SIEMENS

SIMATIC

S7-300
CPU 31xT-3 PN/DP

Manual

Legal information

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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.

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>
> 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.

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>
> indicates that property damage can result if proper precautions are not taken.

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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.

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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.

Preface

Purpose of this manual

This manual contains essential information about the following:

- Installation
- Communication
- Memory concept
- Cycle and response times
- Technical specifications of the CPUs
- Switching to one of the CPUs discussed here

Scope of this manual

This manual describes the properties of the Technology CPU and the differences of the Technology CPU compared to the following manuals:

- Operating instructions S7-300, CPU 31xC and 31x: Installation (http://support.automation.siemens.com/WW/view/en/13008499)
- Device manual S7-300, CPU 31xC and 31x: Technical Specifications (http://support.automation.siemens.com/WW/view/en/12996906)

These manuals are available on the DVD of the S7 Technology add-on package and on the Internet (http://support.automation.siemens.com/WW/view/en/).

Scope of the manual

CPU	Order number	As of firmware version
CPU 315T-3 PN/DP	6ES7315-7TJ10-0AB0	V3.2.9
CPU 317T-3 PN/DP	6ES7317-7TK10-0AB0	V3.2.9
CPU 317TF-3 PN/DP	6ES7317-7UL10-0AB0	V3.2.9

Note

The descriptions apply to all Technology CPU types, insofar as these are not explicitly specified.

You can find product information (pi_cpu317tf_3pndp_x.pdf) describing the special features of the F-CPUs with integrated technology on the DVD of the "S7 Technology" add-on package. You can find more detailed information on replacing fail-safe modules on the Internet (http://support.automation.siemens.com/WW/view/en/11669702/133300).

Note

We reserve the right to include product information on the Internet (http://support.automation.siemens.com) containing the latest information on new modules or modules of a more recent version.

What's new?

The CPU 31xT-3 PN/DP replaces the CPU 31xT-2 DP with compatibility as a spare part.

Position in the documentation landscape

This manual is part of the SIMATIC S7 Technology add-on package On overview of all manuals listed is available on the DVD of the S7 Technology add-on package under \Manuals\<languages>_manuals.pdf.

In addition to the S7 Technology documentation package, you require information from the "System software for S7-300/400 system and standard functions" reference manual. You can also find the description on the Internet (http://support.automation.siemens.com/WW/view/en/15391120)in the online help for STEP 7.

Required basic knowledge

Knowledge required to understand this manual:

● General knowledge of automation engineering

● Knowledge of motion control

● Knowledge of STEP 7 basic software

Required configuration tools

To configure the Technology CPU, you require STEP 7, Version as of V5.5 SP2 and the S7 Technology add-on package, V4.2 SP3 or higher.

Standards and approvals

Chapter "General technical specifications" in the manual S7-300 CPU 31xC and 31x: Technical specifications (http://support.automation.siemens.com/WW/view/en/12996906) provides information about standards and approvals.

Recycling and disposal

The devices described in this manual can be recycled due to their ecologically compatible components. For environment-friendly recycling and disposal of your old equipment, contact a certified disposal facility for electronic scrap.

Service & Support on the Internet

In addition to the documentation, we offer a comprehensive knowledge base online on the Internet (http://support.automation.siemens.com).

There you will find:

- Our newsletter containing up-to-date information on your products
- Up-to-date documents using the Search function in Service & Support
- A forum for global information exchange by users and specialists
- Your local representative for automation and drives in our contact database
- Information about on-site services, repairs, spare parts, and lots more
- Applications and tools for the optimized use of the SIMATIC S7

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Introduction

The current trend in the field of automation is toward PLC-integrated solutions. This also applies to technology and motion control applications.

Integrated technology of Technology CPU

With the Technology CPU, technology and motion control functions are integrated in one SIMATIC CPU.

The Technology CPU incorporates:

- SIMATIC
- PLCopen-compliant motion control functions
- Technological configurations (technology objects, axis configurations, tools)

The Technology CPU is completely integrated in the SIMATIC world.

Field of application

The Technology CPU is especially suited to solving the following control tasks:

- Control tasks and technology requirements primarily relating to motion control in the SIMATIC S7-300
- Motion control tasks for up to 32 axes
- Technological tasks, for example, gearing and camming, position-controlled positioning, pressure-controlled hydraulic axes and path control, (operating modes: Absolute, relative, additive and superimposed), travel to fixed stop, probe-based print mark correction, position- or time-dependent cam control).

The Technology CPU is designed for use with flow machines, processing/assembly lines, flying shears, labeling equipment, drum feeds, or various axis kinematics (with path interpolation).

Typical configurations

The following figures show typical configuration examples with the Technology CPU.

● The DP(DRIVE) interface is characteristic for the connection of the drive systems for the Technology CPU
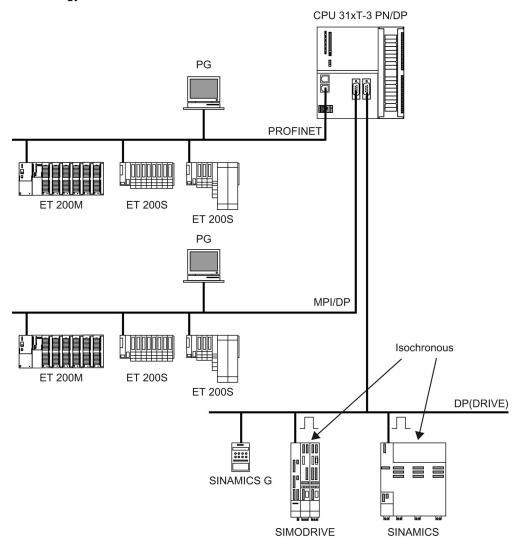
Figure 1-1   Typical configuration of the Technology CPU

Configuring and programming

For the configuration and programming of the Technology CPU, you require the S7 Technology add-on package, which is integrated after the installation in STEP 7.

The STEP 7 tool HW Config is used to configure all hardware components of the system (for example to create subnets on the MPI/DP, PN and DP(DRIVE) interfaces), including the drive components.

You need the S7 Technology add-on package to configure the so-called "technology objects", e.g. axes, path objects, cams, output cams and probes.

The technology object data are made available to the STEP 7 user program through data blocks.

S7 Technology also includes a library containing PLCopen-compliant standard function blocks, which are used to program the actual motion control tasks. You call these standard FBs in your STEP 7 user program.
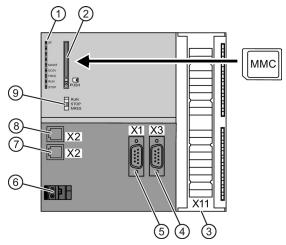
STEP 7 languages LAD, FBD and STL and all the required engineering tools, e.g. S7-SCL or S7-GRAPH are provided to enable you to create the STEP 7 user program (including motion control tasks).

Operator controls and display elements

2

Operator controls and display elements of the CPU

The following figure shows the operator controls and displays on the Technology CPU.

①	Display for bus faults / status and failure displays
②	Slot for the SIMATIC Micro Memory Card including the ejector
③	Connection of the integrated I/Os
④	Interface X3 DP(DRIVE)
⑤	Interface X1 MPI/DP
⑥	Power supply connection
⑦	Interface X2 P2 PROFINET
⑧	Interface X2 P1 PROFINET
⑨	Mode switch
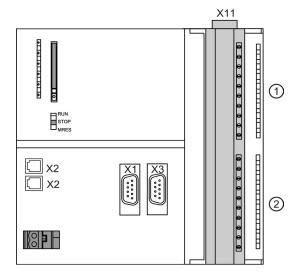
Figure 2-1   Operator controls and display elements of the Technology CPU

Integrated inputs and outputs for integrated technology

The Technology CPU features 4 integrated digital inputs and 8 integrated digital outputs for technological functions, which you can configure using S7T Config (included in the S7 Technology add-on package). You use the integrated inputs and outputs for applications in which rapid technological processing is of prime importance.

The digital outputs are provided for high-speed camming functions and can be used in combination with with technology functions in the STEP 7 user program. Digital inputs can be used with technology functions such as reference point acquisition (reference cam) as well as with technology functions in the STEP 7 user program. The status of the digital inputs and outputs can be read from the S7 program from the "MC_Device" technology object DB. A special call of technology functions is not required. You can also use the signals for non-technology functions, for example as a simple input. Setting is not possible through the technology object DB.

If you wish to evaluate other inputs and outputs in the STEP 7 user program, they can be interconnected in the usual way by means of supplementary input/output modules.

①   4 digital inputs
②   8 digital outputs

Figure 2-2   Integrated technology inputs and outputs on the Technology CPU with open front door

Slot for the SIMATIC Micro Memory Card

Memory module is a SIMATIC Micro Memory Card. The Technology CPU does not have an integrated load memory. You have to use a SIMATIC Micro Memory Card as the memory module. A SIMATIC Micro Memory Card with 8 MB is required to use the complete functionality.

Mode switch

The mode switch is used to set the current mode of the CPU.

Table 2- 1   Mode switch settings

Position	Meaning	Description
RUN	RUN mode	The CPU executes the user program.
STOP	STOP mode	The CPU does not execute a user program.
MRES	CPU memory reset	Mode switch in momentary action position for CPU memory reset. A CPU memory reset by means of mode switch requires a specific sequence of input.

Power supply connection

Each CPU is equipped with a double-pole power supply socket. The connector with screw terminals is inserted into this socket when the CPU is delivered.

Status and error displays

The CPU is equipped with the following LEDs:

Table 2- 2   Status and error displays of the CPU

LED designation	Color	Meaning
SF	Red	Hardware or software error
BF1	Red	Bus error at interface (X1)
BF2	Red	Bus fault at interface (X2)
BF3	Red	Bus error at interface (X3)
MAINT	Yellow	Maintenance demand
5 VDC	Green	5V power supply for the CPU and the S7-300 bus
FRCE	Yellow	LED lights up: Active force job LED flashes at 2 Hz: Node flash test function
RUN	Green	CPU in RUN. The LED flashes during STARTUP at a rate of 2 Hz, and at 0.5 Hz in HOLD state.
STOP	Yellow	CPU in STOP, or HOLD, or STARTUP. The LED flashes • At 0.5 Hz on general reset request • At 2 Hz during general reset • At 2 Hz during shutdown (LED RUN lit)

Shutdown

What happens during shutdown?

