# DLM2000 Series <br> Digital Oscilloscope Mixed Signal Oscilloscope OPERITIOI GUIIE 

## Product Registration

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http://tmi.yokogawa.com/

Thank you for purchasing the DLM2000 Series Digital Oscilloscope/Mixed Signal Oscilloscope. This manual contains useful information about the handling precautions and basic operations of the DLM2000. To ensure correct use, please read this manual thoroughly before beginning operation. After reading the manual, keep it in a convenient location for quick reference whenever a question arises during operation.

## List of Manuals

The following manuals, including this one, are provided as manuals for the DLM2000.
Read them along with this manual.

| Manual Title | Manual No. | Description |
| :---: | :---: | :---: |
| DLM2000 Series <br> Digital Oscilloscope <br> Mixed Signal Oscilloscope <br> Features Guide | IM 710105-01E | The supplied CD contains the PDF file of this manual. The manual explains the DLM2000 features. |
| DLM2000 Series <br> Digital Oscilloscope <br> Mixed Signal Oscilloscope <br> User's Manual | IM 710105-02E | The supplied CD contains the PDF file of this manual. The manual explains how to operate the DLM2000. |
| DLM2000 Series <br> Digital Oscilloscope <br> Mixed Signal Oscilloscope <br> Operation Guide | IM 710105-03E | This manual. It explains the handling precautions and basic operations of the DLM2000. |
| DLM2000 Series <br> Digital Oscilloscope <br> Mixed Signal Oscilloscope <br> Communication Interface <br> User's Manual | IM 710105-17E | The supplied CD contains the PDF file of this manual. The manual explains the DLM2000 communication interface features and instructions on how to use them. |
| DLM2000 Series Digital Oscilloscope Mixed Signal Oscilloscope | IM 710105-92 | Document for China |
| The "E" in the manual number is the language code. |  |  |
| Document No. Description |  |  |
| PIM 113-01Z2 List of worldwide contacts |  |  |

## Notes

- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument's performance and functions. The figures given in this manual may differ from the actual screen.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your nearest YOKOGAWA dealer.
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## Disposing of YOKOGAWA Products

When disposing of YOKOGAWA products, follow the laws and ordinances of the country or region where the product will be disposed of.

## Revisions

- 1st Edition: November 2008
- 2nd Edition: November 2008
- 3rd Edition: March 2009
- 4th Edition: July 2009
- 5th Edition: February 2010
- 6th Edition: April 2011
- 7th Edition: July 2011
- 8th Edition: August 2013
- 9th Edition: December 2013
- 10th Edition: August 2014
- 11th Edition: May 2015
- 12th Edition: January 2016
- 13th Edition: October 2016
- 14th Edition: October 2017


## Checking the Contents of the Package

Unpack the box and check the contents before operating the instrument. If some of the contents are not correct or missing or if there is physical damage, contact the dealer from whom you purchased them.

Check that the product that you received is what you ordered by referring to the model name and suffix code given on the name plate on the rear panel.

| MODEL | SUFFIX ${ }^{1}$ | Specifications |
| :--- | :--- | :--- |
| 710105 |  | DLM2022 Digital Oscilloscope 2 channels, 200 MHz |
| 710110 |  | DLM2024 Mixed Signal Oscilloscope 4 channels+ 8-bit switchable |
|  |  |  |
| 710115 |  | logic, 200 MHz |


| MODEL | SUFFIX $^{1}$ | Specifications |
| :--- | :--- | :--- |
|  | /F10 | PSI5 analysis (4ch model only) |
|  | /F11 | SENT + PSI5 analysis (4ch model only) |
|  | /EX22 Attach two 701946 probes (2ch, 200 MHz model only) |  |
|  | /EX24 Attach four 701946 probes (4ch, 200 MHz model only) |  |
|  | /EX52 Attach two 701946 probes (2ch, $350 / 500 \mathrm{MHz}$ model only) |  |
|  | /EX54 Attach four 701946 probes (4ch, $350 / 500 \mathrm{MHz}$ model only) |  |

1 For products whose suffix code contains " $Z$," an exclusive manual may be included. Please read it along with the standard manual.
2 Make sure that the attached power cord meets the designated standards of the country and area that you are using it in.

## Note

The SUFFIX (suffix code) inscribed in the name plate on the DLM2000 case indicates the installed options at the time of factory shipment. After you add options through additional option licenses, check the options on the DLM2000 overview screen.*

* For details on additional option licenses, see "Overview (Overview)" in chapter 22, "Other Features" of the features guide, IM 710105-01E


## NO. (Instrument Number)

When contacting the dealer from which you purchased the instrument, please give them the instrument number.

## Standard Accessories

The standard accessories below are supplied with the instrument. Check that all contents are present and that they are undamaged.

| Item | Model or Part No. | Quantity | Specifications and Notes |
| :---: | :---: | :---: | :---: |
| Power cord ${ }^{1}$ | A1006WD | 1 | UL/CSA Standard |
|  | A1009WD |  | VDE Standard |
|  | A1054WD |  | BS Standard |
|  | A1024WD |  | AS Standard |
|  | A1064WD |  | GB Standard |
|  | A1088WD |  | NBR standard |
| Panel sheet | See the next page. | 1 | Japanese, Chinese, German, French, Korean, Italian, or Spanish |
| 500-MHz passive probe ${ }^{2}$ | 701939 | 4 (2) | The 710120 and 710130 come with four probes, and the 710115 and 710125 come with two probes. |
| 200-MHz passive probe ${ }^{3}$ | 701938 | 4 (2) | The 710110 comes with four probes, and the 710105 comes with two probes. |
| Rubber feet | B9989EX | 1 | - |
| Soft case | B8059GG | 1 | - |
| Printer roll paper ${ }^{4}$ | B9988AE | 1 | - |
| Front cover | B8059EP | 1 | - |
| Manuals |  |  |  |
| Printed manuals | IM 710105-03E | 1 | Operation Guide (this guide) |
|  | IM 710105-92 | 1 | Document for China |
|  | PIM 113-01Z2 | 1 | List of worldwide contacts |
| Manual CD | B8059RZ | 1 | Contains PDFs of the user's manuals (For the types of manuals that CD contains, see the next page.) |

Standard accessories are not covered by warranty of this instrument.


Printer roll paper ${ }^{4}$ B9988AE 1 roll



Front panel protection cover B8059EP


200-MHz passive probe ${ }^{3}$
7019384 probes(710110)

ber feet B9989EX


Soft case B8059GG


## Manuals


1 Make sure that the attached power cord meets the designated standards of the country and area that you are using it in.
2 On models with the /EX52 or /EX54 option, 701946 passive probes are provided in place of 701939 passive probes.
3 On models with the /EX22 or /EX24 option, 701946 passive probes are provided in place of 701938 passive probes.
4 When using the optional built-in printer (/B5)

## Manual CD

The English folder in the manual CD contains the PDF files shown below. The CD also contains Japanese manuals.

| File Name | Manual Title | Manual No. |
| :---: | :---: | :---: |
| Communication Interface.pdf | DLM2000 Series | IM 710105-17E |
|  | Digital Oscilloscope |  |
|  | Mixed Signal Oscilloscope |  |
|  | Communication Interface User's Manual |  |
| Features Guide\&Users Manual.pdf | DLM2000 Series | IM 710105-01E |
|  | Digital Oscilloscope |  |
|  | Mixed Signal Oscilloscope |  |
|  | Features Guide |  |
|  | DLM2000 Series | IM 710105-02E |
|  | Digital Oscilloscope |  |
|  | Mixed Signal Oscilloscope |  |
|  | User's Manual |  |

To view the PDF files above, you need Adobe Reader.

## WARNING

Never play this manual CD, which contains the user's manuals, in an audio CD player. Doing so may cause loss of hearing or speaker damage due to the large sounds that may be produced.

## French

## AVERTISSEMENT

Ce CD contient les manuels d'utilisation. Ne jamais insérer ce CD dans un lecteur de CD audio. Cela pourrait entraîner une perte d'audition ou l'endommagement des enceintes en raison du volume potentiellement élevé des sons produits.

## Optional Accessories (Sold Separately)

The optional accessories below are available for purchase separately. For information and ordering, contact your nearest YOKOGAWA dealer.

- Use the accessories specified in this manual. Moreover, use the accessories of this product only with Yokogawa products that specify them as accessories.
- Use the accessories of this product within the rated range of each accessory. When using several accessories together, use them within the specification range of the accessory with the lowest rating.

| Item | Model/ Part No. | Min. Q'ty | Specifications | Manual No. |
| :---: | :---: | :---: | :---: | :---: |
| PBDH1000 differential probe with YOKOGAWA probe interface | 701924 | 1 | DC to $1-\mathrm{GHz}$ bandwidth, $1 \mathrm{M} \Omega$, $\pm 35 \mathrm{~V}$ maximum | IM 701924-01E |
| PBDH0150 differential probe with YOKOGAWA probe interface | 701927 | 1 | DC to $150-\mathrm{MHz}$ bandwidth, $\pm 1400 \mathrm{~V}$ maximum | IM 701927-01EN |
| PBC100 current probe with YOKOGAWA probe interface | 701928 | 1 | DC to $100-\mathrm{MHz}$ bandwidth, 30 Arms | IM 701928-01E |
| PBC050 current probe with YOKOGAWA probe interface | 701929 | 1 | DC to $50-\mathrm{MHz}$ bandwidth, 30 Arms |  |
| Passive probe | 701938 | 1 | DC to 200-MHz bandwidth, $10 \mathrm{M} \Omega$ | IM 701938-01E |
|  | 701939 | 1 | DC to $500-\mathrm{MHz}$ bandwidth, $10 \mathrm{M} \Omega$ | IM 701939-01E |
| Miniature Passive Probe | 701946 | 1 | DC to $500-\mathrm{MHz}$ bandwidth, $10 \mathrm{M} \Omega$ | IM 701946-01EN |
| Passive probe (wide temperature range) | 702906 | 1 | DC to 200 MHz bandwidth, $10 \mathrm{M} \Omega$, operating temperature range: <br> $-40^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$ (excluding the phase adjustment side) | IM 702906-01EN |
| PBL100 logic probe | 701988 | 1 | $100-\mathrm{MHz}$ toggle frequency, $1 \mathrm{M} \Omega$ | IM 701988-01E |
| PBL250 logic probe | 701989 | 1 | $250-\mathrm{MHz}$ toggle frequency, $100 \mathrm{k} \Omega$ | IM 701989-01E |
|  | 701944 | 1 | DC to $400-\mathrm{MHz}$ bandwidth, 1000 Vrms , 1.2 m in length | IM 701944-01E |
|  | 701945 | 1 | DC to $250-\mathrm{MHz}$ bandwidth, 1000 Vrms , 3 m in length |  |
| FET probe * | 700939 | 1 | 900-MHz bandwidth, $2.5 \mathrm{M} \Omega$, 1.8 pF | IM 700939-01E |
| Differential probe* | 700924 | 1 | DC to $100-\mathrm{MHz}$ bandwidth, $\pm 1400 \mathrm{~V}$ maximum | IM 700924-01E |
|  | 700925 | 1 | DC to $15-\mathrm{MHz}$ bandwidth, $\pm 500 \mathrm{~V}$ maximum | IM 700925-01E |
|  | 701920 | 1 | DC to $500-\mathrm{MHz}$ bandwidth, $\pm 30 \mathrm{~V}$ maximum (common-mode input) | IM 701920-01E |
|  | 701921 | 1 | DC to $100-\mathrm{MHz}$ bandwidth, $\pm 700 \mathrm{~V}$ maximum | IM 701921-01E |
|  | 701922 | 1 | DC to $200-\mathrm{MHz}$ bandwidth, $\pm 60 \mathrm{~V}$ maximum (common-mode input) | IM 701922-01E |
|  | 701926 | 1 | DC to $50-\mathrm{MHz}$ bandwidth, $\pm 7000 \mathrm{~V}$ maximum (common-mode input) | IM 701926-01E |
| Current probe* | 701917 | 1 | DC to 50 MHz bandwidth, 5 Arms | IM 701917-01EN |
|  | 701918 | 1 | DC to 120 MHz bandwidth, 5 Arms | IM 701917-01EN |
|  | 701930 | 1 | DC to $10-\mathrm{MHz}$ bandwidth, 150 Arms | IM 701930-01E |
|  | 701931 | 1 | DC to 2-MHz bandwidth, 500 Arms | IM 701931-01E |
|  | 701932 | 1 | DC to $100-\mathrm{MHz}$ bandwidth, 30 Arms | IM 701932-01E |
|  | 701933 | 1 | DC to 50-MHz bandwidth, 30 Arms | IM 701933-01E |
| PBL500 5 GHz low capacitance probe | 701974 | 1 | - | IM 701974-01E |
| Deskew signal source | 701936 | 1 | Approx. 0 to 5 V , approx. 0 to 100 mA , approx. 0 to 1 A , approx. 15 kHz | IM 701936-01EN |
| Mini clip adapter | 700971 | 1 set | - | - |
| BNC adapter | 700972 | 1 | - | - |
| Logic probe accessory kit | 701909 | 1 set | For the 701989 | - |
| Probe stand | 701919 | 1 | - | IM 701919-01E |
| PCB adapter | 366945 | 1 set | For 701939 passive probes | - |
| Solder-in adapter | 366946 | 1 set | For 701939 passive probes | - |


| Item | Model/ <br> Part No. | Min. | Specifications | Manual No. |
| :--- | :--- | :--- | :--- | :--- |
| GO/NO-GO cable | 366973 | 1 | - | - |
| Soft carrying case | 701964 | 1 | For the DLM2000 series, three pockets | - |

Optional accessories (sold separately) are not covered by warranty of this instrument.

* Used by connecting to a probe power terminal (/P2 or /P4 option) or a probe power supply (701934; sold separately).


## Spare Parts (Sold Separately)

The spare parts below are available for purchase separately. Check that all contents are present and undamaged.
For information about ordering spare parts, contact your nearest YOKOGAWA dealer.

| Name | Part No. | Minimum Q'ty | Note |
| :--- | :--- | :--- | :--- |
| Printer roll paper | B9988AE | 10 | Thermo-sensitive paper, $111 \mathrm{~mm} \times 10 \mathrm{~m}$ |

## Safety Precautions

This product is designed to be used by a person with specialized knowledge． This instrument is an IEC protection class I instrument（provided with terminal for protective earth grounding）．
The general safety precautions described herein must be observed during all phases of operation．If the instrument is used in a manner not specified in this manual，the protection provided by the instrument may be impaired．
This manual is part of the product and contains important information．Store this manual in a safe place close to the instrument so that you can refer to it immediately．Keep this manual until you dispose of the instrument．
YOKOGAWA assumes no liability for the customer＇s failure to comply with these requirements．

## The Following Symbols Are Used on This Instrument．



Warning：handle with care．Refer to the user＇s manual or service manual． This symbol appears on dangerous locations on the instrument which require special instructions for proper handling or use．The same symbol appears in the corresponding place in the manual to identify those instructions．
$\stackrel{\perp}{=}$
Functional ground terminal（do not use this terminal as a protective ground terminal．）

Alternating current
＝ーモ Direct current

On（power）


Off（power）

French


Avertissement ：À manipuler délicatement．Toujours se reporter aux manuels d＇utilisation et d＇entretien．Ce symbole a été apposé aux endroits dangereux de l＇instrument pour lesquels des consignes spéciales d＇utilisation ou de manipulation ont été émises．Le même symbole apparaît à l＇endroit correspondant du manuel pour identifier les consignes qui s＇y rapportent．
$\stackrel{\perp}{=}$
Borne de terre ou borne de terre fonctionnelle（ne pas utiliser cette borne comme prise de terre．）

Courant alternatif
$\overline{\text {－モ }}$ Courant direct

Marche（alimentation）

Arrêt（alimentation）

## Failure to comply with the precautions below could lead to injury or death or damage to the instrument.

## WARNING

## Use the Instrument Only for Its Intended Purpose

This instrument is a waveform measuring device that monitors and measures electrical signals. Do not use this instrument for anything other than as a waveform measuring device.

## Check the Physical Appearance

Do not use the instrument if there is a problem with its physical appearance.

## Use the Correct Power Supply

Before connecting the power cord, ensure that the source voltage matches the rated supply voltage of the DLM2000 and that it is within the maximum rated voltage of the provided power cord.

## Use the Correct Power Cord and Plug

To prevent the possibility of electric shock or fire, be sure to use the power cord supplied by YOKOGAWA. The main power plug must be plugged into an outlet with a protective earth terminal. Do not invalidate this protection by using an extension cord without protective earth grounding. Additionally, do not use the power cord supplied with this instrument with another instrument.

## Connect the Protective Grounding Terminal

Make sure to connect the protective earth to prevent electric shock before turning on the power. The power cord that comes with the instrument is a three-prong type power cord. Connect the power cord to a properly grounded three-prong outlet.

## Do Not Impair the Protective Grounding

Never cut off the internal or external protective earth wire or disconnect the wiring of the protective earth terminal. Doing so may result in electric shock or damage to the instrument.

## Do Not Use When the Protection Functions Are Defective

Before using this instrument, check that the protection functions, such as the protective grounding and fuse, are working properly. If you suspect a defect, do not use the instrument.

## Do Not Operate in an Explosive Atmosphere

Do not operate the instrument in the presence of flammable gasses or vapors. Doing so is extremely dangerous.

Do Not Remove the Covers or Disassemble or Alter the Instrument Only qualified YOKOGAWA personnel may remove the covers and disassemble or alter the instrument. The inside of the instrument is dangerous because parts of it have high voltages.

## Ground the Instrument before Making External Connections

Securely connect the protective grounding before connecting to the item under measurement or to an external control unit. Before touching a circuit, turn off its power and check that it has no voltage. To prevent the possibility of electric shock or an accident, connect the ground of the probe and input connector to the ground of the item being measured.

## Measurement Category

The measurement category of the DLM2000 signal input terminals is Other (O). Do not use it to measure the main power supply or for Measurement Categories II, III, and IV.

## Install or Use the Instrument in Appropriate Locations

- Do not install or use the instrument outdoors or in locations subject to rain or water.
- Install the instrument so that you can immediately remove the power cord if an abnormal or dangerous condition occurs.


## Accessories

Use the accessories specified in this manual. Moreover, use the accessories of this product only with Yokogawa products that specify them as accessories.
Do not use faulty accessories.

## CAUTION

## Operating Environment Limitations

This product is a Class A (for industrial environments) product. Operation of this product in a residential area may cause radio interference in which case the user will be required to correct the interference.

## French

## AVERTISSEMENT

Utiliser l'instrument aux seules fins pour lesquelles il est prévu
Cet instrument est un appareil de mesure de forme d'onde pour le contrôle et la mesure des signaux électriques. Ne pas utiliser cet instrument à d'autres fins que celles de mesure de forme d'onde.

Inspecter l'apparence physique
Ne pas utiliser l'instrument si son intégrité physique semble être compromise.

## Vérifier l'alimentation

Avant de brancher le cordon d'alimentation, vérifier que la tension source correspond à la tension d'alimentation nominale du DLM2000 et qu'elle est compatible avec la tension nominale maximale du cordon d'alimentation.

Utiliser le cordon d'alimentation et la fiche adaptés
Pour éviter les risques de choc électrique ou d'incendie, utilisez le cordon d'alimentation fourni par YOKOGAWA. La fiche doit être branchée sur une prise secteur raccordée à la terre. En cas d'utilisation d'une rallonge, celle-ci doit être impérativement reliée à la terre. Par ailleurs, n'utilisez pas le cordon d'alimentation fourni pour cet instrument avec un autre appareil.

## Brancher la prise de terre

Avant de mettre l'instrument sous tension, penser à brancher la prise de terre pour éviter tout choc électrique. Le cordon d'alimentation livré avec l'instrument est doté de trois broches. Brancher le cordon d'alimentation sur une prise de courant à trois plots et mise à la terre.

## Ne pas entraver la mise à la terre de protection

Ne jamais neutraliser le fil de terre interne ou externe, ni débrancher la borne de mise à la terre. Cela pourrait entraîner un choc électrique ou endommager l'instrument.

Ne pas utiliser lorsque les fonctions de protection sont défectueuses Avant d'utiliser l'instrument, vérifier que les fonctions de protection, telles que le raccordement à la terre et le fusible, fonctionnent correctement. En cas de dysfonctionnement possible, ne pas utiliser l'instrument.

## Ne pas utiliser dans un environnement explosif

Ne pas utiliser l'instrument en présence de gaz ou de vapeurs inflammables. Cela pourrait être extrêmement dangereux.

Ne pas retirer le capot, ni démonter ou modifier l'instrument
Seul le personnel YOKOGAWA qualifié est habilité à retirer le capot et à démonter ou modifier l'instrument. Certains composants à l'intérieur de l'instrument sont à haute tension et par conséquent, représentent un danger.

Relier l'instrument à la terre avant de le brancher sur des connexions externes
Toujours relier l'instrument à la terre avant de le brancher aux appareils à mesurer ou à une commande externe. Avant de toucher un circuit, mettre l'instrument hors tension et vérifier l'absence de tension. Pour éviter tout risque de choc électrique, brancher la terre de la sonde et du connecteur d'entrée sur la terre de l'appareil à mesurer.

## Catégorie de mesure

La catégorie de mesure des terminaux d'entrée de signal du DLM2000 est Autre (O). Ne pas l'utiliser pour mesurer l'alimentation électrique, ni pour les catégories de mesure II, III et IV.

## Installer et utiliser l'instrument aux emplacements appropriés

- Ne pas installer, ni utiliser l'instrument à l'extérieur ou dans des lieux exposés à la pluie ou à l'eau.
- Installer l'instrument de manière à pourvoir immédiatement le débrancher du secteur en cas de fonctionnement anormal ou dangereux.


## Accessoires

Utiliser les accessoires spécifiés dans ce manuel. En outre, utiliser les accessoires de ce produit uniquement avec des produits Yokogawa pour lesquels ils sont spécifiés comme accessoires.
Ne pas utiliser d'accessoires défectueux.

## ATTENTION

## Limitations relatives à l'environnement opérationnel

Ce produit est un produit de classe A (pour environnements industriels). L'utilisation de ce produit dans un zone résidentielle peut entraîner une interférence radio que l'utilisateur sera tenu de rectifier.

## Sales in Each Country or Region

## Waste Electrical and Electronic Equipment



Waste Electrical and Electronic Equipment (WEEE), Directive
(This directive is valid only in the EU.)
This product complies with the WEEE directive marking requirement. This marking indicates that you must not discard this electrical/electronic product in domestic household waste.

Product Category
With reference to the equipment types in the WEEE directive, this product is classified as a "Monitoring and control instruments" product.

When disposing of products in the EU, contact your local Yokogawa Europe B.V. office. Do not dispose in domestic household waste.

## EU Battery Directive

## EU Battery Directive

(This directive is valid only in the EU.)
Batteries are included in this product. This marking indicates they shall be sorted out and collected as ordained in the EU battery directive.

Battery type: Lithium battery
You cannot replace batteries by yourself. When you need to replace batteries, contact your local Yokogawa Europe B.V. office.

## Authorized Representative in the EEA

Yokogawa Europe B.V. is the authorized representative of Yokogawa Test \& Measurement Corporation for this product in the EEA. To contact Yokogawa Europe B.V., see the separate list of worldwide contacts, PIM 113-01Z2.

## How to Use This Manual

## Structure of the Manual

This manual contains the five chapters and the appendix that are listed below.
Chapter Title Description
1 Component Names and Functions
Introduces the DLM2000 components and their functions, and describes various screens.
2 Before You Start Measuring
Describes handling precautions, how to install the DLM2000, how to connect the DLM2000 to a power supply, how to turn the power switch on and off, how to install modules, how to connect probes, and so on.
3 Basic Operations
Describes how to use panel keys and the jog shuttle, how to enter characters, how to initialize the settings to their default values, how to perform auto setup, how to set the clock, and so on.

## 4 Operating the DLM2000

Using a probe compensation signal as an example, this chapter briefly explains how to display waveforms, adjust the vertical and horizontal scale, configure triggers, perform cursor measurements, zoom in on waveforms, print and save screen captures, and save waveforms.

## 5 Specifications

Summarizes the DLM2000 specifications in tables.

## Appendix

See the reference documents for the relationship between the time axis setting, record length, and sample rate.

## Symbols and Notation Used in This Manual

## Safety Markings

The following markings are used in this manual.


Improper handling or use can lead to injury to the user or damage to the instrument. This symbol appears on the instrument to indicate that the user must refer to the user's manual for special instructions. The same symbol appears in the corresponding place in the user's manual to identify those instructions. In the manual, the symbol is used in conjunction with the word "WARNING" or "CAUTION."

WARNING Calls attention to actions or conditions that could cause serious or fatal injury to the user, and precautions that can be taken to prevent such occurrences.

CAUTION Calls attentions to actions or conditions that could cause light injury to the user or damage to the instrument or user's data, and precautions that can be taken to prevent such occurrences.

## French

AVERTISSEMENT Attire l'attention sur des gestes ou des conditions susceptibles de provoquer des blessures graves (voire mortelles), et sur les précautions de sécurité pouvant prévenir de tels accidents.

## ATTENTION

Attire l'attention sur des gestes ou des conditions susceptibles de provoquer des blessures légères ou d'endommager l'instrument ou les données de l'utilisateur, et sur les précautions de sécurité susceptibles de prévenir de tels accidents.

Note Calls attention to information that is important for proper operation of the instrument.

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## Chapter 5 Specifications

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## Appendix

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### 1.1 Front Panel and Rear Panel

Front Panel


## Rear Panel



### 1.2 Keys and Knobs

## Vertical Axis and Channels



## CH1 to CH4 Keys and LOGIC Key (On 4-channel models)

Displays a menu for turning analog signal input channels on and off, for expanding and reducing the vertical axis, and for setting the vertical position, coupling, probe type, offset voltage, bandwidth limit, linear scaling, and waveform labels. Also, press any of these keys to select which channel the SCALE or POSITION knob will control. Channel keys illuminate when the corresponding channel displays are on. And The LED between the SCALE and POSITION knobs illuminates in the color assigned to the selected channel (the color around the CH key).
Use the LOGIC key to configure the logic channel. At any given time, you can either use

Horizontal Axis


## POSITION Knob

Use this knob to change the center position when you change the time-axis range. This knob has a push switch. You can press the knob to reset the position back to $50 \%$.

## DELAY Key

When you press the DELAY key, the key illuminates. Then you can set the trigger delay using the POSITION knob. You can reset the trigger delay to its default value ( 0 s ) by pressing the POSITION knob when the DELAY key is illuminated.

## TIME/DIV Knob

Use this knob to set the time-axis scale. If you change the scale while signal acquisition is stopped, the waveform is expanded or reduced horizontally. If you restart signal acquisition, the DLM2000 acquires signals using the new time-axis scale.

## Triggering



## EDGE Key

Displays a menu for setting the edge trigger. When you press this key, the edge trigger is selected, and the key illuminates.

## ENHANCED Key

Displays a menu for setting the enhanced trigger. When you press this key, the enhanced trigger is selected, and the key illuminates.
MODE Key and ACTION GO/NO-GO (SHIFT+MODE) Key
Displays a menu for selecting the trigger mode. Press SHIFT and then press MODE to display an action-on-trigger menu.

## B TRIG Key

Use this key to set trigger combinations with the Edge or Enhanced trigger and to set the trigger B trigger type.

## LEVEL Knob

Use this knob to set the trigger level. This knob has a push switch. You can press the knob to automatically set the trigger level to an appropriate level.
TRIG'D LED
Illuminates when the DLM2000 triggers.

## Waveform Acquisition

## ACQUIRE Key



Displays a menu for setting the signal acquisition mode.

## RUN/STOP Key

Starts and stops signal acquisition according to the trigger mode. The key illuminates while the DLM2000 is acquiring signals.

