User's Manual

DTSXL Distributed Temperature Sensor Long Range System

Read Me First

IM 39J06A40-01E

vigilantplant.

This User's Manual (this "Manual") contains important information for the safe operation of DTSXL Distributed Temperature Sensor Long Range System (the "Product") and information common to all user's manuals (the "User's Manuals"). Before using the Product, you must thoroughly read this Manual and DTSXL Distributed Temperature Sensor Long Range System Guide (IM 39J06B40-01E) prior to other User's Manuals.

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YOKOGAWA
Yokogawa Electric Corporation

IM 39J06A40-01E
1st Edition

Safety Precautions

■ Safety, Protection, and Modification of the Product

- In order to protect the system controlled by the product and the product itself and ensure safe operation, observe the safety precautions described in this instruction manual. We assume no liability for safety if users fail to observe these instructions when operating the product.
- If this instrument is used in a manner not specified in this manual, the protection provided by this instrument may be impaired.
- If any protection or safety circuit is required for the system controlled by the product or for the product itself, prepare it separately.
- Be sure to use the spare parts approved by Yokogawa Electric Corporation (hereafter simply referred to as YOKOGAWA) when replacing parts or consumables.
- Modification of the product is strictly prohibited.
- The following symbols are used in the product and instruction manual to indicate that there are precautions for safety:

Indicates that caution is required for operation. This symbol is placed on the product to refer the user to the instruction manual in order to protect the operator and the equipment. In the instruction manuals you will find precautions to avoid physical injury or death of the operator, including electrical shocks.

Indicates a caution of high temperature surface.

Indicates a caution of Laser radiation.

Identifies a functional grounding terminal. Before using the product, ground the terminal.

Indicates a AC supply.

Indicates a DC supply.

■ Notes on Handling Manuals

- Please hand over the user's manuals to your end users so that they can keep the manuals on hand for convenient reference.
- Please read the information thoroughly before using the product.
- The purpose of these manuals is not to warrant that the product is well suited to any particular purpose but rather to describe the functional details of the product.
- No part of the manuals may be transferred or reproduced without prior written consent from YOKOGAWA.
- YOKOGAWA reserves the right to make improvements in the manuals and product at any time, without notice or obligation.
- If you have any questions, or you find mistakes or omissions in the manuals, please contact our sales representative or your local distributor.

SEE ALSO

For User's Manuals and General Specifications, refer to page xiii.

■ Warning and Disclaimer

The product is provided on an "as is" basis. YOKOGAWA shall have neither liability nor responsibility to any person or entity with respect to any direct or indirect loss or damage arising from using the product or any defect of the product that YOKOGAWA cannot predict in advance.

■ Notes on Hardware

● Appearance and Accessories

Check the following when you receive the product:

- Appearance
- Standard accessories

Contact our sales representative or your local distributor if the product's coating has come off, it has been damaged, or there is shortage of required accessories.

● Model and Suffix Codes

The name plate on the product contains the model and suffix codes. Compare them with those in the general specification to make sure the product is the correct one. If you have any questions, contact our sales representative or your local distributor.

■ Notes on Software

- YOKOGAWA makes no warranties, either expressed or implied, with respect to the Software Product's merchantability or suitability for any particular purpose, except as specified in the warranty terms.
- Please purchase the appropriate number of licenses of the Software Product according to the number of computers to be used.
- No copy of the Software Product may be made for any purpose other than backup; otherwise, it is deemed as an infringement of YOKOGAWA's Intellectual Property rights.
- Keep the software medium of the Software Product in a safe place.
- No reverse engineering, reverse compiling, reverse assembling, or converting the Software Product to human-readable format may be performed for the Software Product.
- No part of the Software Product may be transferred, converted, or sublet for use by any third-party, without prior written consent from YOKOGAWA.

Documentation Conventions

■ Symbol Marks

Throughout this manual, you will find several different types of symbols being used to identify different sections of text. This section describes these icons.

CAUTION

- Identifies instructions that must be observed in order to avoid physical injury and electric shock or death of the operator.

WARNING

- Identifies instructions that must be observed in order to prevent the software or hardware from being damaged or the system from becoming faulty.

IMPORTANT

Identifies important information required to understand operations or functions.

TIP

- Identifies additional information.

SEE ALSO

- Identifies a source to be referred to.

■ Typographical Conventions

The following typographical conventions are used throughout the User's Manuals.

● Commonly Used Conventions throughout the User's Manuals

- Δ Mark

  Indicates that a space must be entered between character strings.

  Example: .ALΔPIC010Δ-SC

- Character string enclosed by braces { }

  Indicates character strings that may be omitted.

  Example: .PRΔTAG{Δ.sheet name}

● Conventions Used to Show Key or Button Operations

- Characters enclosed by brackets [ ]

  When characters are enclosed by brackets in the description of a key or button operation, it indicates a key on the keyboard, a button name in a window, or an item in a list box displayed in a window.