1. The control of the Technology CPU is already in STOP mode during "shutdown".
   The outputs of the central and distributed I/O on the MPI/DP are deactivated. The "STOP" LED flashes at 2 Hz. The "RUN" LED lights up.

2. The integrated inputs/outputs for integrated technology and the distributed I/Os on DP(DRIVE) are still active during shutdown.

3. The integrated technology of the Technology CPU shuts down the drives on PROFIBUS DP(DRIVE) in a controlled manner.

4. The integrated technology then also switches to STOP. The integrated inputs/outputs for integrated technology and the distributed I/Os on DP(DRIVE) are deactivated.
   The "STOP" LED lights up.

The maximum duration of shutdown depends on your configuration in S7T Config.

⚠ CAUTION

Shutdown

The distributed I/Os on DP(DRIVE) cannot be controlled from the user program during "shutdown". The outputs which can be controlled with technology function "MC_WritePeripherie" retain their last current setting.

Reference

Additional information

- About the CPU operating modes is available in the STEP 7 online help.

- About operating the mode switch for CPU memory reset is available in the S7-300, CPU 31xC, and CPU 31x Operating Instructions: Configuration (http://support.automation.siemens.com/WW/view/en/13008499), Commissioning section.

- About evaluating the LEDs in the event of an error / diagnostics is available in the operating instructions S7-300, CPU 31xC, and CPU 31x: Configuration (http://support.automation.siemens.com/WW/view/en/13008499), Debugging functions, diagnostics and troubleshooting section.

- About using the SIMATIC MMCs and the memory concept is available in the Memory Concept section.

Setting up an S7-300 with a Technology CPU 3

3.1 Overview

This section
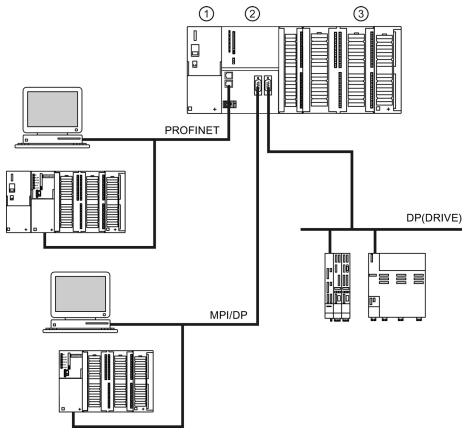
provides information that deviates from the operating instructions, S7-300, CPU 31xC and CPU 31x: Installation, or that that you will also require.

Note

When installing, commissioning and operating the S7-300 systems, observe the installation guidelines and safety instructions in the "Configuring", "Installing" and "Wiring" chapters of the "S7-300, CPU 31xC and CPU 31x: Installation" manual.

3.2 S7-300 components

Sample configuration of an S7-300

① Power supply (PS) module
② Central processing unit (CPU)
③ Signal module (SM)

Figure 3-1   S7-300 components

You use a programming device (PG) to program the S7-300. The PG can be connected to the CPU via the MPI/DP, PROFINET or DP Drive interface.

No programming device / OP on DP(DRIVE)

We recommend that you do not connect a programming device / OP to DP(DRIVE) (X3).

Reason: The connection of a programming device / OP to DP(DRIVE) changes certain properties on DP(DRIVE) such as the constant bus cycle time. Synchronism between drives may be lost as a result. Therefore, always connect a programming device / OP to the MPI/DP interface (X1) or to the PROFINET interface (X2) and access the DP(DRIVE) via the "Routing" function.

3.3 Configuring

3.3.1 Single-tier configuration

Single-tier configuration

The Technology CPU supports only single-tier configurations.

3.3.2 Subnets

Overview: Subnets with the Technology CPU

The Technology CPU provides the following subnets:

- Multi Point Interface (MPI) or PROFIBUS DP
- PROFINET (Industrial Ethernet)
- DP(DRIVE): Optimized for drives

Transmission rate

Maximum transmission rates:

- MPI/PROFIBUS DP: 12 Mbps

  We recommend that you set 12 Mbps for the Technology CPU

- DP(DRIVE): 12 Mbps
- PROFINET: 10/100 Mbps

Note

Before you transfer projects to the Technology CPU via the MPI/DP interface, you should increase the transmission rate to at least 1.5 Mbps; otherwise the data transmission can take a very long time (up to 15 minutes at 187.5 Kbps).

Number of nodes

Maximum number of nodes per subnet:

Table 3- 1   Subnet nodes
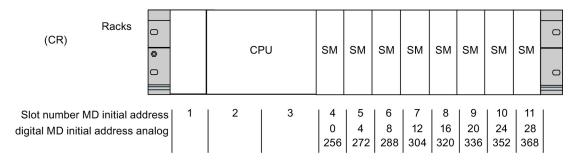
Parameters	MPI	PROFINET	PROFIBUS DP	PROFIBUS DP(DRIVE)
Quantity	127	128	126	64
Addresses	0 to 126	1 to 128	0 to 125	1 to 125
Comment	Default: 32 addresses Reserved addresses: • Address 0 for PG • Address 1 for OP	-	of which: 1 master (reserved) 1 PG connection (address 0 reserved) 124 slaves or other masters	of which: 1 master (reserved) and 32 slaves or drives

3.4   Addressing

Slot-specific addressing of modules

The Technology CPU is assigned to two slot numbers: 2 and 3.

The input and output addresses for I/O modules begin at the same module start address.

Figure 3-2   Slots of the S7-300 with Technology CPU and associated module start addresses

3.5 Commissioning

Requirements

If you wish to utilize the full scope of CPU functions, you will require

- STEP 7 as of V5.5 SP2 and the S7 Technology V4.2 add-on package
- S7-300 is installed
- S7-300 is wired
- For a networked S7-300:
  - MPI/PROFIBUS addresses are set
  - PROFINET settings for PN/DP
  - Terminating resistors on the segments are enabled

3.6 Operating system

Technology CPU operating system

To meet the requirements of the integrated technology, technology functions have been added to the standard CPU operating system to obtain the technology operating system.

The technology operating system is included in the project and the configuration. In other words, if you download a project created with S7 Technology to the Technology CPU, the technology operating system is automatically transferred at the same time.

Updating the operating system

You can order the latest versions of the operating system from your Siemens representative or you can download it from the Internet (http://support.automation.siemens.com).

A firmware update is only possible through the hardware configuration / STEP 7 and online access via the X1 or X2 interface, not through the SIMATIC Micro Memory Card.

3.7 Status and error displays

Status and error displays of the Technology CPU

Table 3- 2   Status and error displays of the Technology CPU

LED						Meaning
SF	MAINT	DC5V	FRCE	RUN	STOP	
Off	Off	Off	Off	Off	Off	CPU power supply missing. Remedy: Check whether the power supply module is connected to mains and switched on. Check whether the CPU is connected to the power supply and switched on.
Off	X	On	X	Off	On	The CPU is in STOP mode. Remedy: Start the CPU.
On	X	On	X	Off	On	The CPU is in STOP mode as a result of error. Remedy: Refer to the tables below, evaluation of the SF LED
X	X	On	X	Off	Flashes (0.5 Hz)	The CPU requests memory reset.
X	X	On	X	Off	Flashes (2 Hz)	The CPU executes memory reset.
X	X	On	X	Flashes (2 Hz)	On	The CPU is in startup mode.
X	X	On	X	Flashes (0.5 Hz)	Flashes (0.5 Hz)	During the transfer of the MC7 blocks from the load memory to the work memory, STOP and RUN flash with 0.5 Hz until the STOP operating state is reached.
X	X	On	X	Flashes (0.5 Hz)	On	The CPU was halted by a programmed break point. For more information, refer to the Manual Programming with STEP 7.
On	X	On	X	X	X	Hardware or software error Remedy: Refer to the tables below, evaluation of the SF LED

LED						Meaning
SF	**MAINT**	**DC5V**	**FRCE**	**RUN**	**STOP**	
X	On	X	X	X	X	With IRT mode of a PROFINET IO system: • Failure of the sync master in a sync domain • Synchronization loss of the own station (for example through failure of the sync master) • Synchronization loss of a PROFINET IO device (for example through failure of the sync master) Other PROFINET IO maintenance demands (for example excessive attenuation of fiber-optic cables) With media redundancy (MRP): • Connection between ring ports is missing or interrupted • An MRP client in the ring has failed • When there are several redundancy managers
X	X	X	On	X	X	You have enabled the Force function. You can find additional information in the Programming with STEP 7 manual
X	X	X	Flashes (2 Hz)	X	X	Station flash test was activated
Flashes	X	Flashes	Flashes	Flashes	Flashes	There is an internal system error in your CPU. Proceed as follows: 1. Set the mode switch to the STOP position. 2. Perform a POWER OFF/POWER ON. 3. Read the diagnostic buffer with STEP 7. 4. Read the service data for CPUs ≥ V2.8. 5. Contact your local SIEMENS representative.
X	X	X	X	On	Flashes (2 Hz)	STOP/shutdown What happens during shutdown? The control of the Technology CPU is already in STOP mode during "shutdown". The outputs of the centralized and distributed I/Os are deactivated. The integrated inputs/outputs for integrated technology and the ET 200M on the DP(DRIVE) are still active during shutdown. The integrated technology of the Technology CPU shuts down the drives on PROFIBUS DP(DRIVE) in a controlled manner. The integrated technology of the CPU then also goes into STOP. The integrated inputs/outputs for integrated technology and the ET 200M on the DP(DRIVE) are deactivated. The maximum duration of shutdown depends on your configuration in S7T Config.