## SINGLE Key

Acquires one waveform. In Average mode, the DLM2000 acquires one waveform that has been obtained by linearly averaging waveforms for the specified number of times.

## Zoom, Search, and Serial Bus

## ZOOM1 and ZOOM2 Keys

Displays a waveform zoom display menu. When a waveform zoom display is on, the corresponding key illuminates. If ZOOM1 and ZOOM2 are both on, the ZOOM knob controls the magnification of the zoom waveform whose corresponding key is illuminated brightly.

## ZOOM Knob

When a zoom display is on, you can turn this knob to set the magnification of the corresponding horizontal axis. Before turning this knob, press ZOOM1 or ZOOM2 to select the zoom waveform whose magnification you want to control. This knob has a push switch. You can press the knob to switch the resolution. If you press the knob so that Fine illuminates, the resolution is set to fine mode.

## SEARCH Key

Displays a waveform search menu.

## SHIFT+SEARCH (SERIAL BUS) Key

Press SHIFT and then press SEARCH to display a serial bus menu.

## Analysis

## CURSOR Key

Displays a menu for making cursor measurements.

## MEASURE Key

Displays a menu for automatic measurement of waveform parameters and for statistical processing.

## ANALYSIS Key

Displays a waveform histogram display and an optional power supply analysis menu.

## MATH/REF Key

Use this key to configure waveform computation and reference waveforms.

## SHIFT+MATH/REF (FFT) Key

Press SHIFT and then press MATH/REF to display an FFT menu.

DISPLAY Key
Use this key to configure the display.
SHIFT+DISPLAY (X-Y) Key
Press SHIFT and then press DISPLAY to display an X-Y display menu.
Screen Capture Printing, Data Storage, History Waveforms, and Other Features PRINT Key
Use this key to save and print screen capture data.
SHIFT+PRINT (MENU) Key
Displays a menu for printing screen captures to the built-in printer or a USB printer or displays a menu for saving screen capture data to a storage medium. An indicator illuminates to show which menu is selected.

## FILE Key

Displays a menu for saving various data to the internal memory and USB memory, loading data that you have saved, and performing other file related tasks.

## UTILITY Key

Displays a menu for calibrating the DLM2000, for LCD back light, for executing selftests, and for configuring the network, the connection to the PC, the date and time, the menu language, the message language, the LCD back light, the offset cancel, the delay cancel, and the click sound.
You can also use this key to display system information (installed options and firmware version).
CLEAR TRACE Key
Clears the displayed waveforms. If you execute a clear trace operation during waveform acquisition, the DLM2000 clears all of the history waveforms that it has acquired and restarts waveform acquisition from the first acquisition.

## SNAPSHOT Key

Retains the currently displayed waveforms on the screen in white (by default).
HISTORY ( $\sqrt{\text { L }}$ ) Key
Displays a menu for displaying and searching the history waveforms.


## AUTO SETUP Key

Executes auto setup, which automatically configures the DLM2000 based on the input signals. The UNDO command, which can be used to revert the settings to their original values, appears in the menu.

DEFAULT SETUP Key
Initializes the DLM2000 settings to their factory default values. The UNDO command, which can be used to revert the settings to their original values, appears in the menu.

## HELP (?) Key

Turns on and off the help window, which explains various features.

## SHIFT Key

Press this key once to access the features that are written in purple below each key. The shift key illuminates when the keys are shifted. Press the key again to clear the shifted state.

## Function Keys (F1 to F7)

Use these keys to select items that appear in the function key menu of the screen.

## ESC Key

Use this key to clear the function key menu, close dialog boxes, and return to the menu level above the current one.

## Jog Shuttle

When configuring various settings, use the jog shuttle to set values, move cursors, and select items. Turn the shuttle ring to vary the rate at which values change. The rate is set based on the shuttle ring angle.

## RESET (Z) Key

Resets the value to its default value.

## SET (O) Key

Press this key to enter the menu item that you selected using the jog shuttle.
If there are two items on the jog shuttle setup menu, you can press the key to change the item that the jog shuttle controls.
Move the SET key left and right to move the cursor between numeric digits.
Move the SET key up and down to increase and decrease a value. You can change the setting on a dialog menu by moving the key up, down, left, and right.

## Notes about the Operation of Knobs with Push Switches

The following knobs have push switches: SCALE, LEVEL, POSITION (vertical and horizontal), and ZOOM. Push the knobs straight. If you push a knob at an angle, it may not operate properly. If this happens, push the knob straight one more time.

## CAUTION

Do not push the knob sideways with strong force. If you do, the knob may break.

## French

## ATTENTION

Ne pas enfoncer les boutons latéralement en employant une force excessive. Cela pourrait les endommager, voire les casser.

### 1.3 Screens

## Normal Analog Signal Waveform Screen



## Logic Signal Waveform Screen (On 4-channel models)



Bit waveforms
Displays waveforms according to the bit

## Screen Displaying Zoom Waveforms



## Screen Displaying Analysis Results



If the setup menu is not displayed, the setup menu display area shows measured waveform parameter values or cursor measurement values.

The higher-level setup menus are displayed using cascaded tags.

|  |  | Menu that is one level higher (CH2) |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Menu that is two levels higher (Ref Level) |  |  |  |  |
| Masure |  |  |  |  |  |  |  |
| Made | $\xrightarrow{6}$ |  | Ref Levels locerinion |  |  | $\left.\right\|_{\text {- }} ^{\text {Tanan Daman }}$ | PusCo.90\% |
| UFF ON |  | Distal | Mesial | Proximal | High Low | - Math2 | Pusho:90\% |
|  | \% Unit | 90\% | 50\% | 10\% | Auto |  | 90\% |

### 2.1 Handling Precautions

## Safety Precautions

If you are using this instrument for the first time, make sure to thoroughly read the safety precautions given on pages viii to xi.

## Do Not Remove the Case

Do not remove the case from the instrument. Some sections inside the instrument have high voltages and are extremely dangerous. For internal inspections or adjustments, contact your dealer.

## Unplug If Abnormal Behavior Occurs

If you notice smoke or unusual odors coming from the instrument, immediately turn OFF the power and unplug the power cord. If such an irregularity occurs, contact your dealer.

Do Not Damage the Power Cord
Nothing should be placed on the power cord. The cord should be kept away from any heat sources. When unplugging the power cord from the outlet, never pull by the cord itself. Always hold and pull by the plug. If the power cord is damaged, contact your dealer for replacement. Refer to page iv for the part number when placing an order.

## General Handling Precautions

Do Not Place Objects on Top of the Instrument
Never place other instruments or objects containing water on top of the instrument, otherwise a breakdown may occur.

## Do Not Apply Shock to the Input Section

Shocks to the input connectors or probes may turn into electrical noise and enter the instrument via the signal lines.

## Do Not Damage the LCD

Since the LCD screen is very vulnerable and can be easily scratched, do not allow any sharp objects near it. Also it should not be exposed to vibrations and shocks.

Unplug during Extended Non-Use
Unplug the power cord from the outlet.

## When Carrying the Instrument

Remove the power cord and connecting cables. When carrying the instrument, either hold the handle or hold the instrument with both hands as shown in the figure below.


## WARNING

- When you hold or put away the handle, be careful not to get your hand caught between the handle and the case.
- When you carry the instrument, be careful not to get your hand caught between the wall, installation surface, or other objects and the instrument.


## French

## AVERTISSEMENT

- Lorsque vous attrapez ou rabattez la poignée, veillez à ne pas vous coincer la main entre la poignée et l'instrument.
- Lorsque vous déplacez l'instrument, veillez à ne pas vous coincer la main entre l'instrument et le mur, la surface d'installation ou tout autre objet.


## Cleaning

When cleaning the case or the operation panel, first remove the power cord from the AC outlet. Then, wipe with a dry, soft, clean cloth Do not use chemical such as benzene or thinner. These can cause discoloring and deformation.

### 2.2 Installing the Instrument



- Do not install the instrument outdoors or in locations subject to rain or water.
- Install the instrument so that you can immediately remove the power cord if an abnormal or dangerous condition occurs.


## CAUTION

If you block the inlet holes on the left side or the outlet holes on the rear side of the DLM2000, the DLM2000 will become hot and may break down.

## French

## AVERTISSEMENT

- Ne pas installer l'instrument à l'extérieur ou dans des lieux exposés à la pluie ou à l'eau.
- Installer l'instrument de manière à pourvoir immédiatement le débrancher du secteur en cas de fonctionnement anormal ou dangereux.
$\qquad$


## ATTENTION

Si vous bloquez les orifices d'entrée gauches ou les orifices de sortie arrière du DLM2000, ce dernier surchauffe et risque de tomber en panne.

## Installation Conditions

Install the instrument in a place that meets the following conditions.

## Flat, Even Surface

Install the instrument with the correct orientation on a stable, horizontal surface. The recording quality of the printer may be hindered when the instrument is placed in an unstable or inclined place.

## Well-Ventilated Location

Inlet holes are located on the left of the instrument. There are also exhaust holes on the rear side. To prevent internal overheating, allow for enough space around the instrument (see the figure below) and do not block the inlet and exhaust holes.


Including the spaces shown in the drawing above, allow for plenty of space to connect the cables and to open and close the cover of the built-in printer.

## Ambient Temperature and Humidity

| Ambient temperature | $5-40^{\circ} \mathrm{C}$ |
| :--- | :--- |
| Ambient humidity | 20 to $80 \%$ RH when the printer is not used. (No condensation) <br>  <br> 35 to $80 \%$ RH when using the printer. (No condensation) |

## Note

- To ensure high measurement accuracy, operate the instrument in the $23 \pm 5^{\circ} \mathrm{C}$ temperature range and $55 \pm 10 \%$ RH.
- Condensation may occur if the instrument is moved to another place where the ambient temperature is higher, or if the temperature changes rapidly. In such cases, allow the instrument adjust to the new environment for at least an hour before using the instrument.


## Do not install the instrument in the following places.

- In direct sunlight or near heat sources.
- Where an excessive amount of soot, steam, dust, or corrosive gas is present.
- Near strong magnetic field sources.
- Near high voltage equipment or power lines.
- Where the level of mechanical vibration is high.
- On an unstable surface.
- Outdoors or in locations subject to rain or water


## Installation position

Place the instrument in a horizontal position (see the figure below).
Rubber stoppers can be attached to the four feet on the bottom of the DLM2000. Four rubber stoppers are included with the DLM2000.
 figures. Also, do not stack the instrument.

French

## AVERTISSEMENT

Ne pas placer l'instrument dans des positions autres celles indiquées ci-dessus. Ne pas empiler l'instrument.

### 2.3 Connecting the Power

## Before Connecting the Power Supply

Make sure that you observe the following points before connecting the power supply. Failure to do so may cause electric shock or damage to the instrument.


## WARNING

- Before connecting the power cord, ensure that the source voltage matches the rated supply voltage of the DLM2000 and that it is within the maximum rated voltage of the provided power cord.
- Connect the power cord after checking that the main power switch of the instrument is turned off.
- To prevent electric shock or fire, be sure to use the power cord for the instrument that is supplied by YOKOGAWA.
- Make sure to connect protective earth grounding to prevent electric shock. Connect the power cord to a three-prong power outlet with a protective earth terminal.
- Do not use an ungrounded extension cord. If you do, the instrument will not be grounded.
- If an AC outlet that conforms to the supplied power cord is unavailable and you cannot ground the instrument, do not use the instrument.


## French

## AVERTISSEMENT

- Avant de brancher le cordon d'alimentation, vérifier que la tension source correspond à la tension d'alimentation nominale du DLM2000 et qu'elle est compatible avec la tension nominale maximale du cordon d'alimentation.
- Brancher le cordon d'alimentation après avoir vérifié que l'interrupteur d'alimentation principal de l'instrument est sur OFF.
- Pour éviter tout risque de choc électrique ou d'incendie, utiliser exclusivement le cordon d'alimentation fourni par YOKOGAWA et prévu pour l'instrument.
- Relier l'instrument à la terre pour éviter tout risque de choc électrique. Brancher le cordon d'alimentation sur une prise de courant à trois plots reliée à la terre.
- Toujours utiliser une rallonge avec broche de mise à la terre, à défaut de quoi l'instrument ne serait pas relié à la terre.
- En l'absence de prise secteur conforme au cordon d'alimentation et dans l'impossibilité de mettre l'instrument à la terre, ne pas utiliser l'instrument.


## Connecting the Power Cord

1. Check that both the main power switch of the DLM2000 is off.
2. Connect the power cord plug to the power connector on the rear panel.
3. Connect the other end of the cord to an outlet that meets the conditions below. Use the three-prong power outlet equipped with a protective earth terminal.

| Rated supply voltage* | 100 to 240 VAC |
| :--- | :--- |
| Permitted supply voltage range | 90 to 264 VAC |
| Rated supply voltage frequency | $50 / 60 \mathrm{~Hz}$ |
| Permitted supply voltage frequency range | 48 to 63 Hz |
| Maximum power consumption | Max. approx. 170 VA |

* The DLM2000 can use a $100-\mathrm{V}$ or a $200-\mathrm{V}$ system for the power supply. The maximum rated voltage differs according to the type of power cord. Check that the voltage supplied to the DLM2000 is less than or equal to the maximum rated voltage of the provided power cord (see page iii) before using it.



## Turning the Instrument On

## Before Turning On the Power, Check That:

- The instrument is installed properly: "2.2 Installing the Instrument"
- The power cord is connected properly: Previous page


## Turning On the Main Power Switch

1. Flip the power switch on the rear panel to the $\mathrm{ON}(\mid)$ position. The front-panel power switch illuminates in red-orange.


## Turning On the Power Switch

2. Press the power switch on the front panel.

The power switch color will change from red-orange to green.


Note
If you turn off the main power switch with the front-panel power switch turned on (with the power switch illuminated in green), you can start the DLM2000 the next time by simply turning on the main power switch. However, if you turn off the main power switch while the front-panel power switch is turned on, the setup data immediately before the power switch is turned off will not be stored properly.

Operations Performed When the Power Is Turned On
When the power switch is turned On, a self-test and calibration start automatically. When the DLM2000 starts normally, the waveform display screen appears. Check that the DLM2000 has started normally before you use it.

## If the DLM2000 Does Not Start Normally When the Power Is Turned On

Turn off the power switch, and check the following items.

- Check that the power cord is securely connected.
- Check that the correct voltage is coming to the power outlet. $\rightarrow$ Page 2-5
- Initialize the settings to their factory defaults by turning on the power switch while holding down the RESET key.
If the instrument still does not work properly, contact your nearest YOKOGAWA dealer for repairs.


## Note

- After turning the power switch OFF, wait at least 10 seconds before you turn it on again.
- It takes several seconds for the startup screen to appear.


## Turning the Instrument Off

## CAUTION

Abruptly turning off the main power switch or unplugging the power cord while data is being saved or the internal printer is printing may corrupt the media on which data is being saved or damage the built-in printer. Also, the data being saved is not guaranteed. Always turn the main power switch off after data has been saved.

## French

## ATTENTION

Mettre brutalement l'instrument hors tension ou débrancher le cordon d'alimentation pendant l'enregistrement de données ou le fonctionnement de l'imprimante interne peut corrompre le support d'enregistrement des données ou endommager l'imprimante intégrée. Les données en cours d'enregistrement pourront également être perdues. Toujours mettre l'instrument hors tension après que les données ont été enregistrées.

## Turning Off the Power Switch

1. Press the power switch on the front panel.

## Turning Off the Main Power Switch

2. Check that the front-panel power switch changes from green to red-orange, and then flip the power switch on the right side panel to the OFF $(O)$ position.

## Operations Performed When the Power Is Turned Off

The settings immediately before the power switch is turned off are stored. Therefore, the next time the power is turned on, waveforms are measured using those settings.

## Note

If you turn off the main power switch on the rear panel while the power switch on the front panel is turned on, the setup data immediately before the power switch is turned off will not be stored properly. The next time you turn on the main power switch, the front-panel power switch automatically turns on, and the instrument starts using the previous settings that were stored properly. When this occurs, a message appears on the screen, but it does not mean that the instrument is broken. When turning the power off, turn off the power switch on the front panel, and then turn off the main power switch on the rear panel.

## To Make Accurate Measurements

- Allow the instrument to warm up for at least 30 minutes after turning on the power switch.
- After the instrument has warmed up, perform calibration.
- If auto calibration is set to ON, the DLM2000 will automatically perform calibration when you perform one of the operations below if the following times have passed since the power was turned on.

3 minutes, 10 minutes, 30 minutes, 1 hour, and each following hour

- When you change time/div during waveform acquisition (when the RUN/STOP key is illuminated)
- When you start waveform acquisition after stopping waveform acquisition (so that the RUN/STOP key is not illuminated)

If calibration is executed while signals are being applied to the DLM2000, we recommend that you stop signal application and recalibrate the DLM2000.

### 2.4 Connecting the Probe

## WARNING

- Always turn off the power of the device under measurement before connecting the device under measurement to the instrument. It is extremely dangerous to connect or disconnect a measuring lead while the device under measurement is on.
- Do not apply an input voltage that exceeds the maximum input voltage, withstand voltage, or allowable surge voltage.
- To avoid electric shock, be sure to ground the instrument, and connect the ground of the probe and input connector to the ground of the item being measured.
- Avoid continuous connections in environments in which a voltage surge may occur.
- If over-range is indicated, the DLM2000 may be receiving a voltage higher than the observed waveform or measured waveform values.* To prevent electric shock, change the vertical scale with the SCALE knob so that the entire amplitude of the waveform is displayed within the waveform display area, and check the input voltage level.
* If the input coupling is set to AC, the over-range indicator may not be displayed. For details, see section 1.1, "Setting the Input Coupling," in the user's manual, IM 71010502E.
(1) $200 \mathrm{~m} \mathrm{~V}_{\text {/iliven }}^{-1+5}$ - Over-range indication


## CAUTION

- The probe interface terminals are located near the input terminals on this instrument. Do not short the probe interface terminals. When you connect a probe, make sure to prevent an excessive voltage caused by static electricity, etc., from being applied to the probe interface terminal, as this may damage the terminal.
- The maximum input voltage for $1 \mathrm{M} \Omega$ input is 150 Vrms when the frequency is less than or equal to 1 kHz . Applying a greater voltage may damage the input section. For frequencies above 1 kHz , damage may occur even if the voltage is less than 150 Vrms.
- The maximum input voltage for $50 \Omega$ input is 5 Vrms or 10 Vpeak. Applying a voltage greater than either of these limits may damage the input section.
- For information about how to handle a probe, refer to the user's manual that came with the probe.


## French

## AVERTISSEMENT

- Toujours mettre l'appareil à mesurer hors tension avant de le brancher sur l'instrument. Il est extrêmement dangereux de brancher un câble de mesure lorsque l'appareil à mesurer est sous tension.
- Ne pas dépasser les valeurs maximales de tension d'entrée, de tension de maintien ou de surtension admissible.
- Pour éviter tout risque de choc électrique, relier l'instrument à la terre et brancher la terre de la sonde et du connecteur d'entrée sur la terre de l'appareil à mesurer.
- Éviter les connexions continues dans les environnements pouvant être soumis à surtension.
- En cas de dépassement, le DLM2000 risque de recevoir une tension supérieure à la forme d'onde observée ou aux valeurs de forme d'onde mesurées.* Pour éviter tout risque de choc électrique, modifier l'échelle de gain vertical à l'aide du bouton SCALE, de sorte que l'amplitude entière de la forme d'onde s'affiche sur l'afficheur, et vérifier le niveau de tension d'entrée.
* Si le couplage d'entrée est réglé sur courant alternatif (CA), l'indicateur de dépassement de plage risque de ne pas s'afficher. Pour en savoir plus, voir la section 1.1 «Setting the Input Coupling» dans le manuel d'utilisation IM 710105-02E.



## ATTENTION

- Sur cet instrument, les bornes d'interface de sonde se situent à proximité des bornes d'entrée. Ne pas court-circuiter les bornes d'interface de sonde. Lors du branchement d'une sonde, éviter qu'une tension excessive, causée entre autre par l'électricité statique, ne soit appliquée sur la borne d'interface de sonde, car cela pourrait l'endommager.
- La tension d'entrée maximale pour une entrée de $1 \mathrm{M} \Omega$ est de 150 Vrms lorsque la fréquence est inférieure ou égale à 1 kHz . L'application d'une tension supérieure pourrait endommager la section d'entrée. Si la fréquence est supérieure à 1 kHz , une tension inférieure à 150 Vrms pourra tout de même endommager la section d'entrée.
- La tension d'entrée maximale pour une entrée de $50 \Omega$ est de 5 Vrms ou 10 Vcrête. L'application d'une tension supérieure à l'une de ces limites pourrait endommager la section d'entrée.
- Pour toute information sur la manipulation de la sonde, se reporter au manuel d'utilisation fourni avec la sonde.


## Connecting the Probe

Connect a probe (or measurement input cable such as a BNC cable) to the input terminal on the bottom of the front panel. The input impedance is $1 \mathrm{M} \Omega \pm 1.0 \%$ and approximately 20 pF or $50 \Omega \pm 1.0 \%$.


## Precautions to Be Taken When Connecting Cables

- When connecting a probe to the instrument for the first time, perform phase correction of the probe as described in section 2.5, "Compensating the Probe (Phase Correction)." If you do not, frequency characteristics will not be flat, and measurements will not be correct. Perform the phase correction on each channel to which a probe is to be connected.
- Note that if the object being measured is directly connected to the instrument without using a probe, correct measurements may not be possible because of the effect of input impedance on the instrument. Use caution.


## About Probes

Specification of standard supplied probe (model 701938 or 701939), after probe phase compensation
For details, see the manual that came with the probe

| Item | Specification |
| :--- | :--- |
| Overall probe length | $701938: 1.5 \mathrm{~m}$ |
|  | $701939: 1.3 \mathrm{~m}$ |
| Input impedance | $10 \mathrm{M} \Omega \pm 2 \%$ |
| Input capacitance | $701938:$ Approx. 13 pF |
|  | $701939:$ Approx. 10.5 pF |
| Attenuation ratio | $10: 1 \pm 2 \%$ |
| Bandwidth | $701938: \mathrm{DC}$ to 200 MHz (not exceeding -3 dB) |
|  | $701939: \mathrm{DC}$ to 500 MHz (not exceeding -3 dB) |
| Rise time | $701938: 1.75 \mathrm{~ns}$ or less (typical*) |
|  | $701939: 700$ ps or less (typical*) |
| Maximum input voltage | 600 V (DC+ACpeak) or 424 Vrms |

[^0]
## Specification of miniature passive probe (701946), after probe phase compensation

On models with the /EX52, /EX54, /EX22, or /EX24 option, 701946 passive probes are provided in place of standard supplied probes.
For details, see the manual that came with the probe.

| Item | Specification |
| :--- | :--- |
| Overall probe length | 1.3 m |
| Input impedance | $10 \mathrm{M} \Omega \pm 1 \%$ |
| Input capacitance | Approx 9.5 pF |
| Attenuation ratio | $10: 1 \pm 2 \%$ |
| Bandwidth | DC to 500 MHz (not exceeding -3 dB ) |
| Rise time | 700 ps or less (typical*) |
| Maximum input voltage | 400 Vrms |

* Typical values are typical or mean values. They are not strictly guaranteed.


## Precautions to Be Taken When Using Voltage Probes Other Than Those Provided with the Instrument

- When measuring a signal including a frequency close to 500 MHz , use a probe with a frequency range above 500 MHz .
- Measurement will only be correct if the attenuation ratio is set properly. Check the attenuation ration of the probe that you are using and set it properly.


## Setting the Probe Attenuation Ratio or Voltage-Current Conversion Factor

 When using a probe not supported by the probe interface connector, set the DLM2000 attenuation ratio or voltage-current conversion factor to match the probe attenuation ratio or voltage-current conversion factor. If this setting is not carried out, correct measurement values will not be displayed.
## Connecting a Probe Supported by the Probe Interface Connector

- If you connect a probe* supported by the probe interface connector to the DLM2000, the probe type is automatically recognized, and the attenuation ratio set. Power is supplied to the probe through the probe interface, and therefore it is not necessary to connect the probe power cable to the probe power terminals.
- You can execute automatic zero adjustment on a current probe that is compatible with the probe interface connector.
* For a list of compatible probes, see "Optional Accessories" on page vi.


## Connecting FET Probe, Current Probe, Differential Probe, or Deskew Correction Signal Source

If you are using the YOKOGAWA's FET Probes, Current Probes, Differential Probes, or Deskew Correction Signal Source, use the Probe Power (option) on the DLM2000 rear panel for the power supply. For details on the connection procedure, see the manual that comes with the respective product.

* For a list of probes and signal sources, see "Optional Accessories" on page vi



## CAUTION

Do not use the Probe Power Terminal (option) on the DLM2000 rear panel for purposes other than supplying power to the FET Probe, Current Probe, Differential Probe, or Deskew Correction Signal Source. Also, be sure that the total current of the four Probe Power Terminals and the four Probe Interface Terminals does not exceed 1.2 A. Otherwise, the device connected to the Probe Power Terminals or to the DLM2000 may break.

French

## ATTENTION

Ne pas utiliser la borne d'alimentation de sonde (en option) sur le volet arrière du DLM2000 à d'autres fins que l'alimentation de la sonde FET, sonde de courant, sonde différentielle ou source de signal de correction Deskew. Vérifier également que le courant total des quatre bornes d'alimentation de sonde et des quatre bornes d'interface de sonde ne dépasse pas 1,2 A, car cela risquerait d'endommager le DLM2000 ou l'appareil connecté aux bornes d'alimentation de sonde.

## Handling Precautions of the Probe Interface Terminals and Probe Power Terminals

If you are connecting the YOKOGAWA's FET Probes, Current Probes, Differential Probes, or Deskew Correction Signal Source to the Probe Power Terminals (option) on the rear panel, be sure that the total current of the four Probe Power Terminals and the four Probe Interface Terminals does not exceed 1.2 A. Otherwise, the DLM2000 operation may become unstable due to the activation of the excessive current protection circuit of the power supply.

- When using current probes (701932/701933), the number of probes is limited, depending on the measured current (the current measured by the current probes). The characteristics of measured current versus current consumption for active probes that can be connected to the DLM2000 are as follows.

- In calculations, take the maximum current consumption of an FET probe (700939) or differential probe (700924, 700925, 701920, 701921, 701922, or 701926) to be 125 mA for both negative and positive voltages. Take the maximum current consumption of a differential probe (701927) to be 50 mA for both negative and positive voltages.


### 2.5 Compensating the Probe (Phase Correction)

Be sure to perform phase correction of the probe first when using a probe to make measurements.


## CAUTION

Do not apply external voltage to the signal output terminal for probe compensation adjustment. Doing so may damage the internal circuitry.

## French



## ATTENTION

Ne pas appliquer de tension externe sur la borne de sortie de signal afin d'ajuster la compensation de sonde. Cela pourrait endommager le circuit interne.

Procedure

1. Turn $O N$ the power switch.
2. Connect the probe to the input terminal to which the signal is to be applied.
3. Connect the tip of the probe to the signal output terminal for probe compensation adjustment on the front panel of the instrument and to the ground wire to the functional ground terminal.
4. Perform auto setup according to the procedures given in section 3.5, "Performing Auto Setup."
5. Insert a flat-head screwdriver to the phase adjustment hole and turn the variable capacitor to make the displayed waveform a correct rectangular wave.


## Explanation

## Necessity of Phase Correction of the Probe

The probe comes with its phase corrected approximately to match the input capacitance of the relevant oscilloscope. However, there is variance in the input resistance and input capacitance of each input channel of individual oscilloscopes. This results in a mismatch in the voltage divider ratio between low and high frequency signals and causes uneven frequency characterstics.
There is a variable capacitor for adjusting the division ratio (trimmer) for high frequency signals on the probe. The phase is corrected by adjusting this trimmer so that even frequency characteristics are obtained.
When using the probe for the first time, make sure to perform phase correction. Because the input capacitance varies on each channel, probe compensation is required when the probe is switched from one channel to another.

