a smooth-surfaced lens that cannot be replaced by the user.

Indicator lights are available in different variants according to the following features:

- Collar and front ring material
- Colors
- Quantity and type of LED modules included in the scope of supply

| Typical diagram |  |
| :---: | :---: |
| Typical diagram <br> Indicator lights with holder (available with screw terminals and spring-loaded terminals) |  |
| Collar / Front ring material | Article number |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221512) |  |
| - Amber | $3 \mathrm{SU110y-6AA00-xAA0}$ |
| - Red | 3SU110y-6AA20-xAA0 |
| - Yellow | 3SU110y-6AA30-xAA0 |
| - Green | $3 S U 110 y-6 A A 40-x A A 0$ |
| - Blue | $3 \mathrm{SU110y-6AA50-xAA0}$ |
| - White | $3 \mathrm{SU110y-6AA60-xAA0}$ |
| - Clear | 3SU110y-6AA70-xAA0 |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221513) |  |
| - Amber | $3 \mathrm{SU115y-6AA00-xAA0}$ |
| - Red | 3SU115y-6AA20-xAA0 |
| - Yellow | $3 S U 115 y-6 A A 30-x A A 0$ |
| - Green | 3SU115y-6AA40-xAA0 |
| - Blue | 3SU115y-6AA50-xAA0 |
| - White | $3 \mathrm{SU115y-6AA60-xAA0}$ |
| - Clear | $3 S U 115 y-6 A A 70-x A A 0$ |

x : 1 = screw terminals
x: 2 = spring-loaded terminals
y: 2 = variant with LED: $24 \mathrm{~V} \mathrm{AC/DC}$
y: 3 = variant with LED: 110 V AC
y: 6 = variant with LED: 230 V AC

## Note

Not all combinations listed in the tables are available. In the case of special versions, please consult Technical Assistance, or initiate a PI1000 request.

### 5.2.6 Selector switches

The selector switch is an actuator with 2 or 3 switch positions. Thanks to the rotary actuation, up to 3 contact modules can be operated with momentary contact or latching operation. The fiber-optic conductor integrated into the actuator can be illuminated using an LED module.
Selector switches are available in different variants according to the following features:

- Switch positions
- Collar and front ring material
- Quantity and type of modules included in the scope of supply


## Short black actuator, 2 switch positions, latching



Typical diagram

| Collar / Front ring <br> material | Number of <br> modules | Number of NO <br> contacts | Number of NC <br> contacts | Article number |
| :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |

## Plastic / Plastic

Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221504)

| $\bullet$ White | 1 | 1 | 0 | $3 S U 1100-2 B F 60-x B A 0$ |
| :--- | :--- | :--- | :--- | :--- |
|  | 1 | 1 | 1 | $3 S U 1100-2 B F 60-x M A 0$ |

Plastic / Metal, matte
Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226609)

| - White | 1 | 1 | 0 | 3SU1130-2BF60-xBA0 |
| :---: | :---: | :---: | :---: | :---: |
|  | 1 | 1 | 1 | 3SU1130-2BF60-xMA0 |
| Metal / Metal |  |  |  |  |
| Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221505) |  |  |  |  |
| - White | 1 | 1 | 0 | 3SU1150-2BF60-xBA0 |
|  | 1 | 1 | 1 | 3SU1150-2BF60-xMA0 |

x : 1 = screw terminals
$\mathrm{x}: 3$ = spring-loaded terminals

## Short black actuator, 3 switch positions

| Collar / Front ring material | Number of modules | Number of NO contacts | Number of NC contacts | Article number |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Latching $2 \times 45^{\circ}$ | Momentary contact $2 \times 45^{\circ}$ reset from left + right O |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221504) |  |  |  |  |  |
| - White | 2 | 2 | 2 | 3SU1100-2BL60-xLA0 | 3SU1100-2BM60-xLA0 |
|  | 2 | 2 | 0 | 3SU1100-2BL60-xNA0 | 3SU1100-2BM60-xNA0 |
| Plastic / Metal, matte <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226609) |  |  |  |  |  |
| - White | 2 | 2 | 0 | 3SU1130-2BL60-xLA0 | 3SU1130-2BM60-xLA0 |
|  | 2 | 2 | 0 | 3SU1130-2BL60-xNA0 | 3SU1130-2BM60-xNA0 |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221505) |  |  |  |  |  |
| - White | 2 | 2 | 0 | 3SU1150-2BL60-xLA0 | 3SU1150-2BM60-xLA0 |
|  | 2 | 2 | 0 | 3SU1150-2BL60-xNA0 | 3SU1150-2BM60-xNA0 |

$\mathrm{x}: 1$ = screw terminals
$x: 3=$ spring-loaded terminals

## Note

Not all combinations listed in the tables are available. In the case of special versions, please consult Technical Assistance, or initiate a PI1000 request.

### 5.2.7 Key-operated switches

Key-operated switches are equipped with a lock for safety reasons. Only an authorized group of persons who have access to the relevant key can perform a switching operation (in this case, actuation of contact modules). Up to 3 switch positions can be temporarily or permanently selected using a key-operated switch.
Key-operated switches are available in different variants according to the following features:

- Key-operated switch manufacturer
- Key removal positions
- Switch positions
- Collar and front ring material
- Color of actuators
- Quantity and type of modules included in the scope of supply


## With Ronis SB30 lock, 2 switch positions; key removal in any position



Typical diagram

| Collar / Front ring <br> material | Number of <br> modules | Number of NO <br> contacts | Number of NC <br> contacts | Article number |
| :--- | :--- | :--- | :--- | :--- |

Latching, $90^{\circ}$
(10:30/1:30 o'clock)
$\sigma^{\circ}$
Plastic / Plastic
Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221510)

| - Black | 1 | 1 | 0 | 3 SU1100-4BF11-xBA0 |
| :--- | :--- | :--- | :--- | :--- |
|  | 1 | 1 | 1 | $3 S U 1100-4 B F 11-x F A 0$ |

## Plastic / Metal, matte

Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226615)

| $\cdot$ Black | 1 | 1 | 0 | 3 SU1130-4BF11-xBA0 |
| :--- | :--- | :--- | :--- | :--- |
|  | 1 | 1 | 1 | $3 S U 1130-4 B F 11-x F A 0$ |

## Metal / Metal

Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221511)

| - Black | 1 | 1 | 0 | $3 S U 1150-4 B F 11-x B A 0$ |
| :--- | :--- | :--- | :--- | :--- |
|  | 1 | 1 | 1 | $3 S U 1150-4 B F 11-x F A 0$ |

x: 1 = screw terminals
x : 3 = spring-loaded terminals

## With CES SSG10 lock, 2 switch positions; key removal in any position

| Collar / Front ring <br> material | Number of modules | Number of NO <br> contacts | Number of NC <br> contacts | Article number |
| :--- | :--- | :--- | :--- | :--- |
| Latching, $90^{\circ}(10: 30 / 1: 30$ o'clock) <br> O/I |  |  |  |  |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221510) |  |  |  |  |
| • Black | 1 | 1 | 0 | 3SU1100-5BF11-3FA0 |

1) Spring-loaded terminal

## With Ronis SB30 lock, 3 switch positions; key removal in any position

| Collar / Front ring material | Number of modules | Number of NO contacts | Number of NC contacts | Article number |
| :---: | :---: | :---: | :---: | :---: |
| Latching, $2 \times 45^{\circ}$ (10:30/12/1:30 o'clock) |  |  |  |  |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221510) |  |  |  |  |
| - Black | 1 | 2 | 0 | 3SU1100-4BL11-1NA0 ${ }^{2}$ |
| Plastic / Metal, matte <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226615) |  |  |  |  |
| - Black | 1 | 2 | 0 | 3SU1130-4BL11-1NA0²) |

[^2]
### 5.3 3SU11 devices for use on 4-slot holder

### 5.3.1 Coordinate switches

Coordinate switches are used to temporarily or permanently select up to 4 positions. They are operated by a vertical and horizontal movement using several fingers. Only one position on the holder is actuated in each case. The coordinate switch is suitable for simple navigation tasks thanks to its 4 selectable directions.

Coordinate switches are available in different variants according to the following features:

- Switch positions
- Collar and front ring material
- Locking (in the middle position)

A holder for 4 modules (3SU15.0-0BA10-OAAO) is required to install any of the devices listed below (see also Chapter "Holders (Page 38)"). For further information, refer to Chapter "Mounting (Page 129)".

Without mechanical interlock

|  |  |  | 2 switch positions |
| :--- | :--- | :--- | :--- | :--- | :--- |



With mechanical interlock





### 5.4 Mounting

### 5.4.1 Front plate mounting



A Actuating element
B Front plate
C Holder
D Contact module
E LED module

## Procedure

1. Remove the components of the complete unit from the packaging
2. Insert the actuating or signaling element $(A)$ from the front through the mounting opening of the front plate (B).
3. Fit the holder (C) from behind (wiring side) onto the actuating or signaling element and lock it into place.
4. The unit must be aligned before it is finally tightened and secured against twisting (see Chapter "Alignment").
5. Turn the screw at the holder until the actuating or signaling element is fixed securely and cannot vibrate or twist (tightening torque 1.0... 1.2 Nm).
6. Snap the contact module(s) (D) from behind onto the holder. To do this, hold the modules so that they are tilted downwards slightly and place them onto the holder from behind and then press them upwards until you feel the module latch in the holder.
7. Mount an LED module (E), if necessary. You can mount the LED module on the holder only in position $3 / 6$ (center position).

## 3SU12 compact units

## Types of 3SU12 compact units

On the 3SU12 compact units, the electrical function (illumination and / or switching functions) is integrated into the actuating or signaling element. The electrical function is not expandable or replaceable. The compact versions are also not combinable with other modules of the 3SU10 / 3SU11 modular series.
The compact units are secured with the holder included in the scope of supply. The cables of the compact units are connected via the screw terminals / M12 connector attached to the rear.
You can find information on the holders in Chapter "Holders (Page 38)".
The following compact units are available:

- Pushbuttons with extended stroke
- Potentiometers
- Sensor switches


## 3SU12 actuating and signaling elements

The 3SU12 actuating and signaling elements are available in the following designs:

- Front ring and collar in plastic
- Front ring in metal matte and collar in plastic
- Front ring and collar in metal

| Actuating element material | Collar material | Plastic |
| :--- | :--- | :--- |
| Plastic |  |  |
|  |  |  |
| Plastic |  |  |
| Metal matte |  |  |

## Holders

The holders with three slots are available in plastic and metal versions.
The following assumptions apply when assigning holders to the actuating elements and signaling elements:

| Material | Plastic holder (3SU1500-0AA10-0AA0) | Metal holder (3SU1550-0AA10-0AA0) |
| :--- | :---: | :---: |
| Plastic | $\checkmark$ | $\checkmark$ |
| Metal | --- | $\checkmark$ |

## Structure of a 3SU12 command point

A compact command point consists of the following elements:

- An actuating or signaling element in front of the control panel
- A holder for securing behind the control panel


### 6.1 Overview

### 6.1.1 Pushbuttons with extended stroke

Pushbuttons with extended stroke are used to actuate a relay in the control cabinet. The pushbuttons are used, for example, as accessories for the Siemens Sivacon modules. They are used as actuating elements without contact modules. These pushbuttons can only be used in conjunction with a 3SU1900-0KG10-0AA0 extension plunger.

Pushbuttons are available in different variants according to the following features:

- Height of button
- Collar and front ring material
- Colors of the buttons

For further information refer to Chapters "Holders (Page 38)" and "Mounting (Page 138)".

|  | Pushbuttons with covere |  |
| :---: | :---: | :---: |
|  | Flat button | Raised button |
| Typical diagram |  |  |
| Collar / Front ring material | Article number |  |
| Plastic / Plastic |  |  |
| Siemens Industry Mall (http | ens.com/mall/en/en/Catal | 10226601) |
| - Black | --- | 3SU1200-0FB10-0AA0 |
| - Red | 3SU1200-0EB20-0AA0 | --- |
| - Green | 3SU1200-0EB40-0AA0 | --- |
| Plastic / Metal, matte |  |  |
|  |  |  |
|  |  |  |
| - Red | 3SU1230-0EB20-0AA0 | --- |
| - Green | 3SU1230-0EB40-0AA0 | --- |
| Metal / Metal |  |  |
| Siemens Industry Mall (http | ens.com/mall/en/en/Catal | 10226602) |
| - Black | --- | 3SU1230-0FB10-0AA0 |
| - Red | 3SU1250-0EB20-0AA0 | --- |
| - Green | 3SU1250-0EB40-0AA0 | --- |


|  | Pushbuttons with transparent button Labeling of the button is possible, see Chapter 'Devices with labeling (Page 89)" in this respect |  |
| :---: | :---: | :---: |
| Typical diagram | Flat button | Raised button |
| Collar / Front ring material | Article number |  |
| Plastic / Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226601) |  |  |
| - Red | 3SU1201-0EB20-0AA0 | --- |
| - Clear | 3SU1201-0EB70-0AA0 | --- |
| Plastic / Metal, matte <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226627) |  |  |
| - Red | 3SU1231-0EB20-0AA0 | --- |
| - Clear | 3SU1231-0EB70-0AA0 | --- |
| Metal / Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226602) |  |  |
| - Red | 3SU1251-0EB20-0AA0 | --- |
| - Clear | 3SU1251-0EB70-0AA0 | --- |

The extension plunger compensates the distance between the pushbutton and the unlatching button of an overload relay. The length of the extension plunger can be adapted individually.

|  | Extension plungers |  |
| :---: | :---: | :---: |
|  | Material | Article number |
|  | Plastic | 3SU1900-0KG10-0AA0 <br> (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221537) |

### 6.1.2 Potentiometers

Potentiometers are devices for the mechanical (linear) regulation of different resistance values. They are operated by turning the actuator.
These devices are available in different variants according to the following features:

- Collar and front ring material
- Resistance areas

For further information refer to Chapters "Holders (Page 38)", "Mounting (Page 138)" and "Accessories (Page 303)".

| Potentiometers |  |  |
| :---: | :---: | :---: |
|  | Collar / Front ring material | Article number |
|  | Plastic / Plastic |  |
|  | - 1 kohm | 3SU1200-2PQ10-1AA0 |
|  | - 4.7 kohm | 3SU1200-2PR10-1AA0 |
|  | - 10 kohm | 3SU1200-2PS10-1AA0 |
|  | - 47 kohm | 3SU1200-2PT10-1AA0 |
|  | - 100 kohm | 3SU1200-2PU10-1AA0 |
|  | - 470 kohm | 3SU1200-2PV10-1AA0 |
|  | Metal / Metal |  |
|  | - 1 kohm | 3SU1250-2PQ10-1AA0 |
|  | - 4.7 kohm | 3SU1250-2PR10-1AA0 |
|  | - 10 kohm | 3SU1250-2PS10-1AA0 |
|  | - 47 kohm | 3SU1250-2PT10-1AA0 |
|  | - 100 kohm | 3SU1250-2PU10-1AA0 |
|  | - 470 kohm | 3SU1250-2PV10-1AA0 |

### 6.1.3 Sensor switches

Sensor switches are capacitive sensors that are actuated when the sensor surface is touched by hand without the application of force or pressure. The sensor switch can be actuated by someone wearing thin gloves. In this case, however, it might be necessary to apply light pressure to the sensor surface.
Sensor switches are used to operate machines or as door opening switches and stop call buttons. Thanks to the water-sealed electronic circuitry and rugged enclosure materials used in their construction, these capacitive and fully electronic sensors are extremely durable. Since sensor switches have no moving mechanical parts, they are maintenance-free. Two integrated status display LEDs provide the user with visual feedback.

| Sensor switches |  |
| :--- | :--- | :--- |

## Application example

When the sensor switches are combined with the appropriate Siemens DIN EN 574compliant evaluation devices with type III C certificate (devices from the SIRIUS 3SK1 Advanced safety relay range or devices from the 3RK3 Modular Safety System (MSS)), they can be deployed as a safety relay, for example, in two-hand control applications. A two-hand control device requires simultaneous actuation with both hands in order to start up a machine and to keep it in operation in a potentially risky situation. The two-hand control device must be located outside the hazard zone (and the hazard zone must be clearly visible) in order to prevent the operator from entering the zone before the machine has reached a complete standstill.
The control command is sent by actuating both pushbuttons simultaneously within 0.5 s .
The following properties must be provided for mobile two-hand control devices:

- Stability
- The safety distance must be maintained between the control actuating devices and the hazard zone
- In the case of adjustable control actuating devices, a latch must be available

The sensor switch provides effective shock protection and the operating surface is easy to clean (protection class IP 69).

A function test must be carried out before commissioning. The following properties must be checked in the function test:

- Simultaneous actuation (use of both hands)
- Synchronous actuation (synchronism $\leq 500 \mathrm{~ms}$ )
- Relationship between input signals and output signals
- Renewed generation of the output signal

For further information refer to Chapters "Mounting (Page 139)", "Two-hand operation console (Page 192)" and "Application examples (Page 441)".

You can find an overview of the evaluation units that can be used in conjunction with the sensor switches at this website.
(https://support.industry.siemens.com/cs/document/109038855/auswertegerte-fr-eine-2-hand-applikation-mit-dem-3su1200-1sk10-2sa0?pnid=16445\&lc=de-WW)

You will find further information about the use of sensor switches in the two-hand operation console (wiring to Siemens safety relays and safety design) in the following FAQs: Sensor switches in the two-hand operation console
(https://support.industry.siemens.com/cs/document/109479531/Einsatz)

### 6.2 Mounting

### 6.2.1 Front plate mounting

## Requirement

You need at least the following elements in order to construct a command point:

- An actuating or signaling element (3SU12) in front of the control panel
- A holder (3SU15) for securing behind the control panel


Typical diagram
A Actuating or signaling element
B Front plate
C Holder

## Procedure

1. Insert the actuating or signaling element $(A)$ from the front through the mounting opening of the front plate (B).
2. Fit the holder (C) from behind (wiring side) onto the actuating or signaling element and lock it into place.
3. The unit must be aligned before it is finally tightened and secured against twisting (see Chapter Alignment (Page 104)).
4. Turn the screw at the holder until the actuating or signaling element is fixed securely and cannot vibrate or twist (tightening torque 1.0 ... 1.2 Nm).
5. Wire the actuating or signaling element.

### 6.2.2 Front plate mounting, sensor switches

Systems designed for the installation and commissioning of the sensor switch must comply with the requirements of EN 574: 2008.
Prevention of accidental actuation and defeat (please also read EN 574, Section 8)
The sensor switches for a two-hand control circuit must be arranged according to the risk assessment for the individual application in such a way that the protective effect of the twohand control circuit cannot be defeated. The probability of accidental actuation must be minimized. The use of a single hand, possible combinations of one hand and/or other parts of the body and/or the use of simple aids which would allow the protective circuit to be defeated must be taken into consideration so that there is no possibility that persons can enter the hazard zone when hazards exist. Accidental actuation (e.g. by the operator's clothing) must also be taken into account.

The following measures as defined by standard EN 574: 2008 must be complied with:

- Prevention of protective circuit defeat by one hand
- Spatial separation between control actuating devices (clearance) of at least 260 mm
- Prevention of defeat by hand and elbow of the same arm
- Spatial separation between control actuating devices (clearance) of at least 550 mm . This clearance should not exceed 600 mm for ergonomic reasons
- Prevention of defeat by one hand and any other part of the body (e.g. knee, hip)
- Arrangement of control actuating devices on a horizontal surface at a distance of at least 1100 mm above the floor or the access level.

The sensor switches should not be installed in an exposed location (i.e. without operation console or protective cover for switch) so as to prevent accidental actuation of the switch by falling objects.

## Safety distance (refer also to EN 574, Section 9.8)

The safety distance between the sensor switches and the hazard zone must be large enough to ensure that the operator cannot enter the hazard zone after release of a sensor switch until all potentially hazardous machinery has ceased moving.
The safety distance " S " in mm is calculated according to the following formula:
$S=V \times T+C$
Key to formula:
$V=$ Hand/arm speed $=1600 \mathrm{~mm} / \mathrm{s}$
$\mathrm{T}=$ Reaction time in seconds (the reaction time of the sensor switch is max. 50 ms )
$\mathrm{C}=$ Additional value $=250 \mathrm{~mm}$
If entry of persons into the hazard zone following actuation of the sensor switch can be reliably prevented, the additional value C can be set to " 0 ".
However, the minimum clearance must always be 100 mm .

## Mounting

The sensor switch can be mounted on front plates and in the following enclosures of the SIRIUS ACT series:

- 3SU1801-1AA00-1AA1 (plastic enclosure; command point in center)
- 3SU1851-1AA00-1AA1 (metal enclosure; command point in center)
- 3SU1803-3AA00-0AA1 (two-hand operation console, plastic)
- 3SU1853-3AA00-0AA1 (two-hand operation console, metal)


## Note

The following applies for the American market:
The devices must only be connected with cables and connectors listed in CYJV.

Procedure (example of mounting on front plate)

(1) Insert the sensor switch into an enclosure (e.g. 3SU18..-3 two-hand operation console) or front plate.
Align the sensor switch so that it is positioned correctly (LED).
(2) Place the holder from behind onto the sensor switch and lock it in position
(3) Turn the screw on the holder until the sensor switch is fixed securely and cannot vibrate or twist (tightening torque 1.0 to 1.2 Nm ).
Then connect the sensor switch to a controller using a connector (3SU1900-0KL10-0AA0).

## Note

The connecting cables are not included in the scope of delivery. The cable used must not be more than 5 m long.

## Connector (3SU1900-0KL10-0AA0)



Tightening torque for the connector fastening screws 3SU1900-0KL10-0AA0: 0.4 Nm

## Connector pin assignment for connection to sensor switch



A floating contact is located between contacts 2 and 4.
You can find more information in the "Technical data (Page 344)"

## Installation of protective cover

1. Before you install the protective cover (3SU1900-0EC10-0AA0), you must clean the surface on which the cover will be mounted

2. Install the sensor switch
3. Remove the protective film from the rear face of the protective cover
4. Mount the protective cover in the space provided (use adhesive to fix cover in position)


## Switching states of the sensor switch

- LED shows a green light $\Rightarrow$ sensor switch active
- LED shows a yellow light $\Rightarrow$ sensor switch actuated


## Commissioning

Operating state: Green LED steadily illuminated (O. K.)


Error: Green LED off -> check the supply voltage
The yellow LED lights up when the switch is actuated.


The contact remains closed while the hand remains in contact with the sensor switch surface. No force needs to be applied in order to actuate the switch.

## Removal


(1) Remove the screw from the holder
(2) Unlock the holder
(3) Remove the holder from the sensor switch
(4) Remove the sensor switch

### 6.3 Connecting

## Procedure for wiring compact units


(1) Insert the relevant cable as far as it will go into the opening of the screw terminal of the compact unit.
(2) Insert the screwdriver (DIN ISO 8764-1-PZD1) into the opening for the screw.

Tighten the screw.

- Tightening torque: $0.8 \ldots 1.0 \mathrm{Nm}$

Pull on the cable to ensure it is screwed tight.

Conductor cross-sections for compact units

|  | Screw terminals |
| :--- | :--- |
|  | Tightening torques: <br> $0.8 \ldots 1.0 \mathrm{Nm}$ |
| DIN ISO 8764-1-PZD1 |  |
|  | $2 \times(1.0 \ldots 1.5) \mathrm{mm}^{2}$ |
| AWG | $2 \times(0.5 \ldots 0.75) \mathrm{mm}^{2}$ |
|  | $2 \times(1.0 \ldots 1.5) \mathrm{mm}^{2}$ |

## 3SU14 modules

### 7.1 Overview

### 7.1.1 Contact modules

## Contact modules

Contact modules are used to switch circuits. The mechanical motion of the actuator is converted to electrical signals in interaction with the contact module when contacts are opened or closed.
The following variants of contact module are available:

- Spring-loaded terminals
- Screw terminals
- Front plate mounting
- Base mounting (enclosure mounting)
- 1-pole
- 2-pole
- Different functions (NC contact, NO contact and combinations thereof)

Color coding of the switching variants depends on the colors of the ID keys:

- 1NO $\rightarrow$ Green
- $1 \mathrm{NC} \rightarrow$ Red
- $2 \mathrm{NC} \rightarrow$ Red
- 2NO $\rightarrow$ Green
- 1NO1NC $\rightarrow$ Gray
- 1NC1NC $\rightarrow$ yellow


### 7.1.2 Terminal designations

The terminal designations of the contact modules comply with EN 50013.
The terminal designations are 2-digit, e.g. 13, 14; 21, 22 :
Units digit = function digit (specify on the contact module)

- 1-2 for normally closed contacts (NC)
- 3-4 for normally open contacts (NO)

Tens digit $=$ Identification number (specify on the holder)

- Related terminals have the same sequence digit

Terminal designation example


## Left-hand module:

- Sequence digit on holder $=1$
- Function digit on module $=.3$
$\Rightarrow$ Terminal designation $=13$


## Right-hand module:

- Sequence digit on holder $=2$
- Function digit on module $=.4$
$\Rightarrow$ Terminal designation $=24$


### 7.1.3 Contact modules for front plate mounting

Contact modules for front plate mounting are installed on the rear face of a holder. For further information refer to Chapters "Holders (Page 171)" and "Mounting (Page 165)"

| Number of NO <br> contacts | Number of NC <br> contacts | Product function <br> positive opening | Suitable for <br> enclosure mounting | Article number |
| :--- | :--- | :--- | :--- | :--- |
| Contact modules <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221526) |  |  |  |  |
| 1 | 0 | No | Yes | 3SU1400-1AA10-xBA0 |
| 0 | 1 | Yes | Yes | 3SU1400-1AA10-xCA0 |
| 2 | 0 | No | No | 3SU1400-1AA10-xDA0 |
| 0 | 2 | Yes | No | 3SU1400-1AA10-xEA0 |
| 1 | 1 | Yes | No | 3SU1400-1AA10-xFA0 |
| 0 | $2(1$ contact for <br> installation <br> monitoring) | Yes | No | 3SU1400-1AA10-xHA01) |

x: 1 = screw terminals; 3 = spring-type terminals

1) The 3SU1400-1AA10-. HA0 contact modules with installation monitoring can only be mounted at positions 1 and 2 on the holder when combined with 3SU1 actuating and signaling elements.
Exception: They can be mounted at all 3 holder positions when they are combined with a non-illuminated EMERGENCY STOP.

## Operating principle of 3SU1400-1AA10-.HA0 contact modules with installation monitoring

The 3SU1400-1AA10-.HA0 contact module monitors proper installation or correct connection to an EMERGENCY STOP actuator. If the contact module is incorrectly installed or is disconnected from the actuator, the contact module initiates an automatic shutdown of the machine or system. As long as operation continues, it is assured that all necessary contacts are functioning properly.

## Machinery Directive

In addition to increased safety, the 3SU1400-1AA10-. HA0 contact module also supports compliance with the Machinery Directive.

## Initial commissioning

The circuits are closed and the contact module is ready for use only after completion of the function test prescribed by the directive, i.e. when activated for the first time.

## During operation

The installation status of the contact module is continuously monitored. If an error occurs, the machine is shut down automatically.

### 7.1.4 Contact modules for base mounting (enclosure mounting)

The contact modules for enclosure mounting are installed in 3SU18 enclosures. On enclosures with raised cover (Article No.: 3SU180(5)1-1AA00-0AA1) base mounting is not envisaged.
For further information refer to Chapter "3SU18 enclosures (Page 177)"

| Number of NO contacts | Number of NC contacts | Product function <br> positive opening | Article number |
| :--- | :--- | :--- | :--- |
| Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10227974) |  |  |  |
| 1 | 0 | No | 3SU1400-2AA10-xBA0 |
| 0 | 1 | Yes | 3SU1400-2AA10-xCA0 |

x: 1 = screw terminals
x : 3 = spring-loaded terminals

## Minimum clearance for front plate mounting

When contact modules are mounted on the front plate, they must be installed at a minimum distance of 4 mm from the closest enclosure wall.
(Typical diagram)


| (1) | Front plate |
| :--- | :--- |
| (2) | Holder |
| (3) | Contact module |
| (4) | Enclosure wall |

## Stackability of contact modules

## Note

## Stackability

With SIRIUS ACT, the modules are mounted on the holder without any further accessories. The modules can be stacked without needing to use a tool (max. $2 \times 1$-pole modules behind one other).

Please note that a 2-pole contact module may not be stacked on a 1-pole contact module.

(1)

Actuating element (here: EMERGENCY STOP mushroom pushbutton)
(2) Holder
(3) Module 1
(4) Module 2

## Number of contact modules per holder without EMERGENCY STOP

3-slot holder:

- $3 \times 2$ single-pole contact modules

Max. 2 single-pole contact modules can be stacked in each holder slot

- 3 two-pole contact modules

4-slot holder:

- $4 \times 2$ single-pole contact modules Max. 2 single-pole contact modules can be stacked in each holder slot
- 4 two-pole contact modules

It is possible to mix both variants (single-pole and two-pole contact modules), e.g. 3-slot holder with 4 single-pole contact modules +1 two-pole contact module.

The following diagrams illustrate by way of an example the maximum number of contact modules that can be installed in a 3 -slot holder (in this case without EMERGENCY STOP).


3 -slot holder $3 \times 2$ single-pole contact modules (4-slot holder $4 \times 2$ single-pole contact modules)


3-slot holder 3 x two-pole contact modules (4-slot holder $4 \times$ two-pole contact modules)


## Equipping of EMERGENCY STOP with contact modules

A holder must be equipped with at least one contact system with 1 NC switching functionality. A maximum total of 4 circuits may be connected.

## Number of contact modules per holder with EMERGENCY STOP without contact modules for installation monitoring

The following diagrams illustrate by way of an example the maximum number of contact modules that can be installed in a 3-slot holder (in this case with EMERGENCY STOP).


3 -slot holder $2 \times 1$ single-pole and 1 two-pole contact module


3-slot holder 2 two-pole contact modules


## Number of contact modules per holder with EMERGENCY STOP with contact modules for installation monitoring

When using the 3SU1400-1AA10-.HA0 contact module (1 NC with installation monitoring) the maximum permissible number of circuits is: 3 .

The following diagrams illustrate by way of an example the maximum number of contact modules that can be installed in a 3-slot holder


1 contact module for installation monitoring (1 NC with installation monitoring) and 2 x 1 single-pole contact module


1 contact module for installation monitoring (1 NC with installation monitoring) and 1 x twopole contact module


## $2 \times 1$ contact module for installation monitoring ( 1 NC with installation monitoring)

For this application, the maximum permissible number of circuits is: 2 .


### 7.1.5 LED modules

Only LED modules with permanently integrated LEDs are available for illuminating the 3SU1 pushbuttons and signaling devices.
LED modules can only be mounted on a 3-slot holder or in the enclosure. LED modules are always snap-mounted at position 3 in the holder or in the enclosure.
These devices are available in different variants according to the following features:

- Spring-loaded terminals
- Screw terminals
- PCB installation
- Front plate mounting
- Base mounting (enclosure mounting)
- Colors
- Voltages

LED modules bear terminal designations in accordance with EN 50013.

### 7.1 Overview

### 7.1.6 LED modules for front plate mounting

LED modules for front plate mounting are installed on the rear face of a holder. For further information refer to Chapters "Holders (Page 38)", "Mounting (Page 165)"

| Typical diagram | Operating voltage | Color of the LED | Article number |
| :---: | :---: | :---: | :---: |
|  | Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221527) |  |  |
|  | 24 V AC/DC | Amber | 3SU1401-1BB00-xAA0 |
|  |  | Red | 3SU1401-1BB20-xAA0 |
|  |  | Yellow | 3SU1401-1BB30-xAA0 |
|  |  | Green | 3SU1401-1BB40-xAA0 |
|  |  | Blue | 3SU1401-1BB50-xAA0 |
|  |  | White | 3SU1401-1BB60-xAA0 |
|  | 110 V AC | Amber | 3SU1401-1BC00-xAA0 |
|  |  | Red | 3SU1401-1BC20-xAA0 |
|  |  | Yellow | 3SU1401-1BC30-xAA0 |
|  |  | Green | 3SU1401-1BC40-xAA0 |
|  |  | Blue | 3SU1401-1BC50-xAA0 |
|  |  | White | 3SU1401-1BC60-xAA0 |
|  | 230 V AC | Amber | 3SU1401-1BF00-xAA0 |
|  |  | Red | 3SU1401-1BF20-xAA0 |
|  |  | Yellow | 3SU1401-1BF30-xAA0 |
|  |  | Green | 3SU1401-1BF40-xAA0 |
|  |  | Blue | 3SU1401-1BF50-xAA0 |
|  |  | White | 3SU1401-1BF60-xAA0 |

x : 1 = screw terminals
x: 3 = spring-loaded terminals

| Typical diagram | Operating voltage | Color of the LED | Article number |
| :---: | :---: | :---: | :---: |
|  | Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221527) |  |  |
|  | 6 ... 24 V AC/DC | Amber | 3SU1401-1BG00-xAA0 |
|  |  | Red | 3SU1401-1BG20-xAA0 |
|  |  | Yellow | 3SU1401-1BG30-xAA0 |
|  |  | Green | 3SU1401-1BG40-xAA0 |
|  |  | Blue | 3SU1401-1BG50-xAA0 |
|  |  | White | 3SU1401-1BG60-xAA0 |
|  | $24 . .240$ V AC / DC | Amber | 3SU1401-1BH00-xAA0 |
|  |  | Red | 3SU1401-1BH20-xAA0 |
|  |  | Yellow | 3SU1401-1BH30-xAA0 |
|  |  | Green | 3SU1401-1BH40-xAA0 |
|  |  | Blue | 3SU1401-1BH50-xAA0 |
|  |  | White | 3SU1401-1BH60-xAA0 |

x : 1 = screw terminals
x : 3 = spring-loaded terminals

## Note

LED modules $6 \ldots 24 \mathrm{~V}$ AC/DC must not be operated in systems with a programmable logic controller because a weak current of 5 V is sufficient to light up the LEDs on the module.

### 7.1.7 LED modules for base mounting (enclosure mounting)

The LED modules for enclosure mounting are installed in 3SU18 enclosures. On enclosures with raised cover (Article No.: 3SU180(5)1-1AA00-0AA1) base mounting is not envisaged.
For further information refer to Chapter "3SU18 enclosures (Page 177)"

| Typical diagram | Operating voltage | Color of the LED | Article number |
| :---: | :---: | :---: | :---: |
|  | Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10251008) |  |  |
|  | 24 V AC/DC | Amber | 3SU1401-2BB00-xAA0 |
|  |  | Red | 3SU1401-2BB20-xAA0 |
|  |  | Yellow | 3SU1401-2BB30-xAA0 |
|  |  | Green | 3SU1401-2BB40-xAA0 |
|  |  | Blue | 3SU1401-2BB50-xAA0 |
|  |  | White | 3SU1401-2BB60-xAA0 |
|  | 110 V AC | Amber | 3SU1401-2BC00-xAA0 |
|  |  | Red | 3SU1401-2BC20-xAA0 |
|  |  | Yellow | 3SU1401-2BC30-xAA0 |
|  |  | Green | 3SU1401-2BC40-xAA0 |
|  |  | Blue | 3SU1401-2BC50-xAA0 |
|  |  | White | 3SU1401-2BC60-xAA0 |
|  | 230 V AC | Amber | 3SU1401-2BF00-xAA0 |
|  |  | Red | 3SU1401-2BF20-xAA0 |
|  |  | Yellow | 3SU1401-2BF30-xAA0 |
|  |  | Green | 3SU1401-2BF40-xAA0 |
|  |  | Blue | 3SU1401-2BF50-xAA0 |
|  |  | White | 3SU1401-2BF60-xAA0 |

x: 1 = screw terminals
x : 3 = spring-loaded terminals

| Typical diagram | Operating voltage | Color of the LED | Article number |
| :---: | :---: | :---: | :---: |
|  | Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10251008) |  |  |
|  | 6 ... 24 V AC/DC | Amber | 3SU1401-2BG00-xAA0 |
|  |  | Red | 3SU1401-2BG20-xAA0 |
|  |  | Yellow | 3SU1401-2BG30-xAA0 |
|  |  | Green | 3SU1401-2BG40-xAA0 |
|  |  | Blue | 3SU1401-2BG50-xAA0 |
|  |  | White | 3SU1401-2BG60-xAA0 |
|  | $24 . .240$ V AC / DC | Amber | 3SU1401-2BH00-хAA0 |
|  |  | Red | 3SU1401-2BH20-xAA0 |
|  |  | Yellow | 3SU1401-2BH30-xAA0 |
|  |  | Green | 3SU1401-2BH40-xAA0 |
|  |  | Blue | 3SU1401-2BH50-xAA0 |
|  |  | White | 3SU1401-2BH60-xAA0 |

x : 1 = screw terminals
x : 3 = spring-loaded terminals

## Note

LED modules 6 ... 24 V AC/DC must not be operated in systems with a programmable logic controller because a weak current of 5 V is sufficient to light up the LEDs on the module.

### 7.1.8 LED modules for PCB mounting

| Operating voltage | Color of the LED | Article number |  |
| :--- | :--- | :--- | :---: |
| Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221527) |  |  |  |
| 5 V DC | Amber | 3SU1401-3BA00-5AA0 |  |
|  | Red | 3SU1401-3BA20-5AA0 |  |
|  | Yellow | 3SU1401-3BA30-5AA0 |  |
|  | Green | 3SU1401-3BA40-5AA0 |  |
|  | Blue | 3SU1401-3BA50-5AA0 |  |
|  | White | 3SU1401-3BA60-5AA0 |  |

Socket terminal (THT)

### 7.1.9 LED test module for base mounting (enclosure mounting)

The LED test modules are used to test the LED modules (AC/DC variants). The LED test module is activated via a contact module. This supplies the connected LED modules (to be tested) with a test voltage. The test module can be used to test LED modules (6-24 V AC/DC, 24 V AC/DC, 24-240 V AC/DC). Up to 30 LED modules can be connected to the test module for testing purposes (max. temperature here $70^{\circ} \mathrm{C}$ ).


For further information refer to Chapters "Holders (Page 38)", "Mounting (Page 165)"

|  | Operating voltage | Article number |
| :--- | :--- | :--- |
| Typical diagram | $12-240 \mathrm{~V} \mathrm{AC} \mathrm{/} \mathrm{DC}$ | 3SU1400-2CK10-1AA0 |

### 7.1.10 ASIsafe F adapters for front plate mounting

With ASIsafe F adapters, distributed SIRIUS ACT pushbuttons and indicator lights can be quickly connected to the AS-Interface communication system. ASIsafe F adapters for front plate mounting are installed on the rear face of a holder.
For more detailed information, refer to Chapter "Mounting (Page 97)".

## AS-Interface EMERGENCY STOP according to ISO 13850

Via the standard AS-Interface with safety-related communication, EMERGENCY STOP devices according to ISO 13850 can be directly connected using the AS-Interface modules.