LED						Meaning
SF	MAINT	DC5V	FRCE	RUN	STOP	
Flashes (2 Hz)	Off	Off	Off	Off	Off	The CPU does not have valid firmware.
X	X	X	X	Flashes (0.5 Hz)	Flashes (2 Hz)	HOLD/shutdown
Flashes	Flashes	Flashes	Flashes	Flashes	Flashes	Internal errors in Technology CPU. Contact your local SIEMENS representative.
X: This status is irrelevant for the current CPU function.						

Status and error displays for DP or DP(DRIVE)

Table 3- 3   LEDs BF1, BF2 and BF3

LED			Meaning
BF1	BF2	BF3	
On/ flashes	X	X	Error on the PROFIBUS DP interface of the Technology CPU. Remedy: See table LED BF1 illuminated
X	On/ flashes	X	Error on the PROFINET interface of the Technology CPU. Remedy: See operating instructions CPU 31xC and CPU 31x: Configuration (http://support.automation.siemens.com/WW/view/en/13008499), section Status and error displays: CPUs with PROFINET interface for the S7-300
X	X	On/ flashes	Error on the DP(DRIVE) interface Remedy: See table LED BF3 flashing
X: The LED can assume the On or Off state. This status, however, is irrelevant for the current CPU function. For example, the states Force On or Off do not influence the CPU STOP status			

Table 3- 4   LED BF1 lit

Possible errors	CPU reaction	Possible remedies
• Bus fault (hardware fault) • DP interface error • Different transmission rates in multiple DP master mode. • If the DP slave / master interface is active: Short-circuit on the bus. • With passive DP slave interface: transmission rate search, i.e. there are no other active nodes on the bus (a master, for example)	Call of OB 86 (when CPU is in RUN mode). CPU switches to STOP if OB 86 is not loaded.	• Check the bus cable for short-circuit or breaks. • Evaluate the diagnostics. Reconfigure or correct the configuration.

Table 3- 5   LED BF1 flashes

Possible errors	CPU reaction	Possible remedies
The CPU is DP master / active slave: • Failure of a connected station • At least one of the configured slaves cannot be accessed. • Incorrect configuration	Call of OB 86 (when CPU is in RUN mode). CPU switches to STOP if OB 86 is not loaded.	Verify that the bus cable is connected to the CPU and the bus is not interrupted. Wait until the CPU has completed its startup. If the LED does not stop flashing, check the DP slaves, or evaluate their diagnostics data.
The CPU is a DP slave The CPU parameters are incorrectly set. Possible causes: • The watchdog timer has elapsed. • PROFIBUS DP communication is down. • Incorrect PROFIBUS address. • Incorrect configuration	Call of OB 86 (if CPU is in RUN mode). CPU switches to STOP if OB 86 is not loaded.	• Check the CPU. • Verify that the bus connector is properly seated. • Check whether the bus cable to the DP master has been disconnected. • Check the configuration and parameter assignment.

Table 3- 6   LED BF3 lit

Possible errors	CPU reaction	Possible remedies
• Bus fault (hardware fault) • DP interface error	Error message in the technology DB configured by you.	Check for short-circuit or interruption in the bus cable.

Table 3- 7   LED BF3 flashes

Possible errors	CPU reaction	Possible remedies
• Failure of a connected station • At least one of the configured slaves cannot be accessed. • Incorrect configuration	Error message in the technology DB configured by you.	Verify that the bus cable is connected to the CPU and the bus is not interrupted. Wait until the CPU has completed its startup. If the LED does not stop flashing, check the DP slaves, or evaluate their diagnostics data.

Communication 4

4.1 Interfaces

4.1.1 Overview

Technology CPU with three interfaces

- MPI/DP interface (X1)
- PROFINET interface (X2)
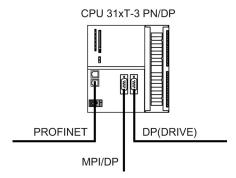- PROFIBUS DP(DRIVE) interface (X3)

Figure 4-1   Technology CPU interfaces

4.1.2 MPI/DP interface (X1)

You can find information about the MPI/DP interface (X1) in the manual CPU 31xC and CPU 31x: Technical Specifications (http://support.automation.siemens.com/WW/view/en/12996906) in the sections Multi Point Interface (MPI) and PROFIBUS DP.

4.1.3   PROFINET interface (X2)

Special features

The CPUs have the following special features:

- PROFINET CBA is not supported.
- IRT "high flexibility" is not supported
- Isochronous mode:
  Isochronous mode (with OB 61) can only be configured at the X1 interface (MPI/DP)
  or at the X2 interface (PROFINET). Simultaneous configuration with both interfaces is not
  possible.
- Use of FB65 TCON
  The local_device_id parameter has to be set to B#16#03.

Reference

You can find additional information about the PROFINET interface in the PROFINET system
description (http://support.automation.siemens.com/WW/view/en/19292127) and in the
manual CPU 31xC and CPU 31x: Technical specifications
(http://support.automation.siemens.com/WW/view/en/12996906) in the PROFINET chapter.

4.1.4   PROFIBUS DP(DRIVE) interface (X3)

Properties

The PROFIBUS DP(DRIVE) interface is used to connect drive systems. You can connect
drive systems in accordance with the PROFIdrive.

The PROFIBUS DP(DRIVE) interface is configured as a master and supports transmission
rates up to 12 Mbps.

The PROFIBUS DP(DRIVE) interface supports the isochronous mode.

The CPU sends its bus parameter settings (e.g. transmission rate) via the
PROFIBUS DP(DRIVE) interface.

Using the "Routing" function, you can access the drive parameters of the slaves in the
DP(DRIVE) line for the purposes of commissioning and diagnostics. Diagnostics cannot be
performed via PROFIBUS DP(DRIVE) from the STEP 7 user program.

Note

If you deselect "Startup if expected/actual config. differ" in the Technology CPU properties in
STEP 7, the Technology CPU boots even if the stations configured on DP-DRIVE are
missing.

Note

The 3rd interface of the Technology CPU is allocated to PROFIBUS DP(DRIVE) and cannot
be used as an additional interface for PROFIBUS DP.

Connectable devices

You can connect drives to PROFIBUS DP(DRIVE), e.g.:

- SINAMICS S120 (optional with TM15 or TM17 high feature for high-speed cams)
- PROFIBUS module IM 174 (interface for analog drives and stepper motors)
- SINAMICS G120
- SIMODRIVE 611 universal
- ET 200M with IM 153-2 (isochronous!) and SM 322 for additional cam output
- ET 200S with IM 151-1 high feature
- Isochronous PROFIBUS encoder "SIMODRIVE sensor isochronous"
- ADI4 (analog drive interface)

The components configured in HW Config are displayed in the "Hardware Catalog" window in HW Config. To show the screen, select profile "SIMATIC Technology CPU" in HW Config.

To ensure that the profile's selection list is complete, you must have installed the most recent version of S7 Technology.

Non-connectable devices

It is not advisable to operate active PROFIBUS stations (PGs, PCs, OPs, TDs, etc.) on PROFIBUS DP(DRIVE). The DP cycle will be burdened by additional access times if you do operate these PROFIBUS nodes on DP(DRIVE). As a consequence, isochronous processing of the drives cannot be ensured.

Therefore, always connect a PG/OP to the MPI/DP or PROFINET interface and access the DP(DRIVE) by means of the "Routing" function.

No diagnostics on DP(DRIVE)

With the Technology CPU, note that you cannot evaluate any diagnostics data from DP(DRIVE) in your STEP 7 user program.

However, with your PC/PG on PROFIBUS DP or PROFINET, you can can use the "Routing" function to access the drive parameters on the DP(DRIVE) segment for commissioning and evaluating diagnostics (with appropriate drive tools).

Additional information

You can find additional information about the communication interfaces and time synchronization in the "Communication" sections of the manual CPU 31xC and CPU 31x: Technical Specifications (http://support.automation.siemens.com/WW/view/en/12996906).

4.2 Communication services

4.2.1 Overview

Selecting the communication service

You need to decide on a communication service, based on functionality requirements. Your choice of communication service will influence

- the functionality available,
- whether an S7 connection is required or not, and
- the connection timing.

The user interface can vary considerably (SFC, SFB, ...), and is also determined by the hardware used (SIMATIC CPU, PC, ...).

Overview of communication services

The table below provides an overview of communication services offered by the CPU.

Table 4- 1   CPU communication services

Communication service	Functionality	Time at which the S7 connection is established ...	via MPI	via DP	to DP(DRIVE)	Via PN
PG communication	Commissioning, test, diagnostics	from the PG, starting when the service is being used	X	X	-	X
OP communication	Operator control and process monitoring	from the OP at Power ON	X	X	-	X
S7 basic communication	Data communication	is programmed at the blocks (SFC parameters)	X	-	-	-
S7 communication	Data communication	As server only, communication link is set up by the communication partner	X	X	-	X
Global data communication*	Cyclic data exchange (for example, bit memories)	Does not require an S7 connection	X	-	-	-
Routing PG functions**	for example testing, internetwork diagnostics	from the PG, starting when the service is being used	X	X	X	X
PROFIBUS DP	Data communication between master and slave	Does not require an S7 connection	-	X	X	-
PROFINET IO data exchange between	IO controllers and the IO devices	Does not require an S7 connection	-	-	-	X
Web server	Diagnostics	Does not require an S7 connection	-	-	-	X

Communication service	Functionality	Time at which the S7 connection is established ...	via MPI	via DP	to DP(DRIVE)	Via PN
SNMP (Simple Network Management Protocol)	Standard protocol for network diagnostics and network configuration	Does not require an S7 connection	-	-	-	X
Open communication via TCP/IP	Data exchange via Industrial Ethernet with TCP/IP protocol (using loadable FBs)	Does not require an S7 connection, programmed via loadable FBs	-	-	-	X
Open communication via ISO on TCP	Data exchange via Industrial Ethernet with ISO on TCP protocol (using loadable FBs)	Does not require an S7 connection, programmed via loadable FBs	-	-	-	X
Open communication via UDP	Data exchange via Industrial Ethernet with UDB protocol (using loadable FBs)	Does not require an S7 connection, programmed via loadable FBs	-	-	-	X
Data record routing	For example, configuration and diagnostics of field devices on the PROFIBUS DP by an engineering system that is operated at an MPI or PROFINET interface (for example, PDM)	Performed when the configuration tool accesses the field device	X	X	-	X
Time synchronization	Broadcast message frames	Does not require an S7 connection	X	X	-	-
	NTP	Does not require an S7 connection	-	-	-	X

* The number of resources for global data communication can be found in the Technical Specifications.