## Phase Compensation Signal

The following square wave signal is output from the signal output terminal for probe compensation adjustment.
Frequency: Approx. 1 kHz
Amplitude: Approx. 1 V
Differences in the Waveform due to the Phase Correction of the Probe

Correct waveform


Over compensated (The gain in the high-frequency region is too high.)


Under compensated (The gain in the highfrequency region is too low.)


### 2.6 Connecting Logic Probes



## WARNING

- Always turn off the power of the device under measurement before connecting the device under measurement to the instrument.
- Do not apply an input voltage that exceeds the maximum input voltage.
- To avoid electric shock, be sure to ground the instrument, and connect the ground of the probe and input connector to the ground of the item being measured.


## CAUTION

- The maximum input voltage for the logic probe (701980, 701981, and 701989) input is $\pm 40 \mathrm{~V}$ (DC+ACpeak) or 28 Vrms . And The maximum input voltage for the logic probe (701988) input is $\pm 42 \mathrm{~V}$ (DC+ACpeak) or 29 Vrms . Applying a voltage greater than either of these limits may damage the logic probe or the instrument. If the frequency is high, damage may occur even if the voltage is below the values specified above. For information about derating based on frequency, see the user's manual of the logic probe that you are using.
- The eight input lines on the logic port have a common ground. In addition, the ground for the instrument and the ground for the logic port is also a common ground. Do not apply inputs that have different common voltages, as doing so may cause damage to the instrument, the logic probe, or other connected instruments.
- Make sure to turn OFF the power to the DLM2000 before connecting or disconnecting a logic probe cable (701980 or 701981).
- For information about how to handle a logic probe, refer to the user's manual that came with the logic probe.


## French

## AVERTISSEMENT

- Toujours mettre l'appareil à mesurer hors tension avant de le brancher sur l'instrument.
- Ne pas dépasser les valeurs maximales de tension d'entrée.
- Pour éviter tout risque de choc électrique, relier l'instrument à la terre et brancher la terre de la sonde et du connecteur d'entrée sur la terre de l'appareil à mesurer.
- La tension d'entrée maximale pour la sonde logique 701980, 701981, et 701989 est $\pm 40 \mathrm{~V}$ (c.c. + c.a.crête) ou 28 Vrms , et la tension d'entrée maximale pour la sonde logique 701988 est $\pm 42 \mathrm{~V}$ (c.c. + c.a.crête) ou 29 Vrms . L'application d'une tension supérieure à l'une de ces limites pourrait endommager la sonde logique ou l'instrument. Si la fréquence est élevée, une tension inférieure aux valeurs indiquées ci-dessus pourra tout de même causer des dégâts. Pour toute information sur le déclassement basé sur la fréquence, se reporter au manuel d'utilisation de la sonde logique utilisée.
- Les huit lignes d'entrée du port logique partagent la même terre. De plus, la terre de l'instrument et la terre du port logique sont également partagées. Ne pas appliquer des entrées qui ont des tensions communes différentes car cela pourrait endommager l'instrument, la sonde logique ou tout autre appareil connecté.
- Veiller à mettre le DLM2000 hors tension avant de brancher ou de débrancher un câble de sonde logique ( 701980 ou 701981).
- Pour toute information sur la manipulation de la sonde logique, se reporter au manuel d'utilisation fourni avec la sonde logique.


## Logic Signal Input Ports

Connect the logic probe (701980/701981/701988/701989) to the logic signal input port.


## About the Logic Probe

The logic probe (701980/701981/701988/701989) is designed exclusively for the logic signal input ports of the DLM2000. Use the connection lead (accessory) to connect to the point of measurement. Do not alter the connection lead, as it may cause the lead from satisfying the specifications.
Each port has 8 lines of logic input terminals. You can set the threshold level from the DLM2000 menu.
Recommended probes: $701988 / 701989$ (can be connected even when the DLM2000 is turned on)
Compatible probes: 701980/701981 (can be connected when the DLM2000 is turned off)

## Logic Input Specifications When Used on the DLM2000

| Item | When using the 701989 | When using the 701988 |
| :---: | :---: | :---: |
| Maximum toggle frequency ${ }^{1}$ | 250 MHz | 100 MHz |
| Number of inputs | 8 |  |
| Maximum input voltage ${ }^{2}$ | $\pm 40 \mathrm{~V}$ (DC + ACpeak) or 28 Vrms | $\pm 42 \mathrm{~V}$ (DC + ACpeak) or 29 Vrms |
| Input range | $\pm 6 \mathrm{~V}$ | $\pm 40 \mathrm{~V}$ |
| Maximum sample rate | 1.25 GS/s (interleave mode OFF) |  |
| Threshold level | $\pm 6 \mathrm{~V}$ (resolution: 0.05 V ) | $\pm 40 \mathrm{~V}$ (resolution: 0.05 V ) |
| Threshold accuracy ${ }^{1}$ | $\pm$ (100 mV + 3\% of setting) |  |
| Minimum input voltage ${ }^{1}$ | $300 \mathrm{mVp}-\mathrm{p}$ | $500 \mathrm{mVp}-\mathrm{p}$ |
| Input impedance | Approx. $100 \mathrm{k} \Omega$, approx. 3 pF (Typical) ${ }^{3}$ | Approx. $1 \mathrm{M} \Omega$, approx. 10 pF (Typical) $^{3}$ |
| Preset threshold levels | $\begin{gathered} \operatorname{CMOS}(5 \mathrm{~V})= \\ =2.5 \mathrm{~V}, \operatorname{CMOS}(3.3 \mathrm{~V})=1.65 \mathrm{~V}, \operatorname{CMOS}(2.5 \mathrm{~V})=1.25 \mathrm{~V}, \\ \\ \end{gathered}$ |  |

1 Under standard operating conditions (see section 5.11) after warm-up.
2 For frequencies up to 1 kHz .
3 Typical values are typical or mean values. They are not strictly guaranteed.

### 2.7 Attaching the Panel Sheet

Attach the supplied front panel sheet to the instrument as necessary. The front panel sheet that comes with the instrument is determined by the instrument's language code. You can attach the panel sheet over the panel sheet that is affixed to the instrument when it is shipped from the factory.

## Procedure

The front panel has six panel sheet hooks: two upper, two lower, one below the POSITION knob (HORIZONTAL), and one under the ZOOM knob.
Hook the panel sheet onto the two upper hooks.
Then, bend the panel sheet slightly, and hook it to the two lower hooks.
Hold near the POSITION knob (HORIZONTAL) and ZOOM knob, and insert the panel sheet into the hooks below the knobs.


### 2.8 Loading Roll Paper into the Built-In Printer (Option)

This section explains how to load roll paper into the optional built-in printer.

## Roll Paper for Printers

Only use roll paper specifically made for use with the DLM2000 series. The DLM2000 comes with one set of roll paper included. Use this when you first load roll paper into the built-in printer. When you require a new supply of roll paper, please contact your nearest YOKOGAWA dealer.

| Part Number: | B9988AE |
| :--- | :--- |
| Specifications: | Heat sensitive paper, 10 m |
| Minimum Quantity: | 10 rolls |

## Handling Roll Paper

The roll paper is made of heat sensitive paper that changes color thermochemically. Please read the following points carefully.

## Storage Precautions

The heat-sensitive paper changes color gradually at temperatures of approximately $70^{\circ} \mathrm{C}$ or higher. The paper can be affected by heat, humidity, or chemicals, whether something has been recorded on it or not. As such, please follow the guidelines listed below.

- Store the paper in a cool, dry, and dark place.
- Use the paper as quickly as possible after you break its protective seal.
- If you attach a plastic film that contains plasticizing material such as vinyl chloride film or cellophane tape to the paper for a long time, the recorded sections will fade due to the effect of the plasticizing material. Use a holder made of polypropylene to store the roll paper.
- When starching the record paper, do not use starches containing organic solvents such as alcohol or ether. Doing so will change the paper's color.
- We recommend that you make copies of the recordings if you intend to store them for a long period of time. Because of the nature of heat-sensitive paper, the recorded sections may fade.


## Handling Precautions

- Only use genuine, YOKOGAWA-supplied roll paper.
- If you touch the roll paper with sweaty hands, there is a chance that you will leave fingerprints on the paper or smudge the recorded sections.
- If you rub the surface of the roll paper against something hard, there is a chance that the paper will change color due to frictional heat.
- If the roll paper comes into contact with products such as chemicals or oil, there is a chance that the paper will change color or that the recorded sections will disappear.


## Attaching the Roll Paper



- Do not touch the print head. If you do, you may burn yourself.
- Do not touch the roll paper cutter section at the end of the printer cover. Doing so may cause injury.

French


## ATTENTION

- Ne pas toucher la tête d'impression. Vous pourriez vous brûler.
- Ne pas toucher la section du coupe-papier à l'extrémité du cache de l'imprimante. Vous pourriez vous blesser.

1. 




Press the OPEN COVER button to open the printer cover.
3.

4.

5.


Close the cover and press LOCK on the center of the cover until you hear a click.

### 3.1 Key and Jog Shuttle Operations

## Key Operations

How to Use Setup Menus That Appear When Keys Are Pressed
The operation after you press a key varies depending on the key that you press.
DISPLAY menu


CURSOR menu


MODE menu


G
A: A selection menu appears when you press the soft key.
Press the soft key that corresponds to the appropriate setting.
B: A related setup menu appears when you press the soft key.
C: The selected setting switches each time you press the soft key.
D: Displays a dialog box or a keyboard.
Use the jog shuttle and the SET (O) key to set values.
E: Pressing the soft key selects the item that you can control using the jog shuttle. The jog shuttle setup menu, which appears at the right end of the setup menu, shows the selected item. Use the SET key to move between digits and set the number.
F: Pressing a key sets the item to the setting that corresponds to that key.
G: Selects which item to configure when configuring a feature that consists of two items that operate with different settings, such as the MATH1 and MATH2 computation features.

## How to Display the Setup Menus That Are Written in Purple below the Keys

In the explanations in this manual, "SHIFT+key name (written in purple)" is used to indicate the following operation.

1. Press the SHIFT key. The SHIFT key illuminates to indicate that the keys are shifted.
Now you can select the setup menus written in purple below the keys.
2. Press the key that you want to display the setup menu of.

## ESC key operation

- If you press ESC when a setup menu or available options are displayed, the screen returns to the menu level above the current one.
- If you press ESC when the highest level menu is shown, the display changes as follows.

| Operation of pressing <br> ESC | When measured values are <br> displayed | When measured values are not <br> displayed |
| :--- | :---: | :---: |
| 1st time | The setup menu disappears. |  |
| 2nd time | Measured values move outside the <br> waveform area. | The jog shuttle setting menu <br> disappears. |
| 3rd time | The jog shuttle setting menu <br> disappears. |  |
|  | From this point, the display position <br> of measured values switches <br> between outside the waveform area <br> and inside the area each time you <br> press ESC. | Nothing changes from this point. |
|  |  |  |

## Entering Values Using the RESET (®) and SET (O) Keys

When you use the jog shuttle to set a value, the jog shuttle setup menu shows a RESET key mark or a SET key mark.

- RESET Key Mark

If the RESET key mark is displayed, you can press the RESET key to reset the value to its default value.(The value may not return to its default value depending on the DLM2000 condition.) The default value is displayed next to the RESET key mark.

- SET Key Mark

If there are two values that you need to set, the SET key mark appears. Press the SET key to select which value you want to set using the jog shuttle. The jog shuttle mark in front of the selected value is enlarged.
Like when the RESET key mark is displayed, you can press the RESET key to reset the value to its default value.


## How to Enter Values in Setup Dialog Boxes

1. Use the keys to display the appropriate setup dialog box.
2. Use the jog shuttle or the SET key ( ) to move the cursor to the appropriate item.
3. Press the SET key $(\mathbf{O})$. The operation varies depending on the selected item.

- A setup menu appears.
- A check box is selected or cleared.
- The item at the cursor is selected.



## How to Clear Setup Dialog Boxes

Press the ESC key to clear the active setup dialog box.

## Scroll Operation

If a vertical or horizontal scroll bar is shown on the screen, you can move the SET key up and down or left and write to scroll.

### 3.2 Entering Values and Strings

## Entering Values

## Using Dedicated Knobs

You can use the following dedicated knobs to enter values directly.

- POSITION knobs (VERTICAL and HORIZONTAL)
- SCALE knob (VERTICAL)
- TIME/DIV knob
- LEVEL knob (TRIGGER)
- ZOOM magnification knob


## Using the Jog Shuttle

Select the appropriate item using soft keys, and change the value using the jog shuttle and the SET key. This manual sometimes describes this operation simply as "using the jog shuttle."

## Note

Items that can be set using the jog shuttle are reset to their default values when you press the RESET key

## Entering Character Strings

Use the keyboard that appears on the screen to enter file names and comments. Use the jog shuttle and the SET key to control the keyboard and enter characters.


## How to Operate the Keyboard

1. After bringing up the keyboard, use the jog shuttle to move the cursor to the character that you want to enter. You can also move the SET key up, down, left, and right to move the cursor.
2. Press the SET key to enter the selected character.

- If a character string is already entered, use the arrow soft keys to move the cursor to the position you want to insert characters into.
- Use the CAPS soft key to switch between uppercase and lowercase.
- Use the BS soft key to delete the previous character.
- Use the CLEAR soft key to clear all the entered characters.

3. Repeat steps 1 and 2 to enter all of the characters in the string.

Select $\sigma$ on the keyboard to display a list of character strings that you have entered previously.
Use the jog shuttle to select a character string and press the SET key to enter the selected character string.
4. Move the cursor to ENTER on the keyboard and press the SET key straight down or press the ENTER soft key to confirm the character string and clear the keyboard.

## Note

- @ cannot be entered consecutively.
- File names are not case-sensitive. Comments are case-sensitive. The following file names cannot be used due to MS-DOS limitations:
AUX, CON, PRN, NUL, CLOCK, COM1 to COM9, and LPT1 to LPT9


### 3.3 Using USB Keyboards and Mouse Devices

## Connecting a USB Keyboard

You can connect a USB keyboard and use it to enter file names, comments, and other items.

## Usable Keyboards

The following keyboards conforming to USB Human Interface Devices (HID) Class Ver. 1.1 can be used.

- When the USB keyboard language is English: 104 keyboards
- When the USB keyboard language is Japanese: 109 keyboards


## Note

- Do not connect incompatible keyboards.
- The operation of keyboards that have USB hubs or mouse connectors are not guaranteed.
- For USB keyboards that have been tested for compatibility, contact your nearest YOKOGAWA dealer.


## USB Port for Peripherals

Connect a USB keyboard to the USB connector for peripherals on the front or rear panel.

## Connection Procedure

Connect a USB keyboard directly to the DLM2000 using a USB cable. You can connect or remove the USB cable regardless of whether or not the DLM2000 power switch is turned on (hot-plug support). Connect the type A connector of the USB cable to the DLM2000, and connect the type B connector to the keyboard. When the power switch is on, the keyboard is detected and enabled approximately 6 seconds after it is connected.

## Note

- Only connect a compatible USB keyboard, mouse, printer, or storage device to the USB connector for peripherals.
- Do not connect multiple keyboards. You can connect one keyboard, one mouse, and one printer to the DLM2000.
- Do not connect and disconnect multiple USB devices repetitively. Allow at least 10 seconds after you connect or remove one USB device until you connect or remove another USB device.
- Do not remove USB cables during the time from when the DLM2000 is turned on until key operation becomes available (approximately 20 seconds).


## Entering File Names, Comments, and Other Items

When a keyboard is displayed on the screen, you can enter file names, comments, and other items using the USB keyboard.

## Using a USB Mouse

You can connect a USB mouse and use it to perform the same operations that you can perform with the DLM2000 keys. Also, on the menu, you can perform the same kinds of operations that you can perform by pressing a menu item's soft key or pressing the SET key by pointing to a menu item and clicking on it.

## USB Port for Peripherals

Connect a USB mouse to a USB connector for peripherals on the front or rear panel of the DLM2000.

## Usable USB Mouse Devices

You can use mouse devices (with wheels) that are compliant with USB HID Class Version 1.1.

## Note

- For USB mouse devices that have been tested for compatibility, contact your nearest YOKOGAWA dealer.
- Some settings cannot be configured by a mouse without a wheel.


## Connection Procedure

Connect a USB mouse to a DLM2000 USB connector for peripherals. You can connect or disconnect the USB mouse at any time regardless of whether the DLM2000 is on or off (hot-plugging is supported). When the power switch is on, the mouse is detected approximately 6 seconds after it is connected, and the mouse pointer (\$) appears.

## Note

- Only connect a compatible USB keyboard, mouse, printer, or storage device to the USB connector for peripherals.
- Even though there are two USB connectors for peripherals, do not connect two mouse devices to the DLM2000.


## Operating the DLM2000 Using a USB Mouse

- Operations That Correspond to the Front Panel Keys (Top menu) Displaying the Top Menu
Right-click on the display. A menu of the DLM2000 front panel keys appears.


## Selecting an Item from the Top Menu

Click on the item that you want to select. A setup menu that corresponds to the item that you selected appears at the bottom of the display. The top menu disappears.
To display an item's submenu, point to the item. To select an item on a submenu, click on it, just as you would to select an item on the top menu.


## Note

- The following keys are not displayed in the top menu:

ESC, RESET, and SET

- Setup Menu Operations (Same as soft key operations)


## Selecting a Setup Menu Item

Click on the setup menu item that you want to select.
If a selection menu appears after you select an item, click on the selection menu item that you want to choose.
If an item such as ON or OFF appears, click on the item to change its setting.
For menu items that are usually selected using the job shuttle and the SET key, clicking on the item that you want to select will confirm your selection and close the dialog box.

Click within this area to display a selection menu.


## Clearing the Menu

To clear the menu, click outside of it.

## - Specifying Values

The following description explains how to specify values for menu items that have a
Oicon next to them.

- If there are two $\bigcirc$ icons next to a single menu item, click on the item to select an item to configure.
- To increase a value, rotate the mouse wheel back.
- To decrease a value, rotate the mouse wheel forward.
- To increase a value, move the pointer above the value so that the pointer becomes $a$, and then click the left mouse button.
- To decrease a value, move the pointer below the value so that the pointer becomes a $=$, and then click the left mouse button.
- To move the decimal place, point to the left or right of the value you want to set so
 decimal place will move one place to the right or left each time you click the left mouse button.

Change the value by clicking and using the mouse wheel.


Click within this area to select the item that you want to set.

## - Selecting Check Boxes

To select a check box, click on it. To clear a check box, click on it again. Click on the item that you want to select.


## Note

To close a dialog box, click outside of it.

- Selecting a file, directory, or media drive from the File List window.

Click on a file, directory, or media drive to select it.
Rotate the mouse wheel to scroll through the file list.
To cancel your selection, click outside of the File List window. The File List window will close when you cancel your selection.


Click on the item that you want to select.

- Setting V/DIV and TIME/DIV


## Setting V/DIV

When the waveform of a channel whose voltage is being measured appears on the display, move the pointer close to the V/DIV value. The pointer becomes a the
Rotate the mouse wheel forward to increase the V/DIV value, and rotate it back to decrease the value.

## Setting TIME/DIV

Move the pointer close to the TIME/DIV value. The pointer becomes a Rotate the mouse wheel forward to increase the TIME/DIV value, and rotate it back to decrease the value.


### 3.4 Synchronizing the Clock

This section explains how to set the DLM2000 clock, which is used to generate timestamps for measured data and files. The DLM2000 is factory shipped with a set date and time. You must set the clock before you start measurements.
Procedure

1. Press UTILITY key to display the Utility menu.

2. Press the System Configuration soft key to display the system menu.
3. Press the Date/Time soft key to display the Date/Time Setup dialog box.

4. Use the jog shuttle and the SET key to set the date and time.

## Explanation

## Turning the Display On and Off (Display)

Sets whether or not to display the date and time on the DLM2000 screen.

## Display Format (Format)

You can display the date in one of the following formats.
Year/Month (numeric)/Day
Day/Month (numeric)/Year
Day-Month (English abbreviation)-Year (the lower two digits)
Day Month (English abbreviation) Year

## Time Difference from Greenwich Mean Time (Time Diff. GMT)

Set the time difference between the region where you are using the DLM2000 and Greenwich Mean Time.

Selectable range: - 12 hours 00 minutes to 13 hours 00 minutes
For example, Japan standard time is ahead of GMT by 9 hours. In this case, set Hour to 9 and Minute to 00.

## Checking the Standard Time

Using one of the methods below, check the standard time of the region where you are using the DLM2000.

- Check the Date, Time, Language, Regional Options on your PC.
- Check the standard time at the URL on the right.http://www.worldtimeserver.com/


## Note

- The DLM2000 does not support Daylight Savings Time. To set the time to Daylight Savings Time, reset the time difference from Greenwich Mean Time.
- Date and time settings are backed up using an internal lithium battery. They are retained even if the power is turned off.
- The DLM2000 has leap-year information.


### 3.5 Performing Auto Setup

## Procedure

## Executing Auto Setup

1. Press AUTO key.

Auto setup is executed, and an Undo item appears.

## Undoing Auto Setup

2. Press the Undo soft key to revert to the settings that were in effect before executing auto setup.

## Explanation

The auto setup feature automatically sets the V/div, T/div, trigger level, and other settings to the most suitable values for the input signals.

## Center Position after the Execution of Auto Setup

The center position after you execute auto setup will be 0 V .

## Source Channels

Auto setup is performed on all channels except LOGIC.
If LOGIC is selected (the LOGIC key is illuminated), auto setup is not performed on CH 4 . LOGIC waveforms appear using the same settings that were used before you executed auto setup.

## Waveforms Displayed before the Execution of Auto Setup

Data in the acquisition memory is overwritten, and waveforms that were displayed before you executed auto setup are cleared.

## Undoing Auto Setup

You can press the Undo soft key to revert to the settings that were in effect before you executed auto setup. You cannot undo auto setup if you switch to a different setup menu or clear the Undo menu using the ESC key.

## Signals That Auto Setup Can Be Applied To

Frequency Approx. 50 Hz or higher
Absolute input voltage Signals whose maximum value is at least approximately 20 mV (at 1:1 setting)
Type Simple, repeating signals

## Note

- The auto setup feature may not work properly for signals that include a DC component or high-frequency components.
- To measure serial bus signals, execute auto setup in the appropriate serial bus signal setup menu.


The values of settings not listed here do not change.

### 3.6 Resetting the DLM2000 to Its Factory Default Settings

## Procedure

## Resetting the DLM2000 to Its Factory Default Settings

1. Press DEFAULT key.

The DLM2000 is reset to its factory default settings.
An Undo item appears.

## Undoing the Reset Operation

2. Press the Undo soft key to revert to the previous settings.

## Explanation

You can reset the DLM2000 settings to their factory default values. This feature is useful when you want to cancel all of the settings that you have entered or when you want to redo measurement from scratch.

## Settings That Cannot Be Reset to Their Factory Default Values

- Date and time settings
- Communication settings
- Language setting (English or Japanese)
- Measured value font size setting


## Undoing the Reset Operation

If you reset the settings by mistake, you can press the Undo soft key to revert to the previous settings. However, you cannot undo the reset operation if you switch to a different setup menu or clear the Undo item by pressing the ESC key.

To Reset All Settings to Their Factory Default Settings
While holding down the RESET key ( ) , turn the power switch on. All settings are reset to their factory default values except the date and time settings (the display on/off setting will be reset) and the setup data stored in internal memory.

### 3.7 Starting and Stopping Waveform Acquisition

## Procedure

Starting or Stopping Waveform Acquisition.<br>Press RUN/STOP key to start or stop waveform acquisition.<br>The key is illuminated while the DLM2000 is acquiring waveforms.<br>Acquiring Waveforms Using a Single Trigger<br>Press SINGLE key to start waveform acquisition.<br>The key is illuminated while the DLM2000 is acquiring waveforms.<br>The DLM2000 acquires waveforms once when it is triggered and then stops waveform acquisition.<br>To cancel waveform acquisition, press RUN/STOP key.<br>If you set the record length to a value that allows only one waveform to be acquired, pressing RUN/STOP key will produce the same result as pressing SINGLE key.

## Explanation

## Waveform Acquisition and Indicators

- When RUN/STOP key or SINGLE key is illuminated, the DLM2000 is acquiring waveforms. "Running" appears at the upper left of the screen.
- When RUN/STOP key and SINGLE key are not illuminated, the waveform acquisition is stopped. "Stopped" appears at the upper left of the screen.


## DLM2000 Operation When the Acquisition Mode Is Set to Averaging

- Averaging stops when you stop waveform acquisition.
- If you restart waveform acquisition again, averaging starts from the beginning.


## RUN and STOP Operations during Accumulation

- Accumulation stops when you stop waveform acquisition.
- If you restart waveform acquisition, past waveforms are cleared, and accumulation starts over.


## Note

- If you start waveform acquisition using RUN/STOP, past data stored in the acquisition memory is cleared.
- You can use the snapshot feature to retain the displayed waveform on the screen. This feature allows you to retain a waveform on the screen while the DLM2000 continues signal acquisition.


### 3.8 Calibrating the DLM2000

## Procedure

1. Press UTILITY key.

2. Press the Calibration soft key.

## Executing Calibration

3. Press the Cal Exec soft key to execute calibration.

## Turning Auto Calibration On or Off

3. Press the Auto Cal soft key to select ON or OFF.

## Explanation

## Calibration

Calibrates the following items. Execute calibration when you want to make accurate measurements.

- Vertical axis ground level and gain
- Trigger threshold level
- Measured time value for repetitive sampling


## Note

Calibration is performed automatically when the power switch is turned on.

## Notes about Calibration

- Allow the DLM2000 to warm up for at least 30 minutes before you execute calibration. If you execute calibration immediately after power-on, the calibrated values may drift due to temperature changes or other environmental changes.
- Execute calibration in a stable temperature environment ranging from 5 to $40^{\circ} \mathrm{C}(23 \pm$ $5^{\circ} \mathrm{C}$ recommended).
- Do not apply signals when calibrating. Calibration may not be executed properly when input signals are being applied to the DLM2000.


## Auto Calibration (Auto Cal)

Auto calibration is executed when you perform one of the following operations and any of the time periods listed below has elapsed since the power was turned on.

3 minutes, 10 minutes, 30 minutes, 1 hour, and each following hour

- When you change time/div during waveform acquisition (when the RUN/STOP key is illuminated)
- When you start waveform acquisition after stopping waveform acquisition (so that the RUN/STOP key is not illuminated)

If calibration is executed while signals are being applied to the DLM2000, we recommend that you stop signal application and recalibrate the DLM2000.

### 3.9 Displaying Help

## Procedure

## Displaying Help

Press the help key (?) to display help.
The table of contents and index appear in the left frame, and text appears in the right frame.

## Switching between Frames

To switch to the frame that you want to control, move the SET key (O) left and right.

## Moving Cursors and Scrolling

To scroll through the screen or to move the cursor in the table of contents or index, turn the jog shuttle.

## Moving to the Link Destination

To move to a description that relates to blue text or to move from the table of contents or index to the corresponding description, move the cursor to the appropriate blue text or item, and press the SET key (O).

## Displaying Panel Key Descriptions

With help displayed, press a panel key to display an explanation of the panel key.

## Returning to the Previous Screen

To return to the previous screen, press the RESET key

## Hiding Help

Press help key (?) to clear help.

### 4.1 Applying Signals to Measure

To help you understand basic oscilloscope operations, this chapter explains how to use the DLM2000 probe compensation signal and perform procedures from displaying waveforms to saving data.

## Connecting to the Power Supply

Follow the procedure in section 2.3, "Connecting the Power," and turn the DLM2000 power switch on.