AS-Interface modules, screw terminals + spring-loaded terminals


Typical diagram

| Slave type | Number of digital inputs |  | Number of digital outputs | Article number |
| :---: | :---: | :---: | :---: | :---: |
|  | Standard inputs |  |  |  |
| Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221528) |  |  |  |
| 2 F-DI | - | 2 | - | 3SU1400-1EA10-2AA0 |
| 2 F-DI + 1 LED | - | 2 | 1 <br> for activating the red LED <br> (LED not replaceable) | 3SU1401-1EE20-2AA0 |
| 2 F-DI + 1 DO | - | 2 | 1 <br> unassigned | 3SU1400-1EC10-2AA0 |

## AS-Interface modules, insulation piercing method



Typical diagram

| Slave type | Number of digital inputs |  | Number of digital outputs | Article number |
| :---: | :---: | :---: | :---: | :---: |
|  | Standard inputs | Fail-safe inputs |  |  |
| Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221528) |  |  |  |
| 2 F-DI | - | 2 | - | 1 <br> 2 F-DI + 1 LED |

AS-Interface modules, spring-loaded terminals + insulation piercing method


Typical diagram

| Slave type | Number of digital inputs |  | Number of digital outputs | Article number |
| :---: | :---: | :---: | :---: | :---: |
|  | Standard inputs | Fail-safe inputs |  |  |
| Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221528) |  |  |  |  |
| 2 F-DI + 1 DO | - | 2 | 1 unassigned | 3SU1400-1EC10-4AA0 |

### 7.1.11 AS-Interface modules for front plate mounting

With AS-Interface modules, distributed SIRIUS ACT pushbuttons and indicator lights can be quickly connected to the AS-Interface communication system. AS-Interface modules for front plate mounting are installed on the rear face of a holder.

|  | Slave type | Number of digital inputs |  | Number of <br> digital outputs | Article number |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  | Standard inputs | Fail-safe inputs |  |  |  | digh/10221528)

### 7.1.12 AS-Interface modules for base mounting (enclosure mounting)

With AS-Interface modules, distributed SIRIUS ACT pushbuttons and indicator lights can be quickly connected to the AS-Interface communication system. The AS-Interface modules for base mounting are installed in 3SU18 enclosures. On enclosures with raised cover (Article No.: 3SU180(5)1-1AA00-0AA1) base mounting is not envisaged.
AS-Interface modules with push-in terminal


### 7.1.13 Electronic modules for ID key-operated switches

The electronic modules for ID key-operated switches are designed for use with the ID keyoperated switch. The electronic modules for ID key-operated switches can be installed in a 3SU18.1-1AA00-1AA1 enclosure for one command point, or in a front plate using 3-slot holders. The 3SU1400-1GD10-1AA0 electronics modules for ID key-operated switches can be parameterized via IO-Link.
For further information refer to Chapters "ID key-operated switches (Page 80)", "ID keys (Page 323)" and "Technical data (Page 335)".

You can find information on using the electronic modules for ID key-operated switches for IO-Link in Chapter "IO-Link (Page 243)".

Article numbers
Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221530)

|  | IO-Link protocol <br> supported | Power supply via <br> IO-Link master | IO-Link transfer rate | Article number |
| :--- | :--- | :--- | :--- | :--- |
| No | --- | --- | 3SU1400-1GC10-1AA0 |  |
| Yes | Yes |  |  |  |

### 7.1.14 Electronic module for IO-Link

The electronic modules for IO-Link can be installed in 3SU1 enclosures or mounted on a front plate.

The modules are controlled by IO-Link communication. The rated supply voltage of the module is 24 V .

## Variants

- Front variant 6DI/2DO

For front plate mounting. The 8 digital inputs and outputs can be parameterized individually as required. The default setting is 6 digital inputs and 2 digital outputs. The inputs and outputs can only be parameterized by IO-Link communication.

- Basic variant 6DI/2DO

For use in a 3SU1 enclosure. The 8 digital inputs and outputs can be parameterized individually as required. The default setting is 6 digital inputs and 2 digital outputs. The inputs and outputs can only be parameterized by IO-Link communication.

- Basic variant 6DI/2DO

6DI/2DO means that the variant has 6 digital inputs and 2 digital outputs. It is not possible to change the number of inputs and outputs.

- Basic variant 4DI/4DO

4DI/4DO means that the variant has 4 digital inputs and 4 digital outputs. It is not possible to change the number of inputs and outputs.

- Basic variant 2DI/6DO

2DI/6DO means that the variant has 2 digital inputs and 6 digital outputs. It is not possible to change the number of inputs and outputs.

## Article numbers


${ }^{1)}$ Default setting. The 8 digital inputs and outputs can be parameterized individually as required.
${ }^{2)}$ It is not possible to change the number of inputs and outputs.

## Short-circuit protection

If a short-circuit occurs at one or more outputs, the occurrence of a fault event is sent and the fault flag is set. All outputs are deactivated for one second. Then the relevant outputs are re-activated to monitor whether the short-circuit is still active. This temporary state exists for approximately 0.1 seconds. If no short-circuit is determined during this period, the fault event is revoked, and the fault flag is deleted. However, if a short-circuit is detected during this time, all outputs are deactivated again, and the short-circuit device fault remains.

### 7.2 Mounting

### 7.2.1 Front plate mounting

### 7.2.1.1 Contact and LED modules



Typical diagram

## Procedure

1. Insert the actuating or signaling element from the front through the mounting opening of the front plate.
2. Fit the holder from behind (wiring side) onto the actuating or signaling element and lock it into place.
3. The unit must be aligned before finally tightening and securing against twisting.
4. Turn the screw at the holder until the actuating or signaling element is fixed securely and cannot vibrate or twist (tightening torque 1.0 to 1.2 Nm ).
5. Snap the contact module(s) from behind onto the holder.

To do this, hold the modules so that they are tilted downward slightly and place them onto the holder from behind (snap the narrow snap hook (b) into the appropriate contour on the holder) and then press them upwards until you feel the broad wide snap hook (a) latch in the holder.
Single- or two-pole contact modules can be mounted on the holder.
6. Ensure secure latching.
7. Connect the cables to the modules. You can find the relevant information in Chapter "Wiring (Page 168)".


### 7.2.1.2 AS-Interface modules, electronic modules for ID key-operated switch / IO-Link

You can find information about installing ASi modules in the section AS-Interface in Chapter "Mounting (Page 206)".

You can find information about installing electronic modules for ID keys in the section IO-Link in Chapter "Mounting (Page 271)".
You can find information about installing electronic modules for IO-Link in the section IO-Link in Chapter "Mounting (Page 286)".

### 7.2.2 Mounting on printed-circuit boards

## Procedure

1. Insert the actuating or signaling element $(A)$ from the front through the mounting opening of the front plate (B).
2. Fit the holder (C) from behind onto the actuating or signaling element and lock it into place.
3. Turn the screw at the holder until the actuating or signaling element is fixed securely and cannot vibrate or twist.
4. Equip the printed-circuit board $(F)$ with the components.

## Note

## Number of PCB carriers

One or more PCB carriers must be used, depending on the application.
If the printed-circuit board is attached, one PCB carrier is sufficient. For an unattached printed-circuit board, at least two PCB carriers must be used.

### 7.2.3 Base mounting for the enclosure

### 7.2.3.1 Contact and LED modules



The contact modules and LED modules are mounted in the enclosure base.
To equip an enclosure, follow these steps:

1. Snap the module (1) onto a slot in the enclosure. The narrow snap hook must point in direction "A" here.
Refer also to the information on fitting in Chapter "Mounting positions (Page 181)".

### 7.2.3.2 AS-Interface modules, electronic modules for IO-Link

You can find information about installing ASi modules in the section AS-Interface in Chapter "Mounting (Page 210)".
You can find information about installing electronic modules for IO-Link in the section IO-Link in Chapter "Mounting (Page 288)".

### 7.3 Connecting

### 7.3.1 Contact and LED modules

## Procedure for wiring a screw terminal


(1) Insert the relevant cable into the opening of the screw terminal of the module until it engages.
(2) Insert the screwdriver (DIN ISO 8764-1-PZD1) at an angle of $10^{\circ}$ into the opening for the screw.
Tighten the screw.

- Tightening torque for contact modules: $0.8 \ldots 0.9 \mathrm{Nm}$
- Tightening torque for LED modules: $0.8 \ldots 1.0 \mathrm{Nm}$

Pull on the cable to ensure it is screwed tight.
Procedure for wiring a spring-loaded terminal

(1) Insert the screwdriver (3RA2908-1A: $3.0 \mathrm{~mm} \times 0.5 \mathrm{~mm}$ ) into the rectangular opening to open the terminal (round opening).
(2) Insert the cable as far as it will go into the round opening
(3) Remove the screwdriver.

Pull on the cable to ensure it is tight.

Conductor cross-sections for contact and LED modules

| Screw terminals |  | Spring-loaded terminals |  |
| :---: | :---: | :---: | :---: |
| DIN ISO 8764-1-PZD1 | Tightening torques: for contact modules: $0.8 \ldots 0.9 \mathrm{Nm}$ <br> LED modules: $0.8 \ldots 1.0 \mathrm{Nm}$ | $10^{\circ}$ <br> 3RA2908-1A: diameter $3.0 \mathrm{~mm} \times 0.5 \mathrm{~mm}$ | --- |
| $\underbrace{7}$ | $2 \times(1.0 \ldots 1.5) \mathrm{mm}^{2}$ | $\pi^{7}$ | $2 \times(0.25 \ldots 1.5) \mathrm{mm}^{2}$ |
| $\underbrace{7}$ | $2 \times(0.5 \ldots 0.75) \mathrm{mm}^{2}$ | $\stackrel{+}{\square}$ | - |
| $\xrightarrow{4}$ | $2 \times(1.0 \ldots 1.5) \mathrm{mm}^{2}$ | $\overbrace{}^{7}$ | $2 \times(0.25 \ldots 1.5) \mathrm{mm}^{2}$ |
| $\xrightarrow[4]{7}$ | $2 \times(0.5 \ldots 1.5) \mathrm{mm}^{2}$ | $\overbrace{4}^{10}$ | $2 \times(0.25 \ldots 0.75) \mathrm{mm}^{2}$ |
| AWG | $2 \times(18$ to 14$)$ | AWG | $2 \times(24$ to 16$)$ |

### 7.3.2 Electronic modules for ID key-operated switches

3SU1400-1GC10-1AA0 electronic module for ID key-operated switches


## Terminal labeling

| Terminal labeling |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Pin | X1 | Pin | X2 |  |  |
| 1 | DQ.0 | Digital output | 6 | - | - |
| 2 | DQ.1 | Digital output | 7 | - | - |
| 3 | DQ.2 | Digital output | 8 | - | - |
| 4 | DQ.3 | Digital output | 9 | M | Ground |
| 5 | DO.4 | Digital output | 10 | L+ | 24 V DC |

## Conductor cross-sections

|  | 0.4 Nm <br> 3.5 lb in <br> SZM $(\varnothing 3.5 \mathrm{~mm} \times 0.6 \mathrm{~mm})$ |
| :--- | :--- |
|  | $1 \times 0.2 \ldots 2.5 \mathrm{~mm}^{2}$ |
|  | $1 \times 0.25 \ldots 1.5 \mathrm{~mm}^{2}$ |
|  | $2 \times 0.25 \ldots 0.75 \mathrm{~mm}^{2}$ |
|  | $1 \times 0.2 \ldots 2.5 \mathrm{~mm}^{2}$ |
|  | $2 \times 0.2 \ldots 0.75 \mathrm{~mm}^{2}$ |
|  | 26 to 14 |

### 7.3.3 AS-Interface modules and electronic module for IO-Link

You can find information on connecting the ASi modules in the section AS-Interface in Chapter "Connecting (Page 217)".
You can find information on connecting the electronic modules for IO-Link in the section IOLink of Chapter "Connecting (Page 272)".

## 3SU15 holders

### 8.1 Holders

The holders are used to secure the actuating or signaling elements and the contact module or LED module. The holders are designed for mounting in front plates with a plate thickness of 1 to 6 mm .

When delivered, the holders are set to a control panel thickness of approximately 4.5 mm . They are placed in the $\uparrow$ arrow direction from the rear onto the actuating and signaling elements. The fastening screw is located at the top. If they are to be mounted on a control panel that is $>4.5 \mathrm{~mm}$ thick, you must adjust the fastening screw of the holder before you install the holder.

## Note

## Note the maximum permissible front plate thickness!

When label holders, protective caps or similar accessories are used, it is important to remember that the maximum permissible front plate thickness must be reduced by the plate thickness of the relevant accessory.

## Tool

For securing, we recommend a size 2 screwdriver (cross-tip DIN ISO 87641PZD1 or flathead DIN ISO $2380-1$ A/B $1 \times 4.5$ ). The tightening torque is 1.0 to 1.2 Nm .

## Grounding of the front plate

If you mount a metal actuator on a metal front plate using a metal holder, the actuator is grounded via the tip of the fastening screw. This enables grounding via the connection on the front plate.

If the metal holder is to be used several times, grounding via the grounding stud is recommended!

(1) Hole for grounding stud (accessory: 3SU1950-0KK80-0AAO)
(2) Fastening screw

## NOTICE

Mounting in front plates / enclosures made of electrically non-conductive material
If you use an enclosure made of plastic, you must loop a grounding cable © $\mathbb{1}$ through the metal holders, and connect it to ground by means of a grounding stud (3SU1950-0KK80OAAO).

## Acaution

## Risk of injury

To ensure secure connection of the grounding cable, the grounding studs (3SU1950-OKK80-0AA0) must be fastened with ring cable lugs.
The grounding stud is not included in the scope of supply and must be ordered separately. For information, please refer to Chapter "Accessories (Page 331)".

## Note

The operator is responsible for checking that the protective measure (grounding) is effective.

## Procedure



1. Attach the holder (b) to the actuating element from behind.
2. Tighten the holder screw (c).
3. Secure the grounding cable (a) with ring cable lugs to the grounding stud (3SU1950-OKK80-OAA0), tightening torque: $0.8-1.0 \mathrm{Nm}$.

## Module slot position

Holders made of metal or plastic and with 3 or 4 slots for contact or LED modules are available.

The module slot positions (contact or LED modules) are indicated on top of the holder. The large digits designate the modules that are snapped directly onto the holder. The small digits indicate the position of stacked modules.


Image 8-1 Marking of slot positions on the 3-slot holder


Image 8-2 Marking of slot positions on the 4-slot holder

Assignment of the holders to the actuating and signaling elements
The following assumptions apply when assigning holders to the actuating elements and signaling elements:

| Front ring material | Collar material | Bore diameter | Holder (plastic) | Holder (metal) |
| :--- | :--- | :---: | :---: | :---: |
| Plastic | Plastic | 22.5 mm | $\checkmark$ | $\checkmark$ |
| Metal, matte | Plastic | 22.5 mm | $\checkmark$ | $\checkmark$ |
| Metal | Metal | 22.5 mm | --- | $\checkmark$ |
| Metal, matte | Metal | 30.5 mm | --- | $\checkmark$ |

## 8. 1 Holders

## Overview of holders without modules

| Material | 3-slot holder | 4-slot holder |
| :---: | :---: | :---: |
|  | (http://mall.industry.siemens.com/mall/en/ | (http://mall.industry.siemens.com/mall/en/ |
|  | en/Catalog/Products/10221520) | en/Catalog/Products/10221520) |
| Plastic |  |  |
|  | 3SU1500-0AA10-0AA0 | 3SU1500-0BA10-0AA0 |
| Metal |  |  |
|  | 3SU1550-0AA10-0AA0 | 3SU1550-0BA10-0AAO |

You can find information on the pre-assembled holders with modules in Chapter "Holders with modules (Page 175)".

### 8.2 Holders with modules

## Overview of holders with contact module

These variants are preassembled. You need only snap them onto the actuator, tighten the fastening screws and connect the cables.
You can find information about the contact modules used in Chapter "Contact modules for front plate mounting (Page 149)".

| Holder position 1 | Holder position 2 | Holder position 3 | Article number |
| :--- | :--- | :--- | :--- |
| Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221521) |  |  |  |
| 3SU1400-1AA10-1BA0 | - | - | 3SU1500-1AA10-1BA0 |
| 3SU1400-1AA10-1CA0 | - | - | 3SU1500-1AA10-1CA0 |
| 3SU1400-1AA10-1BA0 | - | $3 S U 1400-1 A A 10-1 B A 0$ | 3SU1500-1AA10-1NA0 |
| Metal <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221521) |  |  |  |
| 3SU1400-1AA10-1BA0 | - | - | 3SU1550-1AA10-1BA0 |
| 3SU1400-1AA10-1CA0 | - | - | 3SU1550-1AA10-1CA0 |
| 3SU1400-1AA10-1BA0 | - | 3SU1400-1AA10-1BA0 | 3SU1550-1AA10-1NA0 |

[^3]
### 8.2 Holders with modules

## Overview of holders (plastic) with 1 contact and LED module

These variants are preassembled. You need only snap them onto the actuator, tighten the fastening screws and connect the cables.
The LED module included in the scope of supply is a wide-voltage module with a voltage range from 6 to 24 V AC/DC.
You can find information on the contact and LED modules used in Chapters "Contact modules for front plate mounting (Page 149)" and "LED modules for front plate mounting (Page 156)".

| Holder position 1 | Holder position 2 | Holder position 3 | Article number |
| :---: | :---: | :---: | :---: |
| Plastic <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221521) |  |  |  |
| 3SU1400-1AA10-1BA0 | - | 3SU1401-1BG00-1AA0 | 3SU1501-1AG00-1BA0 |
| 3SU1400-1AA10-1CA0 | - | 3SU1401-1BG00-1AA0 | 3SU1501-1AG00-1CA0 |
| 3SU1400-1AA10-1BA0 | 3SU1400-1AA10-1BA0 | 3SU1401-1BG00-1AA0 | 3SU1501-1AG00-1NA0 |
| 3SU1400-1AA10-1BA0 | - | 3SU1401-1BG20-1AA0 | 3SU1501-1AG20-1BA0 |
| 3SU1400-1AA10-1CA0 | - | 3SU1401-1BG20-1AA0 | 3SU1501-1AG20-1CA0 |
| 3SU1400-1AA10-1BA0 | 3SU1400-1AA10-1BA0 | 3SU1401-1BG20-1AA0 | 3SU1501-1AG20-1NA0 |
| 3SU1400-1AA10-1BA0 | - | 3SU1401-1BG30-1AA0 | 3SU1501-1AG30-1BA0 |
| 3SU1400-1AA10-1CA0 | - | 3SU1401-1BG30-1AA0 | 3SU1501-1AG30-1CA0 |
| 3SU1400-1AA10-1BA0 | 3SU1400-1AA10-1BA0 | 3SU1401-1BG30-1AA0 | 3SU1501-1AG30-1NA0 |
| 3SU1400-1AA10-1BA0 | - | 3SU1401-1BG40-1AA0 | 3SU1501-1AG40-1BA0 |
| 3SU1400-1AA10-1CA0 | - | 3SU1401-1BG40-1AA0 | 3SU1501-1AG40-1CA0 |
| 3SU1400-1AA10-1BA0 | 3SU1400-1AA10-1BA0 | 3SU1401-1BG40-1AA0 | 3SU1501-1AG40-1NA0 |
| 3SU1400-1AA10-1BA0 | - | 3SU1401-1BG50-1AA0 | 3SU1501-1AG50-1BA0 |
| 3SU1400-1AA10-1CA0 | - | 3SU1401-1BG50-1AA0 | 3SU1501-1AG50-1CA0 |
| 3SU1400-1AA10-1BA0 | 3SU1400-1AA10-1BA0 | 3SU1401-1BG50-1AA0 | 3SU1501-1AG50-1NA0 |
| 3SU1400-1AA10-1BA0 | - | 3SU1401-1BG60-1AA0 | 3SU1501-1AG60-1BA0 |
| 3SU1400-1AA10-1CA0 | - | 3SU1401-1BG60-1AA0 | 3SU1501-1AG60-1CA0 |
| 3SU1400-1AA10-1BA0 | 3SU1400-1AA10-1BA0 | 3SU1401-1BG60-1AA0 | 3SU1501-1AG60-1NA0 |

3SU1400-1AA10-1BA0: Contact module 1NO normally open contact
3SU1400-1AA10-1CA0: Contact module 1NC normally closed contact
3SU1401-1BG.0-1AA0: LED module
You can find further information on the holders in Chapter "Holders (Page 38)".

## 3SU18 enclosures

The enclosed pushbuttons and indicator lights are available with conventional controls as well as for connection to AS-Interface.
The following versions of the 3SU18 enclosure are available:

- Empty enclosures with 1 to 6 command points (the installed components must be ordered separately)
- Enclosures with standard fittings with 1 to 3 command points
- Enclosures with customized fittings with 1 to 6 command points
- Two-hand operation consoles


### 9.1 Enclosures for actuating and signaling elements

## Enclosures

For the 3SU1 actuating elements and signaling elements, plastic enclosures and metal enclosures with 1, 2, 3, 4 or 6 command points are available.
Cable entry is on the top or bottom of the enclosure front by means of a metric M20 or M25 cable gland (for 1 to 3 command points) or M25 (for 4 and 6 command points).
The enclosures are available in the following colors:

- Enclosure cover:
- Gray
- Yellow
- Enclosure base:
- Black

The enclosures are available for devices with diameter 22.5 mm
Enclosures are available in different variants according to the following features:

- Empty enclosure and enclosure with standard fittings
- With and without labeling fields
- With protective collar


### 9.1.1 Overview of empty enclosures

## Enclosures with raised cover

|  | No. of command points | Article number |
| :---: | :---: | :---: |
|  | Enclosure material plastic |  |
|  | 1 | 3SU1801-1AA00-0AA1 |
|  | Enclosure material metal |  |
| Typical diagram | Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221522) |  |
|  | 1 | 3SU1851-1AA00-0AA1 |

## Enclosure with command point in center

|  | No. of command points | Article number |
| :---: | :---: | :---: |
|  | Enclosure material plastic |  |
|  | Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221522) |  |
|  | 1 | 3SU1801-0AA00-0AAy |
|  | Enclosure material metal |  |
| Typical diagram | Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221522) |  |
|  | 1 | 3SU1851-0AA00-0AAy |

y: 1 = color gray
y: 2 = color yellow

## Enclosure with protective collar in center

|  | No. of command points | Article number |
| :---: | :---: | :---: |
|  | Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221522) |  |
|  | 1 | 3SU1801-0AA00-0ACy |
|  | Enclosure material metal |  |
| Typical diagram | Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221522) |  |
|  | 1 | 3SU1851-0AA0x-0ACy |

y: 1 = color gray
$\mathrm{y}: 2=$ color yellow

## Enclosure with recess for labeling plate

| No. of command |
| :--- | :--- | :--- |
| points | Article number

y: 1 = color gray
y: 2 = color yellow

## Note

Not all combinations listed in the tables are available. In the case of special versions, please consult Technical Assistance, or initiate a PI1000 request.

Actuating and signaling elements with nominal diameter 22.5 mm can be used.
Plastic enclosures are normally equipped with actuating or signaling elements made of plastic. Metal enclosures are equipped as standard with actuating or signaling elements made of metal. If otherwise equipped, please note the grounding information below.

## EMERGENCY STOP according to ISO 13850

For control systems according to IEC 60204-1 or DIN EN 60204-1 (VDE 0113 Part 1), the mushroom pushbuttons of the 3 SU10 series can be used as EMERGENCY STOP devices.

## Grounding

The enclosure must be grounded if it contains metal actuating elements. Grounding is possible on the base of metal enclosures (grounding stud) (1).


Plastic enclosures containing metal actuating elements can be grounded via metal holders. For further information refer to Chapter "Holders (Page 38)".

## Contact modules and LED modules

Contact modules and LED modules for base mounting are snapped into the enclosure base. Base mounting is not provided for on the enclosures with raised cover.
The following elements can be attached for each command point:

- 3 contact modules or
- 2 contact modules and 1 LED module or
- 2 contact modules and 1 ASIM 2F-DI / LED

Due to the high contact stability, the contact modules are also suitable for use in electronic controllers. The function numbers are located on the contact modules.

As well as base mounting, it is also possible to use 1-pole contact and LED modules for front plate mounting.
You can find information on the modules in Chapter "3SU14 modules (Page 147)".

### 9.1.2 Mounting positions

The mounting position of the contact modules or LED modules is specified by the combination of letters and numbers (permissible numbers: $1,2,3$ ).
The lowest mounting position of an actuating or signaling element is always $A$ and the highest possible is $F$ (for enclosures with 6 command points). This yields the following highest possible mounting positions, depending on the number of command points in the enclosure:

- Enclosures with 2 actuating or signaling elements $\Rightarrow B$
- Enclosures with 3 actuating or signaling elements $\Rightarrow \mathrm{C}$
- Enclosures with 4 actuating or signaling elements $\Rightarrow D$
- Enclosures with 6 actuating or signaling elements $\Rightarrow F$

Contact modules can be mounted at the mounting positions 1 and/or 2 and/or 3, but LED modules only at mounting position 3 .


Image 9-1 Labeling for mounting positions in the enclosure base for enclosures with 1 to 6 command points.

### 9.1.3 Mounting



A Enclosure cover
B Labeling plates
C1 Actuating or signaling element (in this case: pushbutton)
C2 Actuating or signaling element (in this case: indicator light)
D Holder
E LED module
F Contact modules
G Enclosure base
H Identification letters for the command points
I Module position (identical to holder labeling)

## Procedure

1. Undo the screws and remove the enclosure cover.
2. Insert the actuating or signaling element (C1) from the front through the opening of the enclosure cover (A).
3. Fit the holder (D) from behind onto the actuating or signaling element and lock it into place.
4. Turn the screw at the holder until the actuating or signaling element is fixed securely and cannot vibrate or twist (tightening torque 1.0 to 1.2 Nm ).
5. Mount an LED module, if necessary. An LED module can only be installed in slot number 3 (e.g. A3, B3, C3 etc.).
6. Mount the contact module(s) in the enclosure base (see Chapter Fitting with contact modules and LED modules (Page 183) for this).
7. Mount the enclosure cover (see Chapter Mounting the enclosure cover (Page 184) for this).

### 9.1.3.1 Fitting with contact modules and LED modules



The contact modules and LED modules are mounted in the enclosure base.
To equip an enclosure, follow these steps:

1. Snap the module (1) onto a slot in the enclosure. The broad snap hook must be pointing in direction "A".
Refer also to the information on fitting in Chapter "Mounting positions (Page 181)".
9.1 Enclosures for actuating and signaling elements

### 9.1.3.2 Mounting the enclosure cover



## Note

Pay attention to the proper position when mounting the enclosure cover. Only one position is possible, recognizable by the coding lugs at the bottom left and right in the enclosure.

### 9.1.3.3 Removal of the modules

Requirement
Enclosure cover is disassembled.

(1) Insert a screwdriver into the opening of the latches (broad snap hook) of the contact modules or LED modules.
(2) Press the screwdriver in the direction of the module you want to remove to open the latches of the modules.
Remove the modules.

### 9.1.3.4 Mounting of connection pieces

## Mounting of plastic connection pieces (M20 as an example)



## Procedure (M20 as an example)


(1) The opening must first be broken out on plastic enclosures. Insert the connection piece into the opening of the enclosure.
(2) Screw the connection piece with a screwdriver.
(3) Insert the connection piece into the opening of the 2nd enclosure.
(4) Screw the connection piece with a screwdriver.

## Mounting of metal connection pieces (M20 as an example)



Procedure (M20 as an example)

(1) Screw the connection piece into the enclosure.
(2) Insert the connection piece into the opening of the 2nd enclosure.
(3) Screw the connection piece with a screwdriver.

### 9.2 Enclosures with EMERGENCY STOP devices

## EMERGENCY STOP according to ISO 13850

For control systems according to IEC 60204-1 or DIN EN 60204-1 (VDE 0113 Part 1), the EMERGENCY STOP mushroom pushbuttons of the 3SU1 series can be used as EMERGENCY STOP devices.

## Safety circuits

Standards IEC 60947-5-1 and EN 60947-5-5 require positive opening. With regard to personal protection, positive opening of normally closed contact elements in all safety circuits is expressly prescribed for the electrical equipment of machines and is designated according to IEC 60947-5-1 with the positive opening symbol $\Theta$.
With the EMERGENCY STOP mushroom pushbuttons, PL e according to ISO 13849-1 or SIL 3 according to IEC 62061 can be achieved if the corresponding fail-safe evaluation devices are selected and correctly connected. The 3SK safety relays, the 3RK3 Modular Safety System, or the corresponding devices from the ASIsafe, SIMATIC and SINUMERIK programs can be used as fail-safe evaluation devices.

### 9.2.1 Overview of enclosures with EMERGENCY STOP mushroom pushbuttons

EMERGENCY STOP mushroom pushbuttons are certified according to ISO 13850/EN 418. The EMERGENCY STOP mushroom pushbutton enables fast and safe stopping of systems in dangerous situations. The metal version is suitable for use even in the harshest conditions.

EMERGENCY STOP devices can be connected directly via the standard AS-Interface with safety-related communication.

|  | Enclosure | Enclosure with collar |
| :---: | :---: | :---: |
|  |  |  |
| Material | Article number |  |
| Plastic | Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221523) |  |
|  | 3SU1801-0NA00-2AA2 | 3SU1801-0NA00-2AC2 |
| Metal | Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221523) |  |
|  | 3SU1851-0NA00-2AA2 | 3SU1851-0NA00-2AC2 |

### 9.3 Enclosures with standard fittings

Enclosures (standard fittings) with pushbuttons and indicator lights are available in the following versions:

- 1 to 3 command points
- Operating voltage up to 500 V
- Vertical mounting type
- Contact modules and LED modules for base mounting (are snapped into the enclosure base); screw terminals as standard; some versions also with spring-loaded terminals

The enclosures have a recess for labeling plate(s). The color of the enclosure cover is gray, and the enclosure base is black.

## Plastic version

Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221523)

| No. of command points | Fittings | Color of the actuating or signaling element | Label | Article number |
| :---: | :---: | :---: | :---: | :---: |
| 1 | Pushbuttons | Green | "I" | 3SU1801-0AB00-2AB1 |
|  |  | Red | "O" | 3SU1801-0AC00-2AB1 |
|  |  | White | "I" | 3SU1801-0AD00-2AB1 |
|  |  | Black | "O" | 3SU1801-0EB00-2AB1 |
| 2 | Pushbuttons Pushbuttons | Red Green | $\begin{array}{\|l\|l\|} \hline \text { "O" } \\ \hline \text { " } \end{array}$ | 3SU1802-0AB00-2AB1 |
|  | Pushbuttons Pushbuttons | Black White | $\begin{array}{\|l\|} \hline \text { "O" } \\ \text { " } \end{array}$ | 3SU1802-0AC00-2AB1 |
| 3 | Pushbuttons <br> Pushbuttons <br> Indicator lights | Red <br> Green <br> Clear | "O" <br> "I" <br> "Without inscription" | 3SU1803-0AB00-2AB1 |
|  | Pushbuttons Pushbuttons Indicator lights | Black <br> White <br> Clear | "O" <br> "I" <br> "Without inscription" | 3SU1803-0AC00-2AB1 |
|  | Pushbuttons <br> Pushbuttons <br> Pushbuttons | Red <br> Black <br> Black | $\begin{aligned} & \text { "O" } \\ & \text { "I" } \\ & \text { "II" } \end{aligned}$ | 3SU1803-0AD00-2AB1 |


| Metal version <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221523) |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| No. of command points | Fittings | Color of the actuating or signaling element | Label | Article number |
| 1 | Pushbuttons | Green | "I" | 3SU1851-0AB00-2AB1 |
|  |  | Red | "O" | 3SU1851-0AC00-2AB1 |
|  |  | White | " 1 | 3SU1851-0AD00-2AB1 |
|  |  | Black | "O" | 3SU1851-0EB00-2AB1 |
| 2 | Pushbuttons Pushbuttons | Red Green | $\begin{array}{\|l\|} \hline \text { "O" } \\ \text { " } \end{array}$ | 3SU1852-0AB00-2AB1 |
|  | Pushbuttons Pushbuttons | Black <br> White | $\begin{array}{\|l\|} \hline \text { "O" } \\ \text { "I" } \end{array}$ | 3SU1852-0AC00-2AB1 |
| 3 | Pushbuttons <br> Pushbuttons <br> Indicator lights | Red <br> Green <br> Clear | "O" <br> " 1 " <br> "Without inscription" | 3SU1853-0AB00-2AB1 |
|  | Pushbuttons <br> Pushbuttons <br> Indicator lights | Black <br> White <br> Clear | "O" <br> "I" <br> "Without inscription" | 3SU1853-0AC00-2AB1 |
|  | Pushbuttons Pushbuttons Pushbuttons | Red <br> Black <br> Black | $\begin{array}{\|l\|} \hline \text { "O" } \\ \text { "I" } \\ \text { "II" } \end{array}$ | 3SU1853-0AD00-2AB1 |

### 9.4 3SU18..-3 two-hand operation console

### 9.4.1 Application areas

Two-hand operation consoles, approved according to EN 574, are used for machines and systems with danger areas for the purpose of controlling the location of both hands of the operator. Through a simultaneous and location-controlled use of both hands, protection from dangerous movement in the danger area of the machine is ensured.

Two-hand operation consoles are used for the following safety requirements:

- Safety at presses and punches
- Safety at printing presses
- Safety at paper processing machines


### 9.4.2 Function

The synchronous and location-controlled operation using both hands occurs throughout the duration of the danger. Bypassing of the safety mechanism or accidental actuation, e.g., by elbows, arms or knees, is effectively prevented by protective collars over the actuating elements. The sloping shape of the top side enables ergonomic operation and working position. Expansion to include additional operator controls is possible.
The two-hand control device must be located outside the hazard zone in order to prevent the operator from entering the zone before the machine has reached a complete standstill.
The following properties must be provided for mobile two-hand control devices:

- Stability
- The safety distance must be maintained between the control actuating devices and the hazard zone
- In the case of adjustable control actuating devices, a latch must be available

The control command is given by pressing the two pushbuttons on the sides simultaneously (within 0.5 s of each other) and must be maintained for as long as a hazard exists.

Appropriate two-hand control devices from the 3SK1 Advanced device range are available for evaluating control commands.
A function test must be carried out before commissioning. The following properties must be checked in the function test:

- Simultaneous actuation (use of both hands)
- Synchronous actuation (synchronism $\leq 500 \mathrm{~ms}$ )
- Relationship between input signals and output signals
- Renewed generation of the output signal


### 9.4.3 Overview of two-hand operation consoles

| Two-hand operation consoles |  | Article number |
| :---: | :---: | :---: |
| Plastic enclosure |  |  |
|  | With standard fittings ${ }^{1)}$ and preset breaking points for 8 additional 22.5 mm pushbuttons, with knock-outs for metric cable glands | 3SU1803-3NB00-1AE1 |
|  | Empty enclosure, unequipped | 3SU1803-3AA00-0AA1 |
| Metal enclosure <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221525) |  |  |
|  | With standard fittings ${ }^{1)}$ | 3SU1853-3NB00-1AA1 |
|  | With standard fittings ${ }^{1}$ ) and 4 additional holes for 22.5 mm pushbuttons | 3SU1853-3NB00-1AD1 |
|  | Empty enclosure, unequipped | 3SU1853-3AA00-0AA1 |
| Accessories for two-hand operation consoles |  |  |
|  | Stands for two-hand operation console |  |
|  | With knock-outs for metric cable glands | 3SU1950-0HN10-0AA0 <br> (http://mall.industry.siemens.com/mall/e n/en/Catalog/Products/10221536) |

1) The standard fittings comprise:

- Two black mushroom pushbuttons, diameter $40 \mathrm{~mm}, 1 \mathrm{NO}+1 \mathrm{NC}$, Article No. 3SU1000-1BD10-0AA0 (plastic) or 3SU1050-1BD10-0AA0 (metal)
- One red EMERGENCY STOP mushroom pushbutton according to EN ISO 13850, diameter 40 mm , with positive latching, 2 NC , Article No. 3SU1000-1HB20-0AA0 (plastic) or 3SU1050-1HB20-0AA0 (metal)
The two-hand operation consoles can be equipped with sensor switches. You can find information about sensor switches in section "Sensor switches" of Chapter 3SU12 compact units.

You can find further information about potential applications of two-hand operation consoles in Chapter "Application examples for two-hand operation consoles (Page 444)".

### 9.4.4 Mounting

The two-hand operation console can be mounted on the associated stand or directly on the machine using the holes in the rear wall.

### 9.4.4.1 Installation and wiring of two-hand operation console

1. Unscrew the cover on the bottom of the two-hand operation console.

2. Wire and ground the two-hand operation console. The diagram shows a typical grounding arrangement for a two-hand operation console mounted on a stand. You can find information on fitting and wiring with modules in Chapter "3SU14 modules (Page 147)"

3. Fit the cable gland (optional step)

4. Screw on the cover.


### 9.4.4.2 Mounting on stand


(1) When mounting the 3SU1803-3NB00-1AE1 plastic enclosure on the stand, the grounding stud on the stand must be removed.


Tightening torque: $1.5 \ldots 2 \mathrm{Nm}$

### 9.4.5 Equipment

The two-hand operation consoles are pre-equipped with 3SU1 pushbuttons. In the case of plastic enclosures the command points are equipped as standard with actuators and indicators made of plastic, in the case of metal enclosures they are equipped with actuators and indicators made of metal.

The standard fittings are:

- Two black mushroom pushbuttons, $\varnothing 40 \mathrm{~mm}, 1 \mathrm{NO}+1 \mathrm{NC}$, Article No. 3SU1000-1BD10-0AA0 or 3SU1050-1BD10-0AA0
- One red EMERGENCY STOP mushroom pushbutton according to EN ISO 13850, $\varnothing 40 \mathrm{~mm}$, with positive latching, 2 NC, Article No. 3SU1000-1HB20-0AAO or 3SU1050-1HB20-0AA0

An unequipped enclosure with 8 additional holes made of plastic is available, as is a metal enclosure with 4 additional holes.

Depending on customer requirements, up to 8 command points can be retrofitted in the plastic enclosure, and up to 4 command points in the metal enclosure. The surface of the console has premachined breaking points for this purpose.

## AS-Interface

### 10.1 Application areas

With AS-Interface modules, distributed pushbuttons from the SIRIUS ACT range can be connected to the AS-Interface bus system. With the help of the modular system, you can assemble your own enclosures with integrated AS-Interface or flexibly modify existing enclosures.

AS-Interface modules are used as the basis or networked systems within a plant. The individual AS-Interface components are fully compatible with one another and can be operated jointly on the yellow AS-Interface cable.
The following solutions are available:

- AS-Interface modules for front plate mounting (Page 200)
- AS-Interface modules for base mounting (Page 203)
- AS-Interface enclosures with 1 to 3 command points (Page 204)


### 10.1.1 Application area of the AS-Interface modules

## AS-Interface safety module (F slave)

Installed in a standard enclosure, the AS-Interface safety module is used for detecting safety-related switching statuses of one- or two-channel EMERGENCY STOP actuators with isolated contact elements. For this purpose, a code table with $8 \times 4$ bits is transferred via the AS-Interface bus and evaluated by the safety monitor. When operated properly, the system fulfills safety category 4 according to EN 13849-1. If an EMERGENCY STOP actuator is queried on just one channel (terminals for F-IN2 jumpered by means of wire), the system fulfills a maximum of safety category 2.

In accordance with IEC 61508, the module can be used in loops up to SIL 3. The PFD value of the entire loop must be calculated by the user.
You can find help and support for calculating at: Safety Evaluation Tool
(http://www.industry.siemens.com/topics/global/en/safety-integrated/machine-safety/safety-evaluation-tool/Pages/default.aspx)

## AS-Interface standard modules (slave 4I/4O and A/B slave 4I/3O)

Mounted in a 3SU1 enclosure, the AS-Interface modules $4 \mathrm{I} / 4 \mathrm{O}$ and $4 \mathrm{I} / 3 \mathrm{O}$ can query 4 mechanical contacts. The AS-Interface module $41 / 4 \mathrm{O}$ also enables control of 4 indicator lights, while the module $4 \mathrm{I} / 30$ enables control of 3 indicator lights. The power required is supplied by the AS-Interface system. In conjunction with an A/B-compatible AS-Interface master, up to $62 \times 4 \mathrm{I} / 30$ modules can be operated in one AS-Interface network.

### 10.1.2 Application areas for AS-Interface modules for front plate mounting

The AS-Interface modules for front plate mounting are used to connect an EMERGENCY STOP device from the SIRIUS ACT series to the AS-Interface bus system according to ISO 13850. The modules for front plate mounting are suitable for pushbuttons with front plate mounting.
The AS-Interface modules for front plate mounting have a safe AS-Interface slave 21 and are snapped onto the holder from behind.

The expanded version $21 / 10$ includes an output for controlling a signaling element with LED.
Depending on the version, the connection to the AS-Interface bus cable is by means of screw terminals, spring-loaded terminals or insulation displacement method. Addressing is performed using the AS-Interface connection or the integrated addressing socket.

With the modules for front plate mounting, applications up to SILCL 3 as per IEC 62061, SIL 3 as per IEC 61508 and PL e (Cat. 4) as per ISO 13849-1 can be implemented depending on the connection of evaluation unit and actuators.