** Functions can be routed only to DP(DRIVE), but not on DP(DRIVE)!

The following section describes the special features of the communication services of the CPU 31xT. You can find general information about the communication services and DPV1 in the device manual S7-300 CPU 31xC and 31x: Technical Specifications (http://support.automation.siemens.com/WW/view/en/12996906) and in the Communication with SIMATIC manual.

4.2.2 Routing

Definition

The routing function enables you to attach a PG/PC at any point in the network and establish a connection to all drives accessible via gateways.

Accessing drives in a DP(DRIVE) subnet from a PG/PC

The Technology CPU supports the routing of test, diagnostics and parameter assignment functions **to** the DP(DRIVE) subnet (X3) via the MPI / DP interface (X1) and PROFINET (X2).

The Technology CPU provides a certain number of connection resources for routing. These connections are available in addition to the S7 connection resources.

The number of routing connections can be found in the Technical Specifications.

Network gateway

Gateways between subnets are routed in a SIMATIC station that is equipped with interfaces to the respective subnets. The figure below shows the Technology CPU (DP master) acting as router for subnets 1 and 2.
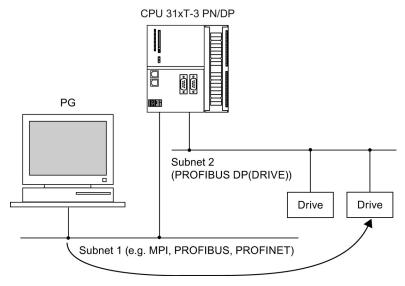

Figure 4-2   Routing - network gateway

Requirements for routing

- The station modules are "capable of routing" (CPUs or CPs).

- The network configuration does not exceed project limits.

- The modules have loaded the configuration data containing the latest "knowledge" of the entire network configuration of the project.

  Reason: All modules participating in the network transition must receive the routing information defining the paths to other subnets.

  Note: This can be done by loading "All stations" in NetPro.
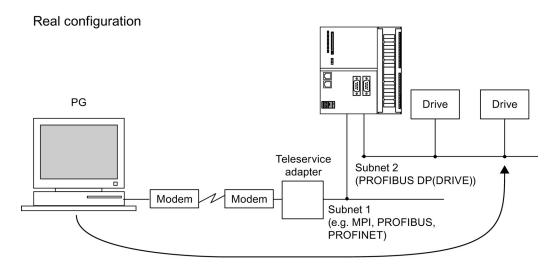
- In your network configuration, the PG/PC you want to use to establish a connection via network node must be assigned to the network it is physically connected to.

Example of an application: TeleService

The figure below shows the example of an application for remote maintenance of an S7 station using a PG. The connection to other subnets is here established via modem connection.

The lower section of the figure shows how to configure this in STEP 7.

Real configuration

Configuration in STEP 7

Figure 4-3   Routing - example of TeleService application

Additional information

Additional information:

● About setting the PG/PC interface for routing can be found in Getting Started CPU 317T: About controlling a SINAMICS S120 is available in section Configuring the PG/PC Interface.

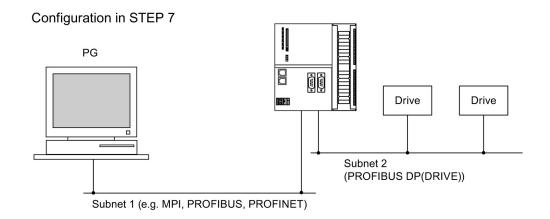● About routing can be found in the Programming with STEP 7 manual, or directly in the STEP 7 online help.

● About configuring with STEP 7 can be found in the Configuring Hardware and Connections in STEP 7 manual.

● About fundamentals can be found in the Communication with SIMATIC manual.

● About the TeleService adapter can be found on the Internet (http://support.automation.siemens.com/WW/view/en/14053309).

● About SFCs can be found in the Instruction list, more details are available in the STEP 7 online help or to the System and Standard Functions reference manual.

● About communication can be found in the Communication with SIMATIC manual.

● About data record routing and time synchronization can be found in the device manual CPU 31xC and CPU 31x: Technical Specifications (http://support.automation.siemens.com/WW/view/en/12996906).

4.3 S7 connections

Number of connection resources for routing

The number of connection resources for the routing function differs:

- Interface X1 configured as:
  - MPI: Max. 10
  - DP master: Max. 24
  - DP slave (active): Max. 14
- Interface X2 configured as:
  - PROFINET: Max. 24

Reference

You can find information about S7 connections in the manual CPU 31xC and CPU 31x: Technical Specifications (http://support.automation.siemens.com/WW/view/en/12996906) in the section S7 connections.

You can find information about DPV1, Web server and PROFINET in the manual CPU 31xC and CPU 31x: Technical Specifications (http://support.automation.siemens.com/WW/view/en/12996906) in the corresponding sections.

Note

PROFINET

PROFINET CBA is not supported.

Only "high performance" is supported for IRT.

Memory concept

<div style="text-align:right; font-size:3em;">5</div>

5.1 Memory areas and retentive address areas

5.1.1 Technology CPU memory areas

The memory of the Technology CPU is divided into three areas:
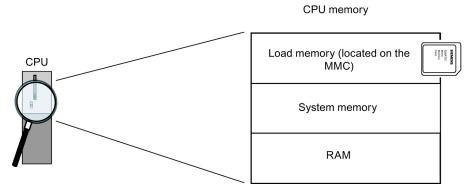
Figure 5-1   Technology CPU memory areas

Load memory

The load memory is located on the SIMATIC micro memory card (MMC). It is used to store code blocks, data blocks and system data (configuration, connections, module parameters, technology system data etc.).

For the Technology CPU, the size of the load memory corresponds to the size of the SIMATIC MMC minus approx. 4 MB. The 4 MB are required for the integrated technology and are therefore not available to the user.

Blocks that are identified as not relevant for the execution are stored exclusively in the load memory.

You can also store all the configuration data for your project on the SIMATIC Micro Memory Card.

⚠ **CAUTION**

Loading user programs

Downloading user programs and hence operating the CPU is only possible if a SIMATIC MMC is inserted.

If you pull out the SIMATIC MMC while the CPU is in RUN mode, the CPU goes to STOP mode and the drives are shut down in accordance with your programming in the STEP 7 user program.

This is why you should only remove the SIMATIC Micro Memory Card when the CPU is in STOP.

System memory

The system memory is integrated in the CPU and cannot be expanded.

It contains

- the operand areas for memory bits, times and counters
- the process image of the inputs and outputs
- the local data

Work memory

The work memory is integrated in the CPU and cannot be extended. It is used to run the code and process user program data. Programs only run in the work memory and system memory.

5.1.2   Retentivity of load memory, system memory, and technology system data

Introduction

Your CPU is equipped with a maintenance-free retentive memory that does not require a backup battery. Data is also retained in the retentive memory throughout POWER OFF and restart (warm restart).

Retentive data in load memory

Your program in the load memory is always retentive: it is already stored on the SIMATIC Micro Memory Card, where it is protected against power failure or memory restart.

Retentive data in system memory

In your configuration (Properties of CPU, Retentivity tab), specify which parts of the tags, timers and counters should be retentive and which of them are to be initialized with "0" on restart (warm restart).

The diagnostics buffer, MPI address (and transmission rate) and operating hour counter data are generally written to the retentive memory area on the CPU. Retentivity of the MPI address and baud rate ensures that your CPU can continue to communicate, even after a power loss, memory reset or loss of communication parameters (e.g. due to removal of the SIMATIC Micro Memory Card or deletion of communication parameters).

Retentive data in the work memory

Therefore, the contents of retentive DBs are always retentive at restart and POWER ON/OFF. Retentive data blocks can be uploaded to the work memory in accordance with the maximum limit allowed by the work memory.

In the case of the Technology CPU, non-retentive DBs are also supported. Non-retentive DBs are initialized from the load memory with their initial values whenever a restart is performed or when the power is switched off and then on again. Non-retentive data blocks and code blocks can be loaded in accordance with the maximum work memory limit.

For information on the size of the retentive working memory (for retentive data blocks), refer to the Technical Specifications.

Technology system data

The technology system data are always stored as retentive data in the load memory of the CPU.

5.1.3 Retentive behavior

Retentive behavior of the memory objects

The table below shows the retentive behavior of memory objects during specific operating state transitions.

Table 5- 1   Retentive behavior of the memory objects

Memory object	Operating state transition		
	POWER ON/ POWER OFF	STOP → RUN	CPU memory reset
User program/data (load memory)	X	X	X
• Retentive behavior of the DBs (without technology DB)	Can be set in the Properties of the DBs.		-
• Retentive behavior of the technology DBs	-	-	-
memory bits, timers and counters configured as retentive data	X	X	-
Diagnostics buffer, operating hour counters	x [1]	X	X
MPI/DP address, baud rate of an MPI interface DP address, baud rate of the MPI/DP interface, if this is programmed for operation as DP node.	X	X	X
IP Suite / device name of the PROFINET interface	Depending of the type of assignment of the IP address parameters and of the device name	X	Depending of the type of assignment of the IP address parameters and of the device name
Technological parameters • Changed with FB "MC_WriteParameter" • Changed with S7T Config	- X	X X	- X

x = retentive; - = non-retentive

[1]   With POWER OFF/POWER ON, only the last 100 entries in the diagnostic buffer are retentive.