## Connecting a Probe

Follow the procedure in section 2.4, "Connecting the Probe" to connect the 701938, 701939 , or 701946 probe that is supplied with the DLM2000.
On models with the /EX52 or /EX54 option, 701946 passive probes are provided in place of 701939 passive probes.
On models with the /EX22 or /EX24 option, 701946 passive probes are provided in place of 701938 passive probes.

## Correcting the Probe Phase

Follow the procedure in section 2.5, "Compensating the Probe (Phase Correction)" to correct the probe phase.
The waveform of the DLM2000 probe compensation signal appears.


## Note

Because the 701938,701939 , and 701946 passive probes have probe ID pins, the DLM2000 automatically detects the probe attenuation when you connect one of these probes to a DLM2000 probe terminal.

### 4.2 Changing the Waveform Display Conditions

This section explains how to change vertical control settings such as the voltage scale and vertical position as well as horizontal control settings such as the time scale. Change these settings while waveform acquisition is in progress.

Changing the Voltage Sensitivity from $\mathbf{5 0 0} \mathbf{~ m V / d i v i s i o n ~ t o ~} \mathbf{2 0 0} \mathbf{~ m V} /$ division

1. Press the appropriate CH key of the channel whose scale you want to change $(\mathrm{CH} 1$

POSITION knob
 in this example).
2. Use the SCALE knob to change the scale to $200 \mathrm{mV} / \mathrm{div}$. The scale value appears enlarged in the scale display section of the screen.

Press the SCALE knob to set the scale in fine detail (FINE illuminates).
A portion of the waveform can no longer be seen,
The new voltage sensitivity because the voltage sensitivity has been increased.


Note
If you change the scale with the SCALE knob while waveform acquisition is stopped, the waveform is displayed expanded or reduced along the vertical axis.

## Decreasing the Vertical Position to View the Entire Waveform

1. Use the POSITION knob to change the vertical position to -2.00 div. The value of
 the new vertical position appears.
If you press the POSITION knob, the position returns to 0.00 div.
Vertical position value

[^1]
## Changing the Time Scale from $\mathbf{2 0 0} \boldsymbol{\mu s} /$ div to $\mathbf{1 0 0} \mathbf{~ m s} / \mathrm{div}$

The time scale refers to the time per division of the grid.
If you increase the time scale when the trigger mode is set to Auto or Auto Level,
the DLM2000 switches from update display mode, in which a stationary waveform is updated, to roll mode display, in which waveforms flow from the right to the left of the screen.
Roll mode display is useful for observing signals with a long period or signals that change slowly.

1. Use the TIME/DIV knob to set the Time/div setting to $100 \mathrm{~ms} / \mathrm{div}$.


TIME/DIV knob


## Changing the Time Scale from $100 \mathrm{~ms} / \mathrm{div}$ to $\mathbf{5 0 0} \boldsymbol{\mu s} / \mathrm{div}$

The DLM2000 switches back from roll mode display to update mode display, and five periods of the waveform appear.


TIME/DIV knob

1. Use the TIME/DIV knob to set the Time/div setting to $500 \mu \mathrm{~s} / \mathrm{div}$.


### 4.3 Changing the Trigger Settings

The trigger settings determine which part of the acquired waveform to display. The main trigger settings are listed below.

Trigger type
Triggers can be classified into edge triggers and enhanced triggers.
Trigger source
The trigger source is the signal that is used to check for the trigger condition.
Trigger slope
Slope refers to the signal movement, such as from a low level to a high level (rising slope) or
from a high level to a low level (falling slope). When the slope is used as one of the trigger
conditions, it is called a trigger slope. An edge refers to a point where the trigger source slope
passes through the trigger level.

Trigger level
Trigger level refers to the level that the trigger source must pass through to trigger the DLM2000. With simple triggers such as the edge trigger, the DLM2000 triggers when the trigger source level passes through the specified trigger level.

## Trigger mode

The trigger mode that you select specifies the conditions (timing or count) for updating the displayed waveforms. If you execute auto setup, the DLM2000 is set to Auto mode.

## Trigger position

When you start waveform acquisition, the DLM2000 triggers on the set trigger condition and displays the waveforms stored in the acquisition memory. By moving the trigger position, the ratio of the displayed data before the trigger point (the pre-trigger section) and the data after the trigger point (the post-trigger section) can be changed. The default setting is $50.0 \%$ (the screen center).

If you initialize the DLM2000 settings or execute auto setup, the trigger type is set to edge trigger (the trigger is set to CH 1 ). With edge triggers, the DLM2000 triggers on the rising or falling edge of a single input signal.
This section explains how to change the trigger slope and trigger position, with the trigger type set to edge trigger.

## Note

The DLM2000 allows you to use trigger combinations, which are combinations of two triggers. If the front-panel B TRIG key is illuminated, a combination trigger is enabled.
If you want to trigger the DLM2000 using only an edge trigger or enhanced trigger, check that the B TRIG key is not illuminated. If the key is illuminated, set Combination to OFF using the B TRIG menu.

## Changing the Trigger Slope from Rising to Falling



1. Press EDGE key.
2. Set Slope to falling ( $\downarrow$ ).


## Changing the Trigger Position to 30\%

Follow the procedure below to move the waveform to the left by $20 \%$ ( 2 divisions) so that you can view more of the post-trigger section of the waveform.


Note

- Set the trigger position as a percentage from the left end of the screen. The screen center is 50\%.
- Press the POSITION knob to set the trigger point to $50 \%$


### 4.4 Measuring the Waveform

This section explains how to use vertical cursors to measure the displayed waveform's voltages and its period. Other convenient features such as computation and the automated measurement of waveform parameters can also be used to measure pulse and other periodic waveforms.

## Measuring Voltages Using Vertical Cursors

The voltages ( Y values) and times ( X values) at the cursor positions are displayed at the bottom section of the waveform display frame.

1. Press CURSOR to display cursors.
2. Press the Type soft key to select $\mid \boldsymbol{\Delta T}$.
3. Use the jog shuttle and SET key $(\mathbf{O})$ to move the cursors.


There are five cursor types.

- $\Delta \mathrm{T}$ cursors: Two $\Delta \mathrm{T}$ cursors are used to measure time values.
- $\Delta \mathrm{V}$ cursors: Two $\Delta \mathrm{V}$ cursors are used to measure vertical values.
- $\Delta T \& \Delta V$ cursors: Two $\Delta T$ cursors and two $\Delta V$ cursors are used to measure time and vertical values.
- Marker cursors (Marker): Four marker cursors that move on the waveform are used to measure waveform values.
- Angle cursors (Degree): Two angle cursors are used to measure angles.


### 4.5 Zooming in on or out from the Waveform

You can expand or reduce a section of the displayed waveform along the time axis. The zoomed waveforms of two locations can be displayed along with the normal waveform. When zoom waveforms are displayed, zoom boxes appear in the normal waveform display frame to indicate the zoom positions.


1. Press ZOOM1 or ZOOM2 key to display a zoom waveform.
2. Use the SET key $(\mathbf{O})$ to select the item whose zoom position you want to change, and then use the jog shuttle to move the zoom box.
You can change the decimal place of the zoom location value by moving the SET key to the left and right.
3. Use the ZOOM knob to set the magnification.

Press the ZOOM knob to set the magnification in fine detail (FINE illuminates). The ZOOM knob controls the zoom waveform whose corresponding panel key (ZOOM1 or ZOOM2) is illuminated brightly.


Press the SET key (O) to select Z1 or Z2 (both Z1 and Z2 can also be selected.)
Use the jog shuttle to move the zoom position

## Note

The ZOOM knob controls the waveforms in the window whose corresponding key, ZOOM1 or ZOOM2, is illuminated.
If both keys are illuminated, the ZOOM knob controls the waveforms in the window whose corresponding key is illuminated more brightly.

### 4.6 Printing and Saving the Waveform

This section explains how to print the displayed waveform on the built-in printer (/B5 option) and how to save measured data or a screen capture to a storage medium.

## Printing a Screen Capture on the Built-in Printer

Follow the procedure below to print a screen capture of the waveform. Before you print, follow the procedure in section 16.1 in the User' Manual (on the CD-ROM) to load roll paper into the built-in printer.

1. Press SHIFT key, and then press PRINT (MENU) key.
2. Press the Print To soft key to set the destination to Builtln.
3. Press the Mode soft key to set the print format.

HardCopy: Prints a screen capture that includes the setup menu.
Normal: Prints a screen capture, excluding the setup menu.
Long: Prints a screen capture by magnifying it 2 to 10 times along the time axis.
4. Press PRINT (MENU) again.


## Saving Screen Capture Data to a Storage Medium

Follow the procedure below to capture the current screen and save it to a file on a storage medium.

when the destination is not File

1. Press SHIFT key, and then press PRINT (MENU) key.
2. Press the Print To soft key to set the destination to File.
3. Press the Mode soft key to set the save format.

HardCopy: Saves a screen capture that includes the setup menu.
Normal: Saves a screen capture, excluding the setup menu.
Wide: Saves a screen capture by magnifying it two times along the time axis.
4. Press the Format soft key to set the data format.
5. Press the Color soft key to set the color.
6. Press the Background soft key to set the background to transparent or opaque.
7. Press the File List soft key to set the save destination medium and folder.
8. Press the File Name soft key to set the save destination file name. If you do not set the file name, a sequence number is used for the file name.
9. Press the PRINT (MENU).


## Saving Measured Data to a Storage Medium

Follow the procedure below to save waveform data displayed on the screen to a storage medium. The vertical, horizontal, and trigger settings for the waveform are also saved in this process.

1. Press File key.
2. Press the Waveform soft key under Save.
3. Press the File List soft key to set the storage destination medium and folder.
4. Press the File Name soft key to set the save destination file name. If you do not set the file name, a sequence number is used for the file name.
5. Press the Data Type soft key to set the data format. The data type that the DLM2000 can load is binary.
6. Press the Trace soft key to set the waveform you want to save.
7. Press the History soft key to set which range of history waveforms to save.
8. Press the Range/Compression soft key to set the window to be saved and data compression
9. Press the Save Waveform soft key to save the waveform.


### 5.1 Signal Input Section

## Analog Signal Input

| Item | Specifications |  |
| :---: | :---: | :---: |
| Number of input channels | DLM2022(710105), DLM2032(710115), DLM2052(710125): 2 (CH1 and CH2) DLM2024(710110), DLM2034(710120), DLM2054(710130): 4 (CH1 to CH4) |  |
| Input coupling settings | AC1M $2, \mathrm{DC} 1 \mathrm{M} \Omega$, DC50 , and GND |  |
| Input connector | BNC connector |  |
| Input impedance | $\begin{aligned} & 1 \mathrm{M} \Omega \pm 1.0 \% \text {, approx. } 20 \mathrm{pF} \\ & 50 \Omega \pm 1.0 \% \text { (VSWR1.4 or less at DC to } 500 \mathrm{MHz} \text { ) } \end{aligned}$ |  |
| Selectable voltage sensitivity range | $1 \mathrm{M} \Omega$ input: $50 \Omega$ input: | $2 \mathrm{mV} /$ div to $10 \mathrm{~V} /$ div (in 1-2-5 steps) $2 \mathrm{mV} /$ div to $500 \mathrm{mV} /$ div (in 1-2-5 steps) |
| Maximum input voltage | $1 \mathrm{M} \Omega$ input: <br> $50 \Omega$ input: | 150 Vrms (At 100 kHz and higher, the voltage decreases at $20 \mathrm{~dB} /$ decade down to 2.5 Vrms .) 5 Vrms or less and 10 Vpeak or less |
| Selectable maximum DC offset range (When the probe attenuation is set to $1: 1$ ) | $1 \mathrm{M} \Omega$ input <br> $2 \mathrm{mV} /$ div to $50 \mathrm{mV} / \mathrm{div}$ : <br> $100 \mathrm{mV} /$ div to $500 \mathrm{mV} / \mathrm{div}$ : <br> $1 \mathrm{~V} /$ div to $10 \mathrm{~V} / \mathrm{div}$ : <br> $50 \Omega$ input <br> $2 \mathrm{mV} / \mathrm{div}$ to $50 \mathrm{mV} /$ div: <br> $100 \mathrm{mV} /$ div to $500 \mathrm{mV} / \mathrm{div}$ : | $\begin{aligned} & \pm 1 \mathrm{~V} \\ & \pm 10 \mathrm{~V} \\ & \pm 100 \mathrm{~V} \\ & \hline \\ & \pm 1 \mathrm{~V} \\ & \pm 5 \mathrm{~V} \end{aligned}$ |
| Vertical-axis (voltage-axis) accuracy <br> DC accuracy ${ }^{1}$ <br> Offset voltage accuracy ${ }^{1}$ | $2 \mathrm{mV} / \mathrm{div}$ to $50 \mathrm{mV} / \mathrm{div}$ : $100 \mathrm{mV} / \mathrm{div}$ to $500 \mathrm{mV} / \mathrm{div}$ : $1 \mathrm{~V} / \mathrm{div}$ to $10 \mathrm{~V} / \mathrm{div}$ : | $\begin{aligned} & \pm(1.5 \% \text { of } 8 \text { divisions }+ \text { offset voltage accuracy }) \\ & \pm(1 \% \text { of set value }+0.2 \mathrm{mV}) \\ & \pm(1 \% \text { of set value }+2 \mathrm{mV}) \\ & \pm(1 \% \text { of set value }+20 \mathrm{mV}) \end{aligned}$ |
| Frequency Bandwidth $(\geq-3 \mathrm{~dB})^{1,2}$ <br> (When sine wave with amplitude $\pm 3 \operatorname{div}_{\mathrm{p} \text {-p }}$ equivalent is input) | ```\(1 \mathrm{M} \Omega\) input (measured from the probe tip when using the supplied 10:1 probe (10:1 conversion)) \(100 \mathrm{~V} /\) div to \(100 \mathrm{mV} /\) div: \(50 \mathrm{mV} /\) div to \(20 \mathrm{mV} / \mathrm{div}\) : \(50 \Omega\) input \(500 \mathrm{mV} /\) div to \(10 \mathrm{mV} /\) div: \(5 \mathrm{mV} /\) div to \(2 \mathrm{mV} / \mathrm{div}\) :``` | DLM2022/ DLM2032/ DLM2052/ <br> DLM2024 DLM2034 DLM2054 <br> DC to 200 MHz DC to 350 MHz DC to 500 MHz <br> DC to 150 MHz DC to $\mathbf{3 0 0} \mathrm{MHz}$ DC to 400 MHz <br> DC to 200 MHz DC to 350 MHz DC to 500 MHz DC to 150 MHz DC to 300 MHz DC to 400 MHz |
| -3 dB point for AC coupling | 10 Hz or less (1 Hz or less when using the supp | 10:1 probe) |
| Skew between channels (when channels are set to the same conditions) | 1 ns or less |  |
| Residual noise level ${ }^{3}$ | 0.4 mVrms or 0.05 divisions rms, whichever is greater (typical value ${ }^{4}$ ) |  |
| Isolation between channels (when set to the same voltage sensitivity) | Maximum bandwidth: -34 dB (typical value ${ }^{4}$ ) |  |
| A/D converter resolution | 8 bits (25 LSB/division) <br> 12 bits maximum (during high-resolution mode) |  |
| Probe attenuation settings | Voltage probe: $0.001: 1$ to $2000: 1$ (in 1-2-5 steps) <br> Current probe: $0.001 \mathrm{~A}: 1 \mathrm{~V}$ to 2000A:1V (in 1-2-5 steps) |  |
| Bandwidth limit | For each channel, can be set to FULL, $200 \mathrm{MHz}, 100 \mathrm{MHz}, 20 \mathrm{MHz}, 10 \mathrm{MHz}, 5 \mathrm{MHz}, 2 \mathrm{MHz}$, $1 \mathrm{MHz}, 500 \mathrm{kHz}, 250 \mathrm{kHz}, 125 \mathrm{kHz}, 62.5 \mathrm{kHz}, 32 \mathrm{kHz}, 16 \mathrm{kHz}$, or 8 kHz . Uses IIR and FIR digital filters |  |
| Maximum sample rate | Real-time sampling mode. Values inside parenthe When interleave mode is on: When interleave mode is off: Repetitive sampling mode: Interpolation sampling mode: | ses are for high resolution mode ${ }^{2}$ $\begin{aligned} & 2.5 \mathrm{GS} / \mathrm{s}(1.25 \mathrm{GS} / \mathrm{s}) \\ & 1.25 \mathrm{GS} / \mathrm{s}(625 \mathrm{MS} / \mathrm{s}) \\ & 125 \mathrm{GS} / \mathrm{s} \\ & 125 \mathrm{GS} / \mathrm{s} \end{aligned}$ |


| Item | Specifications |  |
| :--- | :--- | :--- |
| Maximum record length | Maximum record length for which repetitive acquisitions are possible |  |
|  | No options: | 1.25 M points |
|  | On models with the /M1 option: | 6.25 M points |
|  | On models with the /M2 option: | 12.5 M points |
|  | On models with the /M3 option: | 25 M points |
|  | Maximum record length for which a single acquisition is possible. Values inside parentheses apply |  |
|  | when interleave mode is on. | 6.25 M points (12.5 M points) |
|  | No options: | 25 M points ( 62.5 M points) |
|  | On models with the /M1 (S) option: | 62.5 M points (125 M points) |
|  | On models with the /M2 option: | 125 M points (250M points) |
|  | On models with the /M3 option: |  |

1 Values measured under standard operating conditions (see section 5.11 for details) after a 30-minute warm-up and calibration.
2 Values for repeating phenomena.
The single-shot frequency bandwidth is from DC to the sampling frequency/2.5 or is the frequency bandwidth of the repeating phenomena, whichever is less.
3 Values when the input section is shorted, the acquisition mode is set to Normal, accumulation is set to off, and the probe attenuation is set to $1: 1$.
4 Typical values represent typical or average values. They are not strictly warranted.

## Logic Signal Input

| Item | Specifications |  |
| :---: | :---: | :---: |
| Usable probes | 701980, 701981, 701988, 701989 (8-bit input) |  |
| Number of inputs | 8 |  |
| Nondestructive maximum | 701980, 701981, 701989: | $\pm 40 \mathrm{~V}$ (DC + ACpeak) or 28 Vrms |
| input voltage | 701988: | $\pm 42 \mathrm{~V}$ (DC + ACpeak) or 29 Vrms |
|  | For information about derating based on frequency, see the respective logic probe user's manual. |  |
|  | When using the 701980 When using the 701981 | When using the 701988 When using the 701989 |
| Input range | $\pm 40 \mathrm{~V}$ | $\pm 40 \mathrm{~V}$ Threshold level $\pm 6 \mathrm{~V}$ |
| Minimum input voltage | $500 \mathrm{mVp}-\mathrm{p} \quad 500 \mathrm{mVp}-\mathrm{p}$ | $500 \mathrm{mVp}-\mathrm{p} \quad 300 \mathrm{mVp}-\mathrm{p}$ |
| Maximum toggle frequency ${ }^{1}$ | 100 MHz | 100 MHz |
| Input impedance (typical value ${ }^{3}$ ) | 1 M //approx. $10 \mathrm{pF} \quad 10 \mathrm{k} \Omega /$ approx. 9 pF | $1 \mathrm{M} \Omega$ /approx. $10 \mathrm{pF} \quad \begin{aligned} & \text { Approx. } 100 \mathrm{k} \Omega \text { /approx. } \\ & \\ & \\ & 3 \mathrm{pF}\end{aligned}$ |
| Variable threshold level range | $\pm 40 \mathrm{~V}$ | $\pm 40 \mathrm{~V}$ |
| Threshold level setting | Same value for all 8 bits Same value for all 8 bits | Same value for all 8 bits Different values for each of the 8 bits |
| Threshold level resolution | $0.1 \mathrm{~V} \quad 0.1 \mathrm{~V}$ | 0.05 V |
| Threshold level accuracy ${ }^{1}$ | $\pm(0.1 \mathrm{~V}+3 \%$ of setting) $\pm(0.1 \mathrm{~V}+3 \%$ of setting) | $\pm(0.1 \mathrm{~V}+3 \%$ of setting) $\pm(0.1 \mathrm{~V}+3 \%$ of setting) |
| Hysteresis voltage (typical value ${ }^{3}$ ) |  | 100 mV <br> When noise rejection is off: 100 mV <br> When noise rejection is on: 250 mV |
| Minimum pulse width | 5 ns 2 ns | 5 ns 2 ns |
| Maximum sample rate | Real-time sampling mode. Values inside parentheses are for high resolution mode ${ }^{2}$ |  |
|  | When interleave mode is on: | Unable to acquire logic waveforms |
|  | When interleave mode is off: | $1.25 \mathrm{GS} / \mathrm{s}(625 \mathrm{MS} / \mathrm{s})$ |
|  | Repetitive sampling mode: | 125 GS/s |
|  | Interpolation sampling mode: | 125 GS/s (Pulse interpolation for logic |
| Maximum record length | Maximum record length for which repetitive acquisitions are possible |  |
|  | No options: | 1.25 M points |
|  | On models with the /M1 option: | 6.25 M points |
|  | On models with the /M2 option: | 12.5 M points |
|  | On models with the /M3 option: | 25 M points |
|  | Maximum record length for which a single acquisition is possible. |  |
|  | No options: | 6.25 M points |
|  | On models with the /M1 option: | 25 M points |
|  | On models with the /M2 option: | 62.5 M points |
|  | On models with the /M3 option: | 125 M points |

1 Under standard operating conditions (see section 5.11 for details) after a 30-minute warm-up.
2 Resolution only improves for analog waveforms.
3 Typical values represent typical or average values. They are not strictly warranted.

### 5.2 Triggering Section




| Item | Specifications |  |
| :---: | :---: | :---: |
|  | CAN FD: ${ }^{6}$ | Triggers on CAN FD bus signals |
|  |  | The source can be set to a signal from CH 1 to CH 4 . |
|  |  | Modes: SOF, Error Frame, ID, ID OR |
|  |  | Bit Rate: Arbitration phase |
|  |  | 250 k, 500 k, 1 Mbps, User Define |
|  |  | For User Define, you can set a value from 20 k to 1 Mbps in |
|  |  | Data phase |
|  |  | $500 \mathrm{k}, 1 \mathrm{Mbps}, 2 \mathrm{Mbps}, 4 \mathrm{Mbps}, 5 \mathrm{Mbps}, 8 \mathrm{Mbps}$, User Define |
|  |  | For User Define, you can set a value from 250 k to 10 Mbps in |
|  |  | 0.1-kbps steps. |
|  | LIN: ${ }^{6}$ | Triggers on a LIN (Local Interconnect Network) bus signal |
|  |  | The source can be set to a signal from CH 1 to CH 4 . |
|  |  | Modes: Break Synch, Error, ID/Data, ID OR |
|  |  | Bit Rate: 1200, 2400, 4800, 9600, 19200 bps, User Define |
|  |  | For User Define, you can set a value from 1 k to 20 kbps in 0.01 -kbps steps. |
|  | SENT: ${ }^{6}$ | Triggers on SENT signals (J2716 JAN2010 and earlier) |
|  |  | The source can be set to a signal from CH 1 to CH 4 or from logic bits 0 to $7 .{ }^{2}$ |
|  |  | Modes: Every Fast CH |
|  |  | Clock period: $1 \mu \mathrm{~s}$ to $100 \mu \mathrm{~s}$ (resolution: $0.01 \mu \mathrm{~s}$ ) |
|  | PSI5 Airbag: ${ }^{6}$ | Triggers on PSI5 Airbag signal |
|  |  | The source can be set to a signal from CH 1 to CH 4 . |
|  |  | Mode: Sync, Start Bit, Data |
|  |  | Bit Rate: 125kbps, 189kbps, User Define |
|  |  | For User Define, you can set a value from 10.0 k to 1000.0 kbps in 0.1-kbps steps. |
|  | UART: ${ }^{6}$ | Triggers on a UART (RS232) signal |
|  |  | The source can be set to a signal from CH 1 to CH 4 or from logic bits 0 to $7 .{ }^{2}$ |
|  |  | Modes: Every Data, Error, Data |
|  |  | Formats: $\begin{array}{ll}\text { 8-bit data (no parity bit), 7-bit data + parity bit, } \\ & \text { 8-bit data + parity bit }\end{array}$ |
|  |  | $\begin{array}{ll}\text { Bit Rate: } \quad 1200,2400,4800,9600,19200 \mathrm{bps}, 38400 \mathrm{bps}, 57600 \mathrm{bps}, \\ & 115200 \mathrm{bps}, \text { User Define }\end{array}$ |
|  |  | For User Define, you can set a value from 1 k to 1000 kbps in 0.1 -kbps steps. |
|  | I2C: ${ }^{6}$ | Triggers on an I2C bus signal. |
|  |  | The source can be set to a signal from CH 1 to CH 4 or from logic bits 0 to $7 .{ }^{2}$ |
|  |  | Modes: Every Start, Adr Data, NON ACK, General Call, Start byte, HS Mode |
|  | SPI: ${ }^{6}$ | Triggers on an SPI (Serial Peripheral Interface) bus signal |
|  |  | The source can be set to a signal from CH 1 to CH 4 or from logic bits 0 to $7 .{ }^{2}$ |
|  |  | Modes: 3wire, 4wire |
|  | User Define: | Triggers on a general-purpose serial communication signal |
|  |  | The source can be set to a channel from CH 1 to $\mathrm{CH} 4 .{ }^{1}$ |
|  |  | Data channel, chip select channel, clock channel, and latch channel can be specified. |
|  |  | Bit Rate: 1 k to 200 Mbps (with clock) |
|  |  | 1 k to 49.5 Mbps (without clock) |
|  |  | Data Size: 1 to 128 bits |

1 CH 1 and CH2 on the DLM2022, DLM2032, and DLM2052.
2 Logic only available on the DLM2024, DLM2034, and DLM2054.
3 Values measured under standard operating conditions (see section 5.11 for details) after a 30-minute warm-up and calibration.
4 Values measured under standard operating conditions (see section 5.11 for details) after a 30-minute warm-up.
5 Typical values represent typical or average values. They are not strictly warranted.
6 FlexRay, CAN, CAN FD, LIN, SENT, PSI5, UART, I2C, and SPI are options for 4-channel models.

### 5.2 Triggering Section



### 5.3 Time Axis

| Item | Specifications |
| :--- | :--- |
| Selectable time scale range | $1 \mathrm{~ns} /$ division to 500 s/division |
| Timebase accuracy* | $\pm 0.002 \%$ |
| Time measurement | $\pm(0.002 \%+50 \mathrm{ps}+1$ sample period $)$ |
| accuracy* |  |

* Values measured under standard operating conditions (see section 5.11 for details) after a 30-minute warm-up.