### 10.2 ASIsafe F adapters for front plate mounting

With ASIsafe F adapters, distributed SIRIUS ACT pushbuttons and indicator lights can be quickly connected to the AS-Interface communication system. ASIsafe F adapters for front plate mounting are installed on the rear face of a holder.
For more detailed information, refer to Chapter "Mounting (Page 97)".

## AS-Interface EMERGENCY STOP according to ISO 13850

Via the standard AS-Interface with safety-related communication, EMERGENCY STOP devices according to ISO 13850 can be directly connected using the AS-Interface modules.

## AS-Interface modules, screw terminals + spring-loaded terminals



Typical diagram

| Slave type | Number of digital inputs |  | Number of digital outputs | Article number |
| :---: | :---: | :---: | :---: | :---: |
|  | Standard inputs | Fail-safe inputs |  |  |
| Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221528) |  |  |  |
| 2 F-DI | - | 2 | - | 3SU1400-1EA10-2AA0 |
| 2 F-DI + 1 LED | - | 2 | 1 <br> for activating the red LED <br> (LED not replaceable) | 3SU1401-1EE20-2AA0 |
| 2 F-DI + 1 DO | - | 2 | 1 <br> unassigned | 3SU1400-1EC10-2AA0 |

AS-Interface modules, insulation piercing method


Typical diagram

| Slave type | Number of digital inputs |  | Number of digital outputs | Article number |
| :---: | :---: | :---: | :---: | :---: |
|  | Standard inputs | Fail-safe inputs |  |  |
| Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221528) |  |  |  |
| 2 F-DI | - | 2 | - | 1 <br> 2 F-DI + 1 LED |

## AS-Interface modules, spring-loaded terminals + insulation piercing method



Typical diagram

| Slave type | Number of digital inputs |  | Number of digital outputs | Article number |
| :---: | :---: | :---: | :---: | :---: |
|  | Standard inputs | Fail-safe inputs |  |  |
| Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221528) |  |  |  |  |
| 2 F-DI + 1 DO | - | 2 | 1 unassigned | 3SU1400-1EC10-4AA0 |

### 10.3 AS-Interface modules for front plate mounting

With AS-Interface modules, distributed SIRIUS ACT pushbuttons and indicator lights can be quickly connected to the AS-Interface communication system. AS-Interface modules for front plate mounting are installed on the rear face of a holder.


### 10.4 AS-Interface modules for base mounting (enclosure mounting)

With AS-Interface modules, distributed SIRIUS ACT pushbuttons and indicator lights can be quickly connected to the AS-Interface communication system. The AS-Interface modules for base mounting are installed in 3SU18 enclosures. On enclosures with raised cover (Article No.: 3SU180(5)1-1AA00-0AA1) base mounting is not envisaged.

AS-Interface modules with push-in terminal

|  | Slave type | Number of digital inputs |  | Number of digital outputs | Article number |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Standard inputs | Fail-safe inputs |  |  |
| Siemens Industry Mall |  |  |  |  |  |
| + | $4 \mathrm{DI} / 4 \mathrm{DQ}$ | 4 | - | 4 | 3SU1400-2EK10-6AA0 |
| $0 \cdot 0$ | $4 \mathrm{DI} / 3$ DQ AB | 4 | - | 3 | 3SU1400-2EJ10-6AA0 |
|  | 2F-DI | - | 2 | - | 3SU1400-2EA10-6AA0 |
|  | 2F-DI/1LED | - | 2 | 1 for activating the red LED (LED not replaceable) | 3SU1401-2EE20-6AA0 |

## See also

AS-i base modules
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10251009)

### 10.5 Enclosure with standard equipment for AS-Interface

### 10.5.1 Overview of standard enclosures with AS-Interface

The enclosures with integrated AS-Interface are equipped with contact modules and LED modules with spring-loaded terminals from the SIRIUS ACT series as well as the slave(s) required for connecting the contact modules and LED modules to AS-Interface. Wiring is carried out at the factory. You only need to connect the enclosure to the ASi bus. For information, please refer to Chapter "Connecting (Page 217)".

Enclosures with standard fittings are available in the following versions:

- 1 to 3 command points
- Operational voltage through AS-Interface (approx. 30 V )
- Vertical mounting type
- Plastic enclosure with plastic actuating and signaling elements
- Metal enclosure with metal actuating and signaling elements

The enclosures without EMERGENCY STOP each have one A/B slave $41 / 30$; the enclosures with EMERGENCY STOP mushroom pushbuttons have an AS-Interface $F$ slave mounted in the enclosure.

For enclosures with EMERGENCY STOP mushroom pushbuttons, two NC contact modules are mounted inside the enclosure and wired to the safe F slave. The contact or LED modules of the pushbuttons as well as the AS-Interface slaves are secured by base mounting and connected via cables.

The plastic enclosures are designed with a connection for the AS-Interface flat cable (the cable is routed along the outside of the enclosure). For metal enclosures, the AS-Interface cable is run inside the enclosure (round cable connection).

| Plastic version <br> Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221524) |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| No. of command <br> points | Fittings | Color of the actuating <br> or signaling element | Label | Article number |  |
| 1 | EMERGENCY STOP <br> mushroom pushbuttons | Red | Label without inscription | 3SU1801-0NB10-4HB2 |  |
| 2 | Pushbuttons <br> Pushbuttons | Red <br> Green | "O" <br> "I" | Black <br> White | "I" |

### 10.5.2 Equipping with AS-Interface modules by the customer

## Self-equipping of enclosures

The following slave types are available for connecting the actuating and signaling elements:

- AS-Interface $A / B$ slave with 4 inputs and 3 outputs ( $41 / 30 \mathrm{AB}$ )
- AS-Interface slave with 4 inputs and 4 outputs (4I/4O)
- AS-Interface F slave with 2 safe inputs for EMERGENCY STOP (2F-DI \& 2F-DI/ 1LED)

The following table shows the maximum number of slaves possible:

| Enclosure for | Number of AS-i slaves for enclosures without EMERGENCY STOP | Number of AS-i slaves for enclosures with EMERGENCY STOP |
| :---: | :---: | :---: |
| 1 command point | Not possible | - $1 \times$ F slave ${ }^{1)}$ |
| 2 command points | - $1 \times$ slave $4 \mathrm{I} / 40$ or $4 \mathrm{I} / 30$ | - $1 \times$ slave $4 \mathrm{I} / 40$ or $4 \mathrm{I} / 30$ |
| 3 command points | - 2 x slave $4 \mathrm{I} / 4 \mathrm{O}$ or $4 \mathrm{I} / 3 \mathrm{O}$ | - 2 x slave $4 \mathrm{I} / 4 \mathrm{O}$ or $4 \mathrm{I} / 3 \mathrm{O}^{2}$ ) or <br> - $1 \times 4 \mathrm{I} / 4 \mathrm{O}$ or $4 \mathrm{I} / 3 \mathrm{O}+1 \times \mathrm{F}$ slave |
| 4 command points | - $3 \times$ slave $4 \mathrm{I} / 4 \mathrm{O}$ or $4 \mathrm{I} / 3 \mathrm{O}$ | - 2 x slave $4 \mathrm{I} / 4 \mathrm{O}$ or $\left.4 \mathrm{I} / 3 \mathrm{O}^{2}\right)$ or <br> - $2 \times 4 \mathrm{I} / 4 \mathrm{O}$ or $4 \mathrm{I} / 3 \mathrm{O}+1 \times \mathrm{F}$ slave |
| 6 command points | - 3 x slave $4 \mathrm{I} / 4 \mathrm{O}$ or $4 \mathrm{I} / 3 \mathrm{O}$ | - $3 x$ slave $4 \mathrm{I} / 4 \mathrm{O}$ or $4 \mathrm{I} / 3 \mathrm{O}^{2}$ or <br> - $2 \times 4 \mathrm{I} / 4 \mathrm{O}$ or $4 \mathrm{I} / 3 \mathrm{O}+1 \times \mathrm{F}$ slave |

[^4]
## Notes on installation

- The maximum current with which the enclosures with contact modules may be equipped is 100 A . For example, 10 contact modules 10 A .
- With the AS-Interface F slave modules, the (neighboring) contact modules immediately next to the module may only be used for the inputs of the AS-i module.


### 10.6 Mounting and disassembly of the AS-Interface modules for front plate mounting

### 10.6.1 Mounting

Installing AS-Interface modules for front plate mounting (3SU140.-1E..0-2AA0, 3SU140.-1E..0-4AAO)


## Procedure

(1) Hold the EMERGENCY STOP backing plate onto the front plate.
(2) Insert the EMERGENCY STOP mushroom pushbutton from the front through the opening of the EMERGENCY STOP backing plate and the front plate.
(3) Fit the holder from behind. Ensure secure latching here.
(4) Tighten the screw on the holder (tightening torque 1.0 to 1.2 Nm ).
(5) / (6) Snap the AS-i module for front plate mounting from behind onto the holder.


Ensure the AS-i module for front plate mounting is securely snapped into place.

### 10.6.2 Removal



Procedure
(1) Press the lever of the AS-i module for front plate mounting down. The AS-i module is unlatched.
(2) Move the AS-i module down.
(3) Unlatch the AS-i module.
(4) Remove the AS-i module backwards from the holder.

### 10.7 Installing AS-Interface modules (3SU1400-1E.10-6AA0)

### 10.7.1 Mounting

Installing AS-Interface modules for front plate mounting (3SU1400-1E.10-6AA0)

(1) Insert the actuating / signaling element from the front into the opening of the front plate.
(2) Fit the holder from behind. Ensure secure latching here.
(3) Tighten the screw on the holder (tightening torque 1.0 to 1.2 Nm ).
(4) / (5) Snap the AS-i module for front plate mounting from behind onto the holder.

Ensure the AS-i module for front plate mounting is securely snapped into place.

### 10.8 Installing and dismantling AS-Interface modules for base mounting

### 10.8.1 Mounting / installation positions

The mounting position of the contact modules or LED modules is specified by the combination of letters and numbers (permissible numbers: 1, 2, 3).

The lowest mounting position of an actuating or signaling element is always $A$ and the highest possible is $F$ (for enclosures with 6 command points). This yields the following highest possible mounting positions, depending on the number of command points in the enclosure:

- Enclosures with 2 actuating or signaling elements $\Rightarrow B$
- Enclosures with 3 actuating or signaling elements $\Rightarrow C$
- Enclosures with 4 actuating or signaling elements $\Rightarrow D$
- Enclosures with 6 actuating or signaling elements $\Rightarrow F$

Contact modules can be mounted at the mounting positions 1 and/or 2 and/or 3, but LED modules only at mounting position 3.


Image 10-1 Labeling for mounting positions in the enclosure base for enclosures with 1 to 6 command points.

## Mounting positions of the AS-Interface F slaves

## Note

## Mounting position of the AS-Interface F slave

The AS-i F slave may only be mounted in the enclosure at the slots marked with "3".

The AS-Interface F slaves are factory-mounted at mounting position A3. At the customer's request, the AS-Interface $F$ slave can also be mounted at the highest mounting position of the actuator. The following mounting positions are possible:

- Enclosure with 1 command point $\Rightarrow \mathrm{A} 3$
- Enclosure with 3 command points $\Rightarrow \mathrm{C} 3$
- Enclosure with 4 command points $\Rightarrow \mathrm{D} 3$
- Enclosure with 6 command points $\Rightarrow$ F3


## Note

Enclosures with 2 command points
Enclosures with 2 command points cannot be equipped with an AS-Interface F slave.

## Mounting positions of the AS-Interface slaves and AS-Interface A/B slaves

The AS-Interface slaves and AS-Interface A/B slaves are always mounted in the positions between the command points, and they can be recognized by the additional rib of the mounting support.

## Note

Enclosures with one command point
Enclosures with only one command point cannot be equipped with AS-Interface slaves and AS-Interface A/B slaves.

Mounting position of the AS-Interface slave as the first slave

| Command points in the enclosure | Mounting position between mounting panels |
| :--- | :--- |
| 2 | A and B |
| 3 | A and B <br> $B$ and C |
| 4 | Always A and B <br> except when an EMERGENCY STOP is mounted, then B and C |
| 6 | A and B <br> $B$ and C <br> D and E <br> E and F |

Mounting position of the AS-Interface slave as the second slave

| Command points in the enclosure | Mounting position between mounting panels |
| :--- | :--- |
| 4 | C and D |
| 6 | D and E |

## Example

An enclosure with 6 command points is to be equipped with 2 AS-Interface slaves and one AS-Interface F slave.

1. Mount AS-Interface slave 1 between command points $B$ and $C$.
2. Mount AS-Interface slave 2 between command points $D$ and $E$.
3. Mount the AS-Interface F slave at A3.

You will find more examples in Chapter "Wiring examples (Page 235)".

### 10.8.2 Mounting position of AS-Interface slave

The following mounting positions are available for the AS-Interface slaves:
 3SU1856-0AA00-0AB1


### 10.8.3 Mounting position of AS-Interface F slave

The following mounting positions are available for the ASIsafe modules:


## Note

The figures above show a typical representation of the possible mounting positions. The broken lines do not indicate a second module but only the second possible mounting position.

### 10.8.4 Mounting of the contact modules and AS-Interface F-Safe slaves

The AS-Interface slaves are mounted in the enclosure base like contact modules or LED modules. To equip an enclosure with contact modules and an AS-Interface $F$ slave, follow these steps:

1. Snap the contact module onto the slot in the enclosure marked "1", " 2 " or " 3 ".

2. Insert the AS-Interface $F$ slave (3SU1400-2EA10-6AA0) into the slot marked with " 3 ".


## Note

Mounting position of the AS-Interface $F$ slave
The AS-Interface F slave may only be mounted in the enclosure at the slots marked with " 3 ".

You can find information on the accessories in Chapter "Accessories (Page 293)".

### 10.8.5 Mounting the contact modules and AS-Interface modules

The AS-Interface modules are mounted in the enclosure base like contact modules or LED modules. To equip an enclosure with contact modules and an AS-Interface module, follow these steps:

1. Snap the contact module onto the slot in the enclosure marked "1", "2" or "3".

2. Insert the AS-Interface module into the slot marked with " 5 ".


### 10.8.6 Removal of the modules

## Requirement

Enclosure cover is disassembled.

(1) insert a screwdriver into the opening of the latches of the AS-Interface modules for base mounting.
(2) Press the screwdriver in the direction of the module you want to remove to open the latches of the modules.
Remove the modules.

(3) Insert a screwdriver into the opening of the latches (broad snap hook) of the contact modules or LED modules.
(4) Press the screwdriver in the direction of the module you want to remove to open the latches of the modules.
Remove the modules.

### 10.9 Connecting

### 10.9.1 Connection with AS-Interface modules

## Connection options

- Conventional connection with AS-Interface
- Safe connection using ASIsafe
- With 3SK1, 3RK3 safety relays
- Connection to distributed I/O ET 200SP, SIMATIC S7-1500


## Safe communication via ASIsafe

Safety-related components can be integrated in AS-Interface by means of ASIsafe - up to PL e as per ISO 13849-1 or SIL 3 as per IEC 62061. Use the yellow AS-Interface cable to make this connection.

Safe and standard I/O modules are installed and operated together in a single network. Safety-related data is transferred over the existing standard bus.

### 10.9.2 Connecting the ASIsafe modules for front plate mounting

When connecting, note that the maximum cable length up to the first mounting support must be $\leq 100 \mathrm{~mm}$.
Maximum current $I_{\max }=8 \mathrm{~A}$.


## Screw terminal connection



Procedure
(1) Insert the connecting lead into the screw terminal
(2) Tighten the screws (tightening torque 0.5-0.6 Nm)
(3) Insert the screw terminal into the AS-i module for front plate mounting

## Conductor cross-sections

| Flat-blade screwdriver $(\varnothing 3.5 \mathrm{~mm} \times 0.6 \mathrm{~mm})$ | $0.5 \ldots 0.6 \mathrm{Nm}$ <br> 4.4 to 5.3 lb in |
| :--- | :--- |
|  | $1 \times 0.2 \ldots 2.5 \mathrm{~mm}^{2}$ <br> $2 \times 0.2 \ldots 1.0 \mathrm{~mm}^{2}$ |
|  | $1 \times 0.25 \ldots 2.5 \mathrm{~mm}^{2}$ <br> $2 \times 0.25 \ldots 1.0 \mathrm{~mm}^{2}$ |
|  | $1 \times 0.2 \ldots 2.5 \mathrm{~mm}^{2}$ |
|  | $2 \times 0.2 \ldots 1.5 \mathrm{~mm}^{2}$ |
| AWG | 30 to 12 |

## Spring-loaded terminal connection



Image 10-2 ASIM+spring-type terminal_70

## Procedure

(1) Insert a flat-blade screwdriver into the unlocking groove of the spring-loaded terminal
(2) Insert the connecting lead into the spring-loaded terminal
(3) Insert the spring-loaded terminal into the AS-i module for front plate mounting

Conductor cross-sections

| Flat-blade screwdriver $(\varnothing 3.5 \mathrm{~mm} \times 0.6 \mathrm{~mm})$ | - |
| :--- | :--- |
|  | $1 \times 0.2 \ldots 2.5 \mathrm{~mm}^{2}$ |
|  | $1 \times 0.25 \ldots 2.5 \mathrm{~mm}^{2}$ |
|  | $1 \times 0.2 \ldots 2.5 \mathrm{~mm}^{2}$ |
| AWG |  |

## AS-Interface connection using insulation piercing method



Image 10-3 ASIM+AS-Interface_70

## Procedure

(1) Connect the AS-i shaped cable to the upper part of the adapter for AS-i shaped cable
(2) Insert the upper part with the AS-i shaped cable into the adapter
(3) Snap the adapter onto the male connector of the AS-i module for front plate mounting

## Plug connection



Image 10-4 ASIM+connector_70

## Procedure

(1) Insert a flat-blade screwdriver into the unlocking groove of the spring-loaded terminal
(2) Insert the connecting lead into the spring-loaded terminal
(3) Insert the spring-loaded terminal into the AS-i module for front plate mounting

Conductor cross-sections

| Flat-blade screwdriver ( $\varnothing 3.5 \mathrm{~mm} \times 0.6 \mathrm{~mm}$ ) | - |
| :---: | :---: |
|  | $1 \times 0.2 \ldots 1.5 \mathrm{~mm}^{2}$ |
|  | $1 \times 0.25 \ldots 1.5 \mathrm{~mm}^{2}$ |
|  | $1 \times 0.2 \ldots 1.5 \mathrm{~mm}^{2}$ |
| AWG | 24 to 16 |


| lout $_{\max }$ | 20 mA |
| :--- | :--- |
| $U_{\text {out }}$ | $18 \mathrm{~V} \ldots 24 \mathrm{~V}$ |
| $L_{\max }$ | $\leq 100 \mathrm{~mm}$ |

### 10.9.3 Terminal labeling and conductor cross-sections (AS-Interface modules for front plate mounting)

## AS-Interface modules for front plate mounting



| 3SU1400-1EK10-6AA0 terminal labeling |  |  |  | X2 |
| :--- | :--- | :--- | :--- | :--- |
| Pin | X1 | Sensor supply | OUT- | Ground |
| 1 | S+ | Digital input | OUT3 | Digital output |
| 2 | DI.0 | Digital input | OUT4 | Digital output |
| 3 | DI.1 | Digital input | ASI+ | AS-i connection - positive polarity |
| 4 | DI.2 | Digital input | ASI+ | AS-i connection - positive polarity |
| 5 | IN4 | ASI- | AS-i connection - negative polarity |  |
| 6 | OUT1 | Digital output | ASI- | AS-i connection - negative polarity |
| 7 | OUT2 | Digital output |  |  |


| 3SU1400-1EJ10-6AA0 terminal labeling |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
| Pin | X1 | X2 |  |  |
| 1 | S+ | Sensor supply | OUT- | Ground |
| 2 | DI.0 | Digital input | OUT3 | Digital output |
| 3 | DI.1 | Digital input | - | - |
| 4 | DI.2 | Digital input | ASI+ | AS-i connection - positive polarity |
| 5 | IN4 | Digital input | ASI+ | AS-i connection - positive polarity |
| 6 | OUT1 | Digital output | ASI- | AS-i connection - negative polarity |
| 7 | OUT2 | Digital output | ASI- | AS-i connection - negative polarity |

## 3SU1400-1E.10-6AA0 conductor cross-sections

|  | - |
| :---: | :---: |
| $\text { SZM ( } \varnothing 2.0 \mathrm{~mm} \times 0.4 \mathrm{~mm})$ |  |
|  | $1 \times 0.14 \ldots 0.5 \mathrm{~mm}^{2}$ |
|  | $1 \times 0.2 \ldots 0.5 \mathrm{~mm}^{2}$ |
| AWG | 26 to 20 |

10.9.4 Connection option AS-Interface bus (AS-Interface modules for base mounting)


## Connection to AS-Interface bus connection element



### 10.9.5 Terminal labeling and conductor cross sections (AS-Interface modules for base mounting)

## AS-Interface modules



Terminal labeling 3SU1400-2EK10-6AA0

| Pin | X1 | X2 |  |  |
| :--- | :--- | :--- | :--- | :--- |
| 1 | S+ | Sensor supply | OUT- | Ground |
| 2 | DI.0 | Digital input | DQ.2 | Digital output |
| 3 | DI. 1 | Digital input | DQ.3 | Digital output |
| 4 | DI.2 | Digital input | ASI+ | AS-i connection - positive polarity |
| 5 | DI.3 | Digital input | ASI+ | AS-i connection - positive polarity |
| 6 | DQ.0 | Digital output | ASI- | AS-i connection - negative polarity |
| 7 | DQ. 1 | Digital output | ASI- | AS-i connection - negative polarity |

Terminal labeling 3SU1400-2EJ10-6AA0

| Pin | X1 | X2 |  |  |
| :--- | :--- | :--- | :--- | :--- |
| 1 | S + | Sensor supply | OUT- | Ground |
| 2 | DI.0 | Digital input | DQ.2 | Digital output |
| 3 | DI. 1 | Digital input | - | - |
| 4 | DI.2 | Digital input | ASI+ | AS-i connection - positive polarity |
| 5 | DI.3 | Digital input | ASI+ | AS-i connection - positive polarity |
| 6 | DQ.0 | Digital output | ASI- | AS-i connection - negative polarity |
| 7 | DQ. 1 | Digital output | ASI- | AS-i connection - negative polarity |

## Conductor cross-sections (3SU1400-2EK10-6AA0 and 3SU1400-2EJ10-6AA0)

|  | - |
| :---: | :---: |
| $\begin{aligned} & =\ominus \\ & \operatorname{SZM}(\varnothing 2.0 \mathrm{~mm} \times 0.4 \mathrm{~mm}) \end{aligned}$ |  |
|  | $1 \times 0.14 \ldots 0.5 \mathrm{~mm}^{2}$ |
|  | $1 \times 0.2 \ldots 0.5 \mathrm{~mm}^{2}$ |
| AWG | 26 to 20 |

## AS-Interface modules with fail-safe digital inputs



Terminal labeling 3SU1400-2EA10-6AAO

| Pin | X1 |  | X2 |  |
| :--- | :--- | :--- | :--- | :--- |
| 1 | F-IN1 | Fail-safe digital input | ASI+ | AS-i connection - positive polarity |
| 2 | F-IN1 | Fail-safe digital input | ASI+ | AS-i connection - positive polarity |
| 3 | F-IN2 | Fail-safe digital input | ASI- | AS-i connection - negative polarity |
| 4 | F-IN2 | Fail-safe digital input | ASI- | AS-i connection - negative polarity |

## Terminal labeling 3SU1401-2EE20-6AAO

| Pin | X1 |  | X2 |  |
| :--- | :--- | :--- | :--- | :--- |
| 1 | F-IN1 | Fail-safe digital input | ASI+ | AS-i connection - positive polarity |
| 2 | F-IN1 | Fail-safe digital input | ASI+ | AS-i connection - positive polarity |
| 3 | F-IN2 | Fail-safe digital input | ASI- | AS-i connection - negative polarity |
| 4 | F-IN2 | Fail-safe digital input | ASI- | AS-i connection - negative polarity |

## Conductor cross-sections (3SU1400-2EA10-6AAO and 3SU1401-2EE20-6AA0)

|  | - |
| :--- | :--- |
| SZM $(\varnothing 2.0 \mathrm{~mm} \times 0.4 \mathrm{~mm})$ |  |
|  | $1 \times 0.14 \ldots 0.5 \mathrm{~mm}^{2}$ |
|  | $1 \times 0.2 \ldots 0.5 \mathrm{~mm}^{2}$ |
| AWG |  |

### 10.10 Configuring the AS-Interface

### 10.10.1 Setting the AS-i address

Operation of the addressing unit is described in the operating instructions of the AS-Interface addressing unit (article number of the operating instructions: 3ZX1012-0RK10-4AB1).

## Unique addressing

In the factory setting, a module for AS-Interface has the address 0 . It is detected by the master as a new slave that has not yet been addressed and, in this condition, has not yet been integrated in standard communication/data exchange. The modules for AS-Interface are $A / B$ slaves in accordance with AS-i spec. 2.1.
To enable data to be exchanged between the master and slaves, you have to assign a unique address for each slave (i.e. each slave address must be different) when commissioning the AS-Interface network.

You can select any address in the address range 1A to 31A and 1B to 31B.
Addresses can also be assigned once the devices have been installed.

## Addressing the slaves

You can set the slave address in different ways:

- Offline with the addressing unit via the addressing socket or at the AS-i connection. Recommended when assigning addresses for the entire system. The direct connection between the slave and addressing unit ensures that the slave modules are not mixed up.
- Online by the AS-i master and in the PLC configuration software. Recommended for assigning addresses to individual slaves if an addressing unit is not available. Before assigning addresses, you must ensure that each address exists only once in the AS-i network, that is, several new, additional modules (with address 0 in the factory setting) must not be connected to the AS-i cable.

You can also find further information in the AS-Interface system manual (http://support.automation.siemens.com/WW/view/en/26250840).

## A.CAUTION <br> Follow-on switching operations after addressing <br> As soon as you have assigned a valid address, the master can start cyclic data communication immediately, that is, outputs can be set or inputs read that result in followup switching operations. <br> Make sure that you take appropriate measures to exclude the risk of hazardous conditions. Disconnect the AS-i voltage, for example.

## Offlline addressing with the addressing unit

## Procedure

1. Connect the module to the addressing unit 3RK1904-2AB02.
2. Assign an address to the module:

- Switch the selector switch to ADDR.
- Press $\uparrow$. The address of the connected module is read and displayed.
- Select the address with $\boldsymbol{\nabla}$.

Transfer the address to the module with $\longleftarrow$.
3. Remove the addressing cable.

### 10.10.2 Addressing the AS-Interface modules for front plate mounting



To address the AS-Interface modules for front plate mounting, connect the 3RK1904-2AB02 AS-Interface addressing unit.

3SU1400-1EC10-.AA0 / 3SU1400-1EE20-.AA0 and 3SU1400-1EA10-.AA0 AS-Interface modules with fail-safe digital inputs

| Technical data |  |  |
| :---: | :---: | :---: |
|  | $\begin{aligned} & \text { 3SU1400-1EC10-.AA0 } \\ & \text { 3SU1400-1EE20-.AA0 } \end{aligned}$ | 3SU1400-1EA10-.AA0 |
| $\mathrm{le}_{\mathrm{e}}$ | < 60 mA |  |
| $\mathrm{U}_{\mathrm{e}}$ | $26.5 \mathrm{~V} \text {... } 31.6 \mathrm{~V}$SELV / PELV |  |
| PL | e |  |
| Cat. | 4 |  |
| SILCL | 3 |  |
| PFH [1/h] | $<4.5 \times 10^{-9}[1 / \mathrm{h}]$ |  |
| PFDavg | $<5.0 \times 10^{-6}$ |  |
| SFF | > $99 \%$ |  |
| DCavg | > 99 \% |  |
| AS-i slave profile IO / ID / ID2 (HEX) | 7 / B / F | $0 / \mathrm{B} / \mathrm{F}$ |
| ID1 code (HEX) | $1 \ldots \mathrm{~F}$ | $1 \ldots \mathrm{~F}$ |

### 10.10.3 Addressing the AS-Interface modules for base mounting



To address the AS-Interface modules for base mounting, connect the 3RK1904-2AB02 AS-Interface addressing unit.

3SU1400-2EK10-6AA0 and 3SU1400-2EJ10-6AA0 AS-Interface modules

| Technical data |  |  |  |
| :--- | :--- | :--- | :---: |
|  | 3 3SU1400-2EK10-6AA0 | 3SU1400-2EJ10-6AA0 |  |
| $\mathrm{I}_{\mathrm{e}}$ | $<260 \mathrm{~mA}$ |  |  |
| $\mathrm{U}_{\mathrm{e}}$ | $18.0 \mathrm{~V} \ldots 31.6 \mathrm{~V}$ | $7 / \mathrm{A} / \mathrm{E}$ |  |
| AS-i slave profile IO / ID / ID2 (HEX) | $7 / 0 / \mathrm{E}$ | $1 \ldots \mathrm{~F}$ |  |
| ID1 code (HEX) | $1 \ldots \mathrm{~F}$ |  |  |

## 3SU1401-2EE20-6AA0 and 3SU1400-2EA10-6AA0 AS-Interface modules with fail-safe digital inputs

| Technical data |  |  |
| :--- | :--- | :--- |
|  | 3 SU1400-2EA10-6AA0 | 3SU1401-2EE20-6AA0 |
| $\mathrm{l}_{\mathrm{e}}$ | $<60 \mathrm{~mA}$ |  |
| $\mathrm{U}_{\mathrm{e}}$ | $18.0 \mathrm{~V} \ldots 31.6 \mathrm{~V}$ |  |
| PL | e |  |
| Cat. | 4 |  |
| SILCL | 3 |  |
| PFH $[1 / \mathrm{h}]$ | $<4.8 \times 10^{-9}[1 / \mathrm{h}]$ | $7 / \mathrm{B} / 0$ |
| PFDavg | $<5.0 \times 10^{-6}$ |  |
| SFF | $>99 \%$ | $1 \ldots \mathrm{~F}$ |
| DC $_{\text {avg }}$ | $>99 \%$ |  |
| AS-i slave profile IO / ID / ID2 (HEX) | $0 / \mathrm{B} / \mathrm{F}$ |  |
| ID1 code (HEX) | $1 \ldots \mathrm{~F}$ |  |

### 10.11 Diagnosis of ASIsafe F adapters for front plate mounting

## Status display

The status of a module is indicated by LEDs with continuous or flashing light. This enables diagnostics at a glance:

- for AS-i communication via a dual LED
- for the switching state of the inputs with yellow LEDs

The following chapters provide an overview of the LED status displays of the AS-i modules.

## Inputs

Each input has a yellow LED with designation "F-INx". For the functions, see the table below:

Table 10-1 Diagnostics of the inputs via LED

| F-IN $\mathbf{x}$ | Meaning |
| :--- | :--- |
| Yellow | Signal activated |
| OFF | Signal deactivated |

## Status display AS-i / FAULT

All modules have a dual LED (green/red) for the "AS-i / FAULT" status display. For the functions and remedies, see the table below:

Table 10-2 Diagnostics of the AS $\div$ i status via LEDs

| AS-i / FAULT (green / red) | Possible cause | Possible remedial measures |
| :---: | :---: | :---: |
| Green | Normal operation, AS $\div$ i communication OK | - |
| Red | No AS $\div i$ communication: <br> - Master is switched off or offline | Ensure AS $\div \mathrm{i}$ communication: <br> - Switch on the master or switch it to online mode |
|  | - Slave is not configured in the master | - Reconfigure the master |
|  | - Incorrect slave type is connected | - Connect the correct module |
|  | - Slave has the wrong address | - Check/correct the slave address |
| Flashing yellow/red | Module has slave address "0" (delivery condition) | Assign an address other than "0" |
| OFF | No AS $-i$ voltage | Switch on AS $\ddagger$ i voltage |
|  | AS-i voltage has been connected with reverse polarity | Connect it correctly |
|  | AS*i voltage too low | Measure the AS-i voltage (approx. 30 V DC) |

### 10.12 Diagnosis of AS-Interface modules for base mounting

## Status display

The status of a module is indicated by LEDs with continuous or flashing light. This enables diagnostics at a glance:

- for AS-i communication via a red and green LED

The following chapters provide an overview of the LED status displays of the AS-i modules.

## Status display AS-i / FAULT

All modules have green and red LEDs for the "AS-i / FAULT" status display. For the functions and remedies, see the table below:

Table 10-3 Diagnostics of the AS $\div$ i status via LEDs

| AS-i / FAULT (green / red) | Possible cause | Possible remedial measures |
| :---: | :---: | :---: |
| Green | Normal operation, AS $\div$ i communication OK | - |
| Green <br> Red | No AS $\div$ i communication: <br> - Master is switched off or offline | Ensure AS $\div i$ communication: <br> - Switch on the master or switch it to online mode |
|  | - Slave is not configured in the master | - Reconfigure the master |
|  | - Incorrect slave type is connected | - Connect the correct module |
|  | - Slave has the wrong address | - Check/correct the slave address |
| Flashing green/red | Module has slave address "0" (delivery condition) | Assign an address other than "0" |
| Flashing alternately green/red*) | Overload of the outputs | Disconnect actuator cables Check actuators and cables |
| OFF | No AS $\div$ i voltage | Switch on AS $\div$ i voltage |
|  | AS-i voltage has been connected with reverse polarity | Connect it correctly |
|  | AS $\div$ i voltage too low | Measure the AS-i voltage (approx. 24 V DC or 30 V DC) |

*) Only 4DI/4DO and 4DI/3DOAB modules

### 10.13 Wiring examples

AS-i enclosure with one command point with one AS-Interface F slave and EMERGENCY STOP, wired to the left


AS-i enclosure with two command points with EMERGENCY STOP, wired to the right


## Note

EMERGENCY STOP conventionally wired

## Note

Position of EMERGENCY STOP
If the EMERGENCY STOP is mounted at command point $B$, the wiring must be to the left.

AS-i enclosure with three command points with one AS-Interface F slave and EMERGENCY STOP in $C$, wired to the left


AS-i enclosure with four command points with EMERGENCY STOP in D, wired to the right


AS-i enclosure with four command points with 2 AS-Interface slaves, wired to the left


## AS-i enclosure with six command points with AS-Interface $F$ slave and EMERGENCY STOP in F, wired to the right



AS-i enclosure with six command points with 3 AS-Interface slaves, wired to the left

10.13 Wiring examples

### 11.1 Configuring the IO-Link

### 11.1.1 Combinations

IO-Link master and IO-Link device combinations are shown in the following table.

| IO-Link master... | IO-Link device... |  |
| :---: | :---: | :---: |
|  | ... according to the IO-Link communication specification V1.0 | ... according to the IO-Link communication specification V1.1 |
| ...according to IO-Link communication specification V1.0 | Operation according to specification V1.0 | Operation according to specification V1.0 |
| ...according to IO-Link communication specification V1.1 | Operation according to specification V1.0 | Operation according to specification V1.1 ${ }^{\text {1) }}$ |

${ }^{1)}$ By selection of IODD V1.0.1, the device can be operated according to IO-Link communication specification V1.0.

## Differences between IO-Link communication specifications V1.0 and V1.1

- Usable IO-Link message frame length (not relevant)
- Application-specific name: V1.0: 64 bytes max./V1.1: 32 bytes max.
- Parameter server functionality: V1.0: not available/V1.1: available


### 11.1.2 Configuring with STEP 7 and the S7-PCT Port Configuration Tool

### 11.1.2.1 Basic procedure and prerequisites

## Procedure when configuring IO-Link master and IO-Link devices

Configuration takes place in two steps with STEP 7, V5.4 SP5 or STEP 7 TIA Portal, V12.0 or higher:

1. Configure the IO-Link master in HW Config. You will find IO-Link master on the Internet (http://www.siemens.com/industrymall) under "Automation" > "Industrial communication" > "IO-Link" > "Master".
2. With the Port Configuraton Tool S7-PCT, you configure the connected IO-Link devices.

## Note

An application example facilitates connection of IO-Link devices using a block library, and demonstrates the use of the block library using specific examples. You will find the application example on the Internet (http://support.automation.siemens.com/WW/view/en/90529409).

## Requirements

- STEP 7 V5.4 SP5 or higher (you can download Service Pack 5 from the Internet (http://support.automation.siemens.com/WW/view/en/36184684)) or STEP 7 TIA Portal V12.0 or higher.
- The Port Configuration Tool S7-PCT is installed on the PG/PC. You can either install S7-PCT together with or STEP 7 or you can download it from the Internet (http://support.automation.siemens.com/WW/view/en/37936752).
- IO-Link IODD files (IO Device Description) are installed in the S7-PCT hardware catalog. You can download all current IODD files for the SIRIUS devices from the Internet https://support.industry.siemens.com/cs/\#products?search=IODD\&o=DefaultRankingDes c\&Ic=en-WW).
IODD files for V1.0 and V1.1 are available for the combination of an IO-Link master and an IO-Link device according to the IO-Link communication specification V1.1. You may need IODD files according to the IO-Link communication specification V1.0 when replacing devices in existing installations.
- The GSD files of the IO-Link masters are already installed in STEP 7 HW Config. You can download all current GSD files for the Siemens IO-Link masters from the Internet (http://www.siemens.com/comdec).
- Optional: Install the IO_LINK_MASTER and IO_LINK_DEVICE function blocks for backing up / restoring IO-Link master parameters, IO-Link device parameters, parameterization of IO-Link devices during operation, and reading out IO-Link port functions.
You can find the function blocks on the Internet
(https://support.industry.siemens.com/cs/ww/en/view/82981502).
You can find more information about the function blocks in Chapters "Acyclic data exchange with the IO_LINK_MASTER function block (Page 247) function block" and
"Acyclic data exchange with the IO_LINK_DEVICE function block (Page 247)".


### 11.1.2.2 Configuration

## Configuring the IO-Link master in HW Config

1. Start the SIMATIC Manager (STEP 7) or the TIA Portal and configure the project as described in the STEP 7 online help.
2. Select the IO-Link master in the hardware catalog of HW Config.
3. Drag and drop the IO-Link master from the hardware catalog to the configuration table.
4. Select the IO-Link master in the configuration table (STEP 7)/ device view (TIA Portal).
5. Press the right mouse button and select "Object Properties" from the shortcut menu. Result: The "Properties" window of the IO-Link master opens.
6. Check the settings of the addresses.

Every IO-Link master port needs a corresponding overall address range depending on the IO-Link device used.

## Configuring the IO-Link device with the S7-PCT port configuration tool

1. Select the configured IO-Link master.
2. Press the right mouse button and select "Start device tool" (STEP 7 or TIA Portal)/"Configure IO-Link" (STEP 7 or TIA Portal) from the shortcut menu depending on the configuration tool used.
3. Select the IO-Link device in the component catalog of the S7-PCT port configuration tool.
4. Drag the IO-Link device out of the component catalog to the required port of the IO-Link master.
5. Start by parameterizing the IO-Link device.

Additional information is available in the S7-PCT online help.

### 11.1.3 Configuring with the S7-PCT Stand Alone Port Configuration Tool

### 11.1.3.1 Application

Configuration is always done with the S7-PCT port configuration tool whenever no SIMATIC CPU is available.

### 11.1.3.2 Basic procedure and prerequisites

## Basic procedure when configuring IO-Link master and IO-Link devices with the S7-PCT Port Configuration Tool (stand-alone)

1. You configure the connected IO-Link devices with the S7-PCT Port Configuration Tool.

## Requirements

- The S7-PCT Port Configuration Tool is installed on the PG/PC.

You can either install S7-PCT together with STEP 7 V5.4 SP5 or higher or STEP 7 TIA Portal V12.0 or higher, or you can download it from the Internet (http://support.automation.siemens.com/WW/view/en/37936752).

- IO-Link IODD files (IO Device Description) are installed in the S7-PCThardware catalog. All current IODD files of the SIRIUS devices are available on the Internet (https://support.industry.siemens.com/cs/\#products?search=IODD\&o=DefaultRankingDes c\&Ic=en-WW).
IODD files for V1.0 and V1.1 are available for the combination of an IO-Link master and an IO-Link device according to the IO-Link communication specification V1.1. You may need IODD files according to the communication specification V1.0 when replacing devices in existing installations.