Reference

You can find additional information about the assignment of the IP address parameters and the device name in the operating instructions CPU 31xC and CPU 31x: Installation (http://support.automation.siemens.com/WW/view/en/13008499), in the chapter: Assigning IP address parameters and the device name.

Retentivity of the memory of the CPU's integrated technology

The values for the absolute encoder calibration are stored in a non-volatile memory in the integrated technology of the CPU.

Retentive behavior of a DB with S7-300 CPUs

Information about the retentivity of the memory objects is available in the device manual CPU 31xC and CPU 31x: Technical specifications (http://support.automation.siemens.com/WW/view/en/12996906) in the section Memory areas and retentivity.

Retentive behavior of the technology data blocks

Technology data blocks are non-retentive.

5.1.4   Address areas of system memory

I/O image DP(DRIVE)

Part of the address areas of the DP(DRIVE) is listed in the integrated technology as I/O image DP(DRIVE). You can read this area in the user program with the technology function "MC_ReadPeriphery" and write with the technology function "MC_WritePeriphery".

The update of the I/O image DP(DRIVE) is described in the S7 Technology manual at the technology functions "MC_ReadPeriphery" and "MC_WritePeriphery".

Reference

You can find additional information about the operand areas of the system memory in the manual CPU 31xC and CPU 31x: Technical Specifications (http://support.automation.siemens.com/WW/view/en/12996906) in the section Operand areas of the system memory.

5.2 Memory functions, reset and warm restart

You can find information about the memory function, the restart (warm restart) and storing of project data on the SIMATIC Micro Memory Card in the device manual CPU 31xC and CPU 31x: Technical Specifications (http://support.automation.siemens.com/WW/view/en/12996906) in the section Memory functions.

CPU memory reset

After the insertion/removal of a SIMATIC Micro Memory Card, a CPU memory reset restores defined conditions in order to enable a CPU restart (warm start).

Technology CPU:

● The CPU's memory management is rebuilt.

● Blocks in load memory are retained.

● All runtime-related blocks are transferred from the load memory to the work memory again.

● The data blocks in the work memory are initialized (are thus reset to their initial values).

Integrated technology of Technology CPU:

The CPU waits until the integrated technology has reached the STOP state.

● The integrated technology is configured again.

● The retentive memory of the integrated technology is rebuilt.

● Any distributed I/Os connected to DP(DRIVE) are configured again.

● The integrated technology is initialized again.

Reference

Also refer to CPU memory reset by means mode selector switch in the Commissioning section in the CPU 31xC and CPU 31x Operating Instructions.

5.3 Technology data blocks

Introduction

The integrated technology of the Technology CPU provides current information on the status and on the values of the technology objects via the technology data blocks. To achieve especially short response times, the technology data blocks can be evaluated in OB 65.

Processing sequence

When technology objects are configured, *S7-Technology* creates data blocks in the block folder.

If you initiate jobs to drives using a technology function, you read the states and values in the associated technology data block. A job is active if the block signals busy.

The CPU can execute a maximum of 210 active jobs simultaneously.

Technology functions that access technology data in read or write mode, occupy additional memory via the input parameter ANY-pointer. These are, for example:

- MC_ReadPeriphery
- MC_WritePeriphery
- MC_ReadRecord
- MC_WriteRecord
- MC_ReadDriveParameter
- MC_WriteDriveParameter
- MC_CamSectorAdd

No more than 100 jobs can be active simultaneously with the input parameter ANY-Pointer.

Reference

For further information, refer to the *S7 Technology* manual.

5.4 Memory of the integrated technology of the CPU

Memory utilization

The following table contains typical values for the memory utilization in the integrated technology. The values refer to a Technology CPU with firmware version of the Integrated Technology V4.1.5 of higher: The measuring tolerance is 0.1 %.

Technology	Memory utilization
Base load of the integrated technology	18 %
Speed-controlled axis	0.7 %
Positioning axis	1.0 %
Following axis (with one following object)	1.5 %
Following axis (with two following objects)	2.0 %
External encoders	0.3 %
Output cams	0.15 %
Cam track	1.4 %
Measuring inputs	0.15 %
Cam (empty)	0.02 %
Cam interpolation points*	0.0017 %
Path positioning axis	1.0 %
Path following axis (with one following object)	1.5 %
Path following axis (with two following objects) 1.5 % 1.4 % path object, Cartesian XY	2.0 %
Path object, Roll picker XY	0.9 %
Path object, Cartesian XYZ	0.9 %
Path object, Scara	0.9 %
Path object, articulated arm	0.9 %
Path object, Delta 2D picker	0.9 %
Path object, Delta 3D picker	0.9 %

* You can find more information in the following calculation example.

The maximum memory load should not exceed 80 %.

Note

With insufficient memory, the Technology CPU goes into STOP mode. Note that these listed values are only typical values and some commands may temporarily require more memory during runtime.
If the memory utilization is excessive, online monitoring from S7T Config may no longer be possible. Therefore, the recommended calculated maximum memory utilization should not be exceeded.

Calculation example

The table shows the memory load for an example configuration with SIMATIC with CPU 317T-3 PN/DP E version 01. The maximum memory load of 58 % is therefore less than the recommended maximum.

Quantity	Description	Memory utilization	Memory utilization (total)
1	Base load of the integrated technology	18 %	18 %
6	Following axis (with one following object)	1.5 %	9 %
2	External encoders	0.3 %	0.6 %
6	Output cams	0.15 %	0.9 %
2	Measuring inputs	0.15 %	0.3 %
14	Cam (empty)	0.02 %	0.28 %
6000*	Cam interpolation points	0.0017 %	10.2 %
1000**	Cam interpolation points to be interpolated	0.0034 %	3.4 %
	Total		**42.68 %**

* The maximum possible number of cam interpolation points must be taken into account as value in the Technology CPU. Example:

10 cams each with 300 cam interpolation points

2 cams each with 500 cam interpolation points

2 cams each with 1000 cam interpolation points

This is a total of 6000 cam interpolation points (10x300 + 2x500 + 2x1000).

** Additional memory is used during the interpolation of a cam. As only one cam can be interpolated at one time, in this case the cam with the largest number of cam interpolation points must be taken into account (this is 1000 cam interpolation points in the calculation example).

Reference

You can find more detailed information on determining the actual memory assignment in the integrated technology in the S7 Technology manual.

Cycle and response times

6

Overview

For information on calculating the cycle and response times for the CPU 31xT, refer to the CPU 31xC and CPU 31x manual. Technical Specifications, "Cycle and response times" section

Reference: Cycle time

You can view the cycle time of your user program on the PG.

Reference: Execution time

You can find information in the *S7-300 Instruction List for CPUs 31xC and 31x*. This tabular list contains the execution times for all

- *STEP 7* instructions the relevant CPUs can execute,
- the SFCs / SFBs integrated in the CPUs,
- the IEC functions which can be called in *STEP 7*.

Reference: Motion Control runtimes

You can find information about runtimes on PROFIBUS DP(DRIVE) in the *S7 Technology* manual.

Technical specifications

7

7.1 General technical data

7.1.1 Standards and approvals

The Technology CPU orientates itself on the following standards:

● PLCopen - Technical Committee 2 – Task Force Function blocks for motion control Version 2.0

● Profile Drive Technology PROFIdrive Version 4.1

Reference: Standards and approvals

The current standards and approvals for the CPU 31xT-3 PN/DP are available in the section Standards and approvals in the operating instructions CPU 31xC and CPU 31x: Configuration (http://support.automation.siemens.com/WW/view/en/13008499) (on the product DVD of the S7 Technology add-on package).

7.1.2 Technical specifications of the Micro Memory Card

Plug-in SIMATIC Micro Memory Cards

Memory modules available:

Table 7- 1   Available SIMATIC Micro Memory Card

Type		Order number
SIMATIC Micro Memory Card	8 MB	6ES7953-8LPxx-0AA0

7.1.3 Additional general technical specifications

You can find information about the following topics of the general technical specifications in the operating instructions CPU 31xC and CPU 31x: Configuration (http://support.automation.siemens.com/WW/view/en/13008499) in the corresponding sections:

● Rated voltage of S7-300

● Electromagnetic Compatibility

● Shipping and storage conditions for modules

● Mechanical and climatic environmental conditions for S7-300 operation

● Specification of dielectric tests, protection class, degree of protection, and rated voltage of S7-300
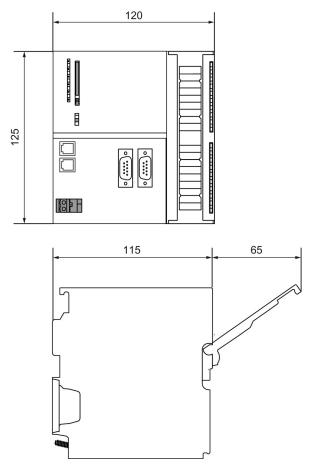
7.1.4 Dimension drawing

Figure 7-1   Dimension drawing of Technology CPU

7.2 Technical specifications of the CPU 315T-3 PN/DP and CPU 317T-3 PN/DP

Technical specifications of the CPUs

- CPU 315T-3 PN/DP, Order no. 6ES7315-7TJ10-0AB0
- CPU 317T-3 PN/DP, Order no. 6ES7317-7TK10-0AB0