### 5.4 Display

| Item | Specifications |
| :--- | :--- |
| Display | 8.4 -inch $(21.3-\mathrm{cm})$ color TFT LCD* |
| Display screen size | 171.264 mm (horizontal) $\times 128.488 \mathrm{~mm}$ (vertical) |
| Resolution of the entire <br> screen | $1024 \times 768($ XGA $)$ |
| Resolution of the waveform <br> display | $1000 \times 640$ |
| The LCD may include a few defective pixels (within 4 ppm over the total number of pixels including RGB). |  |
|  |  |
| The LCD may contain some pixels that are always lighted or that never light. Please be aware that these are not defects. |  |

### 5.5 Features

| Item | Specifications |
| :---: | :---: |
| Channel on/off | CH 1 to $\mathrm{CH} 4^{1}$ and LOGIC can be turned on and off separately. <br> Either CH 4 or LOGIC ${ }^{2}$ can be turned on at any given time. <br> When interleave mode is on, all even-numbered channels (including LOGIC $^{2}$ ) are automatically are turned off. |
| Logic waveform bus display | Bus display can be used for logic waveform bits 0 to 7 . <br> The bus display shows the logic signal according to the specified format (Format) and bit order (Bit Order). |
| Vertical position setting | Analog waveforms: Waveforms can be moved in the range of $\pm 4$ divisions from the center of the waveform display frame. <br> Logic waveforms: ${ }^{2}$ The center of logic waveforms can be moved in the range of $\pm 4$ divisions from the center of the waveform display frame. <br> Press the vertical position knob to reset the position to its default value (0 divisions). |
| Vertical scale settings | The vertical scale knob allows you to set the vertical scale. <br> Press the knob to switch between coarse and fine. <br> For the selectable range when using Coarse adjustment, see "Analog Input Section" in section 5.1, "Signal Input Section." <br> Fine vertical sensitivity is achieved through digital zooming. <br> If you change the scale while the DLM2000 is stopped, you can vertically expand or reduce waveforms. <br> Logic waveforms ${ }^{2}$ can be expanded to three different display-size levels. |
| Input filtering | Bandwidth limit can be specified for CH 1 to $\mathrm{CH} 4^{1}$ separately. <br> For the available filter types, see "Bandwidth limit" in section 5.1, "Signal Input Section." |
| Offset cancelling | Can be set to on or off for CH 1 through $\mathrm{CH} 4{ }^{1}$. <br> OFF: Does not apply the specified offset to the result of cursor measurements, computations, and automated measurement of waveform parameters. <br> ON: Applies the specified offset to the result of cursor measurements, computations, and automated measurement of waveform parameters. |
| Inverted display | Waveforms can be inverted around the vertical position for CH 1 to $\mathrm{CH} 4^{1}$ separately. Configuration and measurement are executed on the waveforms before the inversion. |
| Linear scaling | Scaling coefficient, offset value, and unit can be specified for CH 1 to $\mathrm{CH} 4{ }^{1}$ separately. |


| Item | Specifications |
| :---: | :---: |
| Logic channel threshold level preset | You can choose from the following preset threshold level settings. $\begin{aligned} & \mathrm{CMOS}(5 \mathrm{~V})=2.5 \mathrm{~V}, \mathrm{CMOS}(3.3 \mathrm{~V})=1.65 \mathrm{~V}, \mathrm{CMOS}(2.5 \mathrm{~V})=1.25 \mathrm{~V}, \mathrm{CMOS}(1.8 \mathrm{~V})=0.90 \mathrm{~V} \text {, } \\ & \mathrm{ECL}=-1.30 \mathrm{~V} \end{aligned}$ |
| Deskewing | The waveform display position can be adjusted for CH 1 to $\mathrm{CH}^{1}$ and LOGIC $^{2}$ separately. <br> Trigger skew cannot be adjusted. <br> Logic waveforms can be adjusted at the pod (8-bit) level. Adjustment at the bit level is not possible. The adjustable range is $\pm 100 \mathrm{~ns}$ in 0.01 -ns steps. |
| Horizontal position settin | Horizontal position knob can be used to set the trigger position and trigger delay. <br> What the knob controls is indicated by the DELAY key LED. <br> LED off: Trigger position <br> LED on: Trigger delay <br> For trigger position and trigger delay specification details, see "Trigger position" or "Trigger delay" in section 5.2, "Triggering Section." |
| Delay cancelling | You can select whether or not to apply the specified delay to the time measurement values. ON: Measures time with the trigger position set to 0 s (does not apply the delay to time measurement). <br> OFF: Measures time with the trigger point set to 0 s (applies the delay to time measurement). |
| Time scale setting | The TIME/DIV knob can be used to set the time scale. For the selectable range, see "Selectable time scale range" in section 5.3, "Time Axis." If you change the time scale while the DLM2000 is stopped, you can expand or reduce waveforms along the time axis. |
| Roll mode | The DLM2000 switches to roll mode display when the trigger mode is set to Auto, Auto Level, or Single for the following time scale ranges. For details on the trigger modes, see "Trigger modes" in section 5.2, "Triggering Section." <br> 1.25 M points or less: $100 \mathrm{~ms} /$ division to $500 \mathrm{~s} /$ division <br> 6.25 M points: $\quad 500 \mathrm{~ms} /$ division to $500 \mathrm{~s} /$ division <br> 12.5 M points: $\quad 500 \mathrm{~ms} /$ division to $500 \mathrm{~s} /$ division <br> 25 M points: $\quad 1$ s/division to 500 s/division <br> 62.5 M points: $\quad 5$ s/division to 500 s/division <br> 125 M points: $\quad 5$ s/division to 500 s/division <br> 250 M points: $\quad 10$ s/division to 500 s/division |

CH1 and CH2 on the DLM2022, DLM2032, and DLM2052.
Logic only available on the DLM2024, DLM2034, and DLM2054.

## Signal Acquisition and Screen Display

| Item | Specifications |  |
| :---: | :---: | :---: |
| Acquisition modes | Normal, Envelope, and Averaging. |  |
|  | Normal: N | Normal sampling without special processing |
|  | Envelope: | From the data sampled at the maximum real-time sample rate, the DLM2000 acquires the maximum and minimum values for each memory acquisition interval. |
|  | Average: | Averages normally sampled data over multiple acquisitions. Exponential averaging is performed when the trigger mode is set to Auto, Auto Level, or Normal, and linear averaging is performed when the trigger mode is set to Single. The trigger mode is set to Normal for N Single. The attenuation constant for exponential averaging and the linear average count can be set to a value from 2 to 1024 in $2^{n}$ steps. Averaging cannot be used on logic waveforms. For details on the trigger modes, see "Trigger modes" in section 5.2, "Triggering Section." |
| Sampling modes | scale that would cause the sample rate to exceed the real-time sampling maximum sample rate with the specified record length kept constant, the DLM2000 operates as follows: |  |
|  | For the maximum sample rates, see "Maximum sample rate" in section 5.1, "Signal Input Section." |  |
|  | Realtime: | Achieves the desired time scale by reducing the display record length. |
|  | Interpolation: | Performs interpolation sampling. If you decrease the time scale further and the upper limit of the interpolation sampling rate is exceeded, the DLM2000 reduces the display record length to achieve the desired time scale. |
|  | Repetitive: | Performs repetitive sampling. If you decrease the time scale further and the upper limit of the repetitive sampling rate is exceeded, the DLM2000 reduces the display record length to achieve the desired time scale. |
| High resolution mode | Improves the ana filter. <br> Improves the ver | alog waveform $\mathrm{S} / \mathrm{N}$ ratio by combining the high resolution mode and the digital rtical resolution up to 12 bits. |



| Item | Specifications |
| :--- | :--- |
| Accumulation | Accumulates waveforms with gradually decreasing intensity for the specified amount of time. <br> The accumulation time can be set to a value from 100 ms to 100 s or to infinite. <br> Intensity and color modes can be selected. <br> Intensity: <br> Accumulates waveforms using separate channel colors with gradually decreasing <br> intensity. |
| Color: $\quad$ Displays the intensity that appears in intensity mode using different colors. |  |

## Computation, Analysis, and Searching

| Item | Specifications |
| :---: | :---: |
| Computation | Two computations can be performed, using MATH1 and MATH2 (only MATH1 on the DLM2022, |
|  |  |
|  |  |
|  | MATH1: CH 1 to $\mathrm{CH} 4{ }^{1}$ |
|  | MATH2: CH 1 to CH 4 , and MATH1 |
|  | The maximum computable record length is as follows: |
|  | Standard model: $\quad 6.25 \mathrm{M}$ points |
|  | /M1(S) option: $\quad 25 \mathrm{M}$ points |
|  | /M2 option: $\quad 62.5 \mathrm{M}$ points |
|  | /M3 option: $\quad 125 \mathrm{M}$ points |
|  | The following computation types are available. |
|  | Standard model: Operators + , -, *, FILTER, INTEG, COUNT (EDGE/ROTARY) |
|  | User-defined computation (option): Expressions can be created by combining the following operators and constants. |
|  | Operators +, -, *, l, ABS, SQRT, LOG, LN, EXP, P2, SIN, ASIN, COS, ACOS, TAN, ATAN, PH, DIFF, INTEG, FILT1, FILT2, HLBT, MEAN, DELAY, BIN, PWHH, PWHL, PWLH, PWLL, PWXX, FV, DUTYH, DUTYL, DA |
|  | Constants K1 to K4, 0 to 9, Pl, e, fs, 1/fs, Exp, Measure |
| FFT | Two FFT (Fast Fourier Transform) waveforms, FFT1 and FFT2, can be displayed (only FFT1 on the DLM2022, DLM2032, and DLM2052). |
|  | Sources: $\quad \mathrm{CH} 1$ to $\mathrm{CH} 4^{2}$, MATH1, MATH2 ${ }^{2}$ |
|  | Ranges: Main, Zoom1, Zoom2 |
|  | FFT Points: $\quad 1.25 \mathrm{k}, 12.5 \mathrm{k}, 125 \mathrm{k}, 250 \mathrm{k}$ points (samples the waveform in the above range using the specified number of FFT points) |
|  | Windows: Rectangular, Hanning, and flattop |
|  | Modes: Normal, Max Hold, Average |
|  | On models with the user-defined computation option, the FFT's Type and Sub type settings can be set as follows: |
|  | Type: LS, RS, PS, PSD, CS, TF, CH |
|  | Sub type: MAG, LOGMAG, PHASE, REAL, IMAG |
| Reference waveforms | Two reference waveforms, REF1 and REF2, can be displayed (only REF1 on the DLM2022, DLM2032, and DLM2052). |
|  | Saved waveforms and channel waveforms can be loaded into REF1 and REF2. REF1 uses the MATH1 waveform. REF2 uses the MATH2 waveform. Therefore, REF and MATH cannot be used simultaneously. Maximum record length at which reference waveforms can be used is the same as the maximum record length at which computation is possible. |
| Serial bus signal analysis ${ }^{3}$ | FlexRay, CAN, CAN FD (ISO 11898-1: 2015 or non-ISO), LIN, CXPI, SENT, PSI5 Airbag, UART, I2C, SPI, and user-defined serial bus data can be analyzed and displayed. |
|  | The DLM2000 can decode frames, fields, and other information from the waveform displayed on the screen. Then, it can display the decoded results and the waveform together on the screen or display a list of detailed decoded results. For SENT and PSI5 Airbag signals, trend display is also possible. |
|  | By setting search conditions and performing a search, you can display an expanded waveform with the detected frame's or field's first data byte at the center of the window. |
|  | The DLM2000 can analyze and search the waveforms of up to four serial bus signals. The DLM2022, DLM2032, and DLM2052 can analyze and search the waveforms of one serial bus signal (Serial. Bus1). |


| Item | Specifications |
| :---: | :---: |
| History waveform searching | You can search for waveforms that meet specified conditions, display detected history waveforms, and list the timestamps of the waveforms. <br> You can set a search condition to search for history waveforms that enter a rectangular zone (Simple) or set four ${ }^{4}$ conditions 4 and search on the AND or OR logic of these conditions. <br> Search criterion can be set to whether the source waveform enters the search range (IN), moves outside the search range (OUT), or don't care (X). <br> The following four search range types are available. <br> Rect-Zone: <br> Rectangular zone. FFT waveforms cannot be used. <br> Wave-Zone: Waveform zone. XY and FFT waveforms cannot be used. <br> Polygon-Zone: Polygonal zone. FFT waveforms cannot be used. <br> Parameter: Zone between the upper and lower limits of one waveform parameter. |
| Waveform searching | Searches the displayed waveform for locations that meet the specified conditions and displays the waveform expanded around the detected points. <br> Up to 50000 points can be detected within the specified search range. <br> Search feature: Searches for a particular section after a particular time (Start Point) on the currently displayed waveform and displays the section in the zoom window. <br> Selectable Start Point range is $\pm 5$ divisions. <br> Search Types: Edge, Edge Qualified, State, Pulse Width, State Width |
| Cursor measurement | The following cursors are selectable. $\Delta \mathrm{T}, \Delta \mathrm{V}, \Delta \mathrm{T} \& \Delta \mathrm{~V}$, Marker, Degree |
| Automated measurement of waveform parameters | The following waveform parameters can be automatically measured. <br> - Items that are measured over the entire specified range of data and are irrelevant to the period. Max, Min, P-P, High, Low, Amplitude, Rms, Mean, Sdev, IntegTY+, IntegTY, +Over, -Over, Pulse Count, Edge Count <br> - Items that are measured in the first period in the specified range. <br> Freq, Period, Burst, +Width, -Width, Duty, Rise, Fall, Delay <br> - Items that are measured over all periods in the specified range. <br> AvgFreq, AvgPeriod <br> - $\Delta T \& \Delta V$ cursor value $\mathrm{V} 1, \mathrm{~V} 2, \Delta \mathrm{~T}$ <br> For logic signal, the following items are selectable. <br> Freq, Period, AveFreq, Duty, Pulse Count, Delay <br> In cycle mode, the following items are valid. <br> Max, Min, P-P, High, Low, Amplitude, Rms, Mean, Sdev, IntegTY+, IntegTY, +Over, -Over <br> The maximum total number of items that can be displayed in Area1 and Area2 on the screen is 30. |
| Statistical processing of waveform parameters | The following three types of statistical processing are available. <br> Continuous: Calculates statistics on normal measurement that is performed multiple times. <br> Cycle: <br> Calculates statistics on the measurement of each period of the displayed waveform. <br> History: Calculates statistics on the measurements of multiple history waveforms. <br> The calculated statistics are as follows: <br> Statistical items: Max, Min, Mean, $\sigma$, Count |
| Trend display and histogram display of waveform parameters | Up to two trends or histograms of the specified measurement items can be displayed (only one on the DLM2022, DLM2032, DLM2052). <br> The maximum number of items that can be displayed on the screen is nine. |
| Expanded parameter measurement | Automated measurement of waveform parameters can be performed on two areas. Calculations can be performed using the automated measurement values of waveform parameters. <br> In addition to the normal waveform measurement range (Area1), you can specify another measurement range (Area2). <br> The same parameter measurement as Area1 can be performed in Area2. Cycle mode can be set on Area2. <br> The items that can be measured in Cycle mode are as follows: <br> Max, Min, P-P, High, Low, Rms, Mean, Sdev, IntegTY+, IntegTY, +Over, -Over <br> The maximum total number of items that can be displayed in Area1 and Area2 on the screen is 30. |
| Frequency distribution analysis | Counts the frequency of data occurrence in a specified area and displays the values in a histogram. You can select whether to count the voltage data frequency or the time data frequency. <br> The mean, standard deviation, maximum value, minimum value, peak value, median, etc., can be measured on the histogram. <br> You can set up to two histogram source waveforms (Hist1 and Hist2; only HIST1 on the DLM2022, DLM2032, and DLM2052). |
| Action-on-trigger | A specific action can be executed when the DLM2000 triggers. <br> You can set the number of times to execute the action in terms of the number of waveform acquisitions or the number of determinations. <br> Actions: <br> Beeping, screen capture data printing or saving, waveform data saving, mail transmission ${ }^{5}$ |


| Item | Specifications |
| :---: | :---: |
| GO/NO-GO determination | A specific action can be executed when the GO/NO-GO result is NO-GO. <br> You can set the number of times to execute the action in terms of the number of waveform acquisitions or the number of determinations. <br> Up to four conditions can be set, and the four ${ }^{4}$ conditions can be combined using AND or OR logic to perform determination. <br> Reference condition can be set to whether the source waveform enters the reference range (IN), moves outside the search range (OUT), or don't care (X). <br> The following four reference range types are available. <br> Rect-Zone: Rectangular zone. FFT waveforms cannot be used. <br> Wave-Zone: Waveform zone. XY and FFT waveforms cannot be used. <br> Polygon-Zone: Polygonal zone. FFT waveforms cannot be used. <br> Parameter: Zone between the upper and lower limits of one waveform parameter. <br> Actions <br> Beeping, screen capture data printing or saving, waveform data saving, mail transmission ${ }^{5}$ |
| Power supply analysis feature (option) | You can select and execute the analysis feature or power measurement feature. <br> Analysis feature: Two of the following analyses can be executed simultaneously. <br> - Switching loss analysis (SW Loss): <br> The total loss and the switching loss can be measured. Items such as power waveforms and measured values can be displayed, and statistics can be computed. The items whose switching losses can be measured automatically are listed below. Wp, Wp+, Wp-, Abs.Wp, P, P+, P-, Abs.P, Z <br> - Safe Operating Area (SOA): <br> An X-Y display can be created with voltage input plotted on the $X$-axis and current input plotted on the $Y$-axis. <br> - Harmonic analysis (Harmonics): <br> Simple comparisons can be made between the harmonics and standard limits. <br> IEC 61000-3-2 Ed. 2.2, "Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current $\leq 16 \mathrm{~A}$ per phase)" <br> EN 61000-3-2 (2000) <br> IEC 61000-4-7 Ed. 2 <br> - Joule integral $\left(\mathrm{I}^{2} \mathrm{t}\right)$ : <br> Items such as Joule integral waveforms and measured values can be displayed, and statistics can be computed. The item whose Joule integral can be measured automatically is shown below. $1^{2} \mathrm{t}$ |
|  | Power measurement feature: The power of up to two circuits can be measured simultaneously. <br> The items that can be measured automatically are shown below. <br> U+pk, U-pk, Up-p, Udc, Uac, Urms, Umn, Urmn, Avg Freq (of voltage), I+pk, I-pk, Ip-p, Idc, Iac, <br> Irms, Imn, Irmn, Avg Freq (of current), S, P, Q, Z, $\lambda$, Wp, Wp+, Wp-, Abs.Wp, q, q+, q-, Abs.q <br> The auto deskew feature automatically deskews the time difference between the voltage and current waveforms. Auto deskew uses voltage and current signals of the deskew signal sources (701935 or 701936; sold separately) that are received through probes connected to voltage channels and current channels, respectively. For information about the deskew range, see "Deskewing" described earlier. |
| 1 CH 1 and CH 2 on the DLM2022, DLM2032, and DLM2052. |  |
| $2 \mathrm{CH} 1, \mathrm{CH} 2$, and MATH1 on the DLM2022, DLM2032, and DLM2052. |  |
| 3 FlexRay, CAN, CAN FD, <br> 4 Two on the DLM2022, <br> 5 On models with the Ethe | IN, CXPI, SENT, PSI5, UART, I2C, and SPI are options for 4-channel models. M2032, and DLM2052. net option. |

## Screen Capture Data Printing and Saving

| Item | Specifications |
| :---: | :---: |
| Built-in printer (option) | Prints screen captures in one of the following output formats. |
|  | HardCopy: Prints the displayed screen image. |
|  | Normal: Prints only the waveform area of the displayed screen image. The menu is not printed. |
|  | If cursor measurements or automatically measured results are displayed, they are printed below the waveform area. |
|  | Long: Prints a screen capture whose time axis is magnified 2 to 10 times. The menu is not printed. |
|  | If cursor measurements or automatically measured results are displayed, they are printed below the waveform area. |
| USB printer | Prints screen captures on an external printer via USB. Color can be turned on or off. Supports Epson inkjet printers and HP inkjet printers. |
| Network printer | Prints screen captures on an external printer via Ethernet. ${ }^{*}$ Color can be turned on or off. Supports Epson inkjet printers, HP inkjet printers, and HP laser printers. |
| File | Saves screen capture data to the specified storage medium using one of the following save modes. The storage medium can be set to internal memory or USB storage. |
|  | Output data format can be set to PNG or JPEG. Available color settings are OFF, ON, ON (Rev), and ON (Gray). |
|  | HardCopy: Saves the displayed screen image. |
|  | Normal: $\quad$ Saves only the waveform area of the displayed screen image. The menu is not saved. |
|  | If cursor measurements or automatically measured results are displayed, they are saved below the waveform area. |
|  | Wide: $\quad$ Saves a screen capture whose time axis is magnified twice. The menu is not saved. If cursor measurements or automatically measured results are displayed, they are saved below the waveform area. |

* On models with the Ethernet option.


## Data Storage

| Item | Specifications |
| :---: | :---: |
| Waveform data | Saves waveform data (including history waveforms) to the specified storage medium.*The saved data can be loaded into the DLM2000. <br> Available data formats are binary (.wdf) and ASCII (.csv). Only binary (.wdf) files can be loaded into the DLM2000. <br> Waveform data is saved by specifying the data format, the waveform to save, the history range, the window to be saved (Main, Zoom1, or Zoom2), and the compression method (OFF, P-P, or Decimation). <br> Waveform data is loaded by setting the load destination to ACQ memory, REF1 (MATH1), or REF2 (MATH2). ${ }^{\text {. }}$ <br> If waveform data is loaded into the ACQ memory, the data is cleared when you start waveform acquisition. |
| Setup data | Setup data can be saved to the specified storage medium. ${ }^{1}$ The saved data can be loaded into the DLM2000. |
| Setup data (storage and recall) | Up to three sets of setup data can be stored and loaded from the internal memory. |
| Other types of data | The displayed screen image can be saved. Waveform zones can be saved and loaded. Polygonal zones can be loaded. Snapshot waveforms can be saved and loaded. Automatically measured waveform parameters can be saved. Serial bus analysis results can be saved. FFT waveform data can be saved. Histogram data can be saved and loaded. |

[^2]
## Other Features

| Item | Specifications |
| :--- | :--- |
| Default setup | Resets the DLM2000 to its factory default settings. <br> The following settings are not reset: date and time settings, communication interface settings, <br> settings stored to the internal memory, and language settings. <br> The Undo command can be used to revert to the previous settings. |
| Auto setup | Automatically sets the voltage scale, time scale, trigger, and other settings to the most suitable <br> values for the input signals. <br> The Undo command can be used to revert to the previous settings. |
| Serial bus auto setup* | Auto setup can be executed on the basis of the selected serial bus type (FlexRay, CAN, CAN FD, <br> LIN, CXPI, SENT, PSI5 Airbag, UART, I 2 C, or SPI) and trigger source. The DLM2000 can <br> automatically set the bit rate, source level, and other settings and trigger on the basis of these <br> settings. |
| Auto calibration and manual calibration are available. |  |
| Calibration | The date, time, and message language can be specified. The click sound can be turned on and off. |

* On models with the serial bus option.


### 5.6 Built-in Printer (/B5 Option)

| Item | Specifications |
| :--- | :--- |
| Print system | Thermal line dot system |
| Dot density | 8 dots $/ \mathrm{mm}$ |
| Sheet width | 112 mm |

### 5.7 Storage

## Internal Memory

| Item | Specifications |  |
| :--- | :--- | :--- |
| Media type | SD memory card |  |
| Memory size | Standard model: | Approx. 300 MB |
|  | /C8 option: | Approx. 1.8 GB |
|  | /C9 option: | Approx. 7.2 GB |

USB Storage Device

| Item | Specifications |
| :--- | :--- |
| Compatible USB storage <br> devices | Mass storage device compatible with USB Mass Storage Class Ver. 1.1 |
| Available space | 2 TB |

[^3]
### 5.8 USB for Peripherals

| Item | Specifications |
| :--- | :--- |
| Connector type | USB type A (receptacle) |
| Electrical and mechanical <br> specifications | USB Rev. 2.0 compliant |
| Supported transfer modes | LS (Low Speed; 1.5 Mbps), FS (Full Speed; 12 Mbps), HS (High Speed; 480 Mbps) |
| Ports | 2 |
| Power supply | $5 \mathrm{~V}, 500 \mathrm{~mA}$ (for each port) |
| Compatible devices | Mouse devices that comply with USB HID Class Ver. 1.1 |
|  | 104 or 109 (Japanese) keyboards that comply with USB HID Class Ver. 1.1 |
|  | Supports Epson inkjet printers and HP inkjet printers that are compatible with USB Printer Class |
|  | Ver. 1.0. |
|  | Mass storage device compatible with USB Mass Storage Class Ver. 1.1. |
|  | USB HUB device |
| No. of connectable devices | Hub: 1 per port |
|  | Mouse, keyboard, and printer: 1 each |
|  | Mass storage devices: 4 |
|  | Up to six devices can be connected including the hub |

### 5.9 Auxiliary I/O Section

## External Trigger Input (TRIG IN)

| Item | Specifications |
| :---: | :---: |
| Connector type | BNC |
| Input bandwidth ${ }^{*}$ | DC to 100 MHz |
| Input impedance | Approx. $1 \mathrm{M} \Omega$, approx. 20 pF |
| Maximum input voltage | $\pm 40 \mathrm{~V}$ (DC + ACpeak) or 28 Vrms <br> (At 1 MHz and higher, the voltage decreases at $20 \mathrm{~dB} /$ decade down to $\pm 5 \mathrm{~V}$ (DC+ACpeak) or 3.5 Vrms.) |
| Input range | $\begin{aligned} & \pm 2 \mathrm{~V} \text { (DLM2024, DLM2034, DLM2054). } \\ & \pm 1 \mathrm{~V} \text { (for the } \pm 1 \mathrm{~V} \text { range on the DLM2022, DLM2032, DLM2052). } \\ & \pm 10 \mathrm{~V} \text { (for the } \pm 10 \mathrm{~V} \text { range on the DLM2022, DLM2032, DLM2052). } \end{aligned}$ |
| Trigger level | $\pm 2 \mathrm{~V}$. The resolution is 5 mV (DLM2024, DLM2034, DLM2054). <br> $\pm 1 \mathrm{~V}$. The resolution is 5 mV (for the $\pm 1 \mathrm{~V}$ range on the DLM2022, DLM2032, DLM2052). <br> $\pm 10 \mathrm{~V}$. The resolution is 50 mV (for the $\pm 10 \mathrm{~V}$ range on the DLM2022, DLM2032, DLM2052). |

* Values measured under standard operating conditions (see section 5.11 for details) after a 30-minute warm-up.

Trigger Output (TRIG OUT)

| Item | Specifications |
| :--- | :--- |
| Connector type | BNC |
| Output level | 3.3 V CMOS |
| Output impedance | Approx. $50 \Omega$ |
| Output logic | Negative logic and positive logic switchable |
| Output delay | 50 ns max. |
| Output hold time | Negative logic: Low level: 800 ns min. High level: 50 ns min. <br> Positive logic: High level: 800 ns min. Low level: $50 \mathrm{~ns} \mathrm{min}.$. |

## Probe Interface Terminal

| Item | Specifications |  |
| :--- | :--- | :--- |
| Output terminals | DLM2022, DLM2032, DLM2052: | 3 |
|  | DLM2024, DLM2034, DLM2054: | 4 |
| Output voltage | $\pm 12 \mathrm{~V}$ (up to 1.2 A in combination with the rear-panel probe power terminal), $\pm 5 \mathrm{~V}$ (up to 800 mA |  |
|  | total) |  |
| Usable probes | Active probes (701912, 701913, 701914), differential probes (701923, 701924, 701927), |  |
|  | current probes (701928, 701929) |  |

## Probe Power Terminal (/P2 and /P4 Option)

| Item | Specifications |  |
| :--- | :--- | :--- |
| Output terminals | DLM2022, DLM2032, DLM2052: | 2 (/P2 option) |
|  | DLM2024, DLM2034, DLM2054: | 4 (/P4 option) |
| Output voltage | $\pm 12 \mathrm{~V}$ (up to 1.2 A in combination with the probe interface terminal) |  |
| Usable probes and deskew | FET probe (700939), current probe (701930, 701931, 701932, 701933), differential probes (700924, |  |
| signal sources | $700925,701920,701921,701922,701926)$, deskew signal source (701936) |  |

## GO/NO-GO Output

| Item | Specifications |
| :--- | :--- |
| Connector type | RJ-12 modular jack |
| Output signal | GO OUT, NO-GO OUT |
| Output level | TTL compatible |
| Compliant cable | Four-wire modular cable |

## Video Signal Output (VIDEO OUT)

| Item | Specifications |
| :--- | :--- |
| Connector type | D-sub 15 pin (receptacle) |
| Output type | Analog RGB output |
| Output resolution | XGA-compliant output, $1024 \times 768$ dots, approx. $60-\mathrm{Hz}$ Vsync $(66-\mathrm{MHz}$ dot clock frequency) |

### 5.10 Computer Interface

## GP-IB (Option)

| Item | Specifications |
| :--- | :--- |
| Electrical and mechanical <br> specifications | Complies with IEEE St'd 488-1978 (JIS C 1901-1987) |
| Functional specifications | SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT0, C0 |
| Protocol | Complies with IEEE St'd 488.2-1992 |
| Code | ISO (ASCII) |
| Mode | Addressable mode |
| Addresses | Talker and listener addresses can be specified from 0 to 30. |
| Clearing remote mode | Remote mode can be cleared with the SHIFT+CLEAR TRACE key (except during Local Lockout). |

## USB for PC Connection

| Item | Specifications |
| :---: | :---: |
| Connector type | USB type B (receptacle) |
| Electrical and mechanical specifications | USB Rev. 2.0 compliant |
| Supported transfer modes | FS (Full Speed; 12 Mbps ), HS (High Speed; 480 Mbps ) |
| Ports | 1 |
| Supported protocols | Functions as a device that conforms to one of the following two protocols. USBTMC-USB488 (USB Test and Measurement Class Ver. 1.0)* <br> GP-IB commands can be used through USB. <br> Mass Storage Class Ver.1.1 <br> Only reading is possible from the DLM2000 internal memory through PC access. <br> (Operations, such as formatting, are not possible.) |
| PC system requirements | A PC running the English or Japanese version of Windows 7 (32bit, 64bit), Windows 8 (32bit, 64bit), Windows 8.1 (32bit, 64bit), or Windows 10 (32bit, 64bit) |

* A separate driver is required.