## Note

Configuring with S7-PCT stand-alone is not possible for the CPU versions of the ET 200.

### 11.1.3.3 Configuration

## Configuring the IO-Link device with the S7-PCT port configuration tool

1. Start the S7-PCT port configuration tool.
2. Create a new project or open an existing project as described in the online help.
3. Select a bus category (PROFIBUS DP/PROFINET IO).
4. Select an IO-Link master.
5. Select the IO-Link device in the component catalog of the S7-PCT port configuration tool.
6. Drag the IO-Link device out of the component catalog to the required port of the IO-Link master.
7. Load the configuration into the IO-Link master before parameterizing the IO-Link device.
8. Start by parameterizing the IO-Link device.

Additional information is available in the S7-PCT online help.

## Note

To be able to access the IO-Link master or an IO-Link device online, communication between the ET 200 and the higher-level controller must be active (BF LED on ET 200 interface module is off).

### 11.1.4 Acyclic data exchange with the IO_LINK_MASTER function block

For acyclic data exchange, the IO_LINK_MASTER function block is available as a download for controllers of the S7 families.

With the help of this block, you can back up or restore the device parameters and settings of an IO-Link communication module (e.g. ET 200SP CM 4xIO-Link) via the S7 program.

## Requirements

- Install the IO_LINK_MASTERfunction block. You can download the IO_LINK_MASTER function block and the description from the Internet (https://support.industry.siemens.com/cs/ww/en/view/82981502).


## Procedure when using the IO_LINK_MASTER function block

1. Copy the IO_LINK_MASTER function block (including data block DB10) to a STEP 7 project.
2. Use the IO_LINK_MASTER function block as described in the documentation.

### 11.1.5 Acyclic data exchange with the IO_LINK_DEVICE function block

For acyclic data exchange, the IO_LINK_DEVICE function block is available as a download for controllers of the S7 families.

The block supports you in the following tasks:

- Parameterization of an IO-Link device during operation
- Executing IO-Link port functions
- Backing up/restoring IO-Link device parameters


## Requirements

- Install the IO_LINK_DEVICEfunction block.

You can download the IO_LINK_DEVICE function block and the description from the Internet (https://support.industry.siemens.com/cs/ww/en/view/82981502).

Procedure when using the IO_LINK_DEVICE function block

1. Copy the IO_LINK_DEVICE function block (including data block DB10) to a STEP 7 project.
2. Use the IO_LINK_DEVICE function block as described in the documentation.
3. You can find an application example of how to use the IO-Link devices with the IO_LINK_DEVICE function block on the Internet (http://support.automation.siemens.com/WW/view/en/90529409).

### 11.1.6 Replacing an IO-Link device

### 11.1.6.1 Introduction

To replace an IO-Link device, the devices must be isolated from communication and disconnected from the power supply. After the connections have been restored and communication has been resumed, the parameterization can be restored according to the respective IO-Link communication specification:

- IO-Link communication specification V1.0: concerning the IO_LINK_DEVICEfunction block.
- IO-Link communication specification V1.1: concerning the function of automatic parameter assignment by the IO-Link master modules of the ET 200SP, ET 200AL and S7-1200


### 11.1.6.2 Replacing an IO-Link device (according to IO-Link specification V1.0)

## Procedure

When replacing an IO-Link device, the plug-in connection to the IO-Link port can be removed without isolating the control voltage supply.

Parameter data and configuration data specially optimized by the user for a specific application are stored in an IO-Link device This data deviates in many cases from the default values stored in the IO-Link device.

In the event of replacement of an IO-Link device (referred to below as a "module"), the optimized data must be transferred to the new module because the parameters are stored only in the IO-Link device itself.

Data can be transferred via two channels:

- Module replacement with PG/PC
- Module replacement without PG/PC


## Procedure with PG/PC

In the event of a replacement, a PG/PC is available with the SIMATIC project of the plant.
With the data stored in the SIMATIC project, and the S7-PCT port configuration tool, you transfer the parameters belonging to the replaced IO-Link-Device to the new IO-Link-Device.

## Procedure without PG/PC

## Requirements

- Install the IO_LINK_DEVICEfunction block.

You can download the IO_LINK_DEVICE function block and the description from the Internet (https://support.industry.siemens.com/cs/ww/en/view/82981502).

On completion of commissioning, a PG/PC with the project is no longer available. For backing up and restoring the parameter data and configuration data from or to a module, the IO_LINK_DEVICE function block is available for the SIMATIC controllers of the S7 family.
With this function block, you back up all relevant data records of a module after commissioning, in a data block (DB), for example. In the event of a replacement, write the relevant data from the data block to the replaced module with the IO_LINK_DEVICE function block.
Refer to the Appendix "Process data and data sets (Page 449)" for data records to be backed up in the case of a module.

## Procedure

1. Copy the IO_LINK_DEVICE function block (including data block DB10) to a STEP 7 project.
2. Use the IO_LINK_DEVICE function block as described in the documentation.
3. You will find an application example of how to use the IO-Link devices with the IO_LINK_DEVICE function block on the Internet (http://support.automation.siemens.com/WW/view/en/90529409).

## Note

An IO-Link device is a module that communicates with the IO-Link master via its communication connection.

### 11.1.6.3 Replacing an IO-Link Device (according to IO-Link specification V1.1)

Automatic saving of parameter data
If IO-Link masters and IO-Link devices according to the IO-Link Communication Specification V1.1 are available, the "parameter server" function can be used to automatically back up parameter data.
When devices are replaced, this parameter data is written back to the new IO-Link device automatically on system startup.

### 11.1.7 Integration into the SIMATIC environment

## Integration into the SIMATIC environment

Systematic diagnostics concepts and efficient handling of parameter data are demanded at all levels of automation engineering. It is essential here that sensors and switching devices are integrated into the automation network. The communication standard IO-Link offers new possibilities in this regard by means of intelligent connection of sensors and switching devices to the control level. The core points are switching, protecting, monitoring, commanding and signaling at the field level. A block library is designed to make it easier for end users to connect the IO-Link devices, and to demonstrate use of the library using actual examples

You can download the library from the Internet
(https://support.industry.siemens.com/cs/ww/en/view/90529409) free of charge.

### 11.2 Electronic modules for ID key-operated switches

### 11.2.1 Design of a command point with ID key-operated switch

## Command point with ID key-operated switch on front plate

A modular command point with ID key-operated switch on a front plate consists of the following elements:

(1) Electronic module for ID key-operated switches 3SU1400-1Gx10-1AA0 (Page 163)
(2) 3-slot holder 3SU1500-0AA10-0AA0 (Page 38) for securing behind the control panel
(3) ID key-operated switch 3SU10x0-4WS10-0AA0 (Page 80) in front of the control panel
(4) ID key 3SU1900-0Fxy0-0AA0 (Page 323)
(5) Front plate

## Note

The minimum clearance between two command points when mounted on the front plate is 10 cm in all directions.

## Command point with ID key-operated switch in an enclosure

A modular command point with ID key-operated switch in an enclosure consists of the following elements:

(1) Electronic module for ID key-operated switches 3SU1400-1Gx10-1AA0 (Page 163)
(2) 3-slot holder 3SU1500-0AA10-0AA0 (Page 38) for securing in the enclosure
(3) ID key-operated switch 3SU10x0-4WS10-0AA0 (Page 80)
(4) ID key 3SU1900-0Fxy0-0AA0 (Page 323)
(5) Enclosure with raised cover, command point in center 3SU18x1-1AA00-1AA1 (Page 178)

### 11.2.2 Operating principle of the command point with ID key-operated switch

The ID key-operated switch is used primarily to set the current key position by rotation. To set the current key position, the rotary knob of the ID key-operated switch is turned clockwise or counter-clockwise. There is an opening in the rotary knob into which the ID key is inserted. Actuation is only possible if a valid ID key has been recognized, and the authorization level of the relevant ID key corresponds to, or is higher than, the current key position. The rotary knob can be turned clockwise and counter-clockwise through $360^{\circ}$ in 45-degree steps.

The switch position delay is started and the temporary key position is incremented by turning clockwise.

The temporary key position is indicated by the illuminated surfaces in the ID key-operated switch flashing green. During the switch position delay, the temporary key position can be changed by turning the knob clockwise or counter-clockwise. The switch position delay is restarted by turning the knob clockwise. During the switch position delay, the outputs are not yet affected by the temporary key position. After the delay has expired, the temporary key position is adopted as the current key position, and the outputs are switched in accordance with this position.
By turning counter-clockwise, the current key position is changed to 0 , and the outputs are switched immediately in accordance with this position.

## Note

In a configuration with electronic module for ID key-operated switches for IO-Link, the parameters can be set via IO-Link.

You will find additional information in Chapter "Configuring IO-Link (Page 243)".

## Settings on the electronic module for ID key-operated switches

The electronic modules for ID key-operated switches have five digital outputs. Setting of outputs 0 to 3 depends on the current key position and the module settings. If a valid ID key has been recognized, output 4 is active; otherwise output 4 is inactive.

Table 11-1 Individual method

| Key position | Output |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  | 0 | 1 | 2 | 3 |
| 0 | Inactive | Inactive | Inactive | Inactive |
| 1 | Active | Inactive | Inactive | Inactive |
| 2 | Inactive | Active | Inactive | Inactive |
| 3 | Inactive | Inactive | Active | Inactive |
| 4 | Inactive | Inactive | Inactive | Active |

11.2 Electronic modules for ID key-operated switches

Table 11-2 Addition method (incremental method)

| Key position | Output |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  | 0 | 1 | 2 | 3 |
| 0 | Inactive | Inactive | Inactive | Inactive |
| 1 | Active | Inactive | Inactive | Inactive |
| 2 | Active | Active | Inactive | Inactive |
| 3 | Active | Active | Active | Inactive |
| 4 | Active | Active | Active | Active |

## Note

The addition method (incremental method) can only be set on the electronic modules for ID key-operated switches for IO-Link.

## Short-circuit protection

If a short-circuit occurs at one or more outputs, the occurrence of a fault event is sent and the fault flag is set. All outputs are deactivated for one second. Then the relevant outputs are re-activated to monitor whether the short-circuit is still active. This temporary state exists for approximately 0.1 seconds. If no short-circuit is determined during this period, the fault event is revoked, and the fault flag is deleted. However, if a short-circuit is detected during this time, all outputs are deactivated again, and the short-circuit device fault remains.

## Function of the LEDs in the ID key-operated switch

In the enclosure of the ID key-operated switch are four illuminated surfaces that can assume the following states:

- Showing a green light: Indication of the current key position and the switched outputs.
- Flashing green: Indication of the temporary key position.
- Showing a yellow light: Indication of the associated authorization level (key position that can be reached by turning the rotary knob).
- Flashing yellow (all 4 illuminated surfaces): Indication for the individually codable ID key used that has not yet been configured.
- Showing a red light: Indicates that the relevant key position is higher than permissible for the relevant authorization level. (This key position cannot be reached by turning the rotary knob.) The indicator also shows a red light when there is no ID key plugged in.
- Flashing red (all 4 illuminated surfaces): When using a colored ID key with permanently encoded authorization level (ID group 1 to 4), this indicates when the parameter "Individually codable ID keys only" is enabled.
- Not illuminated: The electronic module is switched off.


## Displayed colors



## Selected position

## Selectable positions dependent on ID key using the adjustment method

In this case, "DS 131 Incremental switching mode" must be set to "disabled" on the electronic modules for ID key-operated switches for IO-Link.


## Selectable positions dependent on ID key using the adjustment method

In this case, "DS 131 Incremental switching mode" must be set to "disabled" on the electronic modules for ID key-operated switches for IO-Link.

| Key <br> color | Output 4 <br> (DQ.4) active | Outputs 0 and 4 <br> (DQ.0 and DQ.4) <br> active | Outputs 1 and 4 <br> (DQ.1 and DQ.4) <br> active | Outputs 2 and 4 <br> (DQ.2 and DQ.4) <br> active | Outputs 3 and 4 <br> (DQ.3 and DQ.4) <br> active |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Green |  |  |  |  |  |

Selectable positions dependent on ID key using the addition method (only for electronic modules for ID key-operated switches for IO-Link).

With this method, "DS 131 Incremental switching mode" must be set to "Unlocked" on the electronic modules for ID key-operated switches for IO-Link.


Selectable positions dependent on ID key using the addition method (only for electronic modules for ID key-operated switches for IO-Link).

With this method, "DS 131 Incremental switching mode" must be set to "Unlocked" on the electronic modules for ID key-operated switches for IO-Link.

| Key color | Output 4 (DQ.4) active | $\begin{gathered} \text { Outputs } 0,4 \\ \text { (DQ. } 4 \text { and DQ.4) } \\ \text { active } \end{gathered}$ | $\begin{gathered} \text { Outputs } 0,1,4 \\ \text { (DQ.0, DQ.1, DQ.4) } \\ \text { active } \end{gathered}$ | $\begin{gathered} \text { Outputs } 0,1,2,4 \\ \text { (DQ.0, DQ.1, DQ.2, } \\ \text { DQ.4) } \\ \text { active } \\ \hline \end{gathered}$ | $\begin{gathered} \text { Outputs } 0,1,2,3,4 \\ \text { (DQ.0, DQ.1, DQ.2, } \\ \begin{array}{c} \text { DQ.3, DQ.4) } \\ \text { active } \end{array} \\ \hline \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Green |  |  |  |  |  |
| Yellow |  |  |  |  |  |
| Red |  |  |  |  |  |
| Blue |  |  |  |  |  |

You can find more information about data sets in Section "Electronic modules for ID keyoperated switches (Page 449)" in Chapter "Process data and data sets" in the appendix.

### 11.2.3 Parameters

### 11.2.3.1 Parameters

The following parameters can be set:

- Incremental switching mode
- Switch position memory
- Switch position retentive memory
- Individually codable ID keys only
- Switch position delay
- Select memory range
- Restore Factory Setting
- Add new individual ID key
- Delete individually codable ID key
- Parameter (write) Access Lock (parameters for IO-Link devices according to IO-Link communication specification V1.1)
- Data Storage Lock (parameters for IO-Link devices according to IO-Link communication specification V1.1)

The "Parameter (write) Access Lock" and "Data Storage Lock" parameters can be set in the "Port Configuration Tool S7-PCT" V3.0 or higher.

Notes on parameter assignment
Transfer of the parameters with the "Parameterserver" function if IO-Link masters and IO-Link devices according to the IO-Link communication specification V1.1 are available:

1. The "Parameter server" function backs up the parameter data from the IO-Link devices.
2. Replace the IO-Link device.
3. The parameter data is automatically written back to the new IO-Link device on system startup.

### 11.2.3.2 "Incremental switching mode" parameter

## "Incremental switching mode" parameter

The "Incremental switching mode" parameter influences the evaluation of the current key position.

1) "Incremental switching mode" disabled: The adjustment method is used.

- Key position $\geq 1$ : The output corresponding to the current key position-1 is switched on; the remaining outputs $0 \ldots 3$ are inactive.
- Key position 0: All outputs $0 \ldots 3$ are inactive.

Example: Key position = 2: Output 0: Off, output 1: On, output 2: Off, output 3: Off
2) "Incremental switching mode" enabled: The addition method is used.

- Key position $\geq 1$ : The outputs with the indices from 0 to the current switch position-1 are switched on; the remaining outputs $0 \ldots 3$ are inactive.
- Key position 0: All outputs $0 \ldots 3$ are inactive.

Example: Key position = 2: Output 0: On, output 1: On, output 2: Off, output 3: Off

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 0 | Incremental switching mode: disabled | Disabled |
| 1 | Incremental switching mode: enabled | - |

### 11.2.3.3 "Switch position memory" parameter

## "Switch position memory" parameter

1) "Switch position memory" disabled:

- No ID key recognized. The current switch position is changed to 0 immediately after removing the ID key, and all active outputs are deactivated.

2) "Switch position memory" enabled:

- No ID key recognized. The last current switch position is retained after the ID key has been removed, and all active outputs remain in the switched-on state. The authorization level of the currently used ID key must correspond to the authorization level of the current switch position or higher.

This value can be changed by:

- Using an ID key with suitable authorization level and turning the rotary knob on the ID key-operated switch.
- Switching off the power supply (if the parameter "switch position retentive memory" is disabled).

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 0 | Switch position memory: disabled | Disabled |
| 1 | Switch position memory: enabled | - |

### 11.2.3.4 "Switch position retentive memory" parameter

## "Switch position retentive memory" parameter

## Prerequisite:

The "Switch position retentive memory" parameter only functions in combination with the "Switch position memory" parameter. The "Switch position memory" parameter must be enabled.

1) "Switch position retentive memory" disabled:

- After shutting down the power supply of the electronic module, the last current switch position is lost, and the module is set to 0 after switching on again

2) "Switch position retentive memory" enabled:

- After shutting down the power supply of the electronic module, the last current switch position is saved to the permanent memory and renewed after the electronic module is switched on again.

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 0 | Switch position retentive memory: disabled | Disabled |
| 1 | Switch position retentive memory: enabled | - |

### 11.2.3.5 "Individually codable ID keys only" parameter

## "Individually codable ID keys only" parameter

1) "Individually codable ID keys only" disabled:

- All authorization levels are activated.

2) "Individually codable ID keys only" enabled:

- Only individually codable ID keys are permitted. In this case, only individually codable ID keys are recognized, regardless of whether they are listed in the key list in the electronic module or not. The ID groups $1 . . .4$ are ignored.

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 0 | Individually codable ID keys only: disabled | Disabled |
| 1 | Individually codable ID keys only: enabled | - |

### 11.2.3.6 "Switch position delay" parameter

## Switch position delay

The switch position delay specifies how long a temporary key position is displayed at the ID key-operated switch (by green flashing of the LED on the electronic module for ID keyoperated switches). During this time, it is still possible to change the temporary key position by turning the knob. The switch position delay restarts when turning of the rotary knob is detected. During the switch position delay, the values at the outputs are not changed. When the switch position delay has expired, the temporary key position is accepted as the current key position. The status of the outputs is changed in accordance with this position.

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 1 | Switch position delay: Minimum value | $20(2$ seconds $)$ |
| 100 | Switch position delay: Maximum value | - |

Increment: 0.1 seconds

### 11.2.3.7 "Select memory range" parameter

## "Select memory range" parameter

The Port Configuration Tool ST-PCT includes a dropdown menu with which you can select the part of the data set to be displayed. The memory range in which the individually codable ID keys are saved can be selected and displayed.

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 1 | Select memory range: Minimum value | 1 (individually codable key $1 \ldots$ 10) |
| 5 | Select memory range: Maximum value | - |

Increment: 10 keys

### 11.2.3.8 "Restore Factory Setting" parameter

## "Restore Factory Setting" parameter

In some situations, the electronic module for ID key-operated switches for IO-Link has to be changed to the standard state quickly and simply. For this purpose, the standardized system command "Restore Factory Setting" (value 0x82 in the data set (Index) 2 - system commands or the button in the Port Configuration Tool $S 7-P C T$ ) is used.

This command triggers the following:

- Standard settings for parameters - data set (index) 131
- Deleting the list of keys
- Data set (index) 24 (Application Specific Name) is deleted

| Settings | Description |
| :--- | :--- |
| 130 | Restore Factory Setting |

Standard values for parameters - data set (index) 131

| Parameters | Setting |
| :--- | :--- |
| Incremental switching mode | Disabled |
| Switch position memory | Disabled |
| Switch position retentive memory | Disabled |
| Individually codable ID keys only | Disabled |
| Switch position delay | 20 (2 seconds) |
| Select memory range | 1 (individually codable key $1 \ldots 10)$ |

### 11.2.3.9 Manage authorization level (individually encodable ID keys)

## "Add new individual ID key" parameter

The electronic module can store up to 50 individually encodable ID keys in its permanent memory, and it can assign each of these individually encodable ID keys to group $1 . . .4$ respectively. When an individually encodable ID key from the list is used, it behaves like an ID key from the relevant authorization level.

A list of the individually encodable ID keys can be displayed in the Port Configuration Tool S7-PCT.
If an individually encodable ID key is used in the ID key-operated switch, the electronic module detects that it belongs to the group of individually encodable ID keys.
A check is then made to see whether this key is included in the individual key list stored in the electronics module. If the identification number of the key used is in the list, the corresponding authorization level is determined using this list and assigned to the key used. This key behaves like a key belonging to the relevant authorization level.
One of the authorization levels $1 \ldots 4$ can be assigned to each individually encodable ID key. If the identification number of the key used is not found in the individual key list, it is assigned to the authorization level "Individual ID key".
In this case, only output 4 is activated, and the illuminated surfaces on the ID key-operated switch flash yellow.
The authorization level is assigned via the Port Configuration Tool S7-PCT.

## Procedure:

To add a new individually encodable ID key to the list of individually encodable ID keys, or to change the authorization level of an already added individually encodable ID key, the following steps are required:

- Use individually encodable ID key in the ID key-operated switches.
- Wait for detection of the ID key
- Write the system command "Set authorization level x"; "x" represents the authorization level assigned to the ID key used (value 0xAx in the data set (index) 2 - system commands or button in the Port Configuration Tool S7-PCT)
- Check: Status of the individually encodable ID key (data set (index) 92 - diagnostics)
- Remove the ID key from the ID key-operated switch

| Settings | Description |
| :--- | :--- |
| 161 | Define authorization level 1 for the individually encodable ID key. |
| 162 | Define authorization level 2 for the individually encodable ID key. |
| 163 | Define authorization level 3 for the individually encodable ID key. |
| 164 | Define authorization level 4 for the individually encodable ID key. |

Status of the individually encodable ID key (data set (index) 92 - diagnostics, byte 19.0 ... 19.7)

You will find additional information in Chapter "Data set (Index) 92 - diagnostics (Page 456)".

| Value | Description |
| :--- | :--- |
| 0 | Individually encodable ID key detected. |
| 1 | Electronic module memory is full. |
| 2 | No valid individually encodable ID key used. |

## "Delete individual ID key" parameter

To delete an individually encodable ID key from the key list, the following steps are required.

## Procedure:

- Use individually encodable ID key in the ID key-operated switches
- Wait for detection of the ID key
- Write the system command "Delete individual ID key" (value 0xA5 in data set (index) 2 system commands or button in the Port Configuration Tool S7-PCT)
- Check: Status of the individually encodable ID key (data set (index) 92 - diagnostics)
- Remove the ID key from the ID key-operated switch

| Settings | Description |
| :--- | :--- |
| 165 | Delete individual ID key used in the ID key-operated switch. |

## Status of the individually encodable ID key (data set (index) 92 - diagnostics, byte 19.0 ... 19.7)

You will find additional information in Chapter "Data set (Index) 92 - diagnostics (Page 456)".

| Value | Description |
| :--- | :--- |
| 0 | Individually encodable ID key detected. |
| 2 | No valid individually encodable ID key used. |
| 3 | Deleted ID key not in the memory of the electronic module. |

## Delete individually encodable ID key using data set 80

If the individually encodable ID key is lost or stolen, it is possible to remove the individually encodable ID key from the key list without the individually encodable ID key being physically available.

In this case, the electronics module offers the option of deleting the key from the key list using data set 80 .

## Procedure:

To delete an individually encodable key from the list using data set 80, the following steps are required:

- Write the identification number of the ID key to be deleted to data set (index) 80 , or enter it in a form field in the Port Configuration Tool ST-PCT
- Load the entered identification number into the electronic module in the Port Configuration Tool S7-PCT
- Write the system command "Delete individually encodable ID key using data set 80" (value 0xA6 in data set (index) 2 - system commands or button in the Port Configuration Tool S7-PCT)
- Check: Status of the individually encodable ID key (data set (index) 92 - diagnostics)

| Settings | Description |
| :--- | :--- |
| 166 | Delete individually encodable ID key using data set 80. |

## Delete all individual ID keys

With the system command "Delete all individual ID keys" (value 0xA7 in data set (index) 2 system commands or button in the Port Configuration Tool S7-PCT), all ID keys of the key list can be deleted.

The complete list of the set authorization levels for the individually encodable ID keys in the electronic module for ID key-operated switch for IO-Link is deleted (memory of the individually encodable ID keys (1-30) - data set (index) 81 and memory of the individually encodable ID keys (31-50) - data set (index) 82).

| Settings | Description |
| :--- | :--- |
| 167 | All individually encodable keys stored in the electronic module for ID key-operated switches for IO-Link, <br> and the set authorization levels, are deleted. |

### 11.2.3.10 Parameters for IO-Link devices (according to IO-Link communication specification V1.1)

## Parameter "Parameter (write) access"

With the "Parameter (write) access" parameter, you define whether or not all write and read access parameters can be accessed.

The table below shows the parameter values.

Table 11-3 "Parameter (write) Access Lock" parameter

| Value | Description | Default setting |
| :--- | :--- | :--- |
| 0 | Parameter (write) access: Unlocked | Unlocked |
| 1 | Parameter (write) access: disabled | - |

## "Data Storage" parameter

With the "Data Storage" parameter, you define whether or not the mechanism for data storage is disabled.

The table below shows the parameter values.

Table 11-4 "Data Storage Lock" parameter

| Value | Description | Default setting |
| :--- | :--- | :--- |
| 0 | Data Storage: Unlocked | Unlocked |
| 1 | Data Storage: disabled | - |

### 11.2.4 Process image

## Process image input (PII)

The process image input contains the most important status information of the electronic modules for the ID key-operated switch for IO-Link.

Table 11-5 PII - status information

| DI (2 bytes) | PII |
| :--- | :--- |
| DI0.0 | 1: Ready |
| DI0.1 | 1: Group error |
| DI0.2 | Reserved |
| DI0.3 | Reserved |
| DI0.4 | Reserved |
| DI0.5 | Reserved |
| DI0.6 | Reserved |
| DI0.7 | Reserved |
| DI1.0 | 1: ID key recognized |
| DI1.1- DI1.3 | 1: Authorization level |
| DI1.4 - DI1.6 | 1: Switch position |

### 11.2.5 Diagnostics

### 11.2.5.1 IO-Link diagnostics

## IO-Link diagnostics

On the electronic modules for ID key-operated switches for IO-Link, it is possible to carry out diagnostics via IO-Link. Short-circuit is signaled via the diagnostics mechanism of IO-Link. With all further diagnostics messages, the corresponding bit is set in data set (index) 92 diagnostics.

The table below provides information on possible causes and remedial measures:

Table 11-6 Possible causes and remedial measures

| Diagnostics and messages | Possible cause | Possible remedial measures |
| :---: | :---: | :---: |
| Short-circuit | - The electrical cable connection on at least one of the digital outputs has been shortcircuited. <br> - The connected actuator is defective. The current consumption of the connected actuator is too high. | - Check the electrical cable connection of the digital outputs. <br> - Check the current consumption of the connected actuator. <br> - Use a new actuator. |
| Self-test error / internal error | - Fault in internal test. <br> - The data saved in the device are invalid. | - Reset the electronic module to the delivery state and reconfigure the electronic module. <br> - Return the device to the manufacturer. |
| Individually codable ID key cannot be saved: Key list is full | 50 individually codable keys have already been saved, and the available memory range is full. | - Check the data in data sets 81 and 82 (memory of the individually codable ID keys (1-30) - data set (index) 81, and memory of the individually codable ID keys (31-50) data set (index) 82) <br> - Delete the no longer used individually codable ID keys from the memory. |
| Individually codable ID key cannot be saved: invalid key | - No valid individually codable ID key inserted. <br> - The inserted individually codable ID key is defective. | - Use an individually codable ID key if, for example, a colored ID key has been inserted. <br> - Use another individually codable ID key since the inserted ID key could be defective. <br> - Check that the ID key has been inserted as far as it will go. |


| Diagnostics and messages | Possible cause | Possible remedial measures |
| :--- | :--- | :--- |
| Individually codable ID key <br> cannot be deleted: <br> invalid key | -No valid individually codable ID key <br> inserted. <br> The inserted individually codable ID key is <br> defective. | -Use an individually codable ID key <br> (white). <br> - <br> Check that the ID key has been <br> inserted as far as it will go. <br> Delete the corresponding ID key by <br> manually entering the identification <br> number in data set 80. |
| Individually codable ID key <br> cannot be deleted: <br> Key to be deleted is not in the <br> key list | - The inserted individually codable ID key <br> was not previously assigned an <br> authorization level. <br> The manually entered identification <br> number in data set 80 has not been <br> assigned an authorization level | -Assign an authorization level to the <br> ID key. |
| -Check the manually entered <br> identification number of the ID key in <br> data set 80. |  |  |

The table below indicates how the manufacturer-specific diagnostics are reported:

Table 11-7 Diagnostics and messages

| Diagnostics and messages | IO-Link for event code ${ }^{1)}$ | PII ${ }^{2)}$ | Data set 92 | LED |
| :--- | :--- | :--- | :--- | :--- |
|  |  | SF $\left.^{3}\right)$ |  | DEVICE |
| Short-circuit | $0 \times 7710$ | X | X | Red |
| Self-test error / internal error | - | X | X | Red |
| Individually codable ID key cannot be saved: <br> Key list is full | - | - | X | - |
| Individually codable ID key cannot be saved: <br> invalid key | - | - | X | - |
| Individually codable ID key cannot be deleted: <br> invalid key | - | - | X | - |
| Individually codable ID key cannot be deleted: <br> Key to be deleted is not in the key list | - | - | X | - |

${ }^{1)}$ The manufacturer-specific diagnostic events listed in the table are reported to the IO-Link master via the diagnostics mechanism of IO-Link.
2) With the "process image input" (see Chapter "Process image (Page 267)"), you can determine via the group error (GE) bit or general warning (GW) bit in the user program whether detailed information on diagnostics or messages is available in diagnostic data set 92. If bit ( = 1 ) is set, you can obtain detailed information on what caused a "group error" by reading data set 92 .
${ }^{3)}$ GE $=$ Group error: You can find detailed information in diagnostics data set 92 (see Chapter "Data set (index) 92 - diagnostics (Page 456)").
x: Bit set
-: Status does not change

## Device LED



The device LEDs are used to indicate the correct functioning of the electronic module for ID key-operated switches. If a short-circuit or internal fault occurs, this is indicated by these LEDs.

- Green device LED (DEVICE) lights up: Normal operation
- Red device LED (DEVICE) lights up: Fault display


## IO-Link LED

The IO-Link LED is only used with the electronic module for ID key-operated switches for IO-Link, and is inactive with the electronic module for ID key-operated switches.

- Normal operation:

When IO-Link communication functions properly, the green IO-Link LED flashes in accordance with the IO-Link communication specification V1.1 (time duration approximately 1 second, ON time approximately 0.9 seconds).

- Fault display:

The IO-Link LED shows a red light in the event of IO-Link communication faults.

### 11.2.6 Mounting a command point with ID key-operated switch



## Procedure

(1) Insert the ID key-operated switch from the front into the opening of the front plate.
(2) Place the holder from behind onto the ID key-operated switch.
(3) Tighten the screw on the holder (tightening torque 1.0 to 1.2 Nm ).
(4) Snap the electronic module for ID key-operated switch onto the back of the holder. Fit the narrow snap hook into the associated contour on the holder.
(5) Engage the broad snap hook into the associated contour on the holder. Ensure secure latching


Snapping an electronic module onto the holder (4) / (5)

### 11.2.7 Connecting

### 11.2.7.1 Electronic modules for the ID key-operated switches for IO-Link

3SU1400-1GD10-1AA0 electronic module for ID key-operated switches for IO-Link


## Terminal labeling

The IO-Link device is connected to the IO-Link master via the terminals L+, C/Q and L-. The IO-Link device is powered ( 24 V DC) via the two cables $\mathrm{L}+$ and L -. Communication of the IO-Link device with the IO-Link master takes place via the cable C/Q. The current available at one IO-Link port of the IO-Link master is 200 mA . If more than 200 mA are required for the IO-Link device, the terminals 1 M and $1 \mathrm{~L}+$ can be additionally connected.

| Terminal labeling |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Pin | X1 | Pin | X2 |  |  |
| 1 | DQ.0 | Digital output | 6 | L+ | Supply voltage for IO-Link |
| 2 | DQ.1 | Digital output | 7 | C/Q | Communication signal/switching signal |
| 3 | DQ.2 | Digital output | 8 | L- | IO-Link ground |
| 4 | DQ.3 | Digital output | 9 | 1 M | Ground |
| 5 | DO.4 | Digital output | 10 | 1 L+ | 24 V DC |

## Conductor cross-sections

| $\begin{aligned} & \text { SZM }(\varnothing 3.5 \mathrm{~mm} \times 0.6 \mathrm{~mm}) \end{aligned}$ | 0.4 Nm 3.5 lb in |
| :---: | :---: |
|  | $1 \times 0.2 \ldots 2.5 \mathrm{~mm}^{2}$ |
|  | $\begin{aligned} & 1 \times 0.25 \ldots 1.5 \mathrm{~mm}^{2} \\ & 2 \times 0.25 \ldots 0.75 \mathrm{~mm}^{2} \end{aligned}$ |
|  | $\begin{aligned} & 1 \times 0.2 \ldots 2.5 \mathrm{~mm}^{2} \\ & 2 \times 0.2 \ldots 0.75 \mathrm{~mm}^{2} \end{aligned}$ |
| AWG | 26 to 14 |

### 11.3 Electronic modules for IO-Link

### 11.3.1 Electronic module for IO-Link

The electronic modules for IO-Link can be installed in 3SU1 enclosures or mounted on a front plate.

The modules are controlled by IO-Link communication. The rated supply voltage of the module is 24 V .

## Variants

- Front variant 6DI/2DO

For front plate mounting. The 8 digital inputs and outputs can be parameterized individually as required. The default setting is 6 digital inputs and 2 digital outputs. The inputs and outputs can only be parameterized by IO-Link communication.

- Basic variant 6DI/2DO

For use in a 3SU1 enclosure. The 8 digital inputs and outputs can be parameterized individually as required. The default setting is 6 digital inputs and 2 digital outputs. The inputs and outputs can only be parameterized by IO-Link communication.

- Basic variant 6DI/2DO

6DI/2DO means that the variant has 6 digital inputs and 2 digital outputs. It is not possible to change the number of inputs and outputs.

- Basic variant 4DI/4DO

4DI/4DO means that the variant has 4 digital inputs and 4 digital outputs. It is not possible to change the number of inputs and outputs.

- Basic variant 2DI/6DO

2DI/6DO means that the variant has 2 digital inputs and 6 digital outputs. It is not possible to change the number of inputs and outputs.

## Article numbers

|  | Mounting type | Digital inputs | Digital outputs | Article number |
| :---: | :---: | :---: | :---: | :---: |
|  | Front plate mounting | $6{ }^{1)}$ | $2^{1)}$ | 3SU1400-1HL10-6AA0 |
|  | Base mounting | 61) | 21) | 3SU1400-2HL10-6AA0 |
|  | Base mounting | $6{ }^{2)}$ | $2^{2)}$ | 3SU1400-2HK10-6AA0 |
|  | Base mounting | 42) | 42) | 3SU1400-2HM10-6AA0 |
|  | Base mounting | $2^{2)}$ | 6) | 3SU1400-2HN10-6AA0 |

${ }^{1}$ ) Default setting. The 8 digital inputs and outputs can be parameterized individually as required.
${ }^{2}$ ) It is not possible to change the number of inputs and outputs.

## Short-circuit protection

If a short-circuit occurs at one or more outputs, the occurrence of a fault event is sent and the fault flag is set. All outputs are deactivated for one second. Then the relevant outputs are re-activated to monitor whether the short-circuit is still active. This temporary state exists for approximately 0.1 seconds. If no short-circuit is determined during this period, the fault event is revoked, and the fault flag is deleted. However, if a short-circuit is detected during this time, all outputs are deactivated again, and the short-circuit device fault remains.

### 11.3.2 Functions

### 11.3.2.1 Input functions

## Static input

## Description

This function is intended for general use. In this mode, a value at the input can be read and transferred to the IO-Link master via IO-Link communication. The output is deactivated in this mode.

## Parameters

- Input delay
- Inverting input


## Switching input

## Description

A value at the input is read in this mode. Signal changes are monitored. The actual value of the relevant counter "Switching cycle number" is incremented by a predefined signal change. The actual value of this counter is compared to the parameterized number of switching cycles. If the actual switching cycle number reaches this value, the switching cycle number status is set to "threshold reached". If the actual switching cycle number reaches 4294967 295 (0xFFFFFFF [hex]), counting ceases and the status for the switching cycle number is set to "expired". If the actual switching cycle number is lower than the number of switching cycles and less than 4294967295 (0xFFFFFFF [hex]), the status for the switching cycle number is set to "active". When the switching input mode is deselected, the status for the switching cycle number is set to "deactivated". The actual switching cycle number is stored in a buffer memory and is available as the start value for continued counting when the switching input mode is selected again. When the device is switched off, the actual switching cycle number is transferred to the non-volatile memory of the device so that it can be retrieved when the device is next switched on.

The actual switching cycle number can be reset to zero by the following methods:

- Change the number of switching cycles.
- Switch over from the switching input mode to the switching output mode, and vice versa.
- Change the type of counted edges.
- Use the standard command "Restore factory setting".
- Use the standard command "Application Reset".
- Use the standard command "Reset switching cycle counter at pin x " ( x refers to the number of the corresponding IO).
- Use the standard command "Switching cycle counter at pins 1-8".


## Parameters

- Input delay
- Threshold switching cycle counter
- Active edges
- Inverting input


## Switch-on duration input

## Description

A value at the input is read in this mode. Signal changes are monitored. The value at the input is monitored. If the input is switched on for 1000 ms , the actual switch-on duration counter is incremented. This increase represents the total period of time during which the input is switched on and may include several pulses that are shorter than 1000 ms . The actual value of this counter is compared to the parameterized time period. If the actual switch-on duration counter reaches this value, the switch-on duration status is set to "threshold reached". If the actual switch-on duration counter reaches 4294967295 (0xFFFFFFFF [hex]), counting ceases and the status for the switch-on duration is set to "expired". If the actual switch-on duration count is shorter than the parameterized time period and less than 4294967295 (0xFFFFFFF [hex]), the status for the switch-on duration is set to "active".

When the switch-on duration input mode is deselected, the status for the switch-on duration is set to "deactivated". The actual switch-on duration count is stored in a buffer memory and is available as the start value for continued counting when the switch-on duration input mode is selected again. When the device is switched off, the actual switch-on duration count is transferred to the non-volatile memory of the device so that it can be retrieved when the device is next switched on.

The actual switch-on duration count can be reset to zero by the following methods:

- Change the parameterized time period.
- Switch over from the switch-on duration input mode to the switch-on duration output mode, and vice versa.
- Use the standard command "Restore Factory Setting".
- Use the standard command "Application Reset".
- Use the standard command "Reset switch-on duration at pin x" (x refers to the number of the corresponding IO).
- Use the standard command "Reset switch-on duration at pins 1-8".


## Parameters

- Input delay
- Threshold switch-on duration
- Inverting input


### 11.3.2.2 Output functions

## Static output

## Description

In this mode, a value for the relevant output can be set and transferred from the IO-Link master to the device. The value for the output is set by means of the output process data.

The output voltage corresponds to EN 61131-2.

## Parameters

- Inverting output


## PWM output

## Description

The value of the output process data is read in this mode. The relevant output can be set as a PWM output in this mode. PWM is activated by means of the output process data.

## Parameters

- PWM frequency
- PWM duty cycle
- Inverting output

If "Inverting output" is deactivated, PWM is active at the output for as long as the corresponding output process data bit is activated. If the relevant process data bit is deactivated, the output is OFF.

If "Inverting output" is activated, PWM is active at the output for as long as the corresponding output process data bit is deactivated. If the relevant process data bit is activated, the output is OFF.

## Dimming output

## Description

The relevant output can be switched on gradually in this mode. The dimming output is activated by means of the output process data. The dimming frequency is 100 Hz . The duty factor increases linearly from 0 to $100 \%$. The output is fully ON when the dimming time expires. Dimming is activated when the output is switched on. When the output is switched off, it is deactivated instantaneously. The dimming status can be read in parameter Dimming Status. The possible values of this parameter are "Deactivated", "Active" and "Expired". This function is used primarily to gradually illuminate LED modules.