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
General information		
HW revision level	01	01
Firmware version	V3.2	V3.2
Engineering with		
Programming package	S7 Technology V4.2 SP3	S7 Technology V4.2 SP3
Supply voltage		
• 24 VDC	Yes	Yes
• valid range, lower limit (DC)	19,2 V	19,2 V
• valid range, upper limit (DC)	28.8 V	28.8 V
external power line fusing (recommendation)	min. 2 A	min. 2 A
Load voltage L+		
• Rated value (DC)	24 V	24 V
• Polarity reversal protection	Yes	Yes
Digital outputs Load voltage L+		
• Rated value (DC)	24 V; (2L+)	24 V; (2L+)
• Polarity reversal protection	No; (2L+)	No; (2L+)
Input current		
• Quiescent current, typically	200 mA	200 mA
• Inrush current, typically	2.5 A	2.5 A
• I²t	1 A²s	1 A²s
Power loss		
• Power loss, typically	6 W	6 W
Memory		
Work memory		
• integrated	384 KB	1024 KB
• expandable	No	No
• Size of the retentive memory for retentive data blocks	128 KB	256 KB

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
Load memory		
• pluggable (MMC)	Yes	Yes
• pluggable (MMC), max.	8 MB	8 MB
• Data retention on MMC (after last programming session), min.	10 a	10 a
Backup		
• Available	Yes, ensured by MMC (maintenance-free)	Yes, ensured by MMC (maintenance-free)
• Without battery	Yes; program and data	Yes; program and data
CPU processing times		
• For bit operations, typ.	0.05 µs	0.025 µs
• For word operations, typ.	0.09 µs	0.03 µs
• For fixed-point arithmetics, typ.	0.12 µs	0.04 µs
• For floating-point arithmetics, typ.	0.45 µs	0.16 µs
CPU blocks		
• Number of blocks (total)	1024; (DBs, FCs, FBs). The maximum number of loadable blocks is possibly reduced due to the MMC used.	2048; (DBs, FCs, FBs). The maximum number of loadable blocks is possibly reduced due to the MMC used.
DB		
• Quantity, max.	1024; range of numbers: 1 to 16000	2048; range of numbers: 1 to 16000
• Size, max.	64 KB	64 KB
FB		
• Quantity, max.	1024; range of numbers: 0 to 7999	2048; range of numbers: 0 to 7999
• Size, max.	64 KB	64 KB
FC		
• Quantity, max.	1024; range of numbers: 0 to 7999	2048; range of numbers: 0 to 7999
• Size, max.	64 KB	64 KB

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
OB		
Description	See Instructions list	See Instructions list
• Size, max.	64 KB	64 KB
• Number of dynamic-cycle OBs	1; OB 1	1; OB 1
• Number of time-of-day interrupt OBs	1; OB 10	1; OB 10
• Number of delay interrupt OBs	1; OB 20, 21	2; OB 20, 21
• Number of cyclic interrupt OBs	1; OB 32, 33, 34, 35	4; OB 32, 33, 34, 35
• Number of process interrupt OBs	1; OB 40	1; OB 40
• Number of DPV1 interrupt OBs	3; OB 55, 56, 57	3; OB 55, 56, 57
• Number of isochronous mode OBs	1; OB 61	1; OB 61
• Number of technology synchronous interrupt OBs	1; OB 65	1; OB 65
• Number of startup OBs	1; OB 100	1; OB 100
• Number of asynchronous error OBs	6; OB 80, 82, 83, 85, 86, 87 (OB83 only for PROFINET IO)	6; OB 80, 82, 83, 85, 86, 87 (OB83 only for PROFINET IO)
• Number of synchronous error OBs	2; OB 121, 122	2; OB 121, 122
Nesting depth		
• per priority class	16	16
• additional ones in an error OB	4	4
Counters, timers and their retentivity		
S7 counters		
• Quantity	256	512
Retentivity		
• Selectable	Yes	Yes
Default	C 0 to C 7	C 0 to C 7
Counting range		
• Selectable	Yes	Yes
• Low limit	0	0
• High limit	999	999

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
IEC counter		
• Available	Yes	Yes
Type	SFB	SFB
• Quantity	Unlimited (limited only by work memory)	Unlimited (limited only by work memory)
S7 times		
• Quantity	256	512
Of which retentive without battery		
• Selectable		Yes
Retentivity		
• Selectable	Yes	Yes
Default	No retentivity	No retentivity
Time range		
• Low limit	10 ms	10 ms
• High limit	9990 s	9990 s
IEC timers		
• Available	Yes	Yes
Type	SFB	SFB
• Quantity	Unlimited (limited only by work memory)	Unlimited (limited only by work memory)
Data areas and their retentivity		
Retentive data area, total	All DBs, max. 128 KB	All DBs, max. 256 KB
Memory bit		
• Quantity, max.	2048 bytes	4096 bytes
• Retentivity available	Yes; MB 0 to MB 2047	Yes; MB 0 to MB 4095
Default retentivity	MB 0 to MB 15	MB 0 to MB 15
• Number of clock bits:	8; 1 memory byte	8; 1 memory byte
Data blocks		
• Quantity, max.	1024; range of numbers: 1 to 16000	2048; range of numbers: 1 to 16000
• Size, max.	64 KB	64 KB
• Retentivity selectable	Yes; at the Non Retain property of the DB	Yes; at the Non Retain property of the DB
Default retentivity	Yes	Yes
Local data		
• per priority class, max.	32 KB; max. 2 KB per block	32 KB; max. 2 KB per block

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
Address space		
I/O address space		
• Inputs	2048 bytes	8192 bytes
• Outputs	2048 bytes	8192 bytes
of those distributed		
• Inputs	2048 bytes	8192 bytes
• Outputs	2048 bytes	8192 bytes
Process image		
• Inputs		8192 bytes
• Outputs		8192 bytes
• Inputs, selectable	2048 bytes	8192 bytes
• Outputs, selectable	2048 bytes	8192 bytes
• Inputs, default	128 bytes	256 bytes
• Outputs, default	128 bytes	256 bytes
Default addresses of integrated channels		
Digital inputs	66	66
Digital outputs	66	66
Process image partitions		
• Number of process image partitions, max.	1	1
Digital channels		
• Inputs	16384	65536
• Outputs	16384	65536
• Inputs, of those central	1024	1024
• Outputs, of those central	1024	1024
Analog channels		
• Inputs	1024	4096
• Outputs	1024	4096
• Inputs, of those central	256	256
• Outputs, of those central	256	256

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
Hardware configuration		
• Racks, max.	1	1
• Modules per rack, max.	8	8
• Expansion devices, max.	0	0
Number of DP masters		
• integrated	2; 1 DP and 1 DP(Drive)	2; 1 DP and 1 DP(Drive)
• via CP	2; for DP	2; for DP
Supported number of FMs and CPs (recommended)		
• FM	8	8
• CP, Point-to-Point	8	8
• CP, LAN	10	10
Time		
Clock		
• Real-time clock	Yes	Yes
• backup, synchronization supported	Yes	Yes
• Daily deviation, max.	10 s	10 s
• Backup duration	6 wk; at 40 °C ambient temperature	6 wk; at 40 °C ambient temperature
Clock behavior after buffer duration has expired		Clock continues to run with the time at which POWER OFF took effect
Operating hours counter		
• Quantity	1	4
Number/range of numbers	0	0 to 3
Range of values	0 to 2^31 hours (with SFC 101)	0 to 2^31 hours (with SFC 101)
Resolution	1 hour	1 hour
• Retentive	Yes; restart necessary after every cold restart	Yes; restart necessary after every cold restart
Time synchronization		
• Supported	Yes	Yes
• On MPI, master	Yes	Yes
• On MPI, slave	Yes	Yes
• On DP, master	Yes	Yes
• On DP, slave	Yes	Yes
• In AS, master	Yes	Yes
• In AS, slave	Yes	Yes

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
Digital data input		
• Number of inputs	4	4
• inputs available for technological functions	4	4
• Input characteristic to IEC 61131, type 1	Yes	Yes
Number of simultaneously controlled inputs		
horizontal mounting position		
• Up to 40 °C, max.	4	4
• Up to 60 °C, max.	4	4
vertical mounting position		
• Up to 40 °C, max.	4	4
Input voltage		
• Rated value, DC	24 V	24 V
For "0" signal	-3 to +5 V	-3 to +5 V
For "1" signal	15 to 30 V	15 to 30 V
Input current		
• For "1" signal, typ.	7 mA	7 mA
Input delay (at rated input voltage)		
For counters/technological functions		
• For "0" to "1", max.	10 µs; typ.	10 µs; typ.
• For "1" to "0", max.	10 µs; typ.	10 µs; typ.
Cable length		
• Shielded cable length, max.	1000 m	1000 m
Digital data output		
• Number of outputs	8	8
• high-speed outputs	8	8
Functions	For technological functions, e.g. high-speed output cam switching signals.	For technological functions, e.g. high-speed output cam switching signals.
• Short-circuit protection	Yes	Yes
Response threshold, typically	1.0 A	1.0 A
Limiting of the inductive cut-off voltage to	48 V	48 V
• Lamp load, max.	5 W	5 W
• Digital input control	No	No

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
Load resistance range		
• Low limit	48 Ω	48 Ω
• High limit	4 kΩ	4 kΩ
Output voltage		
• For "0" signal, max.	3 V; (2L+)	3 V; (2L+)
For "1" signal, min.	Rated voltage - 2.5 V	Rated voltage - 2.5 V
Output current		
• For "1" signal, rated value	0.5 A	0.5 A
• For "1" signal permissible range for 0 to 60 °C, min.	5 mA	5 mA
• For "1" signal permissible range for 0 to 60 °C, max.	0.6 A	0.6 A
• For "0" signal residual current, max.	0.3 mA	0.3 mA
Parallel wiring of two outputs		
• for performance increase	No	No
• for redundant control of a load	No	No
Switching frequency		
• on resistance load, max.	100 Hz	100 Hz
• on inductance load, max.	0.2 Hz to IEC 947-5-1, DC13	0.2 Hz to IEC 947-5-1, DC13
• on lamp load, max.	100 Hz	100 Hz
Total current of outputs (per group) horizontal mounting position		
• Up to 40 °C, max.	4 A	4 A
• Up to 60 °C, max.	3 A	3 A
All other mounting positions		
• Up to 40 °C, max.	3 A	3 A
Cable length		
• Shielded cable length, max.	1000 m	1000 m
Encoder		
Supported encoders		
• 2-wire sensor	No	No