Ethernet Interface (/C10 and /C11 options)

| Item | Specifications |
| :--- | :--- |
| Connector type | RJ-45 |
| Ports | 1 |
| Electrical and mechanical | IEEE 802.3 compliant |
| specifications | Ethernet (1000BASE-T, 100BASE-TX, 10BASE-T) |
| Transmission system | TCP/IP |
| Communication protocol | Server: FTP, HTTP(Web), VXI-11 <br> Client: $\quad$ FTP (Net Drive), SMTP (Mail), SNTP, LPR (Net Print), DHCP, DNS <br> Supported services |
| PC system requirements | A PC running the English or Japanese version of Windows 7 (32bit, 64bit), Windows 8 (32bit, 64bit), <br>  <br> Windows 8.1 (32bit, 64bit), or Windows 10 (32bit, 64bit) |

### 5.11 General Specifications



| Specifications |
| :--- | :--- |
| Compliant standard |
| EN 61010-1 |
| Overvoltage Category II |
| Pofety standard |
| PN 6 llution degree 2 |

1 The overvoltage category (installation category) is a value used to define the transient overvoltage condition and includes the rated impulse withstand voltage. The overvoltage category II applies to electrical equipment that is powered through a fixed installation, such as a switchboard.
2 The pollution degree refers to the degree of adhesion of a solid, liquid, or gas which deteriorates withstand voltage or surface resistivity. Pollution degree 2 applies to normal indoor atmospheres (with only non-conductive pollution).
3 The measurement category of the DLM2000 signal input terminals is Other (O). Do not use it to measure the main power supply or for Measurement Categories II, III, and IV.
Measurement category Other ( O ) applies to measurement of circuits that are not directly connected to a main power supply. This category applies to measurement of secondary electric circuits in equipment across a transformer. The estimated transient overvoltage that may be applied to the DLM2000 signal input terminals is 1500 V .
Measurement category II applies to measurement of circuits, such as household electric appliances and portable electric tools, that are connected to low-voltage installations.
Measurement category III applies to measurement of facility circuits, such as distribution boards and circuit breakers.
Measurement category IV applies to measurement of power source circuits, such as entrance cables to buildings and cable systems, for low-voltage installations.


### 5.12 External Dimensions

Unit: mm
Unless otherwise specified, tolerances are $\pm 3 \%$ (however, tolerances are $\pm 0.3 \mathrm{~mm}$ when below 10 mm ).



# Appendix 1 Relationship between the Time Axis Setting, Record Length, and Sample Rate 

## When the Record Length Is 1.25 k points

(This record length can be selected on all models) Intpl: Interpolation Mode

|  |  |  |  |  |  |  |  |  | Rep: Repetitive Sampling Mode |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | When High Resolution mode is off |  |  |  |  |  |  |  | When High Resolution mode is on |  |  |  |  |  |  |  |
|  | When Interleave mode is off |  |  |  | When Interleave mode is on |  |  |  | When Interleave mode is off |  |  |  | When Interleave mode is on |  |  |  |
|  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep |  |
|  | Sample Rate (S/s) |  | $\begin{array}{\|l\|} \hline \text { Sample } \\ \text { Rate } \\ \text { (S/s) } \\ \hline \end{array}$ | Record Length (Points) | $\begin{array}{\|l\|} \hline \text { Sample } \\ \text { Rate } \\ \text { (S/s) } \\ \hline \end{array}$ | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record Length (Points) | Sample Rate (S/s) | Record Length (Points) | Sample Rate (S/s) | Record <br> Length <br> (Points) | Sample Rate (S/s) | Record <br> Length <br> (Points) |
| 500 s | 50 | 250 k | 50 | 250 k | 50 | 250 k | 50 | 250 k | 50 | 250 k | 50 | 250 k | 50 | 250 k | 50 | 250 k |
| 200 s | 50 | 100 k | 50 | 100 k | 50 | 100 k | 50 | 100 k | 50 | 100 k | 50 | 100 k | 50 | 100 k | 50 | 100 k |
| 100 s | 50 | 50 k | 50 | 50 k | 50 | 50 k | 50 | 50 k | 50 | 50 k | 50 | 50 k | 50 | 50 k | 50 | 50 k |
| 50 s | 50 | 25 k | 50 | 25 k | 50 | 25 k | 50 | 25 k | 50 | 25 k | 50 | 25 k | 50 | 25 k | 50 | 25 k |
| 20 s | 50 | 10 k | 50 | 10 k | 50 | 10 k | 50 | 10 k | 50 | 10 k | 50 | 10 k | 50 | 10 k | 50 | 10 k |
| 10 s | 50 | 5 k | 50 | 5 k | 50 | 5 k | 50 | 5 k | 50 | 5 k | 50 | 5 k | 50 | 5 k | 50 | 5 k |
| 5 s | 50 | 2.5 k | 50 | 2.5 k | 50 | 2.5 k | 50 | 2.5 k | 50 | 2.5 k | 50 | 2.5 k | 50 | 2.5 k | 50 | 2.5 k |
| 2 s | 62.5 | 1.25 k | 62.5 | 1.25 k | 62.5 | 1.25 k | 62.5 | 1.25 k | 62.5 | 1.25 k | 62.5 | 1.25 k | 62.5 | 1.25 k | 62.5 | 1.25 k |
| 1 s | 125 | 1.25 k | 125 | 1.25 k | 125 | 1.25 k | 125 | 1.25 k | 125 | 1.25 k | 125 | 1.25 k | 125 | 1.25 k | 125 | 1.25 k |
| 500 ms | 250 | 1.25 k | 250 | 1.25 k | 250 | 1.25 k | 250 | 1.25 k | 250 | 1.25 k | 250 | 1.25 k | 250 | 1.25 k | 250 | 1.25 k |
| 200 ms | 625 | 1.25 k | 625 | 1.25 k | 625 | 1.25 k | 625 | 1.25 k | 625 | 1.25 k | 625 | 1.25 k | 625 | 1.25 k | 625 | 1.25 k |
| 100 ms | 1.25 k | 1.25 k | 1.25 k | 1.25 k | 1.25 k | 1.25 k | 1.25 k | 1.25 k | 1.25 k | 1.25 k | 1.25 k | 1.25 k | 1.25 k | 1.25 k | 1.25 k | 1.25 k |
| 50 ms | 2.5 k | 1.25 k | 2.5 k | 1.25 k | 2.5 k | 1.25 k | 2.5 k | 1.25 k | 2.5 k | 1.25 k | 2.5 k | 1.25 k | 2.5 k | 1.25 k | 2.5 k | 1.25 k |
| 20 ms | 6.25 k | 1.25 k | 6.25 k | 1.25 k | 6.25 k | 1.25 k | 6.25 k | 1.25 k | 6.25 k | 1.25 k | 6.25 k | 1.25 k | 6.25 k | 1.25 k | 6.25 k | 1.25 k |
| 10 ms | 12.5 k | 1.25 k | 12.5 k | 1.25 k | 12.5 k | 1.25 k | 12.5 k | 1.25 k | 12.5 k | 1.25 k | 12.5 k | 1.25 k | 12.5 k | 1.25 k | 12.5 k | 1.25 k |
| 5 ms | 25 k | 1.25 k | 25 k | 1.25 k | 25 k | 1.25 k | 25 k | 1.25 k | 25 k | 1.25 k | 25 k | 1.25 k | 25 k | 1.25 k | 25 k | 1.25 k |
| 2 ms | 62.5 k | 1.25 k | 62.5 k | 1.25 k | 62.5 k | 1.25 k | 62.5 k | 1.25 k | 62.5 k | 1.25 k | 62.5 k | 1.25 k | 62.5 k | 1.25 k | 62.5 k | 1.25 k |
| 1 ms | 125 k | 1.25 k | 125 k | 1.25 k | 125 k | 1.25 k | 125 k | 1.25 k | 125 k | 1.25 k | 125 k | 1.25 k | 125 k | 1.25 k | 125 k | 1.25 k |
| 500 ¢s | 250 k | 1.25 k | 250 k | 1.25 k | 250 k | 1.25 k | 250 k | 1.25 k | 250 k | 1.25 k | 250 k | 1.25 k | 250 k | 1.25 k | 250 k | 1.25 k |
| $200 \mu \mathrm{~s}$ | 625 k | 1.25 k | 625 k | 1.25 k | 625 k | 1.25 k | 625 k | 1.25 k | 625 k | 1.25 k | 625 k | 1.25 k | 625 k | 1.25 k | 625 k | 1.25 k |
| 100 нs | 1.25 M | 1.25 k | 1.25 M | 1.25 k | 1.25 M | 1.25 k | 1.25 M | 1.25 k | 1.25 M | 1.25 k | 1.25 M | 1.25 k | 1.25 M | 1.25 k | 1.25 M | 1.25 k |
| $50 \mu \mathrm{~s}$ | 2.5 M | 1.25 k | 2.5 M | 1.25 k | 2.5 M | 1.25 k | 2.5 M | 1.25 k | 2.5 M | 1.25 k | 2.5 M | 1.25 k | 2.5 M | 1.25 k | 2.5 M | 1.25 k |
| $20 \mu \mathrm{~s}$ | 6.25 M | 1.25 k | 6.25 M | 1.25 k | 6.25 M | 1.25 k | 6.25 M | 1.25 k | 6.25 M | 1.25 k | 6.25 M | 1.25 k | 6.25 M | 1.25 k | 6.25 M | 1.25 k |
| $10 \mu \mathrm{~s}$ | 12.5 M | 1.25 k | 12.5 M | 1.25 k | 12.5 M | 1.25 k | 12.5 M | 1.25 k | 12.5 M | 1.25 k | 12.5 M | 1.25 k | 12.5 M | 1.25 k | 12.5 M | 1.25 k |
| $5 \mu \mathrm{~s}$ | 25 M | 1.25 k | 25 M | 1.25 k | 25 M | 1.25 k | 25 M | 1.25 k | 25 M | 1.25 k | 25 M | 1.25 k | 25 M | 1.25 k | 25 M | 1.25 k |
| $2 \mu \mathrm{~s}$ | 62.5 M | 1.25 k | 62.5 M | 1.25 k | 62.5 M | 1.25 k | 62.5 M | 1.25 k | 62.5 M | 1.25 k | 62.5 M | 1.25 k | 62.5 M | 1.25 k | 62.5 M | 1.25 k |
| $1 \mu \mathrm{~s}$ | 125 M | 1.25 k | 125 M | 1.25 k | 125 M | 1.25 k | 125 M | 1.25 k | 125 M | 1.25 k | 125 M | 1.25 k | 125 M | 1.25 k | 125 M | 1.25 k |
| 500 ns | 250 M | 1.25 k | 250 M | 1.25 k | 250 M | 1.25 k | 250 M | 1.25 k | 250 M | 1.25 k | 250 M | 1.25 k | 250 M | 1.25 k | 250 M | 1.25 k |
| 200 ns | 625 M | 1.25 k | 625 M | 1.25 k | 625 M | 1.25 k | 625 M | 1.25 k | 625 M | 1.25 k | 625 M | 1.25 k | 625 M | 1.25 k | 625 M | 1.25 k |
| 100 ns | 1.25 G | 1.25 k | 1.25 G | 1.25 k | 1.25 G | 1.25 k | 1.25 G | 1.25 | 625 M | 625 | 1.25 G | 1.25 k | 1.25 G | 1.25 k | 1.25 G | 1.25 k |
| 50 ns | 1.25 G | 625 | 2.5 G | 1.25 k | 2.5 G | 1.25 k | 2.5 G | 1.25 k | 625 M | 312.5 | 2.5 G | 1.25 k | 1.25 G | 625 | 2.5 G | 1.25 k |
| 20 ns | 1.25 G | 250 | 6.25 G | 1.25 k | 2.5 G | 500 | 6.25 G | 1.25 k | 625 M | 125 | 6.25 G | 1.25 k | 1.25 G | 250 | 6.25 G | 1.25 k |
| 10 ns | 1.25 G | 125 | 12.5 G | 1.25 k | 2.5 G | 250 | 12.5 G | 1.25 k | 625 M | 62.5 | 12.5 G | 1.25 k | 1.25 G | 125 | 12.5 G | 1.25 k |
| 5 ns | 1.25 G | 62.5 | 25 G | 1.25 k | 2.5 G | 125 | 25 G | 1.25 k | 625 M | 31.25 | 25 G | 1.25 k | 1.25 G | 62.5 | 25 G | 1.25 k |
| 2 ns | 1.25 G | 25 | 62.5 G | 1.25 k | 2.5 G | 50 | 62.5 G | 1.25 k | 625 M | 12.5 | 62.5 G | 1.25 k | 1.25 G | 25 | 62.5 G | 1.25 k |
| 1 ns | 1.25 G | 12.5 | 125 G | 1.25 k | 2.5 G | 25 | 125 G | 1.25 k | 625 M | 6.25 | 125 G | 1.25 k | 1.25 G | 12.5 | 125 G | 1.25 k |

[^4]
## When the Record Length Is 12.5 k points

| (This record length can be selected on all models) |  |  |  |  |  |  |  |  |  |  |  |  | Intpl: Interpolation Mode <br> Rep: Repetitive Sampling Mode |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Setting | When High Resolution mode is off |  |  |  |  |  |  |  | When High Resolution mode is on |  |  |  |  |  |  |  |
|  | When Interleave mode is off |  |  |  | When Interleave mode is on |  |  |  | When Interleave mode is off |  |  |  | When Interleave mode is on |  |  |  |
|  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep |  |
| Time/div | $\begin{array}{\|l\|} \hline \text { Sample } \\ \text { Rate } \\ \text { (S/s) } \end{array}$ | Record Length (Points) | $\begin{array}{\|l\|} \hline \text { Sample } \\ \text { Rate } \\ (\mathrm{S} / \mathrm{s}) \end{array}$ | Record Length (Points) | Sample Rate (S/s) | Record Length <br> (Points) | $\begin{aligned} & \text { Sample } \\ & \text { Rate } \\ & \text { (S/s) } \end{aligned}$ | Record Length <br> (Points) | $\left\lvert\, \begin{aligned} & \text { Sample } \\ & \text { Rate } \\ & (\mathrm{S} / \mathrm{s}) \end{aligned}\right.$ | Record Length <br> (Points) | $\begin{aligned} & \text { Sample } \\ & \text { Rate } \\ & (\mathrm{S} / \mathrm{s}) \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { Record } \\ & \text { Length } \\ & \text { (Points) } \end{aligned}$ | $\begin{array}{\|l\|} \hline \text { Sample } \\ \text { Rate } \\ \text { (S/s) } \\ \hline \end{array}$ | Record Length (Points) | $\begin{array}{\|l\|} \hline \text { Sample } \\ \text { Rate } \\ (\mathrm{S} / \mathrm{s}) \\ \hline \end{array}$ | Record Length <br> (Points) |
| 500 s | 50 | 250 k | 50 | 250 k | 50 | 250 k | 50 | 250 k | 50 | 250 k | 50 | k | 50 | 0 k | 50 | 250 k |
| 200 s | 50 | 100 k | 50 | 100 k | 50 | 100 k | 50 | 100 k | 50 | 100 k | 50 | 100 k | 50 | 100 k | 50 | 100 k |
| 100 s | 50 | 50 k | 50 | 50 | 50 | 50 k | 50 | 50 | 50 | 50 k | 50 | 50 k | 50 | 50 k | 50 | 50 k |
| 50 s | 50 | 25 | 50 | 25 | 50 | 25 k | 50 | 25 k | 50 | 25 k | 50 | 25 k | 50 | 25 k | 50 | 25 k |
| 20 s | 62.5 | 12.5 k | 62.5 | 12.5 k | 62.5 | 12.5 k | 62.5 | 12.5 k | 62.5 | 12.5 k | 62.5 | 12.5 k | 62.5 | 12.5 k | 62.5 | 12.5 k |
| 10 s | 125 | 12.5 k | 125 | 12.5 k | 125 | 12.5 k | 125 | 12.5 k | 125 | 12.5 k | 125 | 12.5 k | 125 | 12.5 k | 125 | 12.5 k |
| 5 | 250 | 12.5 k | 250 | 12.5 k | 250 | 12.5 k | 250 | 12.5 k | 250 | 12.5 k | 250 | 12.5 k | 250 | 12.5 k | 250 | 12.5 k |
| 2 | 625 | 12.5 | 625 | 12. | 62 | 12.5 k | 625 | 12.5 k | 625 | 12.5 k | 625 | 12.5 k | 625 | 12.5 k | 625 | 12.5 k |
| 1 s | 1.25 k | 12.5 k | 1.25 k | 12.5 k | 1.25 k | 12.5 k | 1.25 k | 12.5 k | 1.25 k | 12.5 k | 1.25 k | 12.5 k | 1.25 k | 12.5 k | 1.25 k | 12.5 k |
| 500 ms | 2.5 k | 12.5 k | 2.5 k | 12.5 k | 2.5 k | 12.5 k | 2.5 k | 12.5 k | 2.5 k | 12.5 k | 2.5 k | 12.5 k | 2.5 k | 12.5 k | 2.5 k | 12.5 k |
| 200 ms | 6.25 k | 12.5 k | 6.25 k | 12.5 k | 6.25 k | 12.5 k | 6.25 k | 12.5 k | 6.25 k | 12.5 k | 6.25 k | 12.5 k | 6.25 k | 12.5 k | 6.25 k | 12.5 k |
| 100 ms | 12.5 k | 12.5 | 12.5 k | 12.5 | 12.5 | 12.5 | 12.5 | 12 | 12.5 | 12 | 12.5 k | 12.5 | 12.5 k | 12. | 12.5 k | 12.5 k |
| 50 ms | 25 k | 12.5 k | 25 k | 12.5 k | 25 k | 12.5 k | 25 k | 12.5 k | 25 | 12.5 k | 25 k | 12.5 k | 25 k | 12.5 k | 25 k | 12.5 k |
| 20 ms | 62.5 k | 12.5 k | 62.5 k | 12.5 k | 62.5 k | 12.5 k | 62.5 k | 12.5 | 62.5 k | 12.5 k | 62.5 k | 12.5 k | 62.5 k | 12.5 k | 62.5 k | 12.5 k |
| 10 ms | 125 k | 12.5 k | 125 k | 12.5 k | 125 k | 12.5 k | 125 k | 12.5 k | 125 k | 12.5 k | 125 k | 12.5 k | 125 k | 12.5 k | 125 k | 12.5 k |
| 5 ms | 250 k | 12.5 k | 250 k | 12.5 k | 250 k | 12.5 k | 250 k | 12.5 k | 250 k | 12.5 k | 250 k | 12.5 k | 250 k | 12.5 k | 250 k | 12.5 k |
| 2 ms | 625 k | 12.5 k | 625 k | 12.5 k | 625 k | 12.5 k | 625 k | 12.5 k | 625 k | 12.5 k | 625 k | 12.5 k | 625 k | 12.5 k | 625 k | 12.5 k |
| 1 ms | 1.25 M | 12.5 k | 1.25 M | 12.5 k | 1.25 M | 12.5 k | 1.25 M | 12.5 k | 1.25 M | 12.5 k | 1.25 M | 12.5 k | 1.25 M | 12.5 k | 1.25 M | 12.5 k |
| 500 us | 2.5 M | 12.5 k | 2.5 M | 12.5 k | 2.5 M | 12.5 k | 2.5 M | 12.5 k | 2.5 M | 12.5 k | 2.5 M | 12.5 k | 2.5 M | 12.5 k | 2.5 M | 12.5 k |
| 200 us | 6.25 M | 12.5 k | 6.25 M | 12.5 k | 6.25 M | 12.5 k | 6.25 M | 12.5 k | 6.25 M | 12.5 k | 6.25 M | 12.5 k | 6.25 M | 12.5 k | 6.25 M | 12.5 k |
| $100 \mu \mathrm{~s}$ | 12.5 M | 12.5 k | 12.5 M | 12.5 k | 12.5 M | 12.5 k | 12.5 M | 12.5 | 12.5 M | 12.5 k | 12.5 M | 12.5 k | 12.5 M | 12.5 k | 12.5 M | 12.5 k |
| 50 | 25 | 12.5 | 25 | 12.5 k | 25 | 12 | 25 M | 12.5 | 25 | 12.5 k | 25 M | 12.5 k | 25 M | 12.5 k | 25 M | 12.5 k |
| $20 \mu \mathrm{~s}$ | 62.5 M | 12.5 k | 62.5 M | 12.5 k | 62.5 M | 12.5 k | 62.5 M | 12.5 k | 62.5 M | 12.5 k | 62.5 M | 12.5 k | 62.5 M | 12.5 k | 62.5 M | 12.5 k |
| $10 \mu \mathrm{~s}$ | 125 M | 12.5 k | 125 M | 12.5 k | 125 M | 12.5 k | 125 M | 12.5 k | 125 M | 12.5 k | 125 M | 12.5 k | 125 M | 12.5 k | 125 M | 12.5 k |
| 5 | 250 M | 12.5 | 250 M | 12 | 250 M | 12.5 | 250 M | 12.5 | 250 M | 12.5 k | 250 M | 12.5 k | 250 M | 12.5 k | 250 M | 12.5 k |
| $2 \mu \mathrm{~s}$ | 625 M | 12.5 k | 625 M | 12.5 k | 625 M | 12.5 k | 625 M | 12.5 k | 625 M | 12.5 k | 625 M | 12.5 k | 625 M | 12.5 k | 625 M | 12.5 k |
| $1 \mu \mathrm{~s}$ | 1.25 G | 12.5 k | 1.25 G | 12.5 k | 1.25 G | 12.5 k | 1.25 G | 12.5 k | 625 M | 6.25 k | 1.25 G | 12.5 k | 1.25 G | 12.5 k | 1.25 G | 12.5 k |
| 500 ns | 1.25 G | 6.25 k | 2.5 G | 12.5 k | 2.5 G | 12.5 | 2.5 G | 12.5 k | 625 M | 3.125 k | 2.5 G | 12.5 k | 1.25 G | 6.25 k | 2.5 G | 12.5 k |
| 200 ns | 1.25 G | 2.5 k | 6.25 G | 12 | 2.5 G | 5 k | 6.25 G | 12.5 k | 625 M | 1.25 k | 6.25 G | 12.5 k | 1.25 G | 2.5 k | 6.25 G | 12.5 k |
| 100 ns | 1.25 G | 1.25 k | 12.5 G | 12.5 k | 2.5 G | 2.5 k | 12.5 G | 12.5 k | 625 M | 625 | 12.5 G | 12.5 k | 1.25 G | 1.25 k | 12.5 G | 12.5 k |
| 50 ns | 1.25 G | 625 | 25 G | 12.5 k | 2.5 G | 1.25 k | 25 G | 12.5 k | 625 M | 312.5 | 25 G | 12.5 k | 1.25 G | 625 | 25 G | 12.5 k |
| 20 ns | 1.25 G | 250 | 62.5 G | 12. | 2.5 G | 500 | 62.5 G | 12.5 | 625 | 125 | 62.5 G | 12.5 k | 1.25 G | 250 | 62.5 G | 12.5 k |
| 10 ns | 1.25 G | 125 | 125 G | 12.5 k | 2.5 G | 250 | 125 G | 12.5 k | 625 M | 62.5 | 125 G | 12.5 k | 1.25 G | 125 | 125 G | 12.5 k |
| 5 ns | 1.25 G | 62.5 | 125 G | 6.25 k | 2.5 G | 125 | 125 G | 6.25 k | 625 M | 31.25 | 125 G | 6.25 k | 1.25 G | 62.5 | 125 G | 6.25 k |
| 2 ns | 1.25 G | 25 | 125 G | 2.5 k | 2.5 G | 50 | 125 G | 2.5 k | 625 M | 12.5 | 125 G | 2.5 k | 1.25 G | 25 | 125 G | 2.5 k |
| 1 ns | 1.25 G | 12.5 | 125 G | 1.25 k | 2.5 G | 25 | 125 G | 1.25 k | 625 M | 6.25 | 125 G | 1.25 k | 1.25 G | 12.5 | 125 G | 1.25 k |

Values outside of the thick borders have been calculated in real-time sampling mode.
Roll Mode