## Parameters

- Dimming time
- Inverting output

If "Inverting output" is deactivated, dimming activates a rising edge in the output process data. When the parameterized dimming time expires, the output is activated. If the output process data are deactivated, the output is OFF.
If "Inverting output" is activated, dimming activates a falling edge in the output process data. When the parameterized dimming time expires, the output is activated. If the output process data are activated, the output is OFF.

Switching output

## Description

The value of the output process data is read in this mode. Signal changes are monitored. The switching output mode is activated by means of the output process data. The actual value of the relevant counter "Switching cycle number" is incremented by a predefined signal change. The actual value of this counter is compared to the parameterized number of switching cycles. If the actual switching cycle number reaches this value, the switching cycle number status is set to "threshold reached". If the actual switching cycle number reaches 4 294967295 (0xFFFFFFFF [hex]), counting ceases and the status for the switching cycle number is set to "expired". If the actual switching cycle number is lower than the number of switching cycles and less than 4294967295 (0xFFFFFFF [hex]), the status for the switching cycle number is set to "active". When the switching output mode is deselected, the status for the switching cycle number is set to "deactivated". The actual switching cycle number is stored in a buffer memory and is available as the start value for continued counting when the switching output mode is selected again. When the device is switched off, the actual switching cycle number is transferred to the non-volatile memory of the device so that it can be retrieved when the device is next switched on. The actual switching cycle number can be reset to zero by the following methods:

- Change the number of switching cycles.
- Switch over from the switching output mode to the switching input mode, and vice versa.
- Change the type of counted edges.
- Use the standard command "Restore Factory Setting".
- Use the standard command "Application Reset".
- Use the standard command "Reset switching cycle counter at pin x" (x refers to the number of the corresponding IO).
- Use the standard command "Switching cycle counter at pins 1-8".


## Parameters

- Threshold switching cycle counter
- Active edges
- Inverting output


## Switch-on duration output

## Description

A value at the output is read in this mode. Signal changes are monitored. The switch-on duration output mode is activated by means of the output process data. The value at the output is monitored. If the output is switched on for 1000 ms , the actual switch-on duration counter is incremented. This increase represents the total period of time during which the output is switched on and may include several pulses that are shorter than 1000 ms . The actual value of this counter is compared to the parameterized time period. If the actual switch-on duration counter reaches this value, the switch-on duration status is set to "threshold reached". If the actual switch-on duration counter reaches 4294967295 (0xFFFFFFF [hex]), counting ceases and the status for the switch-on duration is set to "expired". If the actual switch-on duration count is shorter than the parameterized time period and less than 4294967295 (0xFFFFFFF [hex]), the status for the switch-on duration is set to "active". When the switch-on duration output mode is deselected, the status for the switchon duration is set to "deactivated". The actual switch-on duration count is stored in a buffer memory and is available as the start value for continued counting when the switch-on duration output mode is selected again. When the device is switched off, the actual switchon duration count is transferred to the non-volatile memory of the device so that it can be retrieved when the device is next switched on.

The actual switch-on duration count can be reset to zero by the following methods:

- Change the parameterized time period.
- Switch over from the switch-on duration output mode to the switch-on duration input mode, and vice versa.
- Use the standard command "Restore Factory Setting".
- Use the standard command "Application Reset".
- Use the standard command "Reset switch-on duration at pin $x$ " ( x refers to the number of the corresponding IO).
- Use the standard command "Reset switch-on duration at pins 1-8".


## Parameters

- Threshold
- Inverting output


### 11.3.3 Parameters

The following input parameters can be set:

- Input delay
- Inverting input
- Switching input
- Active edges
- Threshold switch-on duration

The following output parameters can be set:

- Inverting output
- PWM frequency
- PWM duty cycle
- Dimming time
- Switching output
- Active edges


## Notes on parameter assignment

Transfer of the parameters with the "Parameterserver" function if IO-Link masters and IO-Link devices according to the IO-Link communication specification V1.1 are available:

1. The "Parameter server" function backs up the parameter data from the IO-Link devices.
2. Replace the IO-Link device.
3. The parameter data is automatically written back to the new IO-Link device on system startup.

### 11.3.3.1 "Input delay" parameter

## "Input delay "parameter

A delay time must be set at the input as a filter. Signal changes are ignored if they are shorter than the parameterized values. The input values are delayed by the time set for the filter. Values of between 3 and 255 ms can be set as the input delay.

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 3 | Input delay: Minimum value | 3 ms |
| 255 | Input delay: Maximum value | - |

Increment: 1 ms

### 11.3.3.2 "Inverting input" parameter

## "Inverting input" parameter

Each input can be parameterized as a normal or an inverting input.

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 0 | Inverting input: disabled | disabled |
| 1 | Inverting input: enabled | - |

### 11.3.3.3 "Switching input" parameter

## "Switching input" parameter

Target value with which the actual switching cycle number is compared. The number of switching cycles can be set to between 0 and 4294967295 (0xFFFFFFF [hex]).

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 0 | Number of switching cycles: Minimum value | 0 |
| 4294967295 | Number of switching cycles: Maximum value | - |

Increment: 1

### 11.3.3.4 "Active edge" parameter input

## "Active edge" parameter

Selection of type of edges to be counted. The following edge types are available for selection:

- None
- Rising edge
- Falling edge
- All edges

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 0 | None | Rising edge |
| 1 | Rising edge | - |
| 2 | Falling edge | - |
| 3 | All edges | - |

### 11.3.3.5 "Threshold" parameter input

## "Threshold" parameter

Target value with which the actual switch-on duration count is compared. The target value can be set to between 0 and 4294967295 (0xFFFFFFF [hex]) seconds. This approximately corresponds to: 0 to 136 years.

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 1 | Threshold: Minimum value | 0 |
| 4294967295 | Threshold: Maximum value | - |

Increment: 1 second

### 11.3.3.6 "Inverting output" parameter

## "Inverting output" parameter

Each output can be parameterized as a normal or an inverting output.

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 0 | Inverting output: disabled | disabled |
| 1 | Inverting output: enabled | - |

### 11.3.3.7 "PWM frequency" parameter output

## "PWM frequency" parameter

The PWM frequency can be set to values between 1 and 255 Hz .

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 1 | PWM frequency: Minimum value | 1 Hz |
| 255 | PWM frequency: Maximum value | - |

[^5]
### 11.3.3.8 "PWM duty cycle" parameter output

## "PWM duty cycle" parameter

The PWM duty cycle can be set to values between 10 and $90 \%$.

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 10 | PWM duty cycle: Minimum value | $50 \%$ |
| 90 | PWM duty cycle: Maximum value | - |

Increment: 1 \%

### 11.3.3.9 "Dimming time" parameter output

## "Dimming time" parameter

The dimming time can be set to between 0.1 and 25.5 seconds.

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 0.1 | Dimming time: Minimum value | 1 second |
| 25.5 | Dimming time: Maximum value | - |

Increment: 0.1 seconds

### 11.3.3.10 "Switching output" parameter

## "Switching output" parameter

Target value with which the actual switching cycle number is compared. The number of switching cycles can be set to between 0 and 4294967295.

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 1 | Number of switching cycles: Minimum value | 0 |
| 4294967295 | Number of switching cycles: Maximum value | - |

Increment:1
11.3 Electronic modules for IO-Link

### 11.3.3.11 "Active edge" parameter output

## "Active edge" parameter

Selection of type of edges to be counted. The following edge types are available for selection:

- None
- Rising edge
- Falling edge
- All edges

| Settings | Description | Default setting |
| :--- | :--- | :--- |
| 0 | None | Rising edge |
| 1 | Rising edge | - |
| 2 | Falling edge | - |
| 3 | All edges | - |

### 11.3.4 Diagnostics

### 11.3.4.1 IO-Link diagnostics

Electronic modules for IO-Link can be diagnosed via IO-Link. Short-circuit is signaled via the diagnostics mechanism of IO-Link. With all further diagnostics messages, the corresponding bit is set in data set (index) 92 - diagnostics.
The table below provides information on possible causes and remedial measures:

Table 11-8 Possible causes and remedial measures

| Diagnostics and messages | Possible cause | Possible remedial measures |
| :---: | :---: | :---: |
| Short-circuit | - The electrical cable connection on at least one of the digital outputs has been shortcircuited. <br> - The connected actuator is defective. The current consumption of the connected actuator is too high. | - Check the electrical cable connection of the digital outputs. <br> - Check the current consumption of the connected actuator. <br> - Use a new actuator. |
| Self-test error / internal error | - Fault in internal test. <br> - The data saved in the device are invalid. | - Reset the electronic module to the delivery state and reconfigure the electronic module. <br> - Return the device to the manufacturer. |

The table below indicates how the manufacturer-specific diagnostics are reported:

Table 11-9 Diagnostics and messages

| Diagnostics and messages | IO-Link for event code ${ }^{1)}$ | PII ${ }^{2)}$ | Data set 92 | LED |
| :--- | :--- | :--- | :--- | :--- |
|  |  | SF $^{3)}$ |  | DEVICE |
| Short-circuit | $0 \times 7710$ | $X$ | $X$ | Red |
| Self-test error / internal error | - | $X$ | $X$ | Red |

1) The manufacturer-specific diagnostic events listed in the table are reported to the IO-Link master via the diagnostics mechanism of IO-Link.
2) With the "process image input", you can determine via the group error (GE) bit in the user program whether detailed information on diagnostics or messages is available in diagnostic data set 92. If bit ( = 1 ) is set, you can obtain detailed information on what caused a "group error" by reading data set 92.
${ }^{3)}$ GE = Group error: You can find detailed information in diagnostics data set 92 (see Chapter "Diagnostics - data set (index) 92 (Page 465)").
x : Bit set
-: Status does not change

### 11.3.5 Installing and removing electronic modules for IO-Link

11.3.5.1 Installing IO-Link electronic modules for front plate mounting


Procedure
(1) Insert the actuating or signaling element from the front into the opening of the front plate.
(2) Fit the holder from behind. Ensure secure latching here.
(3) Tighten the screw on the holder (tightening torque 1.0 to 1.2 Nm ).
(4) / (5) Snap the IO-Link electronic module for front plate mounting from behind onto the holder.

Ensure the IO-Link electronic module for front plate mounting is securely snapped into place.

### 11.3.5.2 Mounting position of IO-Link modules for base mounting

IO-Link modules for base mounting can be mounted in the following positions:


### 11.3.5.3 Mounting contact modules and IO-Link modules for base mounting

The electronic modules for IO-Link are mounted in the enclosure base like contact modules or LED modules. To equip an enclosure with contact modules and an electronic module for IO-Link, follow these steps:

1. Snap the contact module onto the slot in the enclosure marked "1", "2" or "3".

2. Insert the electronic module for IO-Link in an "intermediate slot, e.g. A / B or B / C.


### 11.3.5.4 Removal of the modules

## Requirement

Enclosure cover is disassembled.

(1) Insert a screwdriver into the opening of the latches (broad snap hook) of the contact modules or LED modules.
Or insert a screwdriver into the opening of the latches of the electronic modules for IOLink.
(2) Press the screwdriver in the direction of the module you want to remove to open the latches of the modules.
Remove the modules.

### 11.3.6 Connecting

### 11.3.6.1 Electronic modules for IO-Link

IO-Link module for base mounting


## Terminal labeling

The IO-Link device is connected to the IO-Link master via the terminals L+, C/Q and L-. The IO-Link device is powered ( 24 V DC) via the two cables L+ and L-. The IO-Link device communicates with the IO-Link master via cable C/Q. A 200 mA current is available at an IO-Link port of the IO-Link master.

| Terminal labeling |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Pin | X1 | Pin | X2 |  |  |
| $\mathbf{1}$ | DIQ.0 | Digital input/output | 8 | DIQ. 7 | Digital input/output |
| $\mathbf{2}$ | DIQ.1 | Digital input/output | 9 | Uout | Module supply voltage |
| $\mathbf{3}$ | DIQ.2 | Digital input/output | 10 | GND | Grounding for modules |
| $\mathbf{4}$ | DIQ.3 | Digital input/output | 11 | L- | IO-Link ground for further modules |
| $\mathbf{5}$ | DIQ.4 | Digital input/output | 12 | C/Q | Communication signal//switching signal |
| $\mathbf{6}$ | DIQ.5 | Digital input/output | 13 | L+ | Supply voltage |
| $\mathbf{7}$ | DIQ.6 | Digital input/output | 14 | L- | Supply voltage |

## Conductor cross-sections

|  | 0.4 Nm 3.5 lb in |
| :---: | :---: |
|  | $1 \times 0.2 \ldots 2.5 \mathrm{~mm}^{2}$ |
| $\approx$ | $\begin{aligned} & 1 \times 0.2 \ldots 2.5 \mathrm{~mm}^{2} \\ & 2 \times 0.2 \ldots 0.75 \mathrm{~mm}^{2} \end{aligned}$ |
| AWG | 26 to 14 |

### 11.3.7 Example of wiring

Enclosure with six command points with three IO-Link modules, wired to the left

11.3 Electronic modules for IO-Link

## Accessories

### 12.1 Backing plates

Backing plates are used for more detailed labeling of a command point. They are typically used under a pushbutton or indicator light. However, there are special backing plates for coordinate switches and twin pushbuttons. They are not suitable for EMERGENCY STOP buttons.

The backing plates consist of a black molded-plastic label holder and a labeling plate (black with white print or silver-colored with black print) for sticking or snapping in place.

## Note

The front plate thickness is restricted to < 4 mm for all accessory components that are installed beneath an actuator

### 12.1.1 Labeling plate $12.5 \times 27 \mathrm{~mm}$

Labeling plates can be snapped on or attached by sticking to the holder. Labeling plates are used in combination with label holders.
Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226804)

|  | Description | Article number |
| :--- | :--- | :--- |
|  | Labeling plate | 3SU1900-0AC16-0AA0 |

Labeling plate with inscription in German

| Description | Article number |
| :--- | :--- |
| Ein | 3 SU1900-0AC16-0AB0 |
| Aus | 3 SU1900-0AC16-0AC0 |
| Auf | 3 3U1900-0AC16-0AD0 |
| Ab | 3 3U1900-0AC16-0AE0 |
| Vor | $3 S U 1900-0 A C 16-0 A F 0$ |
| Zurück | $3 S U 1900-0 A C 16-0 A G 0$ |
| Rechts | $3 S U 1900-0 A C 16-0 A H 0$ |
| Links | $3 S U 1900-0 A C 16-0 A J 0$ |
| Halt | $3 S U 1900-0 A C 16-0 A K 0$ |
| Zu | $3 S U 1900-0 A C 16-0 A L 0$ |
| Betrieb | $3 S U 1900-0 A C 16-0 A P 0$ |
| Störung | $3 S U 1900-0 A C 16-0 A Q 0$ |
| Hand Auto | $3 S U 1900-0 A C 16-0 D B 0$ |
| Hand O Auto | $3 S U 1900-0 A C 16-0 D D 0$ |

Labeling plate with inscription in English

| Description | Article number |
| :--- | :--- |
| On | 3 SU1900-0AC16-0DJ0 |
| Off | 3 SU1900-0AC16-0DK0 |
| Up | 3 SU1900-0AC16-0DL0 |
| Down | 3 SU1900-0AC16-0DM0 |
| Forward | 3 SU1900-0AC16-0DN0 |
| Reverse | 3 SU1900-0AC16-0DP0 |
| Right | 3 SU1900-0AC16-0DQ0 |
| Left | 3 3U1900-0AC16-0DR0 |
| Stop | 3 SU1900-0AC16-0DS0 |
| Start | 3 SU1900-0AC16-0DT0 |
| Reset | 3 SU1900-0AC16-0DU0 |
| Test | 3 SU1900-0AC16-0DV0 |
| Open | 3 SU1900-0AC16-0DW0 |
| Close | 3 SU1900-0AC16-0DX0 |
| Jog | $3 S U 1900-0 A C 16-0 D E 0$ |
| Running | $3 S U 1900-0 A C 16-0 E B 0$ |
| Fault | $3 S U 1900-0 A C 16-0 E C 0$ |
| Run | $3 S U 1900-0 A C 16-0 E D 0$ |
| Stop Start | $3 S U 1900-0 A C 16-0 D C 0$ |
| Off On | $3 S U 1900-0 A C 16-0 D H 0$ |
| Power off | $3 S U 1900-0 A C 16-0 D F 0$ |
| Power on | $3 S U 1900-0 A C 16-0 D G 0$ |
| Man O Auto | $3 S U 1900-0 A C 16-0 D Y 0$ |
| Man Auto | $3 S U 1900-0 A C 16-0 E A 0$ |

Labeling plate with inscription in French

| Description | Article number |
| :--- | :--- |
| Marche | 3 SU1900-0AC16-0GA0 |
| Arrêt | $3 S U 1900-0 A C 16-0 G B 0$ |
| Montée | $3 S U 1900-0 A C 16-0 G C 0$ |
| Descente | $3 S U 1900-0 A C 16-0 G D 0$ |
| Avant | $3 S U 1900-0 A C 16-0 G E 0$ |
| Retour | $3 S U 1900-0 A C 16-0 G F 0$ |
| Droite | $3 S U 1900-0 A C 16-0 G G 0$ |
| Gauche | $3 S U 1900-0 A C 16-0 G H 0$ |
| Ouvert | $3 S U 1900-0 A C 16-0 G J 0$ |
| Fermé | $3 S U 1900-0 A C 16-0 G K 0$ |
| Rapide | $3 S U 1900-0 A C 16-0 G L 0$ |
| En Service | $3 S U 1900-0 A C 16-0 G M 0$ |
| Défaut | $3 S U 1900-0 A C 16-0 G N 0$ |
| Reglage | $3 S U 1900-0 A C 16-0 G P 0$ |
| Arrêt d'urgence | $3 S U 1900-0 A C 16-0 G Q 0$ |
| Hors service | $3 S U 1900-0 A C 16-0 G R 0$ |
| Sous tension | $3 S U 1900-0 A C 16-0 G S 0$ |
| Manu Auto | $3 S U 1900-0 A C 16-0 G T 0$ |
| Marche Arrêt | $3 S U 1900-0 A C 16-0 G U 0$ |
| Rearmement | $3 S U 1900-0 A C 16-0 G V 0$ |

Labeling plate with symbol

| Printed symbols | Article number |
| :--- | :--- |
| O | 3 3U1900-0AC16-0QA0 |
| I | 3 3U1900-0AC16-0QB0 |
| O I | 3SU1900-0AC16-0QG0 |
| 12 | $3 S U 1900-0 A C 16-0 Q J 0$ |
| Motion arrow direction up | 3 3SU1900-0AC16-0QS0 |

### 12.1.2 Labeling plate $17.5 \times 27 \mathrm{~mm}$

Labeling plates can be snapped on or attached by sticking to the holder. Labeling plates are used in combination with label holders.

Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226804)

|  | Description | Article number |
| :--- | :--- | :--- |
|  | Labeling plate | 3SU1900-0AD16-0AA0 |

## Labeling plate with inscription in German

| Description | Article number |
| :--- | :--- |
| Ein | 3SU1900-0AD16-0AB0 |
| Aus | 3SU1900-0AD16-0AC0 |
| Auf | 3SU1900-0AD16-0AD0 |
| Ab | $3 S U 1900-0 A D 16-0 A E 0$ |
| Vor | $3 S U 1900-0 A D 16-0 A F 0$ |
| Zurück | $3 S U 1900-0 A D 16-0 A G 0$ |
| Halt | 3 3U1900-0AD16-0AK0 |
| Zu | $3 S U 1900-0 A D 16-0 A L 0$ |
| Betrieb | $3 S U 1900-0 A D 16-0 A P 0$ |
| Störung | $3 S U 1900-0 A D 16-0 A Q 0$ |
| Hand Auto | $3 S U 1900-0 A D 16-0 D B 0$ |

## Labeling plate with inscription in English

| Description | Article number |
| :---: | :---: |
| Stop Start | 3SU1900-0AD16-0DC0 |
| On | 3SU1900-0AD16-0DJ0 |
| Off | 3SU1900-0AD16-0DK0 |
| Up | 3SU1900-0AD16-0DL0 |
| Down | 3SU1900-0AD16-0DM0 |
| Forward | 3SU1900-0AD16-0DN0 |
| Reverse | 3SU1900-0AD16-0DP0 |
| Right | 3SU1900-0AD16-0DQ0 |
| Left | 3SU1900-0AD16-0DR0 |
| Stop | 3SU1900-0AD16-0DS0 |
| Start | 3SU1900-0AD16-0DT0 |
| Open | 3SU1900-0AD16-0DW0 |
| Close | 3SU1900-0AD16-0DX0 |


| Description | Article number |
| :--- | :--- |
| Man Auto | 3SU1900-0AD16-0EA0 |
| Running | 3SU1900-0AD16-0EB0 |
| Fault | 3SU1900-0AD16-0EC0 |

Labeling plate with inscription in French

| Description | Article number |
| :--- | :--- |
| Marche | 3SU1900-0AD16-0GA0 |
| Arrêt | 3SU1900-0AD16-0GB0 |
| Droite | 3SU1900-0AD16-0GG0 |
| Gauche | 3SU1900-0AD16-0GH0 |
| En Service | 3SU1900-0AD16-0GM0 |
| Défaut | 3SU1900-0AD16-0GN0 |
| Sous tension | 3SU1900-0AD16-0GS0 |
| Manu Auto | 3SU1900-0AD16-0GT0 |
| Marche Arrêt | 3SU1900-0AD16-0GU0 |
| Rearmement | 3SU1900-0AD16-0GV0 |

## Labeling plate with symbol

| Printed symbols | Article number |
| :--- | :--- |
| O | 3SU1900-0AD16-0QA0 |
| I | 3SU1900-0AD16-0QB0 |
| O I | 3SU1900-0AD16-0QG0 |
| Motion arrow direction to right | 3SU1900-0AD16-0QR0 |
| Motion arrow direction up | 3SU1900-0AD16-0QS0 |

### 12.1.3 Labeling plate $27 \times 27 \mathrm{~mm}$

Labeling plates can be snapped on or attached by sticking to the holder. Labeling plates are used in combination with label holders.

Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226804)

|  | Description | Article number |
| :--- | :--- | :--- |
|  | Labeling plate | 3SU1900-0AE16-0AA0 |

Labeling plate with inscription in German

| Description | Article number |
| :---: | :---: |
| Ein | 3SU1900-0AE16-0AB0 |
| Aus | 3SU1900-0AE16-0AC0 |
| Auf | 3SU1900-0AE16-0AD0 |
| Ab | 3SU1900-0AE16-0AE0 |
| Vor | 3SU1900-0AE16-0AF0 |
| Zurück | 3SU1900-0AE16-0AG0 |
| Rechts | 3SU1900-0AE16-0AH0 |
| Links | 3SU1900-0AE16-0AJ0 |
| Halt | 3SU1900-0AE16-0AK0 |
| Zu | 3SU1900-0AE16-0AL0 |
| Betrieb | 3SU1900-0AE16-0AP0 |
| Störung | 3SU1900-0AE16-0AQ0 |
| Hand Auto | 3SU1900-0AE16-0DB0 |

Labeling plate with inscription in English

| Description | Article number |
| :--- | :--- |
| On | 3 SU1900-0AE16-0DJ0 |
| Off | $3 S U 1900-0 A E 16-0 D K 0$ |
| Up | 3 SU1900-0AE16-0DL0 |
| Down | $3 S U 1900-0 A E 16-0 D M 0$ |
| Forward | $3 S U 1900-0 A E 16-0 D N 0$ |
| Reverse | $3 S U 1900-0 A E 16-0 D P 0$ |
| Stop | $3 S U 1900-0 A E 16-0 D S 0$ |
| Start | $3 S U 1900-0 A E 16-0 D T 0$ |
| Emergency Stop | $3 S U 1900-0 A E 16-0 D A 0$ |
| Stop Start | $3 S U 1900-0 A E 16-0 D C 0$ |

Labeling plate with inscription in French

| Description | Article number |
| :--- | :--- |
| Marche | $3 S U 1900-0 A E 16-0 G A 0$ |
| Arrêt | $3 S U 1900-0 A E 16-0 G B 0$ |
| Montée | $3 S U 1900-0 A E 16-0 G C 0$ |
| Descente | $3 S U 1900-0 A E 16-0 G D 0$ |
| En Service | $3 S U 1900-0 A E 16-0 G M 0$ |
| Défaut | $3 S U 1900-0 A E 16-0 G N 0$ |
| Sous tension | $3 S U 1900-0 A E 16-0 G S 0$ |
| Manu Auto | $3 S U 1900-0 A E 16-0 G T 0$ |
| Marche Arrêt | $3 S U 1900-0 A E 16-0 G U 0$ |

## Labeling plate with symbol

| Printed symbols | Article number |
| :--- | :--- |
| O I | 3SU1900-0AE16-0QG0 |
| Motion arrow direction to right | 3SU1900-0AE16-0QR0 |

### 12.1.4 Label holders

Label holders are used to attach labeling plates. Labeling plates can be snapped on or attached by sticking to the holder.
Siemens Industry Mall
(https://mall.industry.siemens.com/mall/en/en/Catalog/Products/10231447)

## Note

The front plate thickness is restricted to $<5 \mathrm{~mm}$ for all label holders that are installed beneath an actuator.


|  | Description <br> labe of the plate | Shape | Article number |  |
| :--- | :--- | :--- | :--- | :--- |
|  | Label holder for <br> labeling plate for <br> coordinate switches and <br> toggle switches | $27 \times 27 \mathrm{~mm}$ | Rectangular | 3SU1900-0AL10-0AA0 |

### 12.1.5 Labeling plates for enclosures ( $22 \times 22 \mathrm{~mm}$ )

The labeling plates in size $22 \mathrm{~mm} \times 22 \mathrm{~mm}$ can be attached to enclosures with recesses for labels. There are versions in black with white print or silver-colored with black print.

You can find information on labeling in Chapter "Customized inscriptions (Page 307)"
Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226805)

|  | Description | Article number |
| :--- | :--- | :--- |
|  | Labeling plate | 3SU1900-0AF16-0AA0 |

Labeling plate with inscription in German

| Description | Article number |
| :--- | :--- |
| Ein | 3 SU1900-0AF16-0AB0 |
| Aus | 3 UU1900-0AF16-0AC0 |
| Auf | 3 SU1900-0AF16-0AD0 |
| Ab | 3 SU1900-0AF16-0AE0 |
| Vor | $3 S U 1900-0 A F 16-0 A F 0$ |
| Zurück | $3 S U 1900-0 A F 16-0 A G 0$ |
| Rechts | $3 S U 1900-0 A F 16-0 A H 0$ |
| Links | $3 S U 1900-0 A F 16-0 A J 0$ |
| Halt | $3 S U 1900-0 A F 16-0 A K 0$ |
| Zu | $3 S U 1900-0 A F 16-0 A L 0$ |
| Schnell | $3 S U 1900-0 A F 16-0 A M 0$ |
| Langsam | $3 S U 1900-0 A F 16-0 A N 0$ |
| Betrieb | $3 S U 1900-0 A F 16-0 A P 0$ |
| Störung | $3 S U 1900-0 A F 16-0 A Q 0$ |
| Einrichten | $3 S U 1900-0 A F 16-0 A R 0$ |
| NOT-AUS | $3 S U 1900-0 A F 16-0 A S 0$ |

Labeling plate with inscription in English

| Description | Article number |
| :--- | :--- |
| On | 3 SU1900-0AF16-0DJ0 |
| Off | 3 SU1900-0AF16-0DK0 |
| Up | 3 SU1900-0AF16-0DL0 |
| Down | 3 SU1900-0AF16-0DM0 |
| Forward | 3 SU1900-0AF16-0DN0 |
| Reverse | 3 SU1900-0AF16-0DP0 |
| Right | 3 SU1900-0AF16-0DQ0 |
| Left | 3 SU1900-0AF16-0DR0 |
| Stop | 3 SU1900-0AF16-0DS0 |
| Start | 3 SU1900-0AF16-0DT0 |
| Reset | 3 UU1900-0AF16-0DU0 |
| Test | 3 SU1900-0AF16-0DV0 |
| Open | 3 SU1900-0AF16-0DW0 |
| Close | 3 3U1900-0AF16-0DX0 |
| Running | $3 S U 1900-0 A F 16-0 E B 0$ |
| Fault | $3 S U 1900-0 A F 16-0 E C 0$ |
| Fast | $3 S U 1900-0 A F 16-0 E E 0$ |
| Slow | $3 S U 1900-0 A F 16-0 E F 0$ |
| Emergency Stop | $3 S U 1900-0 A F 16-0 D A 0$ |

Labeling plate with inscription in French

| Description | Article number |
| :---: | :---: |
| Marche | 3SU1900-0AF16-0GA0 |
| Arrêt | 3SU1900-0AF16-0GB0 |
| Montée | 3SU1900-0AF16-0GC0 |
| Descente | 3SU1900-0AF16-0GD0 |
| Avant | 3SU1900-0AF16-0GE0 |
| Retour | 3SU1900-0AF16-0GF0 |
| Droite | 3SU1900-0AF16-0GG0 |
| Gauche | 3SU1900-0AF16-0GH0 |
| Ouvert | 3SU1900-0AF16-0GJ0 |
| Fermé | 3SU1900-0AF16-0GK0 |
| Rapide | 3SU1900-0AF16-0GL0 |
| En Service | 3SU1900-0AF16-0GM0 |
| Défaut | 3SU1900-0AF16-0GN0 |
| Sous tension | 3SU1900-0AF16-0GS0 |
| Manu Auto | 3SU1900-0AF16-0GT0 |
| Marche Arrêt | 3SU1900-0AF16-0GU0 |
| Rearmement | 3SU1900-0AF16-0GV0 |
| Lent | 3SU1900-0AF16-0GW0 |
| Arrêt d'urgence | 3SU1900-0AF16-0GQ0 |

Labeling plate with symbol (ON/OFF)

| Printed symbols | Article number |
| :--- | :--- |
| O | 3SU1900-0AF16-0QA0 |
| I | 3 3SU1900-0AF16-0QB0 |
| II | 3 3U1900-0AF16-0QC0 |
| III | 3 SU1900-0AF16-0QD0 |
| O I | 3 SU1900-0AF16-0QG0 |
| I O II | 3 SU1900-0AF16-0QK0 |
| I O <br> (one below the other) | 3 SU1900-0AF16-0QP0 |
| II O I <br> (one below the other) | $3 S U 1900-0 A F 16-0 Q Q 0$ |

Labeling plate with symbol

| Printed symbols | Article number |
| :--- | :--- |
| Motion arrow direction to right | 3SU1900-0AF16-0QR0 |
| Pump | 3SU1900-0AF16-0RD0 |
| Fan | 3SU1900-0AF16-0RV0 |
| Cooling | 3SU1900-0AF16-0RW0 |
| Illumination | 3SU1900-0AF16-0RX0 |
| Motor | 3SU1900-0AF16-0RY0 |

### 12.1.6 Labeling plates for enclosures with EMERGENCY STOP

The yellow labeling plates for emergency stop mushroom pushbuttons can be stuck onto gray enclosures. The labeling plates can be used on all enclosures without protective collar.
Siemens Industry Mall
(https://mall.industry.siemens.com/mall/en/en/Catalog/Products/10228442)

### 12.1.7 Labeling plate for potentiometer

The labeling plates for potentiometers are used to improve the readability of the potentiometer setting. They are clipped immediately under the actuator. A label holder is not required for this.

Siemens Industry Mall
(https://mall.industry.siemens.com/mall/en/en/Catalog/Products/10228442)

|  | Description | Article number |
| :--- | :--- | :--- |
|  | Labeling plates for self-inscription | 3SU1900-0BG16-0AA0 |
|  | Labeling plate with inscription: $0 \ldots$ 10 | 3SU1900-0BG16-0RT0 |
|  | Labeling plate with graphical symbol: Startup | 3SU1900-0BG16-0RU0 |
|  |  |  |

### 12.1.8 Insert label

The insert labels can be inserted under the buttons of the pushbuttons (only with clear button 3SU10x0-0AB70-0AA0) and illuminated pushbuttons. They are also suitable for illuminated pushbuttons of the size 30.5 mm . These insert labels are made of translucent plastic with a black inscription. They can be inserted at any $90^{\circ}$ angle.
Insert labels without an inscription are intended for user marking using a permanent marker pen.
You can find information on installing and disassembling in the chapter titled "Mounting (Page 109)".

Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10226803)

| Description | Article number |
| :--- | :--- | :--- |
| Insert label for self-inscription | 3SU1900-0AB71-0AA0 |

Insert label with inscription in German

| Description | Article number |
| :--- | :--- |
| Ein | 3 SU1900-0AB71-0AB0 |
| Aus | 3 3U1900-0AB71-0AC0 |
| Auf | $3 S U 1900-0 A B 71-0 A D 0$ |
| Ab | $3 S U 1900-0 A B 71-0 A E 0$ |
| Vor | $3 S U 1900-0 A B 71-0 A F 0$ |
| Zurück | 3 SU1900-0AB71-0AG0 |
| Rechts | 3 SU1900-0AB71-0AH0 |
| Links | 3 SU1900-0AB71-0AJ0 |
| Halt | $3 S U 1900-0 A B 71-0 A K 0$ |
| Zu | $3 S U 1900-0 A B 71-0 A L 0$ |
| Schnell | $3 S U 1900-0 A B 71-0 A M 0$ |
| Langsam | $3 S U 1900-0 A B 71-0 A N 0$ |
| Betrieb | $3 S U 1900-0 A B 71-0 A P 0$ |
| Störung | $3 S U 1900-0 A B 71-0 A Q 0$ |
| Einrichten | $3 S U 1900-0 A B 71-0 A R 0$ |

Insert label with inscription in English

| Description | Article number |
| :--- | :--- |
| On | 3 3U1900-0AB71-0DJ0 |
| Off | 3 3U1900-0AB71-0DK0 |
| Down | 3 3U1900-0AB71-0DM0 |
| Forward | 3 SU1900-0AB71-0DN0 |
| Reverse | $3 S U 1900-0 A B 71-0 D P 0$ |
| Right | $3 S U 1900-0 A B 71-0 D Q 0$ |
| Left | $3 S U 1900-0 A B 71-0 D R 0$ |
| Stop | $3 S U 1900-0 A B 71-0 D S 0$ |
| Start | $3 S U 1900-0 A B 71-0 D T 0$ |
| Reset | $3 S U 1900-0 A B 71-0 D U 0$ |
| Test | $3 S U 1900-0 A B 71-0 D V 0$ |
| Open | $3 S U 1900-0 A B 71-0 D W 0$ |
| Close | $3 S U 1900-0 A B 71-0 D X 0$ |
| Running | $3 S U 1900-0 A B 71-0 E B 0$ |
| Fast | $3 S U 1900-0 A B 71-0 E E 0$ |
| Slow | $3 S U 1900-0 A B 71-0 E F 0$ |

Insert label with symbol (ON/OFF)

| Description | Printed symbols | Article number |
| :---: | :---: | :---: |
| Black/White (label/lettering) | OI | 3SU1900-0AB16-0QE0 |
| White/Black (label/lettering) | O I | 3SU1900-0AB61-0QE0 |
| Clear/Black (label/lettering) | 0 | 3SU1900-0AB71-0QA0 |
|  | I | 3SU1900-0AB71-0QB0 |
|  | II | 3SU1900-0AB71-0QC0 |
|  | III | 3SU1900-0AB71-0QD0 |

Insert label with symbol (graphical)

| Description | Printed symbols | Article number |
| :---: | :---: | :---: |
| Clear/Black (label/lettering) | Motion arrow direction to right | 3SU1900-0AB71-0QR0 |
|  | Motion arrow direction up | 3SU1900-0AB71-0QS0 |
|  | Clockwise rotation | 3SU1900-0AB71-0QT0 |
|  | Counterclockwise rotation | 3SU1900-0AB71-0QU0 |
|  | Rapid traverse | 3SU1900-0AB71-0QV0 |
|  | Feed | 3SU1900-0AB71-0QW0 |
|  | Increase, plus | 3SU1900-0AB71-0QX0 |
|  | Decrease, minus | 3SU1900-0AB71-0QY0 |
|  | Electric motor | 3SU1900-0AB71-0RA0 |
|  | Horn | 3SU1900-0AB71-0RB0 |
|  | Water tap | 3SU1900-0AB71-0RC0 |
|  | Pump | 3SU1900-0AB71-0RD0 |
|  | Coolant pump | 3SU1900-0AB71-0RE0 |
|  | Lock, tighten | 3SU1900-0AB71-0RF0 |
|  | Unlock, unclamp | 3SU1900-0AB71-0RG0 |
|  | Brake | 3SU1900-0AB71-0RH0 |
|  | Release brake | 3SU1900-0AB71-0RJ0 |
|  | Interlock | 3SU1900-0AB71-0RK0 |
|  | Unlock | 3SU1900-0AB71-0RL0 |
|  | Setting | 3SU1900-0AB71-0RM0 |
|  | ON-OFF momentary contact type | 3SU1900-0AB71-0RN0 |
|  | Manual operation | 3SU1900-0AB71-0RP0 |
|  | Automatic cycle | 3SU1900-0AB71-0RQ0 |
|  | Suction | 3SU1900-0AB71-0RR0 |
|  | Blowing | 3SU1900-0AB71-0RS0 |

### 12.1.9 Customized inscriptions

## Insert labels

The labels can be inscribed with text and symbols not listed in the ordering data.
By default, a letter height of 4 mm (for a single line of text) or 3 mm (for two or three lines of text) is used for text inscriptions.
The typeface used is Arial. Other letter heights and typefaces are possible, but must be specified when ordering.
For round insert labels, the maximum possible number of characters per line is:

- 10 characters for one line of text
- 8 characters for 2 lines of text
- 6 characters for 3 lines of text, but 10 characters in the middle line.

Examples for customized inscription of the insert labels


Image 12-1 Two-line inscription in upper/lower case lettering (QOY)


Image 12-2 Single-line inscription in upper case lettering (Q1Y)

Image 12-3 Three-line inscription in lower case lettering (Q2Y)


Image 12-4 Symbol number 5011 according to IEC 60417 (Q3Y)


Image 12-5 Any symbol according to order form supplement (Q9Y)

## Labeling plates

The labels can be inscribed with text and symbols not listed in the ordering data.
The following letter heights are used as standard for text inscriptions:

- Label size $12.5 \mathrm{~mm} \times 27 \mathrm{~mm}$ : 3 lines with letter height 4 mm (1-line), 3.5 mm (2-line) or 2.5 mm (3-line)
- Label size $17.5 \mathrm{~mm} \times 27 \mathrm{~mm}$ : 3 lines with letter height 4 mm (1- to 2-line) or 3 mm (3-line)
- Label size $27 \mathrm{~mm} \times 27 \mathrm{~mm}$ : 5 lines with letter height 4 mm (1- to 5-line)
- Label size $2 \mathrm{~mm} \times 22 \mathrm{~mm}$ : with letter height 4 mm (1- to 3-line)

Up to 11 characters per line are possible. The typeface used is Arial. Other letter heights and typefaces are possible, but must be specified when ordering.

## Examples for customized inscription of the insert labels

## Heben <br> Aus

Image 12-6 Two-line inscription in upper/lower case lettering (QOY)

## HEBEN

Image 12-7 Single-line inscription in upper case lettering (Q1Y)

## heben

aUS
senken
Image 12-8 Three-line inscription in lower case lettering (Q2Y)


Image 12-9 Symbol number 5011 according to IEC 60417 (Q3Y)


Image 12-10 Any symbol according to order form supplement (Q9Y)

If an order involves a specific inscription, the Article No. must be supplemented with one of the following order codes:

- Text line(s) in upper/lower case, upper case always for beginning of line (e.g. "Lift / Off"): QOY
- Text line(s) in upper case (e.g. "LIFT"): Q1Y
- Text line(s) in lower case (e.g. "lift / off / lower"): Q2Y
- Text line(s) in upper/lower case, all words begin with upper case letters (e.g. "On Off"): Q5Y
- Symbol with number according to ISO 7000 or IEC 60417: Q3Y
- Any inscription or symbol according to order form supplement: Q9Y

When ordering, specify the required inscription in plain text in addition to the article number and order code. In the case of special inscriptions with words in languages other than German, give the exact spelling and specify the language.