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
1. Interface		
Interface type	Integrated RS 485 interface	Integrated RS 485 interface
Hardware	RS 485	RS 485
• electrically isolated	Yes	Yes
• Power supply to interface (15 VDC to 30 VDC), max.	200 mA	200 mA
Functionality		
• MPI	Yes	Yes
• DP master	Yes	Yes
• DP slave	Yes	Yes
• Point-to-Point data link	No	No
MPI		
• Number of connections	32	32
• Transmission speed, max.	12 Mbps	12 Mbps
Services		
• PG/OP communication	Yes	Yes
• Routing	Yes	Yes
• Global data communication	Yes	Yes
• S7 basic communication	Yes	Yes
• S7 communication	Yes	Yes
• S7 communication, as client	No; but possible via CP and loadable FBs	No; but possible via CP and loadable FBs
• S7 communication, as server	Yes; one-way connection configuration only	Yes; one-way connection configuration only
DP master		
• Transmission speed, max.	12 Mbps	12 Mbps
• Number of DP slaves, max.	124	124
Services		
• PG/OP communication	Yes	Yes
• Routing	Yes	Yes
• Global data communication	No	No
• S7 basic communication	Yes; I-blocks only	Yes; I-blocks only
• S7 communication	Yes	Yes
• S7 communication, as client	No	No
• S7 communication, as server	Yes	Yes

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
• Constant bus cycle time supported	Yes	Yes
• Isochronous mode	Yes; OB 61	Yes; OB 61
• SYNC/FREEZE	Yes	Yes
• Enabling/disabling of DP slaves	Yes	Yes
• Number of DP slaves that can be enabled/disabled simultaneously, max.	8	8
• Direct data exchange (broadcast)	Yes; as subscriber	Yes; as subscriber
• DPV1	Yes	Yes
Address space		
• Inputs, max.	2048 bytes	8192 bytes
• Outputs, max.	2048 bytes	8192 bytes
User data per DP slave		
• Inputs, max.	244 bytes	244 bytes
• Outputs, max.	244 bytes	244 bytes
DP slave		
• Transmission speed, max.	12 Mbps	12 Mbps
• Automatic baud rate detection	Yes; with passive interface only	Yes; with passive interface only
• Address space, max.	32	32
• User data per address space, max.	32 bytes	32 bytes
Services		
• PG/OP communication	Yes	Yes
• Routing	Yes; with active interface only	Yes; with active interface only
• Global data communication	No	No
• S7 basic communication	No	No
• S7 communication	Yes	Yes
• S7 communication, as client	No	No
• S7 communication, as server	Yes; one-way connection configuration only	Yes; one-way connection configuration only
• Direct data exchange (broadcast)	Yes	Yes
• DPV1	No	No

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
Transfer memory		
• Inputs	244 bytes	244 bytes
• Outputs	244 bytes	244 bytes
2. Interface		
Interface type	Integrated RS 485 interface	Integrated RS 485 interface
Hardware	RS 485	RS 485
• electrically isolated	Yes	Yes
• Power supply to interface (15 VDC to 30 VDC), max.	200 mA	200 mA
Functionality		
• MPI	No	No
• DP master	Yes; DP(DRIVE) master	Yes; DP(DRIVE) master
• DP slave	No	No
• Local Operating Network	No	No
DP master		
• Transmission speed, max.	12 Mbps	12 Mbps
• Number of DP slaves, max.	64	64
Services		
• PG/OP communication	No	No
• Routing	No	No
• Global data communication	No	No
• S7 basic communication	No	No
• S7 communication	No	No
• Constant bus cycle time supported	Yes	Yes
• Isochronous mode	Yes	Yes
• SYNC/FREEZE	No	No
• Enabling/disabling of DP slaves	Yes	Yes
• DPV1	No	No
Address space		
• Inputs, max.	1024 bytes	1024 bytes
• Outputs, max.	1024 bytes	1024 bytes
User data per DP slave		
• Inputs, max.	244 bytes	244 bytes
• Outputs, max.	244 bytes	244 bytes

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
DP slave		
GSD file	http://support.automation.siemens.com, Product Support pages	http://support.automation.siemens.com, Product Support pages
• Transmission speed, max.	12 Mbps	12 Mbps
3. Interface		
Interface type	PROFINET	PROFINET
Hardware	RJ45 Ethernet	RJ45 Ethernet
• electrically isolated	Yes	Yes
• Integrated switch	Yes	Yes
• Number of ports	2	2
• Automatic determination of transmission speed	Yes; 10/100 Mbps	Yes; 10/100 Mbps
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Change of the IP address during runtime, supported	Yes	Yes
Media redundancy		
• Supported	Yes	Yes
• Switchover time at line interruption, typ.	200 ms	200 ms
• Number of nodes in ring, max.	50	50
Functionality		
• PROFINET IO controller	Yes; also simultaneously with IO device functionality	Yes; also simultaneously with IO device functionality
• PROFINET IO device	Yes; also simultaneously with IO controller functionality	Yes; also simultaneously with IO controller functionality
• Open IE communication	Yes; via TCP/IP, ISO on TCP, UDP	Yes; via TCP/IP, ISO on TCP, UDP
• Web server	Yes	Yes
• Number of HTTP clients	5	5
PROFINET IO controller		
• Transmission speed, max.	100 Mbps	100 Mbps
• Number of IO devices that can be connected, max.	128	128
• Number of IO devices for RT that can be connected, max.	128	128
• Of which in line, max.	128	128

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
• Number of IO devices with IRT and the "high flexibility" option	128	128
• Of which in line, max.	61	61
• Number of IO devices with IRT and the "high performance" option, max.	64	64
• Of which in line, max.	64	64
• Shared device, supported	Yes	Yes
• Prioritized startup supported	Yes	Yes
• Number of IO devices, max.	32	32
• Enabling / disabling of IO devices	Yes	Yes
• Number of IO devices that can be enabled/disabled simultaneously, max.	8	8
• Changing IO devices during operation (partner ports), supported	Yes	Yes
• Number of IO devices per tool, max.	8	8
• Device replacement without medium change	Yes	Yes
Send clock	250 µs, 500 µs,1 ms; 2 ms, 4 ms (not with IRT with "high flexibility" option)	250 µs, 500 µs, 1 ms, 2 ms, 4 ms
Services		
• PG/OP communication	Yes	Yes
• Routing	Yes	Yes
• S7 communication	Yes	Yes
• Isochronous mode	Yes; OB 61 isochronous mode can only be operated at either PROFIBUS DP or PROFINET IO	Yes; OB 61 isochronous mode can only be operated at either PROFIBUS DP or PROFINET IO
• Open IE communication	Yes; via TCP/IP, ISO on TCP, UDP	Yes; via TCP/IP, ISO on TCP, UDP
Address space		
• Inputs, max.	2 KB	8 KB
• Outputs, max.	2 KB	8 KB
• User data consistency, max.	1024 bytes	1024 bytes

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
PROFINET IO device Services		
• PG/OP communication	Yes	Yes
• Routing	Yes	Yes
• S7 communication	Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32	Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32
• Open IE communication	Yes; via TCP/IP, ISO on TCP, UDP	Yes; via TCP/IP, ISO on TCP, UDP
• IRT, supported	Yes	Yes
• PROFIenergy, supported	Yes; with SFB 73 / 74 prepared for loadable PROFIenergy standard FB for I-device	Yes; with SFB 73 / 74 prepared for loadable PROFIenergy standard FB for I-device
• Shared device, supported	Yes	Yes
• Number of IO controllers at shared device, max.	2	2
Transfer memory		
• Inputs, max.	1440 bytes	1440 bytes
• Outputs, max.	1440 bytes	1440 bytes
Submodules		
• Quantity, max.	64	64
• User data per submodule, max.	1024 bytes	1024 bytes
Open IE communication		
• Open IE communication, supported	Yes	Yes
• Number of connections, max.	8	16
Local port number used at the system end	0, 20, 21, 23, 25, 80, 102, 135, 161, 443, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535	0, 20, 21, 23, 25, 80, 102, 135, 161, 443, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
• Keep-alive function, supported	Yes	Yes
Isochronous mode		
• Isochronous mode(application synchronized up to terminal)	Yes; via PROFIBUS DP or PROFINET interface	Yes; via PROFIBUS DP or PROFINET interface

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
Communication functions		
• PG/OP communication	Yes	Yes
• Data record routing	Yes	Yes
Global data communication		
• Supported	Yes	Yes
• Number of GD circuits, max.	8	8
• Number of GD packets, max.	8	8
• Number of GD packets, transmitting stations, max.	8	8
• Number of GD packets, receiving stations, max.	8	8
• Length of GD packets, max.	22 bytes	22 bytes
• Length of GD packets (of those consistent), max.	22 bytes	22 bytes
S7 basic communication		
• Supported	Yes	Yes
• User data per job, max.	76 bytes	76 bytes
• User data per job (of those consistent), max.	76 bytes; 76 bytes (for X_SEND or X_RCV), 76 bytes (for X_PUT or X_GET as server)	76 bytes; 76 bytes (for X_SEND or X_RCV), 76 bytes (for X_PUT or X_GET as server)
S7 communication		
• Supported	Yes	Yes
• as server	Yes	Yes
• as client	Yes; via integrated PROFINET interface and loadable FB or via CP and loadable FB	Yes; via integrated PROFINET interface and loadable FB or via CP and loadable FB
• User data per job, max.	See online help for STEP 7 (shared parameters of the SFBs / FBs and the SFC / FC of S7 communication)	See online help for STEP 7 (shared parameters of the SFBs / FBs and the SFC / FC of S7 communication)
S5-compatible communication		
• Supported	Yes; via CP and loadable FCs	Yes; via CP and loadable FCs
Open IE communication		
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
• Number of connections, max.	8	16
• Data length at connection type 01H, max.	1460 bytes	1460 bytes