## When the Record Length Is 125 k points

| (This record length can be selected on all models) |  |  |  |  |  |  |  |  |  |  |  |  | Intpl: Interpolation Mode <br> Rep: Repetitive Sampling Mode |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ttings | When High Resolution mode is off |  |  |  |  |  |  |  | When High Resolution mode is on |  |  |  |  |  |  |  |
|  | When Interleave mode is off |  |  |  | When Interleave mode is on |  |  |  | When Interleave mode is off |  |  |  | When Interleave mode is on |  |  |  |
|  | Realtime |  | Intpl/Rep |  | Realtime |  | IntpI/Rep |  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep |  |
| Time/div | $\begin{array}{\|l} \hline \text { Sample } \\ \text { Rate } \\ \text { (S/s) } \end{array}$ | Record Length <br> (Points) | Sample Rate (S/s) | Record Length <br> (Points) | Sample Rate (S/s) | Record Length (Points) | Sample Rate (S/s) | Record Length (Points) | Sample <br> Rate <br> (S/s) | Record Length <br> (Points) | $\begin{aligned} & \text { Sample } \\ & \text { Rate } \\ & (\mathrm{S} / \mathrm{s}) \end{aligned}$ | Record Length <br> (Points) | Sample Rate (S/s) | Record Length (Points) | Sample Rate (S/s) | Record Length (Points) |
| 500 s | 50 | 250 k | 50 | 250 k | 50 | 250 k | 50 | 250 k | 50 | 250 k | 50 | 250 k | 50 | 250 k | 50 | 250 k |
| 200 s | 62.5 | 125 k | 62.5 | 125 k | 62.5 | 125 k | 62.5 | 125 k | 62.5 | 125 k | 62.5 | 125 k | 62.5 | 125 k | 62.5 | 125 k |
| 100 s | 125 | 125 k | 125 | 125 k | 125 | 125 k | 125 | 125 k | 125 | 125 k | 125 | 125 k | 125 | 125 k | 125 | 125 k |
| 50 s | 250 | 125 k | 250 | 125 k | 250 | 125 k | 250 | 125 k | 250 | 125 k | 250 | 125 k | 250 | 125 k | 250 | 125 k |
| 20 s | 625 | 125 k | 625 | 125 k | 625 | 125 k | 625 | 125 k | 625 | 125 k | 625 | 125 k | 625 | 125 k | 625 | 125 k |
| 10 s | 1.25 k | 125 k | 1.25 k | 125 k | 1.25 k | 125 k | 1.25 k | 125 k | 1.25 k | 125 k | 1.25 k | 125 k | 1.25 k | 125 k | 1.25 k | 125 k |
| 5 s | 2.5 k | 125 k | 2.5 k | 125 k | 2.5 k | 125 k | 2.5 k | 125 k | 2.5 k | 125 k | 2.5 k | 125 k | 2.5 k | 125 k | 2.5 k | 125 k |
| 2 s | 6.25 k | 125 k | 6.25 k | 125 k | 6.25 k | 125 k | 6.25 k | 125 k | 6.25 k | 125 k | 6.25 k | 125 k | 6.25 k | 125 k | 6.25 k | 125 k |
| 1 s | 12.5 k | 125 k | 12.5 k | 125 k | 12.5 k | 125 k | 12.5 k | 125 k | 12.5 k | 125 k | 12.5 k | 125 k | 12.5 k | 125 k | 12.5 k | 125 k |
| 500 ms | 25 k | 125 k | 25 k | 125 k | 25 k | 125 k | 25 k | 125 k | 25 k | 125 k | 25 k | 125 k | 25 k | 125 k | 25 k | 125 k |
| 200 ms | 62.5 k | 125 k | 62.5 k | 125 k | 62.5 k | 125 k | 62.5 k | 125 k | 62.5 k | 125 k | 62.5 k | 125 k | 62.5 k | 125 k | 62.5 k | 125 k |
| 100 ms | 125 k | 125 k | 125 k | 125 k | 125 k | 125 k | 125 k | 125 k | 125 k | 125 k | 125 k | 125 k | 125 k | 125 k | 125 k | 125 k |
| 50 ms | 250 k | 125 k | 250 k | 125 k | 250 k | 125 k | 250 k | 125 k | 250 k | 125 k | 250 k | 125 k | 250 k | 125 k | 250 k | 125 k |
| 20 ms | 625 k | 125 k | 625 k | 125 k | 625 k | 125 k | 625 k | 125 k | 625 k | 125 k | 625 k | 125 k | 625 k | 125 k | 625 k | 125 k |
| 10 ms | 1.25 M | 125 k | 1.25 M | 125 k | 1.25 M | 125 k | 1.25 M | 125 k | 1.25 M | 125 k | 1.25 M | 125 k | 1.25 M | 125 k | 1.25 M | 125 k |
| 5 ms | 2.5 M | 125 k | 2.5 M | 125 k | 2.5 M | 125 k | 2.5 M | 125 k | 2.5 M | 125 k | 2.5 M | 125 k | 2.5 M | 125 k | 2.5 M | 125 k |
| 2 ms | 6.25 M | 125 k | 6.25 M | 125 k | 6.25 M | 125 k | 6.25 M | 125 k | 6.25 M | 125 k | 6.25 M | 125 k | 6.25 M | 125 k | 6.25 M | 125 k |
| 1 ms | 12.5 M | 125 k | 12.5 M | 125 k | 12.5 M | 125 k | 12.5 M | 125 k | 12.5 M | 125 k | 12.5 M | 125 k | 12.5 M | 125 k | 12.5 M | 125 k |
| 500 us | 25 M | 125 k | 25 M | 125 k | 25 M | 125 k | 25 M | 125 k | 25 M | 125 k | 25 M | 125 k | 25 M | 125 k | 25 M | 125 k |
| 200 ¢s | 62.5 M | 125 k | 62.5 M | 125 k | 62.5 M | 125 k | 62.5 M | 125 k | 62.5 M | 125 k | 62.5 M | 125 k | 62.5 M | 125 k | 62.5 M | 125 k |
| $100 \mu \mathrm{~s}$ | 125 M | 125 k | 125 M | 125 k | 125 M | 125 k | 125 M | 125 k | 125 M | 125 k | 125 M | 125 k | 125 M | 125 k | 125 M | 125 k |
| $50 \mu \mathrm{~s}$ | 250 M | 125 k | 250 M | 125 k | 250 M | 125 k | 250 M | 125 k | 250 M | 125 k | 250 M | 125 k | 250 M | 125 k | 250 M | 125 k |
| $20 \mu \mathrm{~s}$ | 625 M | 125 k | 625 M | 125 k | 625 M | 125 k | 625 M | 125 k | 625 M | 125 k | 625 M | 125 k | 625 M | 125 k | 625 M | 125 k |
| $10 \mu \mathrm{~s}$ | 1.25 G | 125 k | 1.25 G | 125 k | 1.25 G | 125 k | 1.25 G | 125 k | 625 M | 62.5 k | 1.25 G | 125 k | 1.25 G | 125 k | 1.25 G | 125 k |
| 5 \%s | 1.25 G | 62.5 k | 2.5 G | 125 k | 2.5 G | 125 k | 2.5 G | 125 k | 625 M | 31.25 k | 2.5 G | 125 k | 1.25 G | 62.5 k | 2.5 G | 125 k |
| $2 \mu \mathrm{~s}$ | 1.25 G | 25 k | 6.25 G | 125 | 2.5 G | 50 | 6.25 G | 125 k | 625 M | 12.5 k | 6.25 G | 125 k | 1.25 G | 25 k | 6.25 G | 125 k |
| $1 \mu \mathrm{~s}$ | 1.25 G | 12.5 k | 12.5 G | 125 k | 2.5 G | 25 k | 12.5 G | 125 k | 625 M | 6.25 k | 12.5 G | 125 k | 1.25 G | 12.5 k | 12.5 G | 125 k |
| 500 ns | 1.25 G | 6.25 k | 25 G | 125 k | 2.5 G | 12.5 k | 25 G | 125 k | 625 M | 3.125 k | 25 G | 125 k | 1.25 G | 6.25 k | 25 G | 125 k |
| 200 ns | 1.25 G | 2.5 k | 62.5 G | 125 k | 2.5 G | 5 k | 62.5 G | 125 k | 625 M | 1.25 k | 62.5 G | 125 k | 1.25 G | 2.5 k | 62.5 G | 125 k |
| 100 ns | 1.25 G | 1.25 k | 125 G | 125 k | 2.5 G | 2.5 k | 125 G | 125 k | 625 M | 625 | 125 G | 125 k | 1.25 G | 1.25 k | 125 G | 125 k |
| 50 ns | 1.25 G | 625 | 125 G | 62.5 k | 2.5 G | 1.25 k | 125 G | 62.5 k | 625 M | 312.5 | 125 G | 62.5 k | 1.25 G | 625 | 125 G | 62.5 k |
| 20 ns | 1.25 G | 250 | 125 G | 25 k | 2.5 G | 500 | 125 G | 25 k | 625 M | 125 | 125 G | 25 k | 1.25 G | 250 | 125 G | 25 k |
| 10 ns | 1.25 G | 125 | 125 G | 12.5 k | 2.5 G | 250 | 125 G | 12.5 k | 625 M | 62.5 | 125 G | 12.5 k | 1.25 G | 125 | 125 G | 12.5 k |
| 5 ns | 1.25 G | 62.5 | 125 G | 6.25 k | 2.5 G | 125 | 125 G | 6.25 k | 625 M | 31.25 | 125 G | 6.25 k | 1.25 G | 62.5 | 125 G | 6.25 k |
| 2 ns | 1.25 G | 25 | 125 G | 2.5 k | 2.5 G | 50 | 125 G | 2.5 k | 625 M | 12.5 | 125 G | 2.5 k | 1.25 G | 25 | 125 G | 2.5 k |
| 1 ns | 1.25 G | 12.5 | 125 G | 1.25 k | 2.5 G | 25 | 125 G | 1.25 k | 625 M | 6.25 | 125 G | 1.25 k | 1.25 G | 12.5 | 125 G | 1.25 k |

Values outside of the thick borders have been calculated in real-time sampling mode.

## When the Record Length Is 1.25 M points

(This record length can be selected on all models)
Intpl: Interpolation Mode
Rep: Repetitive Sampling Mode

| Settings | When High Resolution mode is off |  |  |  |  |  |  |  | When High Resolution mode is on |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | When Interleave mode is off |  |  |  | When Interleave mode is on |  |  |  | When Interleave mode is off |  |  |  | When Interleave mode is on |  |  |  |
|  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep |  |
|  | Sample Rate (S/s) | Record Length <br> (Points) | Sample Rate <br> (S/s) | Record Length <br> (Points) | Sample Rate (S/s) | Record Length <br> (Points) | Sample Rate (S/s) | Record Length <br> (Points) | Sample Rate <br> (S/s) | Record Length (Points) | Sample Rate <br> (S/s) | Record Length <br> (Points) | Sample Rate (S/s) | Record Length (Points) | Sample Rate (S/s) | Record Length <br> (Points) |
| 500 | 250 | 1.25 M | 250 | M | 250 | 1.25 M | 25 | 1.25 M | 250 | M | 25 | M | 250 | M | 25 | 1.25 M |
| 20 | 62 | 1.2 | 625 | 1.2 | 625 | 1.2 | 62 | 1.25 M | 625 | 1.2 | 625 | M | 625 | 1.25 M | 625 | M |
| 100 s | 1.25 k | 1.25 M | 1.25 k | 1.25 M | 1.25 k | 1.2 | 1.25 k | 1.25 M | 1.25 k | 1.25 M | 1.25 k | 1.25 M | 1.25 k | 1.25 M | 1.25 k | M |
| 50 s | 2.5 k | 1.25 M | 2.5 k | 1.25 M | 2.5 k | 1.25 M | 2.5 k | 1.25 M | 2.5 k | 1.25 M | 2.5 k | 1.25 M | 2.5 k | 1.25 M | 2.5 k | 1.25 M |
| 20 s | 6.25 k | 1.25 M | 6.25 k | 1.25 M | 6.25 k | 1.25 M | 6.25 k | 1.2 | 6.25 k | 1.25 M | 6.25 k | 1.25 M | 6.25 k | 1.25 M | 6.25 k | 1.25 M |
| 10 | 12.5 k | 1.25 M | 12.5 k | 1.2 | 12.5 k | 1.2 | 12.5 k | 1.25 | 12.5 | 1.25 M | 12.5 k | 1.25 M | 12.5 k | 1.25 M | 12.5 k | 1.25 M |
| 5 s | 25 k | 1.25 M | 25 k | 1.25 M | 25 k | 1.25 M | 25 k | 1.25 M | 25 k | 1.25 M | 25 k | 1.25 M | 25 k | 1.25 M | 25 k | 1.25 M |
| 2 s | 62.5 k | 1.25 M | 62.5 k | 1.25 M | 62.5 k | 1.25 M | 62.5 k | 1.25 M | 62.5 k | 1.25 M | 62.5 k | 1.25 M | 62.5 k | 1.25 M | 62.5 k | 1.25 M |
| 1 | 125 k | 1.25 M | 125 k | 1.25 M | 125 k | 1.25 M | 125 k | 1.25 M | 125 k | 1.25 M | 125 k | 1.25 M | 125 k | 1.25 M | 125 k | 1.25 M |
| 500 m | 250 k | 1.25 M | 250 k | 1.2 | 250 k | 1.2 | 250 k | 1.25 | 25 | 1.25 M | 250 k | 1.25 M | 250 k | 1.25 M | 250 k | 25 M |
| 200 | 625 k | 1.25 M | 625 k | 1.25 M | 625 k | 1.25 M | 625 k | 1.25 M | 625 k | 1.25 M | 625 k | 1.25 M | 625 k | 1.25 M | 625 k | M |
| 100 ms | 1.25 M | 1.25 M | 1.25 M | 1.25 M | 1.25 M | 1.25 M | 1.25 M | 1.25 M | 1.25 M | 1.25 M | 1.25 M | 1.25 M | 1.25 M | 1.25 M | 1.25 M | 1.25 M |
| 50 | 2.5 | 1. | 2.5 |  | 2.5 |  | 2.5 |  |  |  |  | M | 2.5 M | 25 M | 2.5 M | 5 M |
| 20 m | 6.25 M | 1.25 M | 6.25 M | 1.25 M | 6.25 M | 1.25 M | 6.25 M | 1.25 M | 6.25 M | 1.25 M | 6.25 M | 1.25 M | 6.25 M | 1.25 M | 6.25 M | 1.25 M |
| 10 ms | 12.5 M | 1.25 M | 12.5 M | 1.25 M | 12.5 M | 1.25 M | 12.5 M | 1.25 | 12.5 M | 1.25 M | 12.5 M | 1.25 M | 12.5 M | 1.25 M | 12.5 M | 1.25 M |
| 5 | 25 M | 1.25 M | 25 | 1.2 | 25 | 1.2 | 25 | 1.2 | 25 | 1.25 M | 25 | 1.25 M | 25 | 1.25 M | 25 | 1.25 M |
| 2 ms | 62.5 M | 1.25 M | 62.5 M | 1.25 M | 62.5 M | 1.25 M | 62.5 M | 1.25 M | 62.5 M | 1.25 M | 62.5 M | 1.25 M | 62.5 M | 1.25 M | 62.5 M | 1.25 M |
| 1 ms | 125 M | 1.25 M | 125 M | 1.25 M | 125 M | 1.25 M | 125 M | 1.25 M | 125 M | 1.25 M | 125 M | 1.25 M | 125 M | 1.25 M | 125 M | 1.25 M |
| 500 us | 250 M | 1.25 M | 250 M | 1.25 M | 250 M | 1.25 | 250 M | 1.25 | 250 M | 1.25 M | 250 M | 1.25 M | 250 M | 1.25 M | 250 M | 1.25 M |
| $200 \mu \mathrm{~s}$ | 625 M | 1.25 M | 62 | 1. | 62 | 1. | 62 | 1. | 625 M | M | 625 M | 1.25 M | 625 M | 1.25 M | 625 M | 5 M |
| 100 us | 1.25 G | 1.25 M | 1.25 G | 1.25 M | 1.25 G | 1.25 M | 1.25 G | 1.25 M | 625 M | 625 k | 1.25 G | 1.25 M | 1.25 G | 1.25 M | 1.25 G | 1.25 M |
| 50 | 1.25 G | 625 k | 2.5 G | 1.25 M | 2.5 G | 1.2 | 2.5 G | 1.25 M | 625 M | 312.5 k | 2.5 G | 1.25 M | 1.25 G | 625 k | 2.5 G | . 25 M |
| 20 | 1.25 G | 250 | 6.25 G |  | 2.5 |  | 6.25 G | 1. |  | 12 | 6.25 G | M | 1.25 G | 250 k | 6.25 G | \% M |
| $10 \mu \mathrm{~s}$ | 1.25 G | 125 k | 12.5 G | 1.25 M | 2.5 G | 250 k | 12.5 G | 1.25 M | 625 M | 62.5 k | 12.5 G | 1.25 M | 1.25 G | 125 k | 12.5 G | 1.25 M |
| 5 | 1.25 G | 62.5 k | 25 G | 1.25 M | 2.5 G | 125 k | 25 G | 1.25 M | 625 M | 31.25 k | 25 G | 1.25 M | 1.25 G | 62.5 k | 25 G | 1.25 M |
| 2 | 1.25 G | 25 k | 62.5 G | 1.25 M | 2.5 G | 50 | 62.5 G | 1.25 | 62 | 12.5 k | 62.5 G | 1.25 M | 1.25 G | 25 k | 62.5 G | 1.25 M |
| 1 | 1.25 G | 12.5 k | 125 G | 1.25 M | 2.5 |  | 125 G | 1.25 | 62 | 6.25 k | 125 G | 1.25 M | 1.25 G | 12.5 k | 125 G | 1.25 M |
| 500 ns | 1.25 G | 6.25 k | 125 G | 625 k | 2.5 G | 12.5 k | 125 G | 625 k | 625 M | 3.125 k | 125 G | 625 k | 1.25 G | 6.25 k | 125 G | 625 k |
| 200 ns | 1.25 G | 2.5 k | 125 G | 250 k | 2.5 G | 5 k | 125 G | 250 k | 625 M | 1.25 k | 125 G | 250 k | 1.25 G | 2.5 k | 125 G | 250 k |
| 100 ns | 1.25 G | 1.25 k | 125 G | 125 | 2.5 G | 2.5 | 125 G | 125 k | 62 | 625 | 125 G | 125 k | 1.25 G | 1.25 | 125 G | 125 k |
| 50 ns | 1.25 G | 625 | 125 G | 62.5 k | 2.5 G | 1.25 | 125 G | 62.5 k | 625 M | 312.5 | 125 G | 62.5 k | 1.25 G | 625 | 125 G | 62.5 k |
| 20 ns | 1.25 G | 250 | 125 G | 25 k | 2.5 G | 500 | 125 G | 25 k | 625 M | 125 | 125 G | 25 k | 1.25 G | 250 | 125 G | 25 k |
| 10 ns | 1.25 G | 125 | 125 G | 12.5 k | 2.5 G | 250 | 125 G | 12.5 k | 625 M | 62.5 | 125 G | 12.5 k | 1.25 G | 125 | 125 G | 12.5 k |
| 5 ns | 1.25 G | 62.5 | 125 G | 6.25 k | 2.5 G | 125 | 125 G | 6.25 k | 625 M | 31.25 | 125 G | 6.25 k | 1.25 G | 62.5 | 125 G | 6.25 k |
| 2 ns | 1.25 G | 25 | 125 G | 2.5 k | 2.5 G | 50 | 125 G | 2.5 k | 625 M | 12.5 | 125 G | 2.5 k | 1.25 G | 25 | 125 G | 2.5 k |
| 1 ns | 1.25 G | 12.5 | 125 G | 1.25 k | 2.5 G | 25 | 125 G | 1.25 k | 625 M | 6.25 | 125 G | 1.25 k | 1.25 G | 12.5 | 125 G | 1.25 k |

Values outside of the thick borders have been calculated in real-time sampling mode.
Roll Mode

## When the Record Length Is $\mathbf{6 . 2 5} \mathbf{M}$ points

(This record length can be selected when there is no memory option or on DLM2000s with the /M1(S) option)

| with the /M1(S) option) |  |  |  |  |  |  |  |  | Rep: Repetitive Sampling Mode |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  |  | W | h Resol | Rep: | de is |  |  |
|  | When Interleave mode is off |  |  |  | When Interleave mode is on |  |  |  | When Interleave mode is off |  |  |  | When Interleave mode is on |  |  |  |
|  | Realtime |  | Intpl/Rep ${ }^{2}$ |  | Realtime |  | Intpl/Rep ${ }^{2}$ |  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep |  |
| Tim | Sample <br> Rate <br> (S/s) |  | Sample  <br> Rate L <br> (S/s) ( |  | Sample <br> Rate <br> (S/s) | $\begin{aligned} & \text { Record } \\ & \text { Length } \\ & \text { (Points) } \end{aligned}$ | Sample <br> Rate <br> (S/s) | Record Length (Points) | Sample <br> Rate <br> (S/s) | Record Length (Points) |  | Record Length (Points) | $\begin{aligned} & \text { Sample } \\ & \text { Rate } \\ & \text { (S/s) } \end{aligned}$ | Record Length (Points) | $\begin{array}{\|l\|} \text { Sample } \\ \text { Rate } \\ \text { (S/s) } \end{array}$ | Record Length (Points) |
| 50 | 1.25 k | 6.2 | 1.25 k | 6.2 | 1.25 k | 6.25 M | 1.25 k | 6.25 M | 1.25 k | 6.25 M | 1.25 k | 6.25 M | 1.25 k | 6.25 M | 1.25 k | M |
| 20 | 3.125 k | 6.2 | 3.1 | 6.2 | 3.125 k | 6.2 | 3.125 k | 6.2 | 3.125 k | 6.2 | 3.125 k | 6.2 | 3.125 k | 6.25 M | k | 6.25 M |
| 100 s | 6.25 k | 6.25 M | 6.25 k | 6.25 M | 6.25 k | 6.25 M | 6.25 k | 6.25 M | 6.25 k | 6.25 M | 6.25 k | 6.25 M | 6.25 k | 6.25 M | 6.25 k | 6.25 M |
| 50 s | 12.5 k | 6.25 M | 12.5 k | 6.25 M | 12.5 | 6.25 M | 12.5 k | 6.25 M | 12.5 k | 6.25 M | 12.5 | 6.25 M | 12.5 k | 6.25 M | 12.5 k | 6.25 M |
| 20 | 31.25 k | 6.25 M | 31.25 k | 6.25 M | 31.25 k | 6.25 M | 31.25 k | 6.25 M | 31.25 k | 6.25 M | 31.25 k 6 | 6.25 M | 31.25 k | 6.25 M | 31.25 k | 6.25 M |
| 10 s | 62.5 k | 6.25 M | 62.5 k | 6.25 M | 62.5 k | 6.25 M | 62.5 k | 6.25 M | 62.5 k | 6.25 M | 62.5 k | 6.25 M | 62.5 k | 6.25 M | 62.5 k | 6.25 M |
| 5 | 125 | 6.25 M | 125 | 6.2 | 125 k | 6.25 M | 125 | 6.25 M | 125 | 6.25 M | 125 k | 6.25 M | 125 k | 6.25 M | 125 k | 6.25 M |
| 2 | 312.5 k | 6.2 | 312.5 k | 6.2 | 312.5 k | 6.25 M | 312.5 k | 6.25 M | 312.5 k | 6.25 M | 312.5 k 6 | 6.25 M | 312.5 k | 6.25 M | 312.5 k | 6.25 M |
| 1 s | 625 | 6.2 | 62 | 6.2 | 62 | 6. | 62 | 6.25 M | 625 k | 6.2 | 62 | 6.25 M | 62 | 6.25 M | k | M |
| 500 ms | 1.25 M | 6.25 M | 1.25 M | 6.25 M | 1.25 M | 6.25 M | 1.25 M | 6.25 M | 1.25 M | 6.25 M | 1.25 M | 6.25 M | 1.25 M | 6.25 M | 1.25 M | 6.25 M |
| 200 m | 3.125 M | 6.25 M | 3.125 M | 6.25 | 3.125 M | 6.25 M | 3.125 M | 6.25 M | 3.125 M | 6.25 M | 3.125 M 6 | 6.25 M | 3.125 M | 6.25 M | 3.125 M | 6.25 M |
| 100 ms | 6.25 M | 6.25 | 6.2 | 6.25 | 6.25 M | 6.25 M | 6.25 M | 6.25 M | 6.25 M | 6.25 M | 6.25 M | 6.25 M | 6.25 M | 6.25 M | 6.25 M | 6.25 M |
| 50 ms | 12.5 M | 6.25 M | 12.5 M | 6.25 | 12.5 M | 6.25 M | 12.5 M | 6.25 M | 12.5 M | 6.25 M | 12.5 M | 6.25 M | 12.5 M | 6.25 M | 12.5 M | 6.25 M |
| 20 ms | 31.25 M | 6.25 M | 31.25 M | 6.25 M | 31.25 M | 6.25 M | 31.25 M | 6.25 M | 31.25 M | 6.25 M | 31.25 M 6 | 6.25 M | 31.25 M | 6.25 M | 31.25 M | 6.25 M |
| 10 ms | 62.5 M | 6.25 M | 62.5 M | 6.25 M | 62.5 M | 6.25 M | 62.5 M | 6.25 M | 62.5 M | 6.25 M | 62.5 M | 6.25 M | 62.5 M | 6.25 M | 62.5 M | 6.25 M |
| 5 | 125 M | 6.25 M | 125 M | 6.25 M | 125 M | 6.25 M | 125 M | 6.25 M | 125 M | 6.25 M | 125 M | 6.25 M | 125 M | 6.25 M | 125 M | 6.25 M |
| 2 ms | 312.5 M | 6.25 M | 312.5 M | 6.25 M | 312.5 M | 6.25 M | 312.5 M | 6.25 M | 312.5 M | 6.25 M | 312.5 M | 6.25 M | 312.5 M | 6.25 M | 312.5 M | 6.25 M |
| 1 | 625 M | 6.25 M | 625 M | 6.25 | 625 M | 6.25 M | 625 M | 6.25 M | 625 M | 6.25 M | 625 M | 6.25 M | 625 M | 6.25 M | 625 M | 6.25 M |
| $500 \mu \mathrm{~s}$ | 1.25 G | 6.25 M | 1.25 G | 6.25 M | 1.25 G | 6.25 M | 1.25 G | 6.25 M | 625 M | 3.125 M | 1.25 G | 6.25 M | 1.25 G | 6.25 M | 1.25 G | 6.25 M |
| $200 \mu \mathrm{~s}$ | 1.25 G | 2.5 M | 3.125 G | 6.25 | 2.5 G | 5 | 3.125 G | 6.25 M | 625 M | 1.25 M | 3.125 G 6 | 6.25 M | 1.25 G | 2.5 M | 3.125 G | 6.25 M |
| $100 \mu \mathrm{~s}$ | 1.25 G | 1.25 M | 6.25 G | 6.25 M | 2.5 G | 2.5 M | 6.25 G | 6.25 | 625 M | 625 k | 6.25 G | 6.25 M | 1.25 G | 1.25 M | 6.25 G | 6.25 M |
| $50 \mu \mathrm{~s}$ | 1.25 G | 625 k | 12.5 G | 6.25 | 2.5 G | 1.25 M | 12.5 | 6.25 | 625 M | 312.5 k | 12.5 G | 6.25 | 1.25 G | 625 k | 12.5 G | 6.25 M |
| $20 \mu \mathrm{~s}$ | 1.25 G | 250 k | 31.25 G | 6.25 | 2.5 G | 500 k | 31.25 G | 6.25 M | 625 M | 125 k | 31.25 G 6 | 6.25 M | 1.25 G | 250 k | 31.25 G | 6.25 M |
| $10 \mu \mathrm{~s}$ | 1.25 G | 125 k | 62.5 G | 6.25 M | 2.5 G | 250 k | 62.5 G | 6.25 M | 625 M | 62.5 k | 62.5 G | 6.25 M | 1.25 G | 125 k | 62.5 G | 6.25 M |
| $5 \mu$ s | 1.25 G | 62.5 k | 125 G | 6.25 | 2.5 G | 125 | 125 | 6.25 | 625 | . 25 k | 125 G | 6.25 | 1.25 G | 62.5 k | 125 G | 6.25 M |
| 2 | 1.25 G | 25 | 125 G |  |  |  | 125 | 2.5 | 625 | 12.5 | 12 | 2. | 1.25 G | 25 k | 125 G | 2.5 M |
| 1 | 1.25 G | 12.5 k | 125 G | 1.25 M | 2.5 G | 25 | 125 G | 1.25 M | 625 M | 6.25 k | 125 G | 1.25 M | 1.25 G | 12.5 k | 125 G | 25 M |
| 500 ns | 1.25 G | 6.25 k | 125 G | 625 k | 2.5 G | 12.5 k | 125 G | 625 k | 625 M | 3.125 k | 125 G | 625 k | 1.25 G | 6.25 k | 125 G | 625 k |
| 200 | 1.2 | 2.5 | 12 | 25 | 2. | 5 | 12 | 25 | 62 | 1. | 12 | 0 k | 1.25 G | 2.5 k | 125 G | 250 k |
| 100 ns | 1.25 G | 1.25 k | 125 G | 125 k | 2.5 G | 2.5 k | 125 G | 125 k | 625 M | 625 | 125 G | 125 k | 1.25 G | 1.25 k | 125 G | 125 k |
| 50 ns | 1.25 G | 625 | 125 G | 62.5 k | 2.5 G | 1.25 k | 125 G | 62.5 k | 625 M | 312.5 | 125 G | 62.5 k | 1.25 G | 625 | 125 G | 62.5 k |
| 20 ns | 1.25 G | 250 | 125 G | 25 k | 2.5 G | 500 | 125 G | 25 k | 625 M | 125 | 125 G | 25 k | 1.25 G | 250 | 125 G | 25 k |
| 10 ns | 1.25 G | 125 | 125 G | 12.5 | 2.5 | 250 | 125 G | 12.5 k | 625 M | 62.5 | 125 G | 12.5 k | 1.25 G | 125 | 125 G | 12.5 k |
| 5 ns | 1.25 G | 62.5 | 125 G | 6.25 k | 2.5 G | 125 | 125 G | 6.25 k | 625 M | 31.25 | 125 G | 6.25 k | 1.25 G | 62.5 | 125 G | 6.25 k |
| 2 ns | 1.25 G | 25 | 125 G | 2.5 k | 2.5 G | 50 | 125 G | 2.5 k | 625 M | 12.5 | 125 G | 2.5 k | 1.25 G | 25 | 125 G | 2.5 k |
| 1 ns | 1.25 G | 12.5 | 125 G | 1.25 k | 2.5 G | 25 | 125 G | 1.25 k | 625 M | 6.25 | 125 G | 1.25 k | 1.25 G | 12.5 | 125 G | 1.25 k |

Values outside of the thick borders have been calculated in real-time sampling mode.
If there is no memory option, acquisition with this record length is performed in single mode.
1 If there is no memory option, high resolution mode cannot be used with this record length.
2 If there is no memory option, interpolation mode and repetitive sampling mode cannot be used with this record length.