In the case of multi-line inscriptions, the text must be assigned to the respective line, e.g. "Z1 = Lift, Z2 =Lower". For long words you can also specify the end-of-line division (see ordering example 1).
Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417 (see ordering examples 2 and 3 ).
For special symbols (order code Q9Y), a CAD drawing in DXF format must be submitted. The SIRIUS ACT Configurator must be used to select special inscriptions and symbols (order code Q9Y). In this case a "CIN" (Configuration Identification Number) is generated for placement of future orders. It is then possible to place an order directly using the CIN and the SIRIUS ACT Configurator (Mall shopping cart) or via the standard ordering channels.
Standard ordering channels:

- Configurator: Internet (http://www.siemens.en/sirius-act/konfigurator)
- Electronic Catalog CA 01 on DVD
- Industry Mall: Internet (http://www.siemens.com/industrymall)

Ordering example 1
A label with a two-line text is required: 3SU1900-0AF16-0AZ0
Q1Y
Z1 = LIFT
Z2 = LOWER

## Ordering example 2

A label inscribed with symbol No. 5011 according to IEC 60417 is required: 3SU1900-OAF16-0AZ0
Q3Y
$Z=5011 \mathrm{IEC}$

## Ordering example 3

A label inscribed with symbol No. 1118 according to ISO 7000 is required: 3SU1900-0AF16OAZO
Q3Y
Z = 1118 ISO

### 12.1.10 Labels for printing

The labels for printing are supplied as preformatted labels on A4 size sheets and can be printed individually.
Using the Label Designer software, which can be downloaded from the Internet, and the labeling plates for laser inscription, you can create your own customized labels with a standard laser printer. The self-adhesive or snap-on labels can be stuck or snapped onto the corresponding label holder. Round labels are provided for inserting in illuminated pushbuttons and switches. The labels are suitable for printing with one to three lines of text or symbols. For applications with more exacting requirements we recommend preprinted labeling plates and insert labels (laser-printed or engraved depending on the type). You can download the Label Designer software from the following website: LabelDesigner (http://support.automation.siemens.com/WW/view/en/24559069)
Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10231346)

| Description | Article number |
| :--- | :--- |
| A4 sheets of insert labels, semi-transparent | 3SU1900-0BH60-0AA0 |
| A4 sheets of labeling plates $12.5 \times 27 \mathrm{~mm}$, white | 3SU1900-0BJ61-0AA0 |
| A4 sheets of labeling plates $17.5 \times 27 \mathrm{~mm}$, white | 3SU1900-0BK61-0AA0 |
| A4 sheets of labeling plates $27 \times 27 \mathrm{~mm}$, white | 3 3U1900-0BL61-0AA0 |
| A4 sheets of labeling plates $22 \times 22 \mathrm{~mm}$, white | 3SU1900-0BM61-0AA0 |

## Note about installation

When mounting the insert labels, the existing insert label must be removed and then the printed label inserted in its place.
For additional information on the procedure, please refer to Chapter "Disassembling pushbuttons (Page 109)".

### 12.1.11 EMERGENCY STOP

## Backing plate diameter 45 mm

Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10228442)

| Inscription | Article number |
| :--- | :--- |
| None | 3SU1900-0BA31-0AA0 |

## Backing plate diameter 75 mm

| Inscription | Article number |
| :--- | :--- |
| None | 3 3U1900-0BB31-0AA0 |
| NOT-AUS | 3 3U1900-0BB31-0AS0 |
| NOT-HALT | 3 3U1900-0BB31-0AT0 |

Backing plate diameter 75 mm , self-adhesive

| Inscription | Article number |
| :--- | :--- |
| None | 3 SU1900-0BC31-0AA0 |
| NOT-AUS | 3 SU1900-0BC31-0AS0 |
| NOT-HALT | 3 3U1900-0BC31-0AT0 |
| EMERGENCY STOP | 3 3U1900-0BC31-0DA0 |
| Arrêt d'urgence | 3 3U1900-0BC31-0GQ0 |
| EMERGENZA | 3 3U1900-0BC31-0JA0 |
| NODSTOP | 3 3U1900-0BC31-0LA0 |
| NOT-HALT, EMERGENCY STOP, EMERGENZA, EMERGENCIA <br> (de, en, it, sp) | 3 SU1900-0BC31-0NB0 |
| EMERGENCY STOP in Chinese | 3 3U1900-0BC31-0MA0 |

### 12.1.12 Square single frame

You can mount the square single frame over a round signal panel cutout to change its appearance to "square".
Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Product/?mlfb=3SU1900-0AX10-0AA0)

|  | Description | Article number |
| :--- | :--- | :--- |
|  | Square single frame <br> (suitable for front plate thickness of $<4 \mathrm{~mm})$ | 3 SU1900-0AX10-0AA0 |

### 12.1.13 Unit labeling plate

The unit labeling plate is snapped onto the back of the contact modules or LED modules (front mounting) and is used for labeling them.
Siemens Industry Mall
(https://mall.industry.siemens.com/mall/en/en/Catalog/Products/10228442)

| Description | Article number |
| :--- | :--- |
| Unit labeling plate | 3SU1900-0AY61-0AA0 |

### 12.2 Protection

### 12.2.1 Sealable cap

The sealable cap is fitted before the pushbutton is installed so as to prevent unauthorized access to the pushbutton.

Siemens Industry Mall (http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221534)

|  | Description |  |
| :--- | :--- | :--- |
|  | Sealable cap for pushbutton <br> (suitable for front plate thickness of $<4 \mathrm{~mm}$ ) | Black |
|  | Clear | 3SU1900-0DA10-0AA0 |
| Sealable cap for pushbutton with extended stroke <br> (suitable for front plate thickness of $<4 \mathrm{~mm}$ ) | Black | 3SU1900-0DA70-0AA0 |
|  | Clear | 3SU1900-0EL70-0AAO |

### 12.2.2 Protective cap

The protective cap is fitted before the actuating element is installed so as to protect the element against dust and contamination.
Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221534)

|  | Description | Article number |
| :--- | :--- | :--- |
|  | Protective cap for pushbuttons, flat | 3 UU1900-0DB70-0AA0 |
|  | Protective cap for pushbuttons, flat, silicone-free | 3SU1900-0ED70-0AA0 |
|  | Protective cap for pushbuttons, raised | 3 UU1900-0DC70-0AA0 |


|  | Description | Article number |
| :--- | :--- | :--- |
|  | Protective cap for selector switch (short selector) | 3SU1900-0DD70-0AA0 |
|  | Protective cap for EMERGENCY STOP button |  |
|  | Protective cap for mushroom pushbutton, diameter 40 mm | 3SU1900-0DE70-0AA0 |


|  | Description | Article number |
| :--- | :--- | :--- |
|  | Dust cap for key-operated switches | 3SU1900-0EB10-0AA0 |
|  |  |  |

### 12.2.3 Sun collar

The sun collar is fitted after the illuminated pushbutton is installed and helps to improve the visibility of the illuminated pushbutton.
Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221534)

|  | Description | Article number |
| :--- | :--- | :--- |
|  | Sun collar | 3SU1900-0DJ10-OAAO |

### 12.2.4 Protective collar

## Note

The front plate thickness is restricted to $<4 \mathrm{~mm}$ for all accessory components that are installed beneath an actuator

The protective collar is fitted before the pushbutton / illuminated pushbutton is installed. It is designed to protect the pushbutton. In addition, the visibility of the illuminated pushbutton is improved.
Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221534)

|  | Description |  | Article number |
| :--- | :--- | :--- | :--- |
|  | $360^{\circ}$ protective collar for pushbutton and short <br> selector switch <br> (suitable for front plate thickness of < 4 mm) | Plastic, <br> black | 3SU1900-0DW10-0AA0 |

The protective collar is fitted before the pushbutton / mushroom pushbutton is installed and is designed to protect the pushbutton against very heavy blows / shocks.

|  | Description |  | Article number |
| :--- | :--- | :--- | :--- |
|  | $360^{\circ}$ protective collar for pushbutton, visible <br> from the side <br> (suitable for front plate thickness of < 4 mm ) | Metal, gray | 3 3SU1950-0DK80-0AAO |

The protective collar is fitted before the EMERGENCY STOP button is installed and is designed to protect the button against heavy blows/shocks.

|  | Description |  | Article number |
| :--- | :--- | :--- | :--- |
|  | Protective collar for EMERGENCY STOP <br> (suitable for front plate thickness of < 4 mm ) | Plastic, gray | 3SU1900-0DY80-0AAO |

The protection for sensor switch is used in combination with the sensor switch and is designed to protect the switch against heavy blows/shocks. The protection for sensor switch can be installed retrospectively.

|  | Description |  | Article number |
| :--- | :--- | :--- | :--- |
|  | Protection for sensor switch <br> Cover: Plastic <br> transparent <br> Base: Plastic, black | 3SU1900-0EC10-0AA0 |  |

### 12.2.5 Locking device

## Note

The front plate thickness is restricted to $<4 \mathrm{~mm}$ for all accessory components that are installed beneath an actuator

Locking devices are designed to protect pushbuttons and switches against unauthorized actuation.

## Siemens Industry Mall

(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221534)

|  | Description | Article number |
| :--- | :--- | :--- |
|  | Locking device for pushbuttons, flat <br> (suitable for front plate thickness of $<4 \mathrm{~mm}$ ) | 3SU1950-0DM80-0AA0 |
| Locking device for pushbuttons, raised <br> (suitable for front plate thickness of $<4 \mathrm{~mm}$ ) | 3SU1950-0DN80-0AA0 |  |


|  | Description | Article number |
| :--- | :--- | :--- |
|  | Locking device for mushroom pushbuttons in <br> diameter 30 mm or 40 mm <br> (suitable for front plate thickness of $<4 \mathrm{~mm})$ |  |

## Note

Locking devices for selector switches require a hole (diameter 22.5 mm ) with knock-out (acc. to IEC 60947-5-1 D22) to prevent unauthorized switch actuation.

| Loscription | Article number |
| :--- | :--- | :--- |
| actuator), position on left |  |
| (suitable for front plate thickness of < 4 mm ) | 3SU1950-0DQ80-0AA0 |

### 12.2.6 Cover

The cover is designed to prevent unintentional operation of an actuator.
Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221534)

|  | Description | Article number |
| :--- | :--- | :--- |
| Cover | 3SU1950-0DV80-0AAO |  |
| (front plate thickness of < 4 mm ) |  |  |

### 12.2.7 Mounting

### 12.2.7.1 Installation steps for dust cover

Procedure


Typical diagram
(1) Place the dust cover from the front onto the key-operated switch.


Typical diagram
(2) Fold the dust cover over.
(3) Push the dust cover onto the key-operated switch to protect the switch surface.


Typical diagram

### 12.2.7.2 Installation steps for locking device

The installation steps for a locking device are shown using a "locking device for selector switches".

## Requirement

Before installing the locking device, you must remove the foil from the rear of the locking device.

Procedure


Typical diagram
(1) Open the locking device
(2) Hold the locking device at the hole of the front plate.

Only for selector switches: Ensure here that the recess at the hole and the latch on the locking device fit together.
(3) Insert the control element (in this case: selector switch) from the front through the locking device and the front plate.
Mount the holder and the contact modules.
You can find information in Chapter "Mounting (Page 97)".


Typical diagram
(4) Optional step: Turn the selector switch to the switch position provided.
(5) Close the locking device. Insert a lock into the hole provided to protect the control element against unauthorized access.


Typical diagram. Lock not included in the scope of supply.

### 12.3 Actuators

## Flat button

Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221535)

| Description |  | Article number |
| :---: | :---: | :---: |
| Flat button for pushbutton, plastic |  |  |
|  | Black | 3SU1900-0FT10-0AA0 |
|  | Red | 3SU1900-0FT20-0AA0 |
|  | Yellow | 3SU1900-0FT30-0AA0 |
|  | Green | 3SU1900-0FT40-0AA0 |
|  | Blue | 3SU1900-0FT50-0AA0 |
|  | White | 3SU1900-0FT60-0AA0 |
| Flat button for illuminable pushbutton, plastic |  |  |
|  | Amber | 3SU1901-0FT00-0AA0 |
|  | Red | 3SU1901-0FT20-0AA0 |
|  | Yellow | 3SU1901-0FT30-0AA0 |
|  | Green | 3SU1901-0FT40-0AA0 |
|  | Blue | 3SU1901-0FT50-0AA0 |
|  | White | 3SU1901-0FT60-0AA0 |
|  | Clear | 3SU1901-0FT70-0AA0 |

## Raised button

Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221535)

| Description |  | Article number |
| :---: | :---: | :---: |
| Flat button for pushbutton, plastic |  |  |
|  | Black | 3SU1900-0FS10-0AA0 |
|  | Red | 3SU1900-0FS20-0AA0 |
|  | Yellow | 3SU1900-0FS30-0AA0 |
|  | Green | 3SU1900-0FS40-0AA0 |
| Flat button for illuminable pushbutton, plastic |  |  |
|  | Red | 3SU1901-0FS20-0AA0 |
|  | Yellow | 3SU1901-0FS30-0AA0 |
|  | Green | 3SU1901-0FS40-0AA0 |
|  | Blue | 3SU1901-0FS50-0AA0 |
|  | Clear | 3SU1901-0FS70-0AA0 |

## Key

Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221535)

| Description |  | Article number |
| :---: | :---: | :---: |
| Ronis key |  |  |
| $\bigcirc$ | SB30 | 3SU1950-0FB80-0AA0 |
|  | 455 | 3SU1950-0FC80-0AA0 |
| BKS key |  |  |
|  | S1 | 3SU1950-0FD80-0AA0 |
| CES key |  |  |
|  | LSG1 | 3SU1950-0FN80-0AA0 |
|  | SSG10 | 3SU1950-0FP80-0AA0 |
|  | VL5 | 3SU1950-0FQ80-0AA0 |
| IKON key |  |  |
|  | 360012 K 1 | 3SU1950-0FR80-0AA0 |

### 12.4 ID keys

The ID keys are used in the ID key-operated switches. Using the four ID keys with different codes, it is possible to select 1 of 4 positions. The ID keys are color-coded (yellow, blue, red, green, white) so that they can be clearly differentiated at a glance. The white ID key is supplied without coding and can be individually encoded via IO-Link using the electronic module for ID key-operated switches for IO-Link.

Different versions of ID keys are available depending on the following features:

- Authorization level (different colors)

For further information refer to Chapters "Operating principle of the command point with ID key-operated switch (Page 253)" and "ID key-operated switches (Page 80)".

## Authorization level

The ID keys are divided into five authorization levels. The authorization levels 1, 2, 3 and 4 as well as "Individually codable ID key". Authorization levels 1 to 4 correspond to the maximum key position. The authorization level "Individually codable ID key" has no maximum key position in the standard setting. The user can configure the key position in accordance with one of the authorization levels 1 to 4 . This configuration option is only available with the white ID key.

## Article numbers

## ID keys

Siemens Industry Mall
(http://mall.industry.siemens.com/mall/de/de/Catalog/Products/10221535)

|  |  | Authorization level | Key color | Article number |
| :---: | :---: | :---: | :---: | :---: |
|  | ID group 1 | 1 | Green | 3SU1900-0FV40-0AA0 |
|  | ID group 2 | 1... 2 | Yellow | 3SU1900-0FW30-0AA0 |
|  | ID group 3 | 1... 3 | Red | 3SU1900-0FX20-0AA0 |
|  | ID group 4 | $1 . . .4$ | Blue | 3SU1900-0FY50-0AA0 |
|  | - Individually codable <br> - Multiple teach-in capability <br> - Can only be used for IO-Link | Can assume all authorization levels | White | 3SU1900-0FU60-0AA0 |

### 12.5 Sealing plug

The sealing plug is used in place of an actuating or signaling element in a command point. You can thus carry out the complete wiring without the need for the actuating or signaling element to be available. You then remove the sealing plug and install the configured actuating or signaling element.

Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221535)

| Description | Article number |
| :--- | :--- |
| Sealing plug, plastic, black | 3SU1900-0FA10-0AA0 |
| Sealing plug, metal matte | 3 3U1930-0FA80-0AA0 |
| Sealing plug, metal | 3 SU1950-0FA80-0AA0 |

### 12.6 Accessories for enclosures

## Cable glands

Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221536)

|  | Description | Material | Article number |
| :--- | :--- | :--- | :--- |
|  | Metric M20 cable gland with AS-i cable entry | Plastic | 3SU1900-0HE10-0AA0 |
|  | Metric M25 cable gland with AS-i cable entry |  | 3SU1900-0HF10-0AA0 |
|  | Metric M20 cable gland for enclosure |  | 3SU1900-0HG10-0AA0 |
|  | Metric M25 cable gland for enclosure |  | 3SU1900-0HH10-0AA0 |
| Typical diagram |  |  |  |

## Connection pieces

|  | Description | Material | Article number |
| :---: | :---: | :---: | :---: |
|  | For plastic enclosure |  |  |
|  | M20/M20 connection piece for connecting 2 enclosures | Plastic | 3SU1900-0HJ10-0AA0 |
|  | M20/M25 connection piece for connecting 2 enclosures |  | 3SU1900-0HK10-0AA0 |
|  | M25/M25 connection piece for connecting 2 enclosures |  | 3SU1900-0HL10-0AA0 |
|  | For metal enclosure |  |  |
| Typical diagram | M20/M20 connection piece for connecting 2 enclosures | Metal | 3SU1950-0HJ10-0AA0 |
|  | M20/M25 connection piece for connecting 2 enclosures |  | 3SU1950-0HK10-0AA0 |
|  | M25/M25 connection piece for connecting 2 enclosures |  | 3SU1950-0HL10-0AA0 |

Adapter for AS-i shaped cables

|  | Description | Material | Article number |
| :--- | :--- | :--- | :--- |
|  | Insulation piercing method, for M20 | Plastic | 3SU1900-0HX10-0AA0 |
|  | Insulation piercing method, for M25 |  | 3SU1900-0HY10-0AA0 |
|  |  |  |  |

## Adapter for AS-i tab connection



For mounting of the above-named accessories, see Chapter "Mounting of connection pieces (Page 186)".

### 12.6.1 Enclosure cover monitoring

## Enclosure cover monitoring

Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221536)
Enclosure cover monitoring is fitted at the intermediate position of the command points. The plunger is screwed onto the enclosure cover (tightening torque: plastic: $0.6 \ldots 0.8 \mathrm{Nm}$, metal: $0.8 \ldots 1.0 \mathrm{Nm}$ ). The module attachment is snapped into the intermediate position on the enclosure base and fitted with 1 NO (normally-open) contact module (3SU1400-2AA10.BAO). The entire circuit is routed via this contact module. When the enclosure has been correctly screwed together, the circuit closes and the controlled device can be operated. Please note that the enclosure cover monitoring cannot be used with the raised enclosures with one command point (3SU18.1-1AA00-1AA1).
For further information about installing the enclosure cover monitoring system, refer to Chapter "Installation steps for enclosure cover monitoring (Page 328)".

|  | Description | Material | Article number |
| :--- | :--- | :--- | :--- |
|  | Enclosure cover monitoring <br> (module with extension plunger) | Plastic | 3SU1900-0HM10-0AA0 |

### 12.6.2 Installation steps for enclosure cover monitoring

Procedure


Typical diagram
(1) Fit the adapter for the enclosure cover monitoring system in the enclosure base.
(2) Mount the contact module on the base element of the enclosure cover monitoring system.


Typical diagram
(3) Screw the push rod of the enclosure cover monitoring system to the enclosure cover. Tightening torques:

- Plastic enclosure: 0.6 ... 0.8 Nm
- Metal enclosure: 0.8 ... 1.0 Nm
(4) Place the enclosure cover on the enclosure base.

(5) Place the enclosure cover on the enclosure base.
(6) Screw the enclosure cover into position.


### 12.7 Additional Accessories

Siemens Industry Mall
(http://mall.industry.siemens.com/mall/en/en/Catalog/Products/10221537)

|  | Article number |
| :--- | :--- | :--- | :--- |


|  | Description | Material | Article number |
| :--- | :--- | :--- | :--- |
|  | Grounding stud | Metal | 3SU1950-0KK80-0AA0 |
|  | Angle plug <br> For connecting the sensor switch | Plastic | 3SU1900-0KL10-0AA0 |

### 12.8 Combination options for accessories

Please note when ordering accessories that several accessory items from the same group cannot be installed. (Reason: reduced level of protection, etc.)

|  | Mounting position |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  | Behind the <br> illuminated <br> pushbutton / <br> button | On the front <br> ring | Under the command <br> point, in front of the <br> front plate | Behind the <br> front plate | In combination <br> with the <br> enclosure |
| Insert label | $\checkmark$ | - | - | - | - |
| Label holder with labeling plate | - | - | - | - | - |
| Single frames | - | - | - | - | - |
| Backing plates | - | - | - | - | - |
| Backing plates | - | - | - | - | - |
| Device identification label | - | - | - | - | - |
| Sealable cap | - | - | - | - | - |
| Protective cap | - | - | - | - | - |
| Sun collar | - | - | - | - | - |
| 360 protective collar | - | - | - | - | - |
| Protective collar visible from the <br> side | - | - | - | - | - |
| Protective collar for EMERGENCY <br> STOP | - | - | - | - | - |
| Protective collar for padlocks | - | - | - | - | - |
| Protection for sensor switch | - | - | - | - | - |
| Locking devices | - | - | - | - | - |
| Cover for locking device | - | - | - | - | - |
| Sealing plug | - | - | - | - | - |
| Labeling plate <br> 22 mm 22 mm | - | - | - | - | - |
| Labeling plates for enclosures with <br> EMERGENCY STOP | - | - | - | - | - |
| Labeling plates for enclosures with <br> EMERGENCY STOP with recess | - | - | - | - | - |


|  | Mounting position |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  | Behind the <br> illuminated <br> pushbutton / <br> button | On the front <br> ring | Under the command <br> point, in front of the <br> front plate | Behind the <br> front plate | In combination <br> with the <br> enclosure |
| Adapters for actuators and <br> indicators with front ring for flat <br> mounting | - | - | - | $\checkmark$ | - |
| Adapter for <br> mounting hole 30.5 mm | - | - | $\checkmark$ | - | - |

${ }^{1)}$ Enclosure with recess for labeling plate
2) Enclosure with command point, center without protective collar

### 12.9 Use of accessories for the enclosure

Please note the following instructions for using the accessories:

| Enclosure with recess for labeling plate | Suitable for front mounting | Suitable for base mounting |
| :--- | :---: | :---: |
| Accessories | $\checkmark$ | - |
| Label holder | $\checkmark$ | - |
| Single frame, square | - | - |
| EMERGENCY STOP backing plate | - | - |
| Protective collar for EMERGENCY STOP | - | - |
| Protective collar for EMERGENCY STOP, <br> SEMI-Industry | $\checkmark$ | - |
| Protective collar for pushbutton | $\checkmark$ | - |
| Protective collar for mushroom pushbutton | $\checkmark$ | $\checkmark$ |
| Sun collar | $\checkmark$ | - |
| Protective collar 360$~ f o r ~ p u s h b u t t o n ~ a n d ~$ <br> short selector | - | - |
| Locking device | - | - |
| Protective collar for padlocks | $\checkmark$ | - |
| Protective caps | $\checkmark$ | $\checkmark$ |
| Dust cap for key-operated switches | $\checkmark$ | - |
| Sealable cap | $\checkmark$ | $\checkmark$ |
| Labeling plates for enclosures with <br> EMERGENCY STOP with recess | $\checkmark$ | $\checkmark$ |
| Sealing plug | - | $\checkmark$ |
| Enclosure cover monitoring |  | - |


| Enclosure without recess for labeling plate (except enclosures with protective collar) |  |  |
| :--- | :---: | :---: |
| Accessories | Suitable for front mounting | Suitable for base mounting |
| Label holder | $\checkmark$ | - |
| Single frame, square | $\checkmark$ | - |
| EMERGENCY STOP backing plate | - | - |
| Protective collar for EMERGENCY STOP | $\checkmark$ | - |
| Protective collar for EMERGENCY STOP, SEMI-Industry | $\checkmark$ | - |
| Protective collar for pushbutton | $\checkmark$ | - |
| Protective collar for mushroom pushbutton | $\checkmark$ | - |
| Sun collar | $\checkmark$ | - |
| Protective collar 360 for pushbutton and short selector | $\checkmark$ | - |
| Locking device | - | - |
| Padlock | $\checkmark$ | - |
| Protective caps | $\checkmark$ | - |
| Dust cap for key-operated switches | $\checkmark$ | - |
| Sealable cap | $\checkmark$ | - |
| Labeling plates for enclosures with | $\checkmark$ | - |
| EMERGENCY STOP | - | - |
| Sealing plug | - | - |
| Enclosure cover monitoring |  | - |

When using an accessory that is mounted between the actuating element and the front plate, the maximum thickness of the front plate is reduced by the corresponding value of the accessory.

## Technical specifications

### 13.1 Product data sheet

You can find the technical data of the devices at Siemens Industry Online Support (https://support.industry.siemens.com/cs/de/en).
Enter the article number of the desired device in the "Product" field to search for it. A view of the device appears with the link to the technical data.


3SU1000-0AA40-0AA0
PUSHBUTTON, GREEN
PUSHBUTTON, 22MM, ROUND, PLASTIC, GREEN, FLAT BUTTON, LATCHING, PUSH TO UNLATCH
> Product details $>$ Technical data

### 13.2 Pushbuttons



| Ambient temperature |  |  |
| :--- | :--- | :--- |
| $\bullet$ during operation | ${ }^{\circ} \mathrm{C}$ | $-25 \ldots+70$ |
| $\bullet$ | during storage | ${ }^{\circ} \mathrm{C}$ |
| 1) | with a relative air humidity of 10 to $95 \%$ |  |
| 2)with non-illuminated variants |  |  |

### 13.3 Mushroom pushbuttons

| Type |  | 3SU1.00-.AA | $\begin{aligned} & \text { 3SU1.00-.BA } \\ & 3 S U 1.00-. \mathrm{CA} \\ & 3 \mathrm{SU1.30-.AA} \\ & 3 S U 1.30-. \mathrm{BA} \\ & 3 S U 1.50-. \mathrm{AA} \\ & \text { 3SU1.50-.BA } \\ & \text { 3SU1.50-.CA } \end{aligned}$ | 3SU1.50-.EA | 3SU1.01-.AA 3SU1.01-BA 3SU1.51-.AA 3SU1.51-BA 3SU1.51-.CA |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Operating principle of the actuating element |  | Latching |  |  |  |
| Product expansion, optional light source |  | No | No | No | Yes |
| Mechanical durability (operating cycles) typical |  | 500000 | 500000 | 300000 | 500000 |
| Switching frequency maximum | 1/h | 3600 | 1800 | 1800 | 1800 |
| Shock resistance according to IEC 60068-2-27 |  | $11 \mathrm{~ms}, 50 \mathrm{~g}$, half-sine |  |  |  |
| Vibration resistance according to IEC 60068-2-6 |  | $10 \ldots 500 \mathrm{~Hz}: 5 \mathrm{~g}$ |  |  |  |
| Degree of protection |  | IP66, IP67, IP69 |  |  |  |
| Climate class in operation according to EN 60721 |  | $3 \mathrm{~K} 6^{1)}, 3 \mathrm{C} 3^{2}$, $3 \mathrm{~S} 2,3 \mathrm{M} 6$ |  |  |  |
| Ambient temperature |  |  |  |  |  |
| - during operation | ${ }^{\circ} \mathrm{C}$ | $-25 \ldots+70$ |  |  |  |
| - during storage | ${ }^{\circ} \mathrm{C}$ | $-40 \ldots+80$ |  |  |  |

1) with a relative air humidity of 10 to $95 \%$
2) with non-illuminated variants


### 13.4 EMERGENCY STOP mushroom pushbuttons

| Type | 3SU1...-.G |
| :---: | :---: |
|  | 3SU1...-.H |
|  | 3SU1...-.J |
|  | 3SU1...-L |
|  | 3SU1...-.N |
| Operating principle of the actuating element |  |
| Product expansion, optional light source |  |
| Mechanical durability (operating cycles) typical | 300000 |
| $\begin{array}{ll}\text { Switching frequency maximum } & 1 / \\ & \mathrm{h}\end{array}$ | 600 |
| Shock resistance according to IEC 60068-2-27 | $11 \mathrm{~ms}, 50 \mathrm{~g}$, half-sine |
| Vibration resistance according to IEC 60068-2-6 | $10 \ldots 500 \mathrm{~Hz}: 5 \mathrm{~g}$ |
| Degree of protection | IP66, IP67, IP69 |
| Climate class in operation according to EN 60721 | 3K61), 3C3 ${ }^{2}$, 3S2, 3M6 |
| Ambient temperature |  |
| - during operation ${ }^{\circ} \mathrm{C}$ | $-25 \ldots+70$ |
| - during storage ${ }^{\circ} \mathrm{C}$ | $-40 \ldots+80$ |

1) with a relative air humidity of 10 to $95 \%$
2) with non-illuminated variants

### 13.5 Selector switches

| Type |  | 3SU100.-2B | 3SU105.-2B |
| :---: | :---: | :---: | :---: |
|  |  | 3SU100.-2C | 3SU105.-2C |
|  |  | 3SU103.-2B | 3SU106.-2D |
|  |  | 3SU103.-2C | 3SU106.-2E |
| Mechanical durability (operating cycles) typical |  | 1000000 | 300000 |
| Switching frequency maximum | 1/h | 1800 |  |
| Shock resistance according to IEC 60068-2-27 |  | $11 \mathrm{~ms}, 50 \mathrm{~g}$, half-sine |  |
| Vibration resistance according to IEC 60068-2-6 |  | $10 . .500 \mathrm{~Hz}: 5 \mathrm{~g}$ |  |
| Degree of protection |  | IP66, IP67, IP69 |  |
| Ambient temperature |  |  |  |
| - during operation | ${ }^{\circ} \mathrm{C}$ |  |  |
| - during storage | ${ }^{\circ} \mathrm{C}$ |  |  |

### 13.6 Toggle switches

| Type |  | 3SU1...-3E |
| :---: | :---: | :---: |
| Mechanical durability (operating cycles) typical |  | 1000000 |
| Switching frequency maximum | 1/h | 1800 |
| Shock resistance according to IEC 60068-2-27 |  | $11 \mathrm{~ms}, 50 \mathrm{~g}$, half-sine |
| Vibration resistance according to IEC 60068-2-6 |  | $10 . .500 \mathrm{~Hz}: 5 \mathrm{~g}$ |
| Degree of protection |  | IP66, IP67, IP69 |
| Ambient temperature |  |  |
| - during operation | ${ }^{\circ} \mathrm{C}$ | $-25 \ldots+70$ |
| - during storage | ${ }^{\circ} \mathrm{C}$ | $-40 \ldots+80$ |

## $13.7 \quad$ Key-operated switches

| Type |  | 3SU100.-4B | 3SU100.-5B | 3SU103.-4B | 3SU103.-5B |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 3SU100.-4C | 3SU100.-5H | 3SU103.-4C | 3SU103.-5H |
|  |  | 3SU100.-4D | 3SU100.-5J | 3SU103.-4D | 3SU103.-5J |
|  |  | 3SU100.-4F | 3SU100.-5K | 3SU103.-4F | 3SU103.-5K |
|  |  | 3SU100.-4G | 3SU100.-5L | 3SU103.-4G | 3SU103.-5L |
|  |  | 3SU100.-4H | 3SU100.-5P | 3SU103.-4H | 3SU103.-5P |
|  |  | 3SU100.-4J | 3SU100.-5Q | 3SU103.-4J | 3SU103.-5Q |
|  |  | 3SU100.-4L | 3SU100.-5R | 3SU103.-4L | 3SU103.-5R |
|  |  |  | 3SU100.-5S |  | 3SU103.-5S |
|  |  |  | 3SU100.-5T |  | 3SU103.-5T |
|  |  |  | 3SU100.-5X |  | 3SU103.-5X |
| Mechanical durability (operating cycles) typical |  | 1000000 |  |  |  |
| Switching frequency maximum | 1/h | 1800 |  |  |  |
| Shock resistance according to IEC 60068-2-27 |  | $11 \mathrm{~ms}, 50 \mathrm{~g}$, half-sine |  |  |  |
| Vibration resistance according to IEC 60068-2-6 |  | $10 \ldots 500 \mathrm{~Hz}: 5 \mathrm{~g}$ |  |  |  |
| Degree of protection |  | IP66, IP67, IP69 |  |  |  |
| Ambient temperature |  |  |  |  |  |
| - during operation | ${ }^{\circ} \mathrm{C}$ | $-25 \ldots+70$ |  |  |  |
| - during storage | ${ }^{\circ} \mathrm{C}$ | $-40 \ldots+80$ |  |  |  |


| Type |  | $\begin{aligned} & \text { 3SU105.-4B } \\ & \text { 3SU105.-4C } \\ & \text { 3SU105.-4D } \\ & \text { 3SU105.-4F } \\ & \text { 3SU105.-4G } \\ & \text { 3SU105.-4H } \\ & \text { 3SU105.-4J } \\ & \text { 3SU105.-4L } \end{aligned}$ | 3SU105.-5B <br> 3SU105.-5H <br> 3SU105.-5J <br> 3SU105.-5K <br> 3SU105.-5L <br> 3SU105.-5P <br> 3SU105.-5Q <br> 3SU105.-5R <br> 3SU105.-5S <br> 3SU105.-5T <br> 3SU105.-5X | 3SU1060-0J |
| :---: | :---: | :---: | :---: | :---: |
| Mechanical durability (operating cycles) typical |  |  | 300000 |  |
| Switching frequency maximum | 1/h |  | 1800 |  |
| Shock resistance according to IEC 60068-2-27 |  |  | $11 \mathrm{~ms}, 50 \mathrm{~g}$, half-sine |  |
| Vibration resistance according to IEC 60068-2-6 |  |  | $10 \ldots 500 \mathrm{~Hz}: 5 \mathrm{~g}$ |  |
| Degree of protection |  |  | IP66, IP67, IP69 |  |
| Ambient temperature |  |  |  |  |
| - during operation | ${ }^{\circ} \mathrm{C}$ |  | $-25 \ldots+70$ |  |
| - during storage | ${ }^{\circ} \mathrm{C}$ |  | $-40 \ldots+80$ |  |

### 13.8 Coordinate switches

| Type | $3 S U 1 \ldots-7 A$ <br> $3 S U 1 \ldots-7 B$ |  |
| :--- | :---: | :---: |
| Mechanical durability (operating cycles) typical | 250000 per direction |  |
| Switching frequency maximum | $1 / \mathrm{h}$ | 3600 |
| Shock resistance <br> according to IEC $60068-2-27$ | $11 \mathrm{~ms}, 50 \mathrm{~g}$, half-sine |  |
| Vibration resistance | $10 \ldots 500 \mathrm{~Hz}: 5 \mathrm{~g}$ |  |
| according to IEC $60068-2-6$ |  | $\mathrm{IP} 66, \mathrm{IP} 67$ |
| Degree of protection | ${ }^{\circ} \mathrm{C}$ |  |
| Ambient temperature | ${ }^{\circ} \mathrm{C}$ | $-25 \ldots+70$ |
| $\bullet$ during operation | $-40 \ldots+80$ |  |
| $\bullet$ during storage |  |  |

## $13.9 \quad$ Indicator lights

| Type | Modular 3SU11-.....-6A |
| :---: | :---: |
| Light source integrated in product | Yes |
| Type of light source | LED |
| Insulation voltage, rated value | V 320 |
| Pollution degree | 3 |
| Rated impulse withstand voltage, rated value | kV 4 |
| Operating time, typical | h 100000 |
| Vibration resistance according to IEC 60068-2-6 | $10 \ldots 500 \mathrm{~Hz}: 5 \mathrm{~g}$ |
| Shock resistance according to IEC 60068-2-27 | $11 \mathrm{~ms}, 50 \mathrm{~g}$, half-sine |
| Degree of protection | IP66, IP67, IP69 |
| Climate class in operation according to EN 60721 | 3K61), 3S2, 3M6 |
| Ambient temperature |  |
| - during operation | ${ }^{\circ} \mathrm{C} \quad-25 \ldots+70$ |
| - during storage | ${ }^{\circ} \mathrm{C} \quad-40 \ldots+80$ |

### 13.10 Acoustic signaling devices

| Type |  | 3SU1...-6K |
| :---: | :---: | :---: |
| Voltages (AC/DC) | V | $\begin{gathered} 6 \ldots 24 \\ 24 \ldots 240 \end{gathered}$ |
| Volume level | dB | 75 |
| Switching frequency maximum | 1/h | 1800 |
| Shock resistance according to IEC 60068-2-27 |  | $11 \mathrm{~ms}, 50 \mathrm{~g}$, half-sine |
| Vibration resistance according to IEC 60068-2-6 |  | $10 \ldots 500 \mathrm{~Hz}: 5 \mathrm{~g}$ |
| Degree of protection | IP | IP66, IP67, IP69 |
| Ambient temperature |  |  |
| - during operation | ${ }^{\circ} \mathrm{C}$ | $-25 \ldots+70$ |
| - during storage | ${ }^{\circ} \mathrm{C}$ | $-40 \ldots+80$ |

### 13.11 Potentiometers

| Type | 3SU1...-2P |  |
| :--- | :---: | :---: |
| Mechanical durability (operating cycles) typical | 25000 |  |
| Switching frequency maximum | $\%$ | 1800 |
| Relative accuracy of the resistor |  | 10 |
| Shock resistance <br> according to IEC 60068-2-27 | $11 \mathrm{~ms}, 50 \mathrm{~g}$, half-sine |  |
| Vibration resistance <br> according to IEC $60068-2-6$ | 10 | $10 \ldots 500 \mathrm{~Hz}: 5 \mathrm{~g}$ |
| Degree of protection | ${ }^{\circ} \mathrm{C}$ | IP 66, IP67, IP69 |
| Ambient temperature | ${ }^{\circ} \mathrm{C}$ | $-25 \ldots+70$ |
| $\bullet$ during operation |  | $-40 \ldots+80$ |
| $\bullet$ during storage |  |  |

### 13.12 Sensor switches



### 13.13 Contact modules

| Type |  | 3SU1400-....-1 | 3SU1400-....-3 | 3SU1400-....-5 |
| :---: | :---: | :---: | :---: | :---: |
| Insulation voltage, rated value | V |  | 500 |  |
| Pollution degree |  |  | 3 |  |
| Rated impulse withstand voltage, rated value | kV |  | 6 |  |
| Operating voltage type |  |  | AC/DC |  |
| Operating voltage |  |  |  |  |
| - At AC <br> - Rated value | V |  | $5 \ldots 500$ |  |
| - At DC <br> - Rated value | V |  | $5 \ldots 500$ |  |
| Thermal current | A |  | 10 |  |
| Operational current, rated value |  |  |  |  |
| - At AC-12 <br> - At 24 V <br> - At 230 V | $\begin{aligned} & \mathrm{A} \\ & \mathrm{~A} \end{aligned}$ |  | $\begin{gathered} 10 \\ 8 \end{gathered}$ |  |
| - At AC-15 <br> - At 24 V <br> - At 230 V <br> - At 400 V <br> - At 500 V | A <br> A <br> A <br> A |  | $\begin{gathered} 6 \\ 6 \\ 3 \\ 1.4 \end{gathered}$ |  |
| - At DC-12 <br> - At 24 V <br> - At 48 V <br> - At 110 V <br> - At 230 V <br> - At 400 V <br> - At 500 V | A <br> A <br> A <br> A <br> A <br> A |  | $\begin{gathered} 10 \\ 5 \\ 2.5 \\ 1 \\ 0.3 \\ 0.3 \end{gathered}$ |  |
| - At DC-13 <br> - At 24 V <br> - At 48 V <br> - At 110 V <br> - At 230 V <br> - At 400 V <br> - At 500 V | A A A A A A |  | $\begin{gathered} 3 \\ 1.5 \\ 0.7 \\ 0.3 \\ 0.1 \\ 0.1 \end{gathered}$ |  |