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• Data length at connection type 11H, max.	32768 bytes	32768 bytes
• Multiple passive connections per port, supported	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
• Number of connections, max.	8	16
• Data length, max.	32768 bytes	32768 bytes
• UDP	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
• Number of connections, max.	8	16
• Data length, max.	1472 bytes	1472 bytes
Web server		
• Supported	Yes	Yes
• Number of HTTP clients	5	5
• User-defined Web pages	Yes	Yes
Number of connections		
• Total	16	32
• suitable for PG communication	15	31
• reserved for PG communication	1	1
• selectable for PG communication, min.	1	1
• selectable for PG communication, max.	15	31
• suitable for OP communication	15	31
• reserved for OP communication	1	1
• selectable for OP communication, min.	1	1
• selectable for OP communication, max.	15	31
• suitable for S7 basic communication	14	30
• reserved for S7 basic communication	0	0

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
• selectable for S7 basic communication, min.	0	0
• selectable for S7 basic communication, max.	14	30
• Suitable for S7 communication	14	16
• Reserved for S7 communication	0	0
• Selectable for S7 communication, min.	0	0
• Selectable for S7 communication, max.	14	16
• Number of instances total, max.	32	32
S7 message functions		
• Number of stations that can be logged on for message functions, max.	16; depending on the connections configured for PG, OP and S7 basic communication	32; depending on the connections configured for PG, OP and S7 basic communication
• Process diagnostics messages	Yes	Yes
• simultaneously active Alarm-S blocks, max.	300	300
Test and commissioning functions		
• Block status	Yes	Yes
• Single-step mode	Yes	Yes
• Number of breakpoints	4	4
Status/modify		
• Status/modify variable	Yes	Yes
Variables	Inputs, outputs, memory bits, DBs, timers, counters	Inputs, outputs, memory bits, DBs, timers, counters
• Number of variables, max.	30	30
• of those are status variables, max.	30	30
• of those are modify variables, max.	14	14
Force		
• Force	Yes	Yes
Force, variables	Inputs, outputs	Inputs, outputs
• Number of variables, max.	10	10

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
Diagnostics buffer		
• Available	Yes	Yes
• Number of entries, max.	500	500
• Selectable	No	No
• Of which protected against power failure	100; only the last 100 entries are retentive	100; only the last 100 entries are retentive
• Number of entries that can be read in RUN, max.	499	499
• Selectable	Yes; from 10 to 499	Yes; from 10 to 499
• Default	10	10
Service data		
• Can be read	Yes	Yes
Alarms/ diagnostics/ status information		
Diagnostics LED		
• Status display, digital output, (green)	Yes	Yes
• Status display, digital input, (green)	Yes	Yes
Electrical isolation		
Electrical isolation for digital input signals		
• Between channels and the backplane bus	Yes	Yes
Electrical isolation for digital output signals		
• Between channels and the backplane bus	Yes	Yes
Permissible potential difference		
between different electrical circuits	75 VDC / 60 VAC	75 VDC / 60 VAC
Insulation		
Insulation test voltage	500 VDC	500 VDC
Environmental conditions		
Operating temperature		
• Min.	0 °C	0 °C
• Max.	60 °C	60 °C

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
Configuration		
Configuration software		
• STEP 7	Yes; as of V5.5 SP2 and S7 Technology add-on package	Yes; as of V5.5 SP2 and S7 Technology add-on package
Programming		
Instruction set	See Instructions list	See Instructions list
• Parenthesis levels	8	8
Programming language		
• LAD	Yes	Yes
• FBD	Yes	Yes
• STL	Yes	Yes
• SCL	Yes	Yes
• CFC	Yes	Yes
• GRAPH	Yes	Yes
• HiGraph®	Yes	Yes
System functions (SFC)	See Instructions list	See Instructions list
System function blocks (SFB)	See Instructions list	See Instructions list
Know-how protection		
• User program protection / password security	Yes	Yes
• Block encryption	Yes; with S7 Block Privacy	Yes; with S7 Block Privacy
Cycle time monitoring		
• Low limit	1 ms	1 ms
• High limit	6000 ms	6000 ms
• Selectable	Yes	Yes
• Default	150 ms	150 ms
Dimensions		
• Width	120 mm	120 mm
• Height	125 mm	125 mm
• Depth	130 mm	130 mm
Weights		
• Weight, approx.	640 g	640 g

7.3 Technical specifications of the integrated technology of CPUs 31xT

Technical specifications of the integrated technology

- CPU 315T-3 PN/DP with the order number 6ES7315-7TJ10-0AB0
- CPU 317T-3 PN/DP with the order number 6ES7317-7TK10-0AB0

	6ES7315-7TJ10-0AB0	6ES7317-7TK10-0AB0
Technology objects		
Total	32 (axes, cams, output cams, cam tracks, measuring inputs, external encoders)	64 (axes, cams, output cams, cam tracks, measuring inputs, external encoders)
Axes	8 axes (virtual or real axes)	32 axes (virtual or real axes)
Output cams	16 output cams 8 output cams can be output as "high-speed output cams" on the integrated outputs of the Technology CPU. An additional 8 output cams can be implemented via distributed I/Os (for example on ET 200M, or ET 200S) These can be implemented as "high-speed output cams" on the TM15 and TM17 High Feature.	32 output cams 8 output cams can be output as "high-speed output cams" on the integrated outputs of the Technology CPU. An additional 24 output cams can be implemented via distributed I/Os (for example on ET 200M, or ET 200S) These can be implemented as "high-speed output cams" on the TM15 and TM17 High Feature.
Cam tracks	16	32
Total number of output cams that are used in cam tracks	512 (32 output cams per cam track)	1024 (32 output cams per cam track)
Cams	16	32
Measuring inputs	8	16
External encoders	8	16
Path objects	4	8

7.4 Arrangement of integrated inputs/outputs for integrated technology

Introduction

The Technology CPU has 4 digital inputs and 8 digital outputs integrated. You use these inputs and outputs for technology functions, e.g. reference point acquisition (reference cams), or for high-speed output cam switching signals.

You can also use the digital inputs / digital outputs with the technology functions "MC_ReadPeriphery" and "MC_WritePeriphery" in the STEP 7 user program.
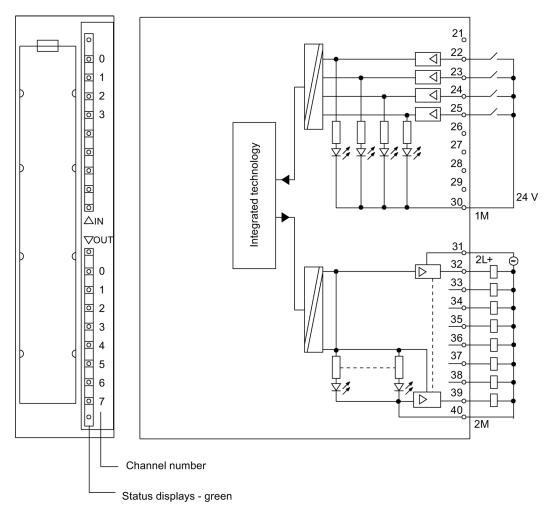
Figure 7-2   Block diagram of integrated inputs/outputs for integrated technology

Glossary

DP(DRIVE)

PROFIBUS interface that is controlled by the integrated technology of the CPU isochronously (and therefore also equidistant).

Engineering station

PC workplace, at which configuration work is performed on a control system.

Execution level

Execution levels form the interface between the operating system of the CPU and the user program. The sequence for executing the blocks of the user program is specified in the execution levels.

Integrated inputs/outputs for integrated technology

The Technology CPU has 4 digital inputs and 8 digital outputs integrated. You use these inputs and outputs for technology functions, e.g. reference point acquisition (reference cams), or for high-speed output cam switching signals. The integrated inputs and outputs can also be used with technology functions in the STEP 7 user program.

Integrated technology

In addition to the standard PLC functions, the Technology CPU has been expanded with integrated technology functions. The operating system of the Technology CPU has also been expanded in order to guarantee fast processing times for these technology functions.

Intelligent DP slave

Signal preprocessing field device. One of its features is that the input/output range provided for the DP master does not correspond to an actually existing I/O, but an input/output range that is emulated by a preprocessing CPU.

S7T Config

Using S7T Config, you configure the technology objects you need to implement your motion control task. The STARTER for the drives from the MICROMASTER and SINAMICS families is integrated in S7T Config.

Shutdown

What happens during shutdown?

5. The control of the Technology CPU is already in STOP mode during shutdown. The outputs of the centralized and distributed I/Os are deactivated.

6. The integrated inputs/outputs for integrated technology and the ET 200M on the DP(DRIVE) are still active during shutdown.

7. The integrated technology of the Technology CPU shuts down the drives on the PROFIBUS DP(DRIVE) in a controlled manner.

8. The integrated technology of the CPU then also goes into STOP. The integrated inputs/outputs for integrated technology and the ET 200M on the DP(DRIVE) are deactivated.

The maximum duration of shutdown depends on your configuration in S7T Config.

Technology configuration data

The configuration that you have created with *STEP 7* is stored in the technology configuration data.

Technology data block

The integrated technology provides current information on the status and on the values of the technology objects via the technology data blocks.

Technology objects

Technology objects are the logical representation of axes, output cams, measuring inputs, cams and external encoders, with which the drive components can be controlled. The technology objects configured with the SIMATIC S7 Technology add-on package contain definitions for the physical properties of the mechanical system, for limits, monitoring and control.

Technology system data

Technology system data are the data of the technology objects, such as drive axis, output cam, ...

User memory

The user memory contains the → code blocks and → data blocks of the user program. User memory can be integrated in the CPU, or stored on plug-in memory cards or memory modules. However, the user program is principally processed from the work memory of the CPU.

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