## When the Record Length Is $\mathbf{1 2 . 5}$ M points

(This record length can be selected when there is no memory option or on DLM2000s with the /M2 option)

Intpl: Interpolation Mode
Rep: Repetitive Sampling Mode

| Settings <br> Timeldiv | When High Resolution mode is off |  |  |  |  |  |  |  | When High Resolution mode is on ${ }^{1}$ |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | When Interleave mode is off ${ }^{2}$ |  |  |  | When Interleave mode is on |  |  |  | When Interleave mode is off |  |  |  | When Interleave mode is on |  |  |  |
|  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep ${ }^{3}$ |  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep |  |
|  | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample Rate (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record Length (Points) | Sample <br> Rate $\\|(\mathrm{S} / \mathbf{s})$ | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) |
| 500 s | 2.5 | 12.5 M | 2.5 k | 12.5 M | 2.5 k | 12.5 M | 2.5 k | 12.5 M | 2.5 k | 12.5 M | 2.5 k | 12.5 M | 2.5 k | 12.5 M | 2.5 k | 12.5 M |
| 200 s | 6.25 | 12.5 M | 6.25 k | 12.5 M | 6.25 k | 12.5 M | 6.25 k | 12.5 M | 6.25 k | 12.5 M | 6.25 k | 12.5 M | 6.25 k | 12.5 M | 6.25 k | 12.5 M |
| 100 | 12.5 | 12.5 M | 12.5 k | 12.5 M | 12.5 k | 12.5 M | 12.5 | 12.5 M | 12.5 | 12.5 M | 12.5 k | 12.5 M | 12.5 k | 12.5 M | 12.5 k | 12.5 M |
| 50 s | 25 | 12.5 M | 25 k | 12.5 M | 25 k | 12.5 M | 25 k | 12.5 M | 25 | 12.5 M | 25 k | 12.5 M | 25 k | 12.5 M | 25 k | 12.5 M |
| 20 s | 62.5 k | 12.5 M | 62.5 k | 12.5 M | 62.5 k | 12.5 M | 62.5 k | 12.5 M | 62.5 k | 12.5 M | 62.5 k | 12.5 M | 62.5 k | 12.5 M | 62.5 k | 12.5 M |
| 10 s | 125 k | 12.5 M | 125 k | 12.5 M | 125 k | 12.5 M | 125 k | 12.5 M | 125 k | 12.5 M | 125 k | 12.5 M | 125 k | 12.5 M | 125 k | 12.5 M |
| 5 s | 250 k | 12.5 M | 250 k | 12.5 M | 250 k | 12.5 M | 250 k | 12.5 M | 250 k | 12.5 M | 250 k | 12.5 M | 250 k | 12.5 M | 250 k | 12.5 M |
| 2 s | 625 | 12.5 M | 625 k | 12.5 M | 625 k | 12.5 M | 625 k | 12.5 M | 625 | 12.5 M | 625 k | 12.5 M | 625 k | 12.5 M | 625 k | 12.5 M |
| 1 s | 1.25 | 12.5 | 1.25 | 12 | 1. | 12 | 1. | 12 | 1. | 12.5 M | 1.25 M | 12.5 M | 1.25 M | 12.5 M | 1.25 M | 12.5 M |
| 500 | 2.5 | 12 | 2.5 | 12 | 2.5 | 12 | 2. | 12 | 2. | 12.5 M | 2.5 | 12.5 M | 2.5 | 12.5 M | 2.5 M | M |
| 200 | 6.2 | 12 | 6. | 12 | 6. | 12 | 6. | 12 | 6.25 M | 12.5 M | 6.25 M | M | 6.25 M | M | 6.25 M | M |
| 100 m | 12.5 | 12.5 | 12.5 | 12. | 12.5 M | 12.5 M | 12.5 M | 12.5 M | 12.5 M | 12.5 M | 12.5 M | 12.5 M | 12.5 M | 12.5 M | 12.5 M | 12.5 M |
| 50 ms | 25 | 12.5 | 25 | 12.5 | 25 | 12.5 M | 25 | 12.5 M | 25 | 12.5 M | 25 | 12.5 M | 25 | 12.5 M | 25 M | 12.5 M |
| 20 | 62.5 M | 12.5 M | 62.5 M | 12.5 M | 62.5 M | 12.5 M | 62.5 M | 12.5 M | 62.5 M | 12.5 M | 62.5 M | 12.5 M | 62.5 M | 12.5 M | 62.5 M | 12.5 M |
| 10 m | 125 | 12.5 M | 125 M | 12.5 M | 125 M | 12.5 M | 125 M | 12.5 M | 125 M | 12.5 M | 125 M | 12.5 M | 125 M | 12.5 M | 125 M | 12.5 M |
| 5 ms | 250 M | 12.5 | 250 M | 12.5 M | 250 M | 12.5 M | 250 M | 12.5 M | 250 M | 12.5 M | 250 M | 12.5 M | 250 M | 12.5 M | 250 M | 12.5 M |
| 2 ms | 625 M | 12.5 M | 625 M | 12.5 M | 625 M | 12.5 M | 625 | 12.5 M | 625 M | 12.5 M | 625 M | 12.5 M | 625 M | 12.5 M | 625 M | 12.5 M |
| 1 ms | 1.25 G | 12.5 | 1.25 G | 12.5 M | 1. | 12 | 1.25 G | 12 | 625 M | 6.25 M | 1.25 G | 12.5 M | 1.25 G | 12.5 M | 1.25 G | 12.5 M |
| $500 \mu \mathrm{~s}$ | 1.25 | 6.25 | 2.5 | 12 | 2.5 | 12 | 2.5 G | 12.5 M | 625 M | 3.125 M | 2.5 G | 12.5 M | 1.25 G | 6.25 M | 2.5 G | M |
| $200 \mu \mathrm{~s}$ | 1.25 | 2.5 | 6.25 G | 12 | 2. | 5 | 6.25 G | 12 | 625 M | 1. | 6.25 G | 12.5 M | 1.25 G | 2.5 M | 6.25 G | 12.5 M |
| $100 \mu \mathrm{~s}$ | 1.25 | 1.25 | 12.5 G | 12.5 | 2.5 | 2. | 12.5 G | 12. | 625 M | 625 | 12.5 G | 12.5 M | 1.25 G | 1.25 M | 12.5 G | 12.5 M |
| $50 \mu \mathrm{~s}$ | 1.25 | 625 | 25 | 12 | 2.5 G | 1.25 | 25 | 12.5 | 62 | 312.5 k | 25 G | 12.5 M | 1.25 G | 625 k | 25 G | 12.5 M |
| $20 \mu \mathrm{~s}$ | 1.25 G | 250 | 62.5 G | 12.5 M | 2.5 G | 500 | 62.5 G | 12.5 | 625 M | 125 | 62.5 G | 12.5 M | 1.25 G | 250 k | 62.5 G | 12.5 M |
| 10 | 1.25 G | 125 k | 125 G | 12.5 M | 2.5 G | 250 k | 125 G | 12.5 M | 625 M | 62.5 k | 125 G | 12.5 M | 1.25 G | 125 k | 125 G | 12.5 M |
| 5 | 1.25 G | 62.5 k | 125 G | 6.25 M | 2.5 G | 125 k | 125 G | 6.25 M | 625 M | 31.25 k | 125 G | 6.25 M | 1.25 G | 62.5 k | 125 G | 6.25 M |
| $2 \mu \mathrm{~s}$ | 1.25 G | 25 k | 125 G | 2.5 M | 2.5 G | 50 k | 125 G | 2.5 M | 625 M | 12.5 k | 125 G | 2.5 M | 1.25 G | 25 k | 125 G | 2.5 M |
| 1 | 1.25 G | 12.5 k | 125 G | 1.25 M | 2.5 G | 25 k | 125 G | 1.25 M | 625 M | 6.25 k | 125 G | 1.25 M | 1.25 G | 12.5 k | 125 G | 1.25 M |
| 500 ns | 1.25 G | 6.25 k | 125 G | 625 k | 2.5 G | 12.5 k | 125 G | 625 k | 625 M | 3.125 k | 125 G | 625 k | 1.25 G | 6.25 k | 125 G | 625 k |
| 200 ns | 1.25 G | 2.5 k | 125 G | 250 k | 2.5 G | 5 | 125 G | 250 k | 625 M | 1.25 k | 125 G | 250 k | 1.25 G | 2.5 k | 125 G | 250 k |
| 100 ns | 1.25 G | 1.25 k | 125 G | 125 | 2.5 G | 2.5 k | 125 G | 125 k | 625 M | 625 | 125 G | 125 k | 1.25 G | 1.25 k | 125 G | 125 k |
| 50 ns | 1.25 G | 625 | 125 G | 62.5 k | 2.5 G | 1.25 k | 125 G | 62.5 k | 625 M | 312.5 | 125 G | 62.5 k | 1.25 G | 625 | 125 G | 62.5 k |
| 20 ns | 1.25 G | 250 | 125 G | 25 k | 2.5 G | 500 | 125 G | 25 k | 625 M | 125 | 125 G | 25 k | 1.25 G | 250 | 125 G | 25 k |
| 10 ns | 1.25 G | 125 | 125 G | 12.5 k | 2.5 G | 250 | 125 G | 12.5 k | 625 M | 62.5 | 125 G | 12.5 k | 1.25 G | 125 | 125 G | 12.5 k |
| 5 ns | 1.25 G | 62.5 | 125 G | 6.25 k | 2.5 G | 125 | 125 G | 6.25 k | 625 M | 31.25 | 125 G | 6.25 k | 1.25 G | 62.5 | 125 G | 6.25 k |
| 2 ns | 1.25 G | 25 | 125 G | 2.5 k | 2.5 G | 50 | 125 G | 2.5 k | 625 M | 12.5 | 125 G | 2.5 k | 1.25 G | 25 | 125 G | 2.5 k |
| 1 ns | 1.25 G | 12.5 | 125 G | 1.25 k | 2.5 G | 25 | 125 G | 1.25 k | 625 M | 6.25 | 125 G | 1.25 k | 1.25 G | 12.5 | 125 G | 1.25 k |

Values outside of the thick borders have been calculated in real-time sampling mode.
If there is no memory option, acquisition with this record length is performed in single mode.
1 If there is no memory option, high resolution mode cannot be used with this record length.
2 If there is no memory option, with this record length, interleave mode cannot be turned off.
3 If there is no memory option, interpolation mode and repetitive sampling mode cannot be used with this record length.

## When the Record Length Is $\mathbf{2 5} \mathbf{M}$ points

(This record length can be selected on DLM2000s with the /M1(S) or /M3 option)
Intpl: Interpolation Mode Rep: Repetitive Sampling Mode

| Settings | When High Resolution mode is off |  |  |  |  |  |  |  | When High Resolution mode is on ${ }^{1}$ |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | When Interleave mode is off |  |  |  | When Interleave mode is on |  |  |  | When Interleave mode is off |  |  |  | When Interleave mode is on |  |  |  |
|  | Realtime |  | Intpl/Rep ${ }^{2}$ |  | Realtime |  | Intpl/Rep ${ }^{2}$ |  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep |  |
|  | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) |
| 500 s | 5 k | 25 M | 5 k | 25M | 5 k | 25 M | 5 k | 25M | 5 k | 25M | 5k | M | 5k | 25M | 5k | 25M |
| 200 s | 12.5 k | 25 M | 12.5 | 25M | 12.5 k | 25 M | 12.5k | 25M | 12.5k | 25M | 12.5k | 25M | 12.5k | 25M | 12.5k | 25M |
| 100 s | 25 k | 25 M | 25 | 25M | 25 k | 25 M | 25k | 25M | 25k | 25M | 25k | 25M | 25k | 25M | 25k | 25M |
| 50 s | 50 k | 25 M | 50k | 25M | 50 k | 25 M | 50k | 25M | 50k | 25M | 50k | 25M | 50k | 25M | 50k | 25M |
| 20 s | 125 k | 25 M | 125k | 25M | 125 k | 25 M | 125k | 25M | 125k | 25M | 125k | 25M | 125k | 25M | 125k | 25M |
| 10 s | 250 k | 25 M | 250k | 25M | 250 k | 25 M | 250k | 25M | 250k | 25M | 250k | 25M | 250k | 25M | 250k | 25M |
| 5 s | 500 k | 25 | 500k | 25M | 500 k | 25 M | 500k | 25M | 500k | 25M | 500k | 25M | 500k | 25M | 500k | 25M |
| 2 s | 1.25 | 25 | 1.25 | 25 | 1.2 | 25 | 1.25 | 25 | 1.25 | 25M | 1.25 | M | 1.25M | 25M | 1.25M | 25M |
| 1 s | 2.5 M | 25 | 2.5M | 25M | 2.5 M | 25 | 2.5M | 25 | 2.5M | 25 | 2.5M | 25 | 2.5M | 25M | 2.5M | 25M |
| 500 ms | 5 | 25 | 5 | 25 | 5 | 25 | 5 | 25M | 5 | , | 5M | , | 5 | 25M | , | 25M |
| 200 ms | 12.5 M | 25 | 12.5 | 25M | 12.5 | 25 M | 12.5 | 25M | 12.5 | 25M | 12.5 | 25M | 12.5M | 25M | 12.5M | 25M |
| 100 ms | 25 | 25 | 25 | 25M | 25 | 25 M | 25 | 25M | 25M | 25M | 25M | 25M | 25M | 25M | 25M | 25M |
| 50 ms | 25 | 12.5 M | 25M | 12.5M | 25 M | 12.5 M | 25M | 12.5M | 25M | 12.5M | 25M | 12.5M | 25M | 12.5M | 25M | 12.5M |
| 20 ms | 125 M | 25 M | 125M | 25M | 125 M | 25 M | 125M | 25M | 125M | 25M | 125M | 25M | 125M | 25M | 125M | 25M |
| 10 ms | 250 M | 25 M | 250M | 25M | 250 M | 25 M | 250M | 25M | 250M | 25M | 250M | 25M | 250M | 25M | 250M | 25M |
| 5 ms | 250 M | 12.5 M | 250M | 12.5M | 250 M | 12.5 M | 250M | 12.5M | 250M | 12.5M | 250M | 12.5M | 250M | 12.5M | 250M | 12.5M |
| 2 ms | 1.25 G | 25 | 1.25G | 25M | 1.25 G | 25 | 1.25G | 25 | 625M | 12.5 M | 1.25G | 25M | 1.25G | 25M | 1.25G | 25M |
| 1 ms | 1.25 | 12.5 M | 2.5 | 25 | 2.5 G | 25 | 2.5G | 25M | 625M | 6.25 M | 2.5G | 25M | 1.25G | 12.5M | 2.5G | 25M |
| $500 \mu \mathrm{~s}$ | 1.25 | 6.25 M | 5G | 25 | 2.5 | 12 | 5 | 2 | 6 | 3.125M | 5G | 25M | 1.25G | 6.25M | 5G | 25M |
| $200 \mu \mathrm{~s}$ | 1.25 G | 2.5 | 12.5G | 25 | 2.5 | 5 | 12.5 | 2 | 625M | 1.25M | 12.5 | 25M | 1.25G | 2.5M | 12.5G | 25M |
| $100 \mu \mathrm{~s}$ | 1.25 G | 1.25 M | 25G | 25 | 2.5 | 2. | 25G | 25 | 625M | 625k | 25G | 25M | 1.25G | 1.25M | 25G | 25M |
| $50 \mu \mathrm{~s}$ | 1.25 G | 625 | 50G | 25M | 2.5 | 1.25 M | 50G | 25M | 625M | 312.5k | 50G | 25M | 1.25 G | 625k | 50G | 25M |
| $20 \mu \mathrm{~s}$ | 1.25 G | 250 k | 125G | 25M | 2.5 G | 500 k | 125G | 25M | 625M | 125k | 125G | 25M | 1.25G | 250k | 125G | 25M |
| $10 \mu \mathrm{~s}$ | 1.25 G | 125 k | 125G | 12.5M | 2.5 G | 250 k | 125G | 12.5M | 625M | 62.5k | 125G | 12.5M | 1.25G | 125k | 125G | 12.5M |
| $5 \mu \mathrm{~s}$ | 1.25 G | 62.5 k | 125G | 6.25M | 2.5 G | 125 k | 125G | 6.25M | 625M | 31.25k | 125G | 6.25M | 1.25G | 62.5k | 125G | 6.25M |
| $2 \mu \mathrm{~s}$ | 1.25 G | 25 k | 125G | 2.5 M | 2.5 G | 50 k | 125G | 2.5M | 625M | 12.5k | 125G | 2.5M | 1.25G | 25k | 125G | 2.5M |
| $1 \mu \mathrm{~s}$ | 1.25 G | 12.5 k | 125G | 1.25M | 2.5 G | 25 k | 125G | 1.25M | 625M | 6.25k | 125G | 1.25M | 1.25G | 12.5k | 125G | 1.25M |
| 500 ns | 1.25 G | 6.25 k | 125G | 625k | 2.5 G | 12.5 k | 125G | 625k | 625M | 3.125k | 125G | 625k | 1.25G | 6.25k | 125G | 625k |
| 200 ns | 1.25 G | 2.5 k | 125G | 250k | 2.5 G | 5 k | 125G | 250k | 625M | 1.25k | 125G | 250k | 1.25G | 2.5k | 125G | 250k |
| 100 ns | 1.25 G | 1.25 k | 125G | 125k | 2.5 G | 2.5 k | 125G | 125k | 625M | 625 | 125G | 125k | 1.25G | 1.25k | 125G | 125k |
| 50 ns | 1.25 G | 625 | 125G | 62.5k | 2.5 G | 1.25 k | 125G | 62.5k | 625M | 312.5 | 125G | 62.5k | 1.25G | 625 | 125G | 62.5k |
| 20 ns | 1.25 G | 250 | 125G | 25k | 2.5 G | 500 | 125G | 25k | 625M | 125 | 125G | 25k | 1.25G | 250 | 125G | 25k |
| 10 ns | 1.25 G | 125 | 125G | 12.5k | 2.5 G | 250 | 125G | 12.5k | 625M | 62.5 | 125G | 12.5k | 1.25G | 125 | 125G | 12.5k |
| 5 ns | 1.25 G | 62.5 | 125G | 6.25k | 2.5 G | 125 | 125G | 6.25k | 625M | 31.25 | 125G | 6.25k | 1.25G | 62.5 | 125G | 6.25k |
| 2 ns | 1.25 G | 25 | 125G | 2.5k | 2.5 G | 50 | 125G | 2.5k | 625M | 12.5 | 125G | 2.5k | 1.25G | 25 | 125G | 2.5k |
| 1 ns | 1.25 G | 12.5 | 125G | 1.25k | 2.5 G | 25 | 125G | 1.25k | 625M | 6.25 | 125G | 1.25k | 1.25G | 12.5 | 125G | 1.25k |

Values outside of the thick borders have been calculated in real-time sampling mode.
On DLM2000s with the /M1(S) option, acquisition with this record length is performed in single mode.
1 On DLM2000s with the /M1(S) option, high resolution mode cannot be used with this record length.
2 On DLM2000s with the /M1 (S) option, interpolation mode and repetitive sampling mode cannot be used with this record length.
Roll Mode

## When the Record Length Is $\mathbf{6 2 . 5} \mathbf{M}$ points

(This record length can be selected on DLM2000s with the /M1(S) or /M2 option) Intpl: Interpolation Mode

|  |  |  |  |  |  |  |  |  | Rep: Repetitive Sampling Mode |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Settings <br> Time/div | When High Resolution mode is off |  |  |  |  |  |  |  | When High Resolution mode is on |  |  |  |  |  |  |  |
|  | When Interleave mode is off* |  |  |  | When Interleave mode is on |  |  |  | When Interleave mode is off |  |  |  | When Interleave mode is on |  |  |  |
|  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep |  | Realtime |  | Intpl/Rep |  |
|  | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample R <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) | Sample <br> Rate <br> (S/s) | Record <br> Length <br> (Points) |
| 500 s | 12.5 k | 62.5 M | Interpolation mode and repetitive sampling mode cannot be used when you specify this record length. |  | 12.5 k | 62.5 M | Interpolation mode and repetitive sampling mode cannot be used when you specify this record length. |  | When you specify this record length, high resolution mode cannot be turned on. |  |  |  |  |  |  |  |
| 200 s | 31.25 k | 62.5 M |  |  | 31.25 k | 62.5 M |  |  |  |  |  |  |  |  |  |  |
| 100 s | 62.5 k | 62.5 M |  |  | 62.5 k | 62.5 M |  |  |  |  |  |  |  |  |  |  |
| 50 s | 125 k | 62.5 M |  |  | 125 k | 62.5 M |  |  |  |  |  |  |  |  |  |  |
| 20 s | 312.5 k | 62.5 M |  |  | 312.5 k | 62.5 M |  |  |  |  |  |  |  |  |  |  |
| 10 s | 625 k | 62.5 M |  |  | 625 k | 62.5 M |  |  |  |  |  |  |  |  |  |  |
| 5 s | 1.25 M | 62.5 M |  |  | 1.25 M | 62.5 M |  |  |  |  |  |  |  |  |  |  |
| 2 s | 3.125 M | 62.5 M |  |  | 3.125 M | 62.5 M |  |  |  |  |  |  |  |  |  |  |
| 1 s | 6.25 M | 62.5 M |  |  | 6.25 M | 62.5 M |  |  |  |  |  |  |  |  |  |  |
| 500 ms | 12.5 M | 62.5 M |  |  | 12.5 M | 62.5 M |  |  |  |  |  |  |  |  |  |  |
| 200 ms | 31.25 M | 62.5 M |  |  | 31.25 M | 62.5 M |  |  |  |  |  |  |  |  |  |  |
| 100 ms | 62.5 M | 62.5 M |  |  | 62.5 M | 62.5 M |  |  |  |  |  |  |  |  |  |  |
| 50 ms | 125 M | 62.5 M |  |  | 125 M | 62.5 M |  |  |  |  |  |  |  |  |  |  |
| 20 ms | 312.5 M | 62.5 M |  |  | 312.5 M | 62.5 M |  |  |  |  |  |  |  |  |  |  |
| 10 ms | 625 M | 62.5 M |  |  | 625 M | 62.5 M |  |  |  |  |  |  |  |  |  |  |
| 5 ms | 1.25 G | 62.5 M |  |  | 1.25 G | 62.5 M |  |  |  |  |  |  |  |  |  |  |
| 2 ms | 1.25 G | 25 M |  |  | 2.5 G | 50 M |  |  |  |  |  |  |  |  |  |  |
| 1 ms | 1.25 G | 12.5 M |  |  | 2.5 G | 25 M |  |  |  |  |  |  |  |  |  |  |
| $500 \mu \mathrm{~s}$ | 1.25 G | 6.25 M |  |  | 2.5 G | 12.5 M |  |  |  |  |  |  |  |  |  |  |
| $200 \mu \mathrm{~s}$ | 1.25 G | 2.5 M |  |  | 2.5 G | 5 M |  |  |  |  |  |  |  |  |  |  |
| $100 \mu \mathrm{~s}$ | 1.25 G | 1.25 M |  |  | 2.5 G | 2.5 M |  |  |  |  |  |  |  |  |  |  |
| $50 \mu \mathrm{~s}$ | 1.25 G | 625 k |  |  | 2.5 G | 1.25 M |  |  |  |  |  |  |  |  |  |  |
| $20 \mu \mathrm{~s}$ | 1.25 G | 250 k |  |  | 2.5 G | 500 k |  |  |  |  |  |  |  |  |  |  |
| $10 \mu \mathrm{~s}$ | 1.25 G | 125 k |  |  | 2.5 G | 250 k |  |  |  |  |  |  |  |  |  |  |
| $5 \mu \mathrm{~s}$ | 1.25 G | 62.5 k |  |  | 2.5 G | 125 k |  |  |  |  |  |  |  |  |  |  |
| $2 \mu \mathrm{~s}$ | 1.25 G | 25 k |  |  | 2.5 G | 50 k |  |  |  |  |  |  |  |  |  |  |
| $1 \mu \mathrm{~s}$ | 1.25 G | 12.5 k |  |  | 2.5 G | 25 k |  |  |  |  |  |  |  |  |  |  |
| 500 ns | 1.25 G | 6.25 k |  |  | 2.5 G | 12.5 k |  |  |  |  |  |  |  |  |  |  |
| 200 ns | 1.25 G | 2.5 k |  |  | 2.5 G | 5 k |  |  |  |  |  |  |  |  |  |  |
| 100 ns | 1.25 G | 1.25 k |  |  | 2.5 G | 2.5 k |  |  |  |  |  |  |  |  |  |  |
| 50 ns | 1.25 G | 625 |  |  | 2.5 G | 1.25 k |  |  |  |  |  |  |  |  |  |  |
| 20 ns | 1.25 G | 250 |  |  | 2.5 G | 500 |  |  |  |  |  |  |  |  |  |  |
| 10 ns | 1.25 G | 125 |  |  | 2.5 G | 250 |  |  |  |  |  |  |  |  |  |  |
| 5 ns | 1.25 G | 62.5 |  |  | 2.5 G | 125 |  |  |  |  |  |  |  |  |  |  |
| 2 ns | 1.25 G | 25 |  |  | 2.5 G | 50 |  |  |  |  |  |  |  |  |  |  |
| 1 ns | 1.25 G | 12.5 |  |  | 2.5 G | 25 |  |  |  |  |  |  |  |  |  |  |

Acquisition when you specify this record length is performed in single mode.

* On DLM2000s with the /M1(S) option, with this record length, interleave mode cannot be turned off.


## When the Record Length Is $\mathbf{1 2 5}$ M points



Acquisition when you specify this record length is performed in single mode.

* On DLM2000s with the /M2 option, with this record length, interleave mode cannot be turned off.


## When the Record Length Is $\mathbf{2 5 0} \mathbf{M}$ points

(This record length can be selected on DLM2000s with the /M3 option)
Intpl: Interpolation Mode Rep: Repetitive Sampling Mode


Acquisition when you specify this record length is performed in single mode.


[^0]:    * Typical values are typical or mean values. They are not strictly guaranteed.

[^1]:    Ground level also moves.

[^2]:    1 The storage medium can be set to internal memory or USB storage.
    2 ACQ memory or REF1 (MATH1) on the DLM2022, DLM2032, and DLM2052.

[^3]:    * See section 5.8, "USB for Peripherals."

[^4]:    Values outside of the thick borders have been calculated in real-time sampling mode.