  Example: To alter the function, press the [ESC] key.

● Conventions of a User-defined Folder

- User-defined folder name enclosed by parenthesis ( )

  User definable path is written in a pair of parentheses.

  Example:

  (DTSX Project Folder)\SCS0101

  If the RS Project Folder is C:\MYRSPJT, the above path becomes C:\MYRSPJT\SCS0101.

■ Drawing Conventions

Drawings used in the User's Manuals may be partially emphasized or simplified for convenience of description, so that the unnecessary parts are omitted from the drawings.

Drawings of the window may be slightly different from the actual screen shots with different settings or fonts; the difference is not extended to the range that may hamper the understanding of basic functionalities and operation and monitoring tasks.

System Configuration and Cautions

■ System Configuration

● DTSXL Distributed Temperature Sensor Long Range System

DTSXL Distributed Temperature Sensor Long Range System (the “DTSXL System”) is the system using DTSX3000 as Distributed Temperature Sensor.

DTSXL System is configured by the following modules.

- Distributed temperature sensor DTSX3000
- Optical switch module DTOS2L, DTOS4L, DTOS16L
- Base module DTSBM10
- Power supply module NFPW426, NFPW441, NFPW442, NFPW444
- CPU module NFCP050
- Rack mount kit DTRK10
- Optical Fiber DTFB10
- Control visualization software DTAP3000
- Data conversion software DTAP3000D

SEE ALSO

For the conformity standards and the details of DTSXL System, refer to General Specifications of DTSXL Distributed Temperature Sensor Long Range System (GS 39J06B40-01E).

For the Low Voltage directive, EMC directive in EU, the hardware configurations are described in the following table:

The EU Declaration of Conformity does not cover DTSXL configurations in where Power supply module NFPW441 is installed.

Information relevant to the conformity and identification of DTSXL System is provided in System name plate affixed on DTSX3000 and detail information (specifications, serial numbers, etc.) is provided in name plate affixed on each module.

Use	Configuration Type	Power supply module *1	Base module	Distributed Temperature Sensor	CPU module	Optical switch module	Option
Normal	Type-N	NFPW426 or NFPW442 or NFPW444	DTSBM10	DTSX3000	None or NFCP050	None or DTOS2L or DTOS4L or DTOS16L	None or DTRK10 and/or DTFB10

*1: Dual-redundant configuration is not allowed for the power supply module.

Under EU legislation, the manufacturer and the authorised representative in EEA (European Economic Area) are indicated below:

Manufacturer: YOKOGAWA Electric Corporation
(2-9-32 Nakacho, Musashino-shi, Tokyo 180-8750, Japan).

Authorised Representative in EEA:
Yokogawa Europe B.V.
(Euroweg 2, 3825 HD Amersfoort, The Netherlands)

■ Installation and Maintenance Notes

SEE ALSO

For more information about installation and maintenamce, refer to DTSXL Distributed Temperature Sensor Long Range System Guide (IM 39J06B40-01E).

● Installation method

Follow the guidance below on how to use this device to guarantee satisfactory safety and performance.

- Install rack type devices in the metal cabinet.
- Confirm that all the empty slots are covered by dummy covers.
- Confirm that all cables are firmly secured with the screws.
- Keep the cabinet door closed and lock the cabinet doors for safety.
- Prepare a dedicated circuit breaker in the same room of the device so that it can be used to cut off the power supply when abnormality occurs. Use this breaker to shutdown power supply to equipment devices when a device abnormality occurs. Use a breaker that meets STARDOM power supply specification requirements.

● Requirements for Installation

When installing the device, the installation requirements of the device must be satisfied.

Install the device under the following conditions:

- Installation height : Altitude up to 3000 m (*1)
- Installation category based on IEC 61010 : I or II (*2)
- Pollution degree based on IEC 61010 : 2 (*3)

*1: Altitude up to 2000 m when power supply module NFPW441, NFPW442 or NFPW444 is used.
*2: Installation category is the specification of the impulse withstanding voltage which is termed overvoltage category. Category I applies to specially protected electrical devices on the secondary side.
*3: Pollution degree represents the level of foreign matter adhesion, solid, liquid, and gaseous, which may decrease the withstanding voltage.
Pollution degree 2 is applicable to general indoor atmosphere.

● Measurement Categories

Regarding to the measurement inputs, the following requirements must be satisfied to meet the specifications for the device:

The category of the equipment applies to No.1 in the following table.

The rated transient overvoltage is 1500 V.

Note: Do not use the equipment for measurements within measurement categories II, III and IV.