13.13 Contact modules

| Type |  | 3SU1400-....-1 | 3SU1400-....-3 | 3SU1400-.....-5 |
| :---: | :---: | :---: | :---: | :---: |
| Contact reliability | One contact failure per 100 million ( $17 \mathrm{~V}, 5 \mathrm{~mA}$ ), one contact failure per 10 million ( $5 \mathrm{~V}, 1 \mathrm{~mA}$ ) |  |  |  |
| Mechanical durability (operating cycles) typical | 10000000 |  |  |  |
| Switching frequency, maximum | 1/h | 3600 |  |  |
| Type of short-circuit protection / auxiliary switches / fuse link (weld-free protection at short-circuit current Ik of $\leq 1 \mathrm{kA}$ ) | gG / Dz 10 A, quick-response / Dz 10 A |  |  |  |
| Type of short-circuit protection / auxiliary switches / miniature circuit breakers $C$ characteristic (short-circuit current Ik of $\leq 400 \mathrm{~A}$ ) | A | 10 |  |  |
| Vibration resistance according to IEC 60068-2-6 | 10 ... $500 \mathrm{~Hz}: 5 \mathrm{~g}$ |  |  |  |
| Shock resistance according to IEC 60068-2-27 | $11 \mathrm{~ms}, 50 \mathrm{~g}$, half-sine |  |  |  |
| Climate class in operation according to EN 60721 | 3K611, 3C3, 3S2, 3M6 |  |  |  |
| Ambient temperature |  |  |  |  |
| - during operation | ${ }^{\circ} \mathrm{C}$ | $-25 \ldots+70$ |  |  |
| - during storage | ${ }^{\circ} \mathrm{C}$ | $-40 \ldots+80$ |  |  |
| Degree of protection | IP |  |  |  |
| - of the enclosure | 40 |  |  |  |
| - of the terminal | 20 |  |  |  |
| Type of electrical connection |  | Screw terminals | Spring-loaded terminals | Socket terminals (THT) |
| Stripped lengths |  | 7 mm | 7 mm | --- |
| Type of connectable conductor crosssections |  |  |  |  |
| - For auxiliary contacts <br> - Solid <br> - With end sleeves <br> - Finely stranded <br> - Without end sleeves <br> - With end sleeves |  |  | $\begin{gathered} 2 x\left(0.25 \ldots 1.5 \mathrm{~mm}^{2}\right) \\ \\ 2 x\left(0.25 \ldots 1.5 \mathrm{~mm}^{2}\right) \\ 2 x\left(0.25 \ldots 0.75 \mathrm{~mm}^{2}\right) \end{gathered}$ | $\begin{gathered} 0.8 \mathrm{~mm} \times 0.8 \mathrm{~mm} \times 4 \mathrm{~mm} \\ --- \\ ---\mathrm{-} \\ -- \end{gathered}$ |
| - For AWG cables for auxiliary contacts |  | $2 \times(18 \ldots 14)$ | 2 x (24 ... 16) | --- |
| Tightening torque <br> - For screw terminals | Nm | 0.8 ... 0.9 | --- | --- |

1) no condensation in operation permitted in atmospheres with a relative air humidity of 10 to $95 \%$

### 13.14 LED modules



1) no condensation in operation permitted in atmospheres with a relative air humidity of 10 to $95 \%$

### 13.15 Electronic modules for ID key-operated switches

## Communication

| Type | 3SU1400-1GC10-1AA0 | 3SU1400-1GD10-1AA0 |  |
| :--- | :---: | :---: | :---: |
| Protocol is supported, IO-Link protocol | No | Yes |  |
| Product function | Group ID 24 V DC | IO-Link 24 V DC |  |
| IO-Link transfer rate | - | COM2 (38.4 kBaud) |  |
| Point-to-point cycle time between the master and the <br> lO-Link device minimum | ms | - | 10 |
| Type of power supply via IO-Link Master | - | Yes |  |
| Data volume | - |  |  |
| of the address area of the inputs with cyclic transfer, | bytes | - | 2 |
| total |  |  | 0 |
| of the address area of the outputs with cyclic | bytes | -- | 5 |
| transfer total |  | 5 |  |

## General data

| Type | 3SU1400-1GC10-1AA0 | 3SU1400-1GD10-1AA0 |
| :--- | :---: | :---: |
| Rated impulse withstand voltage | V | 800 |
| Insulation voltage rated value | V | 30 |
| Pollution degree |  | 3 |
| Type of voltage | DC |  |
| $\bullet$ Operating voltage | DC |  |
| $\bullet$ Input voltage | V |  |
| Operating voltage | V | 24 |
| $\bullet 1$ at DC rated value | mA | $18 \ldots 30$ |
| $\bullet$ Rated value | ${ }^{\circ} \mathrm{C}$ | 49 |
| Current consumed, maximum | ${ }^{\circ} \mathrm{C}$ | $-25 \ldots+70$ |
| Ambient temperature |  | $-40 \ldots+80$ |
| $\bullet$ during operation |  | 20 |
| $\bullet$ during storage | Finger-safe |  |
| IP degree of protection |  |  |
| Touch protection against electric shock |  |  |

## Connections

| Type | 3SU1400-1GC10-1AA0 | 3SU1400-1GD10-1AA0 |
| :--- | :--- | :---: |
| Type of electrical connection | Screw terminals |  |
| Connectable conductor cross-section for auxiliary <br> contacts |  |  |
| - Solid or stranded | $\mathrm{mm}^{2}$ | $0.2 \ldots 2.5$ |
| - Solid with end sleeve | $\mathrm{mm}^{2}$ | $0.2 \ldots 0.75$ |
| - Finely stranded with end sleeve | $\mathrm{mm}^{2}$ | $0.25 \ldots 1.5$ |
| - Finely stranded without end sleeve | $\mathrm{mm}^{2}$ | $0.2 \ldots 2.5$ |
| AWG number as coded connectable conductor cross- <br> section | $26 \ldots 14$ |  |
| - For auxiliary contacts |  |  |
| Tightening torque | Nm | $0.4 \ldots 0.8$ |
| - For screw terminals |  |  |

### 13.16 Two-hand operation console



1) For standard screwdriver size 2 or Pozidriv 2

## Dimension drawings

### 14.1 Mounting dimensions

Minimum clearances
Minimum clearances for devices in the following design series:

- Plastic
- Metal shiny
- Metal matte


|  | 3-slot holder |  | 4-slot holder |  |
| :---: | :---: | :---: | :---: | :---: |
|  | a | b | a | b |
| Standard <br> (all actuators that are not listed below) | 30 mm | 40 mm | 40 mm | 40 mm |
| EMERGENCY STOP mushroom pushbutton, $\varnothing 30 \mathrm{~mm}$ | 33 mm | 40 mm | - | - |
| Mushroom pushbutton, diameter 40 mm <br> EMERGENCY STOP mushroom pushbutton diameter 40 mm | 40 mm | 40 mm | - | - |
| Mushroom pushbutton, diameter 60 mm <br> EMERGENCY STOP mushroom pushbutton diameter 60 mm | 60 mm | 60 mm | - | - |
| Twin pushbuttons | 30 mm | 60 mm | - | - |
| Sensor switches | 55 mm | 55 mm | - | - |
| Electronic module for IO-Link (front variant) | 55 mm | 70 mm | - | - |
| AS-Interface modules for front plate mounting | 55 mm | 70 mm | - | - |
| Electronic module for ID key-operated switches | 100 mm | 100 mm | - | - |
| Label holders $12.5 \times 27 \mathrm{~mm}$ | 30 | 45 | 40 | 45 |
| Label holders $17.5 \times 27 \mathrm{~mm}$ | 30 | 50 | 40 | 50 |
| Label holders $27 \times 27 \mathrm{~mm}$ | 30 | 60 | 40 | 60 |
| Label holders $2 \times 27 \times 27 \mathrm{~mm}$ | 30 | 90 | 40 | 90 |
| Label holders $4 \times 27 \times 27 \mathrm{~mm}$ | 90 | 90 | 90 | 90 |
| Label holders for twin pushbuttons | 30 | 75 | - | - |

Minimum clearances for devices in the following design series:

- Metal matte for recessed mounting


|  | 3-slot holder |  |
| :--- | :---: | :---: |
|  | a | b |
|  | 40 mm | 45 mm |

## Fastening hole for locking device

Fastening holes in accordance with IEC 60947-5-1 must be provided for locking devices.


### 14.1 Mounting dimensions

## Overview of mounting depths

## Devices with modules



|  | 3-slot holder | 4-slot holder |  |
| :--- | :---: | :---: | :---: |
| X1 | 49.7 mm | 53.7 mm |  |
| X2 | 71.7 mm | 75.7 mm |  |
| X3 | 71.7 mm | 75.7 mm |  |
| a |  |  |  |

## Compact units



|  | Device | 3-slot holder |
| :--- | :--- | :---: |
| X5 | Potentiometers | 46.9 mm |
|  | Acoustic signaling devices; indicator lights | 49.6 mm |
| a | $1 \ldots 6 \mathrm{~mm}$ |  |

## Enclosures



| Enclosures with: | A | B |
| :--- | :---: | :---: |
| 1 command point | 20 mm | 64 mm |
| 1 command point, raised | 20 mm | 68 mm |
| 1 command point with protective collar | 20 mm | 112.5 mm |
| 2 command points | 20 mm | 64 mm |
| 3 command points | 20 mm | 64 mm |
| 4 command points | 25 mm | 64 mm |
| 6 command points | 25 mm | 64 mm |

### 14.2 3SU10 devices

### 14.2.1 STOP buttons

## STOP buttons

Article No.: 3SU1000-0HC10-0AA0, 3SU1000-0HC(1,2)0-0AA0


### 14.2.2 Pushbuttons / illuminated pushbuttons

Pushbuttons or illuminated pushbuttons, flat button, flat front ring
Article No.: 3SU1001-0AA20-0AA, 3SU10(0,3,5)(0,1)-0A(A,B,D).0-0A(A,B,C,D,Q,R)0


Pushbuttons or illuminated pushbuttons, raised button, flat front ring
Article No.: 3SU1001-OBB20-0AAO, 3SU10(0,3,5)(0,1)-0BB.0-0AA0


Pushbuttons or illuminated pushbuttons, flat button, raised front ring
Article No.: 3SU1001-0DB50-0AA0, 3SU10(0,3,5)0-0CB.0-0AA0


Pushbuttons or illuminated pushbuttons, flat button, raised castellated front ring Article No.: 3SU1050-0CB20-0AA0, 3SU100(0,1)-ODB.0-0AA0


### 14.2.3 Twin pushbuttons

Twin pushbuttons, flat button
Article No.: 3SU1050-3AB42-0AK0, 3SU10(0,3,5)0-3AB(1,4,6)(1,2,6)-OA(A,K,L,M,N,P,Q)0


Twin pushbuttons, raised button
Article No.: 3SU1050-3BB42-0AAO, 3SU10(0,3,5)0-3BB(4,6)(1,2)-0A(A,K)0


Twin pushbuttons, flat illuminable button
Article No.: 3SU1001-3AB66-0AAO,
3SU10(0,3,5)1-3AB(4,6)(1,2,6)-0A(A,K)0


Twin pushbuttons, raised illuminable button
Article No.: 3SU1001-3BB42-0AAO,
3SU10(0,3,5)1-3BB(4,6)(1,2)-0A(A,K)0

14.2.4 $\quad 30.5 \mathrm{~mm}$ pushbuttons / illuminated pushbuttons

Article No.: 3SU1061-0JA20-0AAO,
3SU106(0,1)-0J(A,B,D).0-0AA0


### 14.2.5 Indicator lights

Article No.: 3SU1001-6AA20-0AAO, 3SU10(0,5)1-6AA.0-0AA0


### 14.2.6 Selector switches

## Short actuator

Article No.: 3SU1032-2BF20-0AAO, 3SU10(0,3)2-2B(F,C,L,M,N,P).0-0AA0 3SU1052-2B(C,F,L,M,N,P).0-0AA0


## Long actuator

Article No.: 3SU1032-2CF20-OAAO,
3SU10(0,3)2-2CF.0-0AA0
3SU1052-2C(C,F,L,M,N,P).0-0AA0


### 14.2.7 $\quad 30.5 \mathrm{~mm}$ selector switches

Short actuator
Article No.: 3SU1062-2DF20-0AAO, 3SU1062-2D(C,F,L,M).0-0AA0


## Long actuator

Article No.: 3SU1062-2EF20-OAAO, 3SU1062-2E(C,F,L,M,N,P).0-0AA0

14.2.8 Selector switches 4 switch positions

Article No.: 3SU1002-2AF20-0AAO, 3SU10(0,3)2-2AF.0-0AAO


### 14.2.9 Toggle switches

Toggle switches
Article No.: 3SU1000-3EA10-0AAO,

14.2.10 Mushroom pushbuttons / illuminated mushroom pushbuttons

Diameter 30 mm
Article No.: 3SU1000-1AD10-0AA0, 3SU10(0,3,5).-1(A,B)D..-0AA0


## Diameter 40 mm

Article No.: 3SU1000-1BA10-0AA0,
3SU10(0,3,5).-1(B,E)(A,D)..-OAA0


Diameter 60 mm
Article No.: 3SU1000-1CD10-0AAO, 3SU10(0,3,5).-1C(A,D)..-0AA0


### 14.2.11 Key-operated switches

## With CES lock

Article No.: 3SU1000-5BF11-0AAO,
3SU10(0,3)0-5(B,L,H)(C,F,L,M,N,P)..-OAAO
3SU1050-5(B,L,H)(C,F,L,M,N,P)..-OAAO


With BKS lock
Article No.: 3SU1000-5PF11-0AA0, 3SU10(0,3)0-5(P,Q,R,S,T)(C,F,L,M,N,P)..-OAA0 3SU1050-5(P,Q,R,S,T)(C,F,L,M,N,P)..-OAA0


With RONIS lock
Article No.: 3SU1000-4BF11-0AAO, 3SU10(0,3,5)0-(4,5)(B,C,D,X)(C,F,L,M,N)(0,1,5)1-0AA0


### 14.2.12 30.5 mm key-operated switches

With RONIS lock
Article No.: 3SU1060-4LF11-0AA0, 3SU1060-4L(C,F,L,M,P,N)..-0AA0

14.2.13 ID key-operated switches

Article No.: 3SU1000-4WS10-0AA0, 3SU10(0,3)0-4WS10-0AA0


### 14.2.14 EMERGENCY STOP with rotate-to-unlatch mechanism

Diameter 30 mm
Article No.: 3SU1000-1GB20-0AAO,
3SU10(0,5)(0,1)-1GB..-0AA0


## Diameter 40 mm

Article No.: 3SU1000-1HB20-OAA0, 3SU10(0,5)(0,1)-1HB..-0AA0


## Diameter 60 mm

Article No.: 3SU1000-1JB20-0AAO, 3SU10(0,5)(0,1)-1JB..-0AA0


### 14.2.15 EMERGENCY STOP with pull-to-unlatch mechanism

Diameter 40 mm
Article No.: 3SU1000-1HA20-0AA0, 3SU10(0,5)(0,1)-1HA..-0AA0

14.2.16 EMERGENCY STOP with lock

Diameter 40 mm with CES lock
Article No.: 3SU1000-1HR20-0AA0,
3SU10(0,3,5)0-1H(S,T,R)..-0AA0


Diameter 40 mm with CES lock
Article No.: 3SU1050-1HU20-0AA0,
3SU1050-1H(U,V)..-0AA0


Diameter 40 mm with BKS lock
Article No.: 3SU1000-1HK20-0AA0, 3SU10(0,5)0-1H(K,M,N)..-OAA0


Diameter 40 mm with OMR lock
Article No.: 3SU1000-1HQ20-0AA0, 3SU10(0,5)0-1HQ..-0AA0


Diameter 40 mm with Ronis lock
Article No.: 3SU1000-1HF20-0AAO, 3SU10(0,3,5)0-1H(F,G,H)..-0AA0


Diameter 40 mm with IKON lock
Article No.: 3SU1050-1HX20-0AAO, 3SU1050-1HX20-0AA0

14.2.17 Coordinate switches

Article No.: 3SU1000-7AA10-0AA0, 3SU10(0,3,5)0-7A(A,B,C,D,E,F)(1,8)(0,8)-0AA0


### 14.3 3SU12 devices

### 14.3.1 Pushbuttons with extended stroke

Flat button
Article No.: 3SU1251-0EB20-OAAO, 3SU12(0,3,5)(0,1)-0EB(2,4,7)0-0AAO


Raised button
Article No.: 3SU1250-0FB10-0AA0,
3SU12(0,3,5)0-0FB10-0AA0


### 14.3.2 Potentiometers

Article No.: 3SU1201-6AB00-1AAO,
3SU1200-2P(Q,R,S,T,U,V) 10-1AAO 3SU1250-2P(Q,R,S,T,U,V)10-1AA0


### 14.3.3 Sensor switches

Article No.: 3SU1200-1SK10-2SA0


### 14.4 3SU14 modules

14.4.1 Contact modules for front plate mounting Contact module 1NO, screw terminals
Article No.: 3SU1400-1AA10-1BA0
3SU1400-1AA10-1(B,L)A0


Contact module 1NC, screw terminals
Article No.: 3SU1400-1AA10-1CA0
3SU1400-1AA10-1(C,M)A0


Contact module 1NO, spring-loaded terminals Article No.: 3SU1400-1AA10-3BA0


Contact module 1NC, spring-loaded terminals Article No.: 3SU1400-1AA10-3CA0


Contact module 2NC, screw terminals
Article No.: 3SU1400-1AA10-1EA0


Contact module 2NC, screw terminals
Article No.: 3SU1400-1AA10-3EAO

14.4.2 Contact modules for base mounting Contact module 1NO, screw terminals

Article No.: 3SU1400-2AA10-1BA0
3SU1400-2AA10-1BA0


Contact module 1NC, screw terminals
Article No.: 3SU1400-2AA10-1CA0
3SU1400-2AA10-1CA0


Contact module 1NO, spring-loaded terminals
Article No.: 3SU1400-2AA10-3BA0
3SU1400-2AA10-3BA0


Contact module 1NC, spring-loaded terminals
Article No.: 3SU1400-2AA10-3CA0
3SU1400-2AA10-3CA0


### 14.4.3 LED modules for front plate mounting

LED module, screw terminals
Article No.: 3SU1401-1BG20-1AA0
3SU1401-1B..0-1AA0


LED module, spring-loaded terminals Article No.: 3SU1401-1BG20-3AA0
3SU1401-1B..0-3AA0


### 14.4.4 LED modules for base mounting

LED module, screw terminals
Article No.: 3SU1401-2BG20-1AA0
3SU1401-2B(B,C,F,G,H).0-1AA0


LED module, spring-loaded terminals
Article No.: 3SU1401-2BG20-3AA0
3SU1401-2B(B,C,F,G,H).0-3AA0


### 14.4.5 LED modules for PCB mounting

Article No.: 3SU1401-3BA20-5AA0
3SU1401-3BA.0-5AA0

14.4.6 LED test module for base mounting (enclosure mounting)

Article No.: 3SU1400-2CK10-1AA0


### 14.4.7 AS-Interface modules for front mounting

2F-DI screw terminals and spring-loaded terminals
Article No.: 3SU1400-1EA10-2AA0


2F-DI + 1 LED screw terminals and spring-loaded terminals
Article No.: 3SU1401-1EE20-2AAO


2F-DI + 1 DO screw terminals and spring-loaded terminals
Article No.: 3SU1400-1EC10-2AA0


2F-DI insulation piercing method
Article No.: 3SU1400-1EA10-4AA0


2F-DI + 1 LED insulation piercing method
Article No.: 3SU1401-1EE20-4AA0


2 F-DI + 1 DO spring-loaded terminals and insulation piercing method Article No.: 3SU1400-1EC10-4AA0

14.4.8 AS-Interface modules for base mounting

2F-DI
Article No.: 3SU1400-2EA10-6AA0


## 2F-DI/1LED

Article No.: 3SU1401-2EE20-6AAO


## 4DI/3DO AB and 4DI/4DO

Article No.: 3SU1400-2E.10-6AA0

14.4.9 Electronic modules for ID key-operated switches

Article No.: 3SU1400-1G.10-1AA0

14.4.10 Electronic modules for IO-Link

Article No.: 3SU1400-1HL10-6AA0


Article No.: 3SU1400-2HL10-6AA0
3SU1400-2H(K,M,N)10-6AA0


### 14.5 3SU15 holders

3-slot holder
Article No.: 3SU1500-0AA10-0AA0
3SU15(0, 5)0-0AA10-0AA0


## 4-slot holder

Article No.: 3SU1500-0BA10-0AA0
3SU15(0, 5)0-0BA10-0AA0


### 14.5.1 Holders with contact modules

Holder, plastic with contact module 1NO + 1NC
Article No.: 3SU1500-1AA10-1BA0


Holder, plastic with contact module 1NC
Article No.: 3SU1500-1AA10-1CA0


Holder, plastic with contact module $1 \mathrm{NO}+1 \mathrm{NC}$
Article No.: 3SU1500-1AA10-1NA0


Holder, metal with contact module 1NO
Article No.: 3SU1550-1AA10-1BA0


Holder, metal with contact module 1NC
Article No.: 3SU1550-1AA10-1CA0


Holder, metal with contact module 1NO + 1NC
Article No.: 3SU1550-1AA10-1NA0


### 14.5.2 Holders with contact and LED modules

Holder, plastic with contact module 1NO and LED module Article No.: 3SU1501-1AG.0-1BAO


Holder, plastic with contact module 1NC and LED module Article No.: 3SU1501-1AG.0-1CA0


Holder, plastic with contact module $1 \mathrm{NO}+1 \mathrm{NC}$ and LED module
Article No.: 3SU1501-1AG.0-1NAO


### 14.6 3SU18 enclosures

### 14.6.1 Enclosures, plastic

## Enclosures with 1 command point

Article No.: 3SU1801-0AA00-0AA2


The thickness of the enclosure cover is 4 mm

Enclosure with 1 command point with recess for labeling plate
Article No.: 3SU1801-0AA00-OAB1, 3SU1801-OAA00-0AB2


The thickness of the enclosure cover is 4 mm

Enclosure with 1 command point with protective collar
Article No.: 3SU1801-0AA00-0AC2


The thickness of the enclosure cover is 4 mm

Enclosure with 1 command point with raised cover
Article No.: 3SU1801-1AA00-1AA1


The thickness of the enclosure cover is 4 mm

Enclosure with 2 command points with recess for labeling plate Article No.: 3SU1802-0AA00-0AB1, 3SU1802-0AA00-0AB2


The thickness of the enclosure cover is 4 mm

## Enclosure with 3 command points with recess for labeling plate

Article No.: 3SU1803-0AA00-0AB1


The thickness of the enclosure cover is 4 mm

## Enclosure with 4 command points with recess for labeling plate

Article No.: 3SU1804-0AA00-0AB1


The thickness of the enclosure cover is 4 mm

## Enclosure with 6 command points with recess for labeling plate

Article No.: 3SU1806-0AA00-0AB1


The thickness of the enclosure cover is 4 mm

### 14.6.2 Enclosures, metal

## Enclosures with 1 command point

Article No.: 3SU1851-0AA00-0AA2


The thickness of the enclosure cover is 4 mm

Enclosure with 1 command point with recess for labeling plate
Article No.: 3SU1851-0AA00-OAB1, 3SU1851-OAA00-OAB2


The thickness of the enclosure cover is 4 mm

Enclosure with 1 command point with protective collar
Article No.: 3SU1851-0AA00-0AC2


The thickness of the enclosure cover is 4 mm

Enclosure with 1 command point with raised cover
Article No.: 3SU1851-1AA00-1AA1


The thickness of the enclosure cover is 4 mm

Enclosure with 2 command points with recess for labeling plate
Article No.: 3SU1852-0AA00-OAB1, 3SU1852-0AA00-0AB2


The thickness of the enclosure cover is 4 mm

## Enclosure with 3 command points with recess for labeling plate

Article No.: 3SU1853-0AA00-0AB1


The thickness of the enclosure cover is 4 mm

## Enclosure with 4 command points with recess for labeling plate

Article No.: 3SU1854-0AA00-0AB1


The thickness of the enclosure cover is 4 mm

## Enclosure with 6 command points with recess for labeling plate

Article No.: 3SU1856-0AA00-0AB1


The thickness of the enclosure cover is 4 mm

### 14.6.3 Two-hand operation console

Article No.: 3SU1803-3NB00-0AE1




Article No.: 3SU1803-3AA00-0AA1


Article No.: 3SU1853-3AA00-0AA1


Article No.: 3SU1853-3NB00-1AD1



Stand for two-hand operation console
Article No.: 3SU1950-0HN10-0AA0


### 14.7 Accessories

### 14.7.1 Labels and label holders

14.7.1.1 Labels

## Insert labels

Article No.: 3SU1900-0AB71-0AAO
3SU1900-0AB(1,6,7)(1,6)-O(A,D,E,Q,R). 0


Labeling plate $12.5 \mathrm{~mm} \times 27 \mathrm{~mm}$
Article No.: 3SU1900-0AC81-0AA0
3SU1900-0AC..-0.. 0


Labeling plate $17.5 \mathrm{~mm} \times 27 \mathrm{~mm}$
Article No.: 3SU1900-OAD16-0AA0
3SU1900-0AD..-0.. 0


Labeling plate $27 \mathrm{~mm} \times 27 \mathrm{~mm}$ for sticking or snapping onto enclosure
Article No.: 3SU1900-0AE16-0AA0
3SU1900-OAE..-0.. 0


Labeling plate $22 \mathrm{~mm} \times 22 \mathrm{~mm}$ for sticking onto enclosure
Article No.: 3SU1900-OAF16-0AA0
3SU1900-0AF..-0.. 0


Labeling plate for enclosures with EMERGENCY STOP
Article No.: 3SU1900-0BE31-0AA0
3SU1900-0BE31-0A(A,S)0


Labeling plates for enclosures with EMERGENCY STOP with recess
Article No.: 3SU1900-0BF31-0AA0


Unit labeling plate
Article No.: 3SU1900-0AY61-0AA0


EMERGENCY STOP backing plate diameter 45 mm
Article No.: 3SU1900-0BA31-0AA0


EMERGENCY STOP backing plate diameter 75 mm
Article No.: 3SU1900-0BB31-0AA0
3SU1900-0BB31-OA(A,S,T)0


EMERGENCY STOP backing plate diameter 75 mm
Article No.: 3SU1900-0BC31-0DA0
3SU1900-0BC31-0(A,D,G,J,L,M,N)(A,B,Q,S,T)0


## Backing plate for potentiometer

Article No.: 3SU1900-0BG16-0RT0
3SU1900-0BG16-0(A,R)(A,T,U)0


### 14.7.1.2 Label holders

Label holder for labeling plates with rounded bottom $12.5 \mathrm{~mm} \times 27 \mathrm{~mm}$ Article No.: 3SU1900-0AG10-0AA0 adhesive
Article No.: 3SU1900-0AR10-0AA0 snap-on


Label holder for labeling plates with rounded bottom $17.5 \mathrm{~mm} \times 27 \mathrm{~mm}$
Article No.: 3SU1900-0AG10-0AA0 adhesive
Article No.: 3SU1900-0AS10-0AA0 snap-on


Label holder for labeling plates with rounded bottom $27 \mathrm{~mm} \times 27 \mathrm{~mm}$
Article No.: 3SU1900-0AJ10-0AA0 adhesive
Article No.: 3SU1900-0AT10-OAAO snap-on


Label holder for labeling plates with square bottom $12.5 \mathrm{~mm} \times 27 \mathrm{~m}$ self-adhesive Article No.: 3SU1900-0AN10-0AA0


Label holder for labeling plates with square bottom $17.5 \mathrm{~mm} \times 27 \mathrm{~mm}$ self-adhesive Article No.: 3SU1900-0AP10-0AA0


Label holder for labeling plates with square bottom $27 \mathrm{~mm} \times 27 \mathrm{~mm}$ self-adhesive Article No.: 3SU1900-0AQ10-0AA0


Label holder for twin pushbuttons self-adhesive
Article No.: 3SU1900-0AK10-0AA0


Label holder for coordinate switches self-adhesive
Article No.: 3SU1900-0AL10-0AA0


Label holder for coordinate switches self-adhesive
Article No.: 3SU1900-0AM10-0AA0


Single frame, square
Article No.: 3SU1900-0AX10-0AA0


### 14.7.2 Protection

### 14.7.2.1 Protective caps

Sealable cap for pushbuttons, flat
Article No.: 3SU1900-0DA10-0AA0
3SU1900-0DA(1,7)0-0AA0


Sealable cap for pushbuttons, raised
Article No.: 3SU1900-0EL10-0AAO
3SU1900-0EL(1,7)0-0AA0


Protective cap for pushbuttons, flat
Article No.: 3SU1900-0DB70-0AA0


Protective cap for pushbuttons, raised Article No.: 3SU1900-0DC70-0AA0


Protective cap for selectors, short Article No.: 3SU1900-0DD70-0AA0


Protective cap for mushroom pushbuttons, diameter 40 mm
Article No.: 3SU1900-0DE70-0AAO
3SU1900-0(D,E)(E,G)70-0AA0


## Protective cap for EMERGENCY STOP

Article No.: 3SU1900-0DF70-0AA0
3SU1900-0(D,E)(F,H)70-0AA0


Protective cap for twin pushbuttons
Article No.: 3SU1900-0DG70-0AA0
3SU1900-0(D,E)(H,K)70-0AA0
3SU1900-0(D,E)(G,J)70-0AA0


Dust cap for key-operated switches
Article No.: 3SU1900-0EB10-0AA0


### 14.7.2.2 Protection for sensor switch

Article No.: 3SU1900-0EC10-0AA0


### 14.7.2.3 Protective collars

Sun collar
Article No.: 3SU1900-0DJ10-0AA0

$360^{\circ}$ protective collar for pushbuttons and selectors, short Article No.: 3SU1900-0DW10-0AA0

$360^{\circ}$ protective collar for pushbuttons, visibility from the side
Article No.: 3SU1950-0DK80-0AA0

$360^{\circ}$ protective collar for mushroom pushbuttons 40 mm , visibility from the side Article No.: 3SU1950-0DL80-0AAO


Protective collar for EMERGENCY STOP
Article No.: 3SU1900-0DY30-0AA0


Protective collar for padlocks
Article No.: 3SU1950-0DX30-0AA0

$360^{\circ}$ protective collar for EMERGENCY STOP, SEMI-Industry Article No.: 3SU1900-0EA30-0AAO


### 14.7.2.4 Locking devices

Locking device for pushbuttons, flat
Article No.: 3SU1950-0DM80-0AA0


Locking device for pushbuttons, raised
Article No.: 3SU1950-ODN80-0AA0


Locking device for mushroom pushbuttons, diameter 30 mm and 40 mm
Article No.: 3SU1950-0DP80-0AA0


Locking device for selector switches, in the left position
Article No.: 3SU1950-0DQ80-0AA0


Locking device for selector switches, in the center position Article No.: 3SU1950-0DR80-0AA0


Locking device for selector switches, in the right position
Article No.: 3SU1950-0DS80-0AA0


Locking device for selector switches, window from center to left, blocked on right Article No.: 3SU1950-0DU80-0AA0


Locking device for selector switches, window from center to right, blocked on left Article No.: 3SU1950-0DT80-0AA0


Cover for locking device
Article No.: 3SU1950-0DV80-0AA0

14.7.3 Keys

Ronis keys
Article No.: 3SU1950-0FB80-0AA0
3SU1950-0F(B,C)80-0AA0


## BKS keys

Article No.: 3SU1950-0FD80-0AAO
3SU1950-0F(D,E,F,G,H)80-0AA0


## OMR keys

Article No.: 3SU1950-0FJ50-0AAO
3SU1950-0F(J,K,L,M)(1,2,3,5)0-0AA0


## CES LSG1 keys

Article No.: 3SU1950-0FN80-0AAO
3SU1950-0F(N,P)80-0AA0


## CES VL5 keys

Article No.: 3SU1950-0FQ80-0AA0


IKON keys
Article No.: 3SU1950-0FR80-0AAO


ID keys
Article No.: 3SU1900-0FV40-0AA0
3SU1900-0F(U,V,W,X,Y).0-0AA0


### 14.7.4 Actuators

Sealing plug
Article No.: 3SU1950-0FA80-0AA0
3SU19(0,3,5)0-0FA(1,8)0-0AA0


## Flat button

Article No.: 3SU1900-0FT20-0AA0
3SU190(0,1)-0FT.0-0AAO


## Raised button

Article No.: 3SU1900-0FS20-0AA0
3SU190(0,1)-0FS.0-0AAO


### 14.7.5 Accessories for enclosures

### 14.7.5.1 Cable glands and connection pieces

Cable glands for plastic enclosure
Metric M20 cable gland
Article No.: 3SU1900-0HG10-0AA0


Metric M25 cable gland
Article No.: 3SU1900-0HH10-0AA0


Connection pieces for plastic enclosures
M20/M20 connection piece
Article No.: 3SU1900-0HJ10-0AA0


M20/M25 connection piece
Article No.: 3SU1900-0HK10-0AA0


M25/M25 connection piece
Article No.: 3SU1900-0HL10-0AA0


## Connection pieces for metal enclosures

M20/M20 connection piece
Article No.: 3SU1950-OHJ10-0AA0


## M20/M25 connection piece

Article No.: 3SU1950-0HK10-0AA0


M25/M25 connection piece
Article No.: 3SU1950-0HL10-0AAO


### 14.7.5.2 Adapters for AS-i shaped cables

Adapter for AS-i shaped cables, insulation piercing method M20
Article No.: 3SU1900-0HX10-0AA0


Adapter for AS-i shaped cables, insulation piercing method M25
Article No.: 3SU1900-0HY10-0AA0


### 14.7.5.3 Adapters for AS-i tab connection

Adapter for plastic enclosure
M12 socket, M20
Article No.: 3SU1930-0HA10-0AA0
3SU1930-0H(A,P,T)10-0AA0


M12 socket, M25
Article No.: 3SU1930-0HB10-0AA0
3SU1930-0H(B,Q,U)10-0AA0


M12 connector, M20
Article No.: 3SU1930-0HC10-0AA0
3SU1930-0H(C,R,V)10-0AA0


M12 connector, M25
Article No.: 3SU1930-0HD10-0AA0
3SU1930-0H(D,S,W)10-0AA0


## Adapter for metal enclosure

M12 socket, M20
Article No.: 3SU1950-0HA10-0AA0
3SU1950-0H(A,P,T)10-0AA0


## M12 socket, M25

Article No.: 3SU1950-0HB10-0AA0
3SU1950-0H(B,Q,U)10-0AA0


M12 connector, M20
Article No.: 3SU1950-0HC10-0AA0
3SU1950-0H(C,R,V)10-0AA0


M12 connector, M25
Article No.: 3SU1950-0HD10-0AA0
3SU1950-0H(D,S,W)10-0AA0


### 14.7.5.4 Enclosure cover monitoring

Article No.: 3SU1900-0HM10-0AA0


### 14.7.6 Miscellaneous accessories

PCB carrier
Article No.: 3SU1900-0KA10-0AA0


Pressure plate for selectors and locks
Article No.: 3SU1900-0KC10-0AA0


Extension plungers
Article No.: 3SU1900-0KG10-0AA0


Adapter for installing 22.5 mm actuators in a 30.5 mm mounting hole Article No.: 3SU1950-0KB10-0AA0


Adapter for actuators and indicators with front ring for flat mounting Article No.: 3SU1950-0KJ80-0AAO


Grounding stud
Article No.: 3SU1950-0KK80-0AAO


## Application examples

### 15.1 Examples of EMERGENCY STOP shutdown applications

15.1.1 Emergency stop shutdown to SIL 3 or PL e with a safety relay

## Application

Two-channel emergency stop shutdown of a motor by a 3SK1 safety relay and power contactors.

## Configuration



Image 15-1 Emergency stop shutdown to SIL 3 or PL e with a safety relay

## Operating principle

The safety relay monitors the emergency stop device on two channels. When the emergency stop device is actuated, the safety relay opens the enabling circuits and switches the power contactors off in a safetyrelated way. If the emergency stop device is unlatched and the feedback circuit is closed, the Start button can be used to switch on again.


## Safety-related components

| Emergency stop device | Safety relay | Contactor |
| :---: | :---: | :---: |
|  |  |  |
|  |  |  |

### 15.1.2 Emergency stop shutdown via AS-i with a Modular Safety System to SIL 3 or

 PLe
## Application

Monitoring of multiple emergency stop devices via AS-i with a 3RK3 Modular Safety System.

## Configuration



Image 15-2 Emergency stop shutdown via AS-i to SIL 3 or PL e with a Modular Safety System

## Operating principle

The Modular Safety System monitors each of the two-channel emergency stop devices connected to AS-i. When one of the emergency stop devices is actuated, the Modular Safety System opens the enabling circuits and switches the power contactors off in a safety-related way. If the emergency stop device is unlatched and the feedback circuit is closed, the Start button can be used to switch on again.


## Safety-related components

| Emergency stop device | Modular Safety System | Contactor |
| :---: | :---: | :---: |
|  |  |  |
|  |  |  |
|  |  |  |

## Note

In addition to the safety-related components, operation of an AS-i network requires an AS-i master and an AS-i power supply.

### 15.2 Examples of two-hand operation console applications

## Two-hand operation console, wall-mounted



For further examples of applications refer to Chapter "Application examples (Page 441)"

### 15.2.1 Safety Evaluation Tool

The Safety Evaluation Tool for the standards IEC 62061 and ISO 13849-1 gets you straight to your goal. This TÜV-tested online tool provides you with swift and reliable help in assessing the safety functions of your machine. It provides you with a standard-compliant report that can be integrated into the documentation as a safety verification.
Link: Safety Evaluation Tool (http://www.industry.siemens.com/topics/global/en/safety-integrated/maschinensicherheit/safety-evaluation-tool/Seiten/default.aspx)

### 15.2.2 Two-hand operation to SIL 3 or PLe with a safety relay

## Application

Two-hand operation consoles comprise two pushbuttons (e.g. mushroom pushbuttons or sensor switches) that must be pressed simultaneously to operate a machine. This prevents the operator from reaching into the danger zone during operation.

## Configuration



Image 15-3 Two-hand operation to SIL 3 or PL e with a safety relay

## Operating principle

By imposing the condition of simultaneous pressing of both pushbuttons, the operator is restricted to the twohand operation console and is thus unable to reach into the danger zone. The safety relay only switches the enabling circuits when both signals are active within 500 ms and the feedback circuit is closed.

If one of the two pushbuttons is released, the safety relay immediately switches the machine off in a safetyrelated manner.

After the emergency stop is actuated, the Start button
 must be used to restart.

## Safety-related components

| Two-hand operation console | Safety relay | Input expansion | Contactor |
| :---: | :---: | :---: | :---: |
|  |  |  |  |
| $3 S U 18$ | $3 S K 1$ | $3 S K 1$ | $2 \times 3 R T 20$ |

### 15.2.3 Two-hand operation to SIL 3 or PL e with a Modular Safety System

## Application

Two-hand operation consoles comprise two pushbuttons (e.g. mushroom pushbuttons or sensor switches) that must be pressed simultaneously to operate a machine. This prevents the operator from reaching into the danger zone during operation.

## Configuration



Image 15-4 Two-hand operation to SIL 3 or PL e with a Modular Safety System

## Operating principle

By imposing the condition of simultaneous pressing of both pushbuttons, the operator is restricted to the twohand operation console and is thus unable to reach into the danger zone. The Modular Safety System only switches the enabling circuits when both signals are active within 500 ms and the feedback circuit is closed.

If one of the two pushbuttons is released, the Modular Safety System immediately switches the machine off in a safety-related manner.


The four-channel design in the two-hand operation console ensures that possible welding of one of the contacts is detected immediately.
After the emergency stop device is actuated, the Start button must be used to restart.

## Safety-related components

| Two-hand operation console | Modular Safety System | Contactor |
| :---: | :---: | :---: |
|  |  |  |
| $3 S U 18$ |  |  |

You will find further information about the use of sensor switches in the two-hand operation console (wiring to Siemens safety relays and safety design) in the following FAQs: Sensor switches in the two-hand operation console (https://support.industry.siemens.com/cs/document/109479531/Einsatz)

### 15.3 Application examples for ID key-operated switches

## Machine tool application

Generally with special-purpose applications on a machine tool
Selection of optional assemblies with 2 differently encoded ID keys / 2 user groups

| Module 1 |
| :--- | :--- | :--- |

- Added value: Registration of the use of the supplementary devices


## Production line application

Generally with special-purpose applications on a production line, e.g. in automobile manufacture
Mode selector of a measuring machine with 4 differently encoded ID keys / 4 user groups.

| Automatic mode (operating personnel) | Setting / maintenance mode (setting engineer) | Manual mode (service personnel) | Calibration mode (calibration service) |
| :---: | :---: | :---: | :---: |
| - Normal process cycle <br> - Manual infeed and removal | - Setting up the machine for manufacturing a new part <br> - Setting <br> - Cleaning | - Step-by-step switching of the functions in the machine possible to determine the step where the fault occurs | - A special section in the control program is used to align the machine <br> - The machine is provided with a sample part and carries out calibration with that |
| - Added value:Registration of the time required for production | - Added value: Registering the time required for setting | - Added value: Registration of the fault times / fault frequency | - Added value: Registration of the time required for calibration |

## Appendix

## A. 1 Process data and data sets

## A.1.1 Electronic module for ID key-operated switches

## A.1.1.1 Structure of the data sets

## Overview of the data sets

Table A-1 Data sets - overview

| Data set |  |  | Name | Access | Value | Length (bytes) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Index (dec) | Index <br> (hex) | Subindex supported |  |  |  |  |
| 0 | 0 | Yes | Parameter Page 1 | r/w | - | 16 |
| 2 | 2 | Yes | System Command | w | - | 1 |
| 3 | 3 | Yes | Data Storage | r/w | - | 24 |
| 12 | OC | No | Device Access locks | r/w | - | 2 |
| 16 | 10 | No | Vendor Name | $r$ | Siemens AG | 10 |
| 17 | 11 | No | Vendor Text | $r$ | Internet (http://support.automation.siemens.co m/WW/view/en/29801139/130000) | 64 |
| 18 | 12 | No | Product Name | $r$ | SIRIUS ACT electronic module for ID key-operated switch | 55 |
| 19 | 13 | No | Product ID | $r$ | 3SU1400-1GD10-1AA0 | 18 |
| 23 | 17 | No | Firmware Revision | $r$ | - | 5 |
| 24 | 18 | No | Application Specific Name | r/w | - | 32 |
| 69 | 45 | Yes | Process Data In | $r$ | - | 6 |
| 80 | 50 | Yes | Delete individually codable <br> ID key, data set 80 | r/w | - | 5 |
| 81 | 51 | Yes | Memory for the individually codable ID keys (1-30) data set 81 | $r$ | - | 180 |
| 82 | 52 | Yes | Memory for the individually codable ID keys (31-50) data set 82 | $r$ | - | 120 |
| 92 | 5C | Yes | Diagnostics - data set 92 | $r$ | - | 20 |
| 94 | 5E | Yes | Diagnostics - data set 94 | $r$ | - | 22 |
| 131 | 83 | Yes | Parameters - data set 131 | r/w | - | 20 |

## A.1.1.2 IO-Link communication parameters

## Parameter Page 1 - IO-Link communication parameters

Table A- 2 Parameter Page 1

| Address | Parameter name | Access | Description |
| :---: | :---: | :---: | :---: |
| 0x00 | Master Command | W | - |
| $0 \times 01$ | Master Cycle Time | r/w | - |
| 0x02 | Min. Cycle Time | r | $0 \times 6 \mathrm{e}$ |
| 0x03 | M-Sequence Capability | r | $0 \times 11$ |
| 0x04 | IO-Link Revision ID | r/w | $0 \times 11$ |
| 0x05 | Process data IN | r | $0 \times 50$ |
| 0x06 | Process data OUT | r | $0 \times 00$ |
| 0x07 | Vendor ID 1 | r | 0x00 |
| 0x08 | Vendor ID 2 | r | 0x2a |
| 0x09 | Device ID 1 | r/w | $0 \times 0 \mathrm{c}$ |
| $0 \times 0 \mathrm{~A}$ | Device ID 2 | r/w | $0 \times 03$ |
| $0 \times 0 \mathrm{~B}$ | Device ID 3 | r/w | $0 \times 01$ |
| $0 \times 0 \mathrm{C}$ | Function ID 1 | r | $0 \times 00$ |
| 0x0D | Function ID 2 | r | 0x00 |
| 0x0E | Reserved | r | - |
| $0 \times 0 \mathrm{~F}$ | System Command | w | - |

## A.1.1.3 Identification data

## Identification data

Identification data refers to data stored in a module that supports users in the following areas:

- When checking the system configuration
- When locating modified system hardware
- When troubleshooting a system.

Modules can be uniquely identified using the identification data.

Table A-3 Identification data of the electronic modules for ID key-operated switches for IO-Link

| DPP ${ }^{1)}$ | Data set | Access | Parameter | Length (bytes) | Default setting |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Index (dec) | Index (dec) |  |  |  |  |
| 0x07 (7) | - | $r$ | Vendor ID | 2 | 0x00 |
| 0x08 (8) | - | $r$ |  |  | 0x2A |
| 0x09 (9) | - | r | Device ID | 3 | 0x0C |
| $0 \times 0 \mathrm{~A}(10)$ | - | r |  |  | 0x03 |
| 0x0B (11) | - | r |  |  | 0x01 |
| - | 0x10 (16) | r | Vendor Name | 11 | SIEMENS AG |
| - | 0x11 (17) | r | Vendor Text | 64 max. | Internet <br> (http://support.automation.siemens.com/ <br> WW/view/en/29801139/130000) |
| - | 0x12 (18) | r | Product Name | 64 max. | SIRIUS ACT electronic module for ID key-operated switch |
| - | 0x13 (19) | r | Product ID | 18 | 3SU1400-1GD10-1AA0 |
| - | 0x17 (23) | $r$ | Firmware Revision | 7 | Firmware version |
| - | 0x18 (24) | r/w | Application Specific Name | 32 max. | - |

1) Direct Parameter Page

## A.1.1.4 System commands - data set (index) 2

## Data set (index) 2 - system commands

Table A-4 Data set (index) 2 - system commands

| Data set | Access | Parameter | Length (bytes) | Default setting |
| :--- | :--- | :--- | :--- | :--- |
| Index (dec) |  |  | 1 | - |
| $0 \times 02(2)$ | w | System Command 1 ) |  |  |

1) Permitted vendor-specific system commands:
$0 \times 82$ for restore factory settings
0xA1 for authorization level 1
0xA2 for authorization level 2
0xA3 for authorization level 3
0xA4 for authorization level 4
$0 \times A 5$ for delete individually encodable ID key
0xA6 for delete individually encodable ID key using data set 80
$0 x A 7$ for delete all keys

## A.1.1.5 Delete individually encodable ID key - data set (index) 80

Data set (index) 80- delete individually encodable ID key

Table A-5 Data set (index) 80- delete individually encodable ID key

| Data set | Access | Parameter | Length (bytes) | Default setting |
| :--- | :--- | :--- | :--- | :--- |
| Index (dec) | $\mathrm{r} / \mathrm{w}$ | Identification number of the individually <br> encodable ID key to be deleted | 5 | - |
| $0 \times 50(80)$ |  |  |  |  |

## A.1.1.6 Memory for the individually encodable ID keys (1-30) - data set (index) 81

## Data set (index) 81- memory for the individually encodable ID keys

Table A- 6 Data set (index) 81- memory for the individually encodable ID keys

| Byte.Bit | Subindex | Description |
| :---: | :---: | :---: |
| 0.0... 4.7 | 1 | Key 1 |
| $5.0 \ldots 5.7$ | 2 | Authorization level for key 1 |
| 6.0 ... 10.7 | 3 | Key 2 |
| 11.0 ... 11.7 | 4 | Authorization level for key 2 |
| 12.0 ... 16.7 | 5 | Key 3 |
| 17.0 ... 17.7 | 6 | Authorization level for key 3 |
| 18.0 ... 22.7 | 7 | Key 4 |
| 23.0 ... 23.7 | 8 | Authorization level for key 4 |
| 24.0 ... 28.7 | 9 | Key 5 |
| 29.0 ... 29.7 | 10 | Authorization level for key 5 |
| 30.0 ... 34.7 | 11 | Key 6 |
| 35.0 ... 35.7 | 12 | Authorization level for key 6 |
| 36.0 ... 40.7 | 13 | Key 7 |
| 41.0 ... 41.7 | 14 | Authorization level for key 7 |
| 42.0 ... 46.7 | 15 | Key 8 |
| 47.0 ... 47.7 | 16 | Authorization level for key 8 |
| 48.0 ... 52.7 | 17 | Key 9 |
| 53.0 ... 53.7 | 18 | Authorization level for key 9 |
| 54.0 ... 58.7 | 19 | Key 10 |
| 59.0 ... 59.7 | 20 | Authorization level for key 10 |
| 60.0 ... 64.7 | 21 | Key 11 |
| 65.0 ... 65.7 | 22 | Authorization level for key 11 |
| 66.0 ... 70.7 | 23 | Key 12 |
| 71.0 ... 71.7 | 24 | Authorization level for key 12 |
| 72.0 ... 76.7 | 25 | Key 13 |
| 77.0 ... 77.7 | 26 | Authorization level for key 13 |
| 78.0 ... 82.7 | 27 | Key 14 |
| 83.0 ... 83.7 | 28 | Authorization level for key 14 |
| 84.0 ... 88.7 | 29 | Key 15 |
| 89.0 ... 89.7 | 30 | Authorization level for key 15 |
| 90.0 ... 94.7 | 31 | Key 16 |
| 95.0 ... 95.7 | 32 | Authorization level for key 16 |
| 96.0 ... 100.7 | 33 | Key 17 |
| 101.0 ... 101.7 | 34 | Authorization level for key 17 |

## A. 1 Process data and data sets

| Byte.Bit | Subindex | Description |
| :---: | :---: | :---: |
| 102.0 ... 106.7 | 35 | Key 18 |
| 107.0 ... 107.7 | 36 | Authorization level for key 18 |
| 108.0 ... 112.7 | 37 | Key 19 |
| 113.0 ... 113.7 | 38 | Authorization level for key 19 |
| 114.0 ... 118.7 | 39 | Key 20 |
| 119.0 ... 119.7 | 40 | Authorization level for key 20 |
| 120.0 ... 124.7 | 41 | Key 21 |
| 125.0 ... 125.7 | 42 | Authorization level for key 21 |
| 126.0 ... 130.7 | 43 | Key 22 |
| 131.0 ... 131.7 | 44 | Authorization level for key 22 |
| 132.0 ... 136.7 | 45 | Key 23 |
| 137.0 ... 137.7 | 46 | Authorization level for key 23 |
| 138.0 ... 142.7 | 47 | Key 24 |
| 143.0 ... 143.7 | 48 | Authorization level for key 24 |
| 144.0 ... 148.7 | 49 | Key 25 |
| 149.0 ... 149.7 | 50 | Authorization level for key 25 |
| 150.0 ... 154.7 | 51 | Key 26 |
| 155.0 ... 155.7 | 52 | Authorization level for key 26 |
| 156.0 ... 160.7 | 53 | Key 27 |
| 161.0 ... 161.7 | 54 | Authorization level for key 27 |
| 162.0 ... 166.7 | 55 | Key 28 |
| 167.0 ... 167.7 | 56 | Authorization level for key 28 |
| 168.0 ... 172.7 | 57 | Key 29 |
| 173.0 ... 173.7 | 58 | Authorization level for key 29 |
| 174.0 ... 178.7 | 59 | Key 30 |
| 179.0 ... 179.7 | 60 | Authorization level for key 30 |

## A.1.1.7 Memory for the individually encodable ID keys (31-50) - data set (index) 82

## Data set (index) 82- memory for the individually encodable ID keys

Table A-7 Data set (index) 82- memory for the individually encodable ID keys

| Byte.Bit | Subindex | Description |
| :--- | :--- | :--- |
| $0.0 \ldots 4.7$ | 1 | Key 31 |
| $5.0 \ldots 5.7$ | 2 | Authorization level for key 31 |
| $6.0 \ldots 10.7$ | 3 | Key 32 |
| $11.0 \ldots 11.7$ | 4 | Authorization level for key 32 |
| $12.0 \ldots 16.7$ | 5 | Key 33 |
| $17.0 \ldots 17.7$ | 6 | Authorization level for key 33 |


| Byte.Bit | Subindex | Description |
| :---: | :---: | :---: |
| 18.0 ... 22.7 | 7 | Key 34 |
| 23.0 ... 23.7 | 8 | Authorization level for key 34 |
| 24.0 ... 28.7 | 9 | Key 35 |
| 29.0 ... 29.7 | 10 | Authorization level for key 35 |
| 30.0 ... 34.7 | 11 | Key 36 |
| 35.0 ... 35.7 | 12 | Authorization level for key 36 |
| 36.0 ... 40.7 | 13 | Key 37 |
| 41.0 ... 41.7 | 14 | Authorization level for key 37 |
| 42.0 ... 46.7 | 15 | Key 38 |
| 47.0 ... 47.7 | 16 | Authorization level for key 38 |
| 48.0 ... 52.7 | 17 | Key 39 |
| 53.0 ... 53.7 | 18 | Authorization level for key 39 |
| 54.0 ... 58.7 | 19 | Key 40 |
| 59.0 ... 59.7 | 20 | Authorization level for key 40 |
| 60.0 ... 64.7 | 21 | Key 41 |
| 65.0 ... 65.7 | 22 | Authorization level for key 41 |
| 66.0 ... 70.7 | 23 | Key 42 |
| 71.0 ... 71.7 | 24 | Authorization level for key 42 |
| 72.0 ... 76.7 | 25 | Key 43 |
| 77.0 ... 77.7 | 26 | Authorization level for key 43 |
| 78.0 ... 82.7 | 27 | Key 44 |
| 83.0 ... 83.7 | 28 | Authorization level for key 44 |
| 84.0 ... 88.7 | 29 | Key 45 |
| 89.0 ... 89.7 | 30 | Authorization level for key 45 |
| 90.0 ... 94.7 | 31 | Key 46 |
| 95.0 ... 95.7 | 32 | Authorization level for key 46 |
| 96.0 ... 100.7 | 33 | Key 47 |
| 101.0 ... 101.7 | 34 | Authorization level for key 47 |
| 102.0 ... 106.7 | 35 | Key 48 |
| 107.0 ... 107.7 | 36 | Authorization level for key 48 |
| 108.0 ... 112.7 | 37 | Key 49 |
| 113.0 ... 113.7 | 38 | Authorization level for key 49 |
| 114.0 ... 118.7 | 39 | Key 50 |
| 119.0 ... 119.7 | 40 | Authorization level for key 50 |

## A.1.1.8 Diagnostics - data set (index) 92

## Data set (index) 92 - diagnostics

## Note

Bits that are not described in the tables below are reserved and should be ignored.

Table A- 8 Data set (index) 92 - diagnostics

| Byte.Bit | Subindex | Description |
| :--- | :--- | :--- |
| $0.0 \ldots 15.7$ | $1 \ldots 3$ | Reserved |
| 16.0 | 4 | Ready |
| 16.1 | 5 | Group error |
| 16.2 | 6 | Reserved |
| 16.3 | 7 | Reserved |
| 16.4 | 8 | Reserved |
| 16.5 | 9 | Reserved |
| 16.6 | 10 | Reserved |
| 16.7 | 11 | Reserved |
| 17.0 | 12 | Digital output 0 |
| 17.1 | 13 | Digital output 1 |
| 17.2 | 15 | Digital output 2 |
| 17.3 | 16 | Digital output 3 |
| 17.4 | 17 | Digital output 4 |
| 17.5 | 18 | Reserved |
| 17.6 | 19 | Reserved |
| 17.7 | 20 | Reserved |
| 18.0 | 21 | Detection of the ID key |
| $19.0 \ldots 19.7$ | Status of the individually encodable ID key |  |

## A.1.1.9 Diagnostics - data set (index) 94

Data set (index) 94 (ID keys)

## Note

Bits that are not described in the tables below are reserved and should be ignored.

Table A-9 Data set (index) 94 (ID keys)

| Byte.Bit |  | Subindex |
| :--- | :--- | :--- |
| Description |  |  |
| $0.0 \ldots 15.7$ | $1 \ldots 3$ | Reserved |
| $16.0 \ldots 20.7$ | 4 | Identification number of the individually codable ID key |
| $21.0 \ldots 21.2$ | 5 | Authorization level |
| $21.3 \ldots 21.5$ | 6 | Key position |

## A.1.1.10 Parameters - Data set (index) 131

## Data set (index) 131 (parameters)

## Note

Bits that are not described in the tables below are reserved and should be ignored.

Table A- 10 Data set (index) 131 (parameters)

| Byte.Bit | Subindex | Description |
| :---: | :---: | :---: |
| Operating system functions |  |  |
| 0.0 ... 15.7 | 1 ... 3 | Reserved |
| 16.0 | 4 | Incremental mode <br> Default: [0] <br> [0] disabled <br> [1] enabled |
| 16.1 | 5 | Switch position memory <br> Default: [0] <br> [0] disabled (key position = 0) <br> [1] enabled (last switch position is retained) |
| 16.2 | 6 | Key memory <br> Default: [0] <br> [0] disabled <br> [1] enabled |
| 16.3 | 7 | Individual keys only <br> Default: [0] <br> [0] disabled <br> [1] enabled |
| 17.0 ... 17.7 | 8 | Switch position delay <br> Type: CHAR <br> Resolution: $0.1 \mathrm{~s}=1$ <br> Default: 20 <br> Min: 1 or 0 (disabled) <br> Max: 100 * $0.1 \mathrm{~s}=10 \mathrm{~s}$ |
| 18.0 ... 18.7 | 9 | Select memory range <br> Default [1] <br> Min: 1 <br> Max: 5 |
| 19.0 ... 19.7 | - | Reserved |

## A.1.2 Electronic module for IO-Link

## A.1.2.1 Structure of the data sets

## Overview of the data sets

Table A-11 Data sets - overview

| Data set |  |  | Name | Access | Value | Length (bytes) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Index <br> (dec) | Index (hex) | Subindex supported |  |  |  |  |
| 0 | 0 | Yes | Parameter Page 1 | r/w | - | 16 |
| 2 | 2 | Yes | System Command | w | - | 1 |
| 3 | 3 | Yes | Data Storage | r/w | - | 18 |
| 12 | 0c | No | Device Access locks | r/w | - | 2 |
| 16 | 10 | No | Vendor Name | r | Siemens AG | 10 |
| 17 | 11 | No | Vendor Text | r | Internet <br> (http://support.automation.siemens.co m/WW/view/en/29801139/130000) | 64 |
| 18 | 12 | No | Product Name | r | SIRIUS ACT 8DIQ electronic module for IO-Link | 40 |
| 19 | 13 | No | Product ID | r | 3SU1400-2HL10-6AA0 <br> (example of article number) | 18 |
| 23 | 17 | No | Firmware Revision | r | - | 6 |
| 24 | 18 | No | Application specific tag | r/w | - | 32 |
| 67 | 43 | Yes | Process Data Out | r | - | 6 |
| 69 | 45 | Yes | Process Data In | $r$ | - | 6 |
| 92 | 5c | Yes | Diagnostics - data set 92 | $r$ | - | 24 |
| 94 | 5 e | Yes | Diagnostics - data set 94 | r | - | 82 |
| 131 | 83 | Yes | Parameters - data set 131 | r/w | - | 126 |

## A.1.2.2 IO-Link communication parameters

## Parameter Page 1 - IO-Link communication parameters

| Address | Parameter name | Access | Description |
| :---: | :---: | :---: | :---: |
| 0x00 | Master-Command | w |  |
| 0x01 | MasterCycle-Time | r/w |  |
| 0x02 | MinCycle-Time | r | 0x49 |
| 0x03 | M-Sequence Capability | r | 0x11 |
| 0x04 | Revision ID | r/w | $0 \times 11$ |
| 0x05 | ProcessDataln | r | 0x50 |
| 0x06 | ProcessDataOut | r | 0x10 |
| 0x07 | Vendor ID1 | r | 0x00 |
| 0x08 | Vendor ID2 | r | 0x2a |
| 0x09 | Device ID1 | r/w | 0x04 |
| 0x0a | Device ID2 | r/w | 0x40 |
| 0x0b | Device ID3 | r/w | 0x01 |
| 0x0c | Function ID1 | r | 0x00 |
| 0x0d | Function ID2 | r | 0x00 |
| 0x0e | Reserved | r |  |
| 0x0f | System Command | w |  |

## A.1.2.3 Identification data

## Identification data

Identification data refers to data stored in a module that supports users in the following areas:

- When checking the system configuration
- When locating modified system hardware
- When troubleshooting a system.

Modules can be uniquely identified using the identification data.

Table A-12 Identification data of the electronic modules for IO-Link

| DPP 1) | Data set | Access | Parameter | Length (bytes) | Default setting |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Index (dec) | Index (dec) |  |  |  |  |
| 7 | - | $r$ | Vendor ID | 2 | 0x00 |
| 8 | - | r |  |  | 0x2A |
| 9 | - | r | Device ID | 3 | 0x0C |
| 10 | - | r |  |  | 0x03 |
| 11 | - | r |  |  | 0x01 |
| - | 16 | r | Vendor Name | 11 | SIEMENS AG |
| - | 17 | r | Vendor Text | 64 max. | Internet <br> (http://support.automation.siemens.com/W <br> W/view/en/29801139/130000) |
| - | 18 | r | Product Name | 64 max. | SIRIUS ACT 8DIQ electronic module for IO-Link |
| - | 19 | $r$ | Product ID | 18 | 3SU1400-2HL10-6AA0 <br> (example of article number) |
| - | 21 | r | Serial Number | 16 |  |
| - | 22 | r | Hardware Revision | 6 |  |
| - | 23 | r | Firmware Revision | 6 | Firmware version |
| - | 24 | r/w | Application Specific Name | 32 max. | - |

[^6]A. 1 Process data and data sets

## A.1.2.4 System commands - data set (index) 2

## Data set (index) 2 - system commands

Table A-13 Data set (index) 2 - system commands

| Data set | Access | Parameter | Length <br> (bytes) | Default setting |
| :--- | :--- | :--- | :--- | :--- |
| Index (dec) | w | System Command 1 1) | 1 | - |
| 2 | W |  |  |  |

1) Permissible vendor-specific system commands:

0x81 for Application Reset
$0 \times 82$ for Restore Factory Setting
0xA0 for Reset On-Duration Counter Input/Output 0
0xA1 for Reset On-Duration Counter Input/Output 1
0xA2 for Reset On-Duration Counter Input/Output 2
0xA3 for Reset On-Duration Counter Input/Output 3
0xA4 for Reset On-Duration Counter Input/Output 4
0xA5 for Reset On-Duration Counter Input/Output 5
0xA6 for Reset On-Duration Counter Input/Output 6 0xA7 for Reset On-Duration Counter Input/Output 7 0xA8 for Reset Switching Counter Input/Output 0 0xA9 for Reset Switching Counter Input/Output 1 0xAA for Reset Switching Counter Input/Output 2 0xAB for Reset Switching Counter Input/Output 3 0xAC for Reset Switching Counter Input/Output 4 0xAD for Reset Switching Counter Input/Output 5 0xAE for Reset Switching Counter Input/Output 6 0xAF for Reset Switching Counter Input/Output 7 0xB0 for Reset On-Duration Counter Input/Output 0-7 0xB1 for Reset Switching Counter Input/Output 0-7

## A.1.2.5 Process Data Out - data set (index) 67

## Data set (index) 67 (parameter)

## Note

Bits that are not described in the tables below are reserved and should be ignored.

Table A- 14 Data set (index) 67 (parameter), read access only

| Byte.Bit | Subindex | Description | Value |
| :---: | :---: | :---: | :---: |
| Operating system functions |  |  |  |
| $\begin{aligned} & 0.0 \ldots \\ & 3.7 \end{aligned}$ | 1 | Reserved |  |
| 4.0 | 2 | Output 0 | [0x00] Output off |
| 4.1 | 3 | Output 1 | [0x01] Output on |
| 4.2 | 4 | Output 2 |  |
| 4.3 | 5 | Output 3 |  |
| 4.4 | 6 | Output 4 |  |
| 4.5 | 7 | Output 5 |  |
| 4.6 | 8 | Output 6 |  |
| 4.7 | 9 | Output 7 |  |
| 5.0 | 10 | Reserved |  |
| 5.1 | 11 | Reserved |  |
| 5.2 | 12 | Reserved |  |
| 5.3 | 13 | Reserved |  |
| 5.4 | 14 | Reserved |  |
| 5.5 | 15 | Reserved |  |
| 5.6 | 16 | Reserved |  |
| 5.7 | 17 | Reserved |  |

## A.1.2.6 Process Data In - data set (index) 69

## Data set (index) 69 (parameter)

## Note

Bits that are not described in the tables below are reserved and should be ignored.

Table A- 15 Data set (index) 69 (parameter), read access only

| Byte.Bit | Subindex | Description | Value |
| :---: | :---: | :---: | :---: |
| Operating system functions |  |  |  |
| 0.0 ... 3.7 | 1 | Reserved |  |
| 4.0 | 2 | Ready |  |
| 4.1 | 3 | Group error |  |
| 4.2 | 4 | Reserved | $0 \times 00$ |
| 4.3 | 5 | Reserved | $0 \times 00$ |
| 4.4 | 6 | Reserved | $0 \times 00$ |
| 4.5 | 7 | Reserved | $0 \times 00$ |
| 4.6 | 8 | Reserved | $0 \times 00$ |
| 4.7 | 9 | Reserved | $0 \times 00$ |
| 5.0 | 10 | Input 0 | [0x00] Input off |
| 5.1 | 11 | Input 1 | [0x01] Input on |
| 5.2 | 12 | Input 2 |  |
| 5.3 | 13 | Input 3 |  |
| 5.4 | 14 | Input 4 |  |
| 5.5 | 15 | Input 5 |  |
| 5.6 | 16 | Input 6 |  |
| 5.7 | 17 | Input 7 |  |

## A.1.2.7 Diagnostics - data set (index) 92

## Data set (index) 92

## Note

Bits that are not described in the tables below are reserved and should be ignored.

Table A-16 Data set (index) 92, read access only

| Byte.Bit | Subindex | Description | Value |
| :---: | :---: | :---: | :---: |
| 0.0-15.7 | 1... 3 | Reserved |  |
| 16.0 | 4 | Ready |  |
| 16.1 | 5 | Group error |  |
| 16.2 | 6 | Reserved | $0 \times 00$ |
| 16.3 | 7 | Reserved | $0 \times 00$ |
| 16.4 | 8 | Reserved | $0 \times 00$ |
| 16.5 | 9 | Reserved | $0 \times 00$ |
| 16.6 | 10 | Reserved | $0 \times 00$ |
| 16.7 | 11 | Reserved | $0 \times 00$ |
| 17.0-17.1 | 12 | Switch-on duration status IO0 | Switch-on duration status: [0x00] deactivated [0x01] active [0x02] threshold reached [0x03] expired |
| 17.2-17.3 | 13 | Switch-on duration status IO1 |  |
| 17.4-17.5 | 14 | Switch-on duration status IO2 |  |
| 17.6-17.7 | 15 | Switch-on duration status IO3 |  |
| 18.0-18.1 | 16 | Switch-on duration status IO4 |  |
| 18.2-18.3 | 17 | Switch-on duration status IO5 |  |
| 18.4-18.5 | 18 | Switch-on duration status IO6 |  |
| 18.6-18.7 | 19 | Switch-on duration status IO7 |  |

A. 1 Process data and data sets

| Byte.Bit | Subindex | Description | $\left.\begin{array}{c}\text { Value } \\ \hline 19.0-19.1\end{array} \right\rvert\, 20$ |
| :--- | :---: | :---: | :---: | \(\left.\begin{array}{c}Dimming status: <br>

[0x00] deactivated <br>
[0x01] active <br>
[0x03] expired\end{array}\right\}\)

## A.1.2.8 Diagnostics - data set (index) 94

## Data set (index) 94 (electronic module for IO-Link)

## Note

Bits that are not described in the tables below are reserved and should be ignored.

Table A- 17 Data set (index) 94, read access only

| Byte.Bit | Subindex | Description | Value |
| :---: | :---: | :---: | :---: |
| 0.0 ... 15.7 | 1 ... 3 | Reserved |  |
| 16.0-19.7 | 4 | Switch-on duration IO0 | Switch-on duration: Factory setting: 0 seconds <br> Minimum value: 0 seconds <br> Maximum value: 4294967295 seconds Increment: 1 second |
| 20.0-23.7 | 5 | Switch-on duration IO1 |  |
| 24.0-27.7 | 6 | Switch-on duration IO2 |  |
| 28.0-31.7 | 7 | Switch-on duration IO3 |  |
| 32.0-35.7 | 8 | Switch-on duration IO4 |  |
| 36.0-39.7 | 9 | Switch-on duration IO5 |  |
| 40.0-43.7 | 10 | Switch-on duration IO6 |  |
| 44.0-47.7 | 11 | Switch-on duration IO7 |  |


| Byte.Bit | Subindex | Description | Value |
| :---: | :---: | :---: | :---: |
| 48.0-51.7 | 12 | Switching cycle counter IOO | Switching cycle counter: <br> Factory setting: 0 <br> Minimum value: 0 <br> Maximum value: 4294967295 |
| 52.0-55.7 | 13 | Switching cycle counter IO1 |  |
| 56.0-59.7 | 14 | Switching cycle counter IO2 |  |
| 60.0-63.7 | 15 | Switching cycle counter IO3 |  |
| 64.0-67.7 | 16 | Switching cycle counter IO4 |  |
| 68.0-71.7 | 17 | Switching cycle counter IO5 |  |
| 72.0-75.7 | 18 | Switching cycle counter IO6 |  |
| 76.0-79.7 | 19 | Switching cycle counter 107 |  |
| 80.0 | 20 | Input 0 | Input: <br> [0x00] activated [0x01] deactivated |
| 80.1 | 21 | Input 1 |  |
| 80.2 | 22 | Input 2 |  |
| 80.3 | 23 | Input 3 |  |
| 80.4 | 24 | Input 4 |  |
| 80.5 | 25 | Input 5 |  |
| 80.6 | 26 | Input 6 |  |
| 80.7 | 27 | Input 7 |  |
| 81.0 | 28 | Output 0 | Output: [ $0 \times 00$ ] activated [ $0 \times 01$ ] deactivated |
| 81.1 | 29 | Output 1 |  |
| 81.2 | 30 | Output 2 |  |
| 81.3 | 31 | Output 3 |  |
| 81.4 | 32 | Output 4 |  |
| 81.5 | 33 | Output 5 |  |
| 81.6 | 34 | Output 6 |  |
| 81.7 | 35 | Output 7 |  |

## A.1.2.9 Parameters - Data set (index) 131

## Data set (index) 131 (parameters)

## Note

Bits that are not described in the tables below are reserved and should be ignored.

Table A- 18 Data set (index) 131 (parameters)

| Byte.Bit | Subindex | Description | Value |
| :---: | :---: | :---: | :---: |
| 0.0... 15.7 | 1 ... 3 | Reserved |  |
| 16.0-16.7 | 4 | Functional mode IOO | Functional mode: |
| 17.0-17.7 | 5 | Functional mode IO1 | Factory setting: [0x01] |
| 18.0-18.7 | 6 | Functional mode IO2 | [0x01] Static input |
| 19.0-19.7 | 7 | Functional mode IO3 | [0x02] Static output |
| 20.0-20.7 | 8 | Functional mode IO4 | [0x03] PWM output |
| 21.0-21.7 | 9 | Functional mode IO5 | [0x04] Dimming output |
| 22.0-22.7 | 10 | Functional mode IO6 | [0x05] Switching input |
| 23.0-23.7 | 11 | Functional mode IO7 | [0x06] Switching output [0x07] Switch-on duration input [0x08] Switch-on duration output |
| 24.0-24.1 | 12 | Setting range | Factory setting: [0x00] <br> [0x00] Individual: Individual setting of all IOs [0x01] Collective: All IOs according to IO 0 mode [0x02] Groups: Group 1 according to IO 0 mode Group 2 according to IO 4 mode |
| 24.2 | 13 | Reset process data | Factory setting: [0x01] <br> [0x00] enabled <br> [0x01] disabled |
| 25.0-25.7 | 14 | PWM frequency output 0 | Frequency: |
| 26.0-26.7 | 15 | PWM frequency output 1 | Factory setting: 1 Hz |
| 27.0-27.7 | 16 | PWM frequency output 2 | Minimum: 1 Hz |
| 28.0-28.7 | 17 | PWM frequency output 3 | Maximum: 255 Hz |
| 29.0-29.7 | 18 | PWM frequency output 4 | Increment: 1 Hz |
| 30.0-30.7 | 19 | PWM frequency output 5 |  |
| 31.0-31.7 | 20 | PWM frequency output 6 |  |
| 32.0-32.7 | 21 | PWM frequency output 7 |  |


| Byte.Bit | Subindex | Description | Value |
| :---: | :---: | :---: | :---: |
| 33.0-33.7 | 22 | PWM duty cycle output 0 | Duty cycle: <br> Factory setting: 50 \% <br> Minimum: 10 \% <br> Maximum: 90 \% <br> Increment: 1 \% |
| 34.0-34.7 | 23 | PWM duty cycle output 1 |  |
| 35.0-35.7 | 24 | PWM duty cycle output 2 |  |
| 36.0-36.7 | 25 | PWM duty cycle output 3 |  |
| 37.0-37.7 | 26 | PWM duty cycle output 4 |  |
| 38.0-38.7 | 27 | PWM duty cycle output 5 |  |
| 39.0-39.7 | 28 | PWM duty cycle output 6 |  |
| 40.0-40.7 | 29 | PWM duty cycle output 7 |  |
| 41.0-41.7 | 30 | Dimming time output 0 | Dimming time: <br> Factory setting: 1 second <br> Minimum: 0.1 seconds <br> Maximum: 25.5 seconds <br> Increment: 0.1 seconds |
| 42.0-42.7 | 31 | Dimming time output 1 |  |
| 43.0-43.7 | 32 | Dimming time output 2 |  |
| 44.0-44.7 | 33 | Dimming time output 3 |  |
| 45.0-45.7 | 34 | Dimming time output 4 |  |
| 46.0-46.7 | 35 | Dimming time output 5 |  |
| 47.0-47.7 | 36 | Dimming time output 6 |  |
| 48.0-48.7 | 37 | Dimming time output 7 |  |
| 49.0-49.7 | 38 | Input delay 0 | Input delay: <br> Factory setting: 3 milliseconds <br> Minimum: 3 milliseconds <br> Maximum: 255 milliseconds Increment: 1 millisecond |
| 50.0-50.7 | 39 | Input delay 1 |  |
| 51.0-51.7 | 40 | Input delay 2 |  |
| 52.0-52.7 | 41 | Input delay 3 |  |
| 53.0-53.7 | 42 | Input delay 4 |  |
| 54.0-54.7 | 43 | Input delay 5 |  |
| 55.0-55.7 | 44 | Input delay 6 |  |
| 56.0-56.7 | 45 | Input delay 7 |  |
| 57.0-60.7 | 46 | Threshold I/O 0 | Threshold: <br> Factory setting: 0 seconds Minimum: 0 seconds <br> Maximum: 4294967295 seconds Increment: 1 second |
| 61.0-64.7 | 47 | Threshold I/O 1 |  |
| 65.0-68.7 | 48 | Threshold I/O 2 |  |
| 69.0-72.7 | 49 | Threshold I/O 3 |  |
| 73.0-76.7 | 50 | Threshold I/O 4 |  |
| 77.0-80.7 | 51 | Threshold I/O 5 |  |
| 81.0-84.7 | 52 | Threshold I/O 6 |  |
| 85.0-88.7 | 53 | Threshold I/O 7 |  |
| 89.0-92.7 | 54 | Threshold switching cycle counter I/O 0 | Threshold switching cycle counter: <br> Factory setting: 0 <br> Minimum: 0 <br> Maximum: 4294967295 |
| 93.0-96.7 | 55 | Threshold switching cycle counter I/O 1 |  |
| 97.0-100.7 | 56 | Threshold switching cycle counter I/O 2 |  |
| 101.0-104.7 | 57 | Threshold switching cycle counter I/O 3 |  |
| 105.0-108.7 | 58 | Threshold switching cycle counter I/O 4 |  |
| 109.0-112.7 | 59 | Threshold switching cycle counter I/O 5 |  |
| 113.0-116.7 | 60 | Threshold switching cycle counter I/O 6 |  |
| 117.0-120.7 | 61 | Threshold switching cycle counter I/O 7 |  |

A. 1 Process data and data sets

| Byte. Bit | Subindex | Description | Value |
| :---: | :---: | :---: | :---: |
| 121.0-121.1 | 62 | Active edges I/O 0 | Active edges: Factory setting: [0x01] [0x00] None [0x01] Rising edge [0x02] Falling edge [0x03] All edges |
| 121.2-121.3 | 63 | Active edges I/O 1 |  |
| 121.4-121.5 | 64 | Active edges I/O 2 |  |
| 121.6-121.7 | 65 | Active edges I/O 3 |  |
| 122.0-122.1 | 66 | Active edges I/O 4 |  |
| 122.2-122.3 | 67 | Active edges I/O 5 |  |
| 122.4-122.5 | 68 | Active edges I/O 6 |  |
| 122.6-122.7 | 69 | Active edges I/O 7 |  |
| 123.0 | 70 | Inverting input 0 | Inverting input: |
| 123.1 | 71 | Inverting input 1 | Factory setting: [0x00] |
| 123.2 | 72 | Inverting input 2 | [0x00] disable |
| 123.3 | 73 | Inverting input 3 | [0x01] enabled |
| 123.4 | 74 | Inverting input 4 |  |
| 123.5 | 75 | Inverting input 5 |  |
| 123.6 | 76 | Inverting input 6 |  |
| 123.7 | 77 | Inverting input 7 |  |
| 124.0 | 78 | Inverting output 0 | Inverting output: |
| 124.1 | 79 | Inverting output 1 | Factory setting: [0x00] |
| 124.2 | 80 | Inverting output 2 | [ $0 \times 00$ ] disable |
| 124.3 | 81 | Inverting output 3 | [0x01] enabled |
| 124.4 | 82 | Inverting output 4 |  |
| 124.5 | 83 | Inverting output 5 |  |
| 124.6 | 84 | Inverting output 6 |  |
| 124.7 | 85 | Inverting output 7 |  |

## A. 2 Certifications and approvals

## Approval markings



## Communautés Européennes

(The CE approval mark is required in order to market your products within Europe. The CE mark indicates to European authorities that your claims of product compliance meet the applicable standards.)
Underwriters Laboratories Inc.
(Product safety certification organization)
(Approval mark for Canada and USA)
Underwriters Laboratories Inc.
(Product safety certification organization)
UL Recognized Component Mark
(Approval mark for recognized components)
Canadian Standards Association
(Zertifizierung für den kanadischen Markt)
China Compulsory Certification
(Certification system in China)

Association of German Electrical Engineers (The VDE logo for electrical/electronic products including products as defined in the German legislation on equipment and product safety (GPSG), and medical products as defined in the medical products legislation (MPG), designates compliance with the VDE regulations or European or internationally harmonized standards, and confirms that the protection requirements of the relevant directives are met).
A. 2 Certifications and approvals

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[^0]:    1) The documents are available for download free of charge in the Service\&Support Portal.
[^1]:    1) Pushbutton cannot be illuminated
[^2]:    2) Screw terminal
[^3]:    3SU1400-1AA10-1BA0: Contact module 1NO normally open contact
    3SU1400-1AA10-1CA0: Contact module 1NC normally closed contact

[^4]:    1) With recess for a labeling plate
    2) EMERGENCY STOP conventionally wired
[^5]:    Increment: 1 Hz

[^6]:    1) Direct Parameter Page