No.	Applicable Standard		Description
	EC/EN/CSA 61010-1	EN 61010-2-030	
No.1	Measurement category I	O (Other)	For measurements performed on circuits not directly connected to MAINS.
No.2	Measurement category II	Measurement category II	For measurements performed on circuits directly connected to the low-voltage installation.
No.3	Measurement category III	Measurement category III	For measurements performed in the building installation.
No.4	Measurement category IV	Measurement category IV	For measurements performed at the source of the low-voltage installation.

- **Wiring Power Cable**

CAUTION

Connect the power cables according to the procedure given in DTSXL Distributed Temperature Sensor Long Range System Guide (IM 39J06B40-01E).

Power cables must conform to the safety standards of the country where the device is installed.

SEE ALSO

For more information about power cables, refer to DTSXL Distributed Temperature Sensor Long Range System Guide (IM 39J06B40-01E).

- **Earth Wiring**

CAUTION

Ground the device following the procedure in DTSXL Distributed Temperature Sensor Long Range System Guide (IM 39J06B40-01E) to prevent electric shock and to minimize noise.

SEE ALSO

For more information about earth wiring, refer to DTSXL Distributed Temperature Sensor Long Range System Guide (IM 39J06B40-01E).

- **Battery**

CAUTION

- Yokogawa designated batteries must be used.
- Mount and change batteries following the procedure given in DTSXL Distributed Temperature Sensor Long Range System Guide (IM 39J06B40-01E).

SEE ALSO

For more information about batteries, refer to DTSXL Distributed Temperature Sensor Long Range System Guide (IM 39J06B40-01E).

- **I/O Devices**

CAUTION

To ensure this system compliance with the CSA safety standards, all devices connected to this system shall be CSA certified devices.

SEE ALSO

For Wiring I/O Cables for I/O Devices, refer to DTSXL Distributed Temperature Sensor Long Range System Guide (IM 39J06B40-01E).

- **Maintenance**

CAUTION

- When the device becomes dusty, use a vacuum cleaner or a soft cloth to clean it.
- During maintenance, wear a wrist strap, and adopt appropriate ESD (Electrostatic Discharge) measures.

SEE ALSO

For Maintenance, refer to DTSXL Distributed Temperature Sensor Long Range System Guide (IM 39J06B40-01E).

- **Cards, Cables and Connectors**

CAUTION

When power of DTSXL is ON, Do not install or remove the cards, cables, connectors which are listed in DTSXL Distributed Temperature Sensor Long Range System Guide (IM 39J06B40-01E).

SEE ALSO

For Cards, Cables and Connectors, refer to DTSXL Distributed Temperature Sensor Long Range System Guide (IM 39J06B40-01E).

Laser Beam

Safety Precautions for Laser Products

This instrument uses a laser light source. This instrument is a Class 1M laser product as defined by IEC60825-1 Safety of Laser Products—Part1: Equipment classification and requirements. In addition, this instrument complies with 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.

The table below shows the parameters of the laser light used in this instrument.

Table Parameters of Laser Light

Laser Class	Class 1M
Structure	DFB-LD and EDFA
Wavelength	1552 nm
Output power (average)	3.8 mW
Pulse train	Periodic pulse train
Pulse time	Max 10 ns
Pulse repetition cycle	80 µs (min.)

The figure bellow shows Laser Class 1M label. This label is printed on the front panel of the instrument.

CAUTION

Invisible laser light is output from the OPTICAL OUTPUT terminal located on the front face of this instrument. When Optical switch module connects to Distributed Temperature Sensor with the optical fiber, the laser beam is output from optical terminals of Optical switch module.

Do not look directly or indirectly into the laser beam or at a specular reflection of the beam without protective equipment.

Do not aim the laser beam at the eye. The laser beam may cause blindness or damage to your eyes. Attach the cover to the optical connector when it is not in use.

Using an optical instrument, such as a loupe, magnifying glass, or microscope, to observe the laser beam from a distance of less than 100 mm may cause eye injury.

This instrument uses invisible laser light, which may cause eye injury or vision damage if it enters the human eye. To prevent accidents, always observe the following precautions:

- Do not turn on laser output when no optical fiber is connected to the optical connector.
- Always stop laser output before disconnecting the optical fiber from the optical connector.
- Never look into the end of an optical fiber connected to the optical connector during laser output.

High-power laser light may be emitted during disassembly and modification of this instrument. For this reason, customers must not disassemble or modify this instrument under any circumstance.

Operating this instrument not in accordance with procedures described in this manual may result in exposure to hazardous laser emissions.

- **High Temperature Safety Caution**

Figure High Temperature Caution Mark

CAUTION

Avoid skin contact. Burn hazard.

When installed in high ambient temperature environments, the instrument surface may become hot. Wear thermal protective gloves when touching metallic parts. Avoid direct skin contact. Beware especially in high temperature installation environments.

■ Measurement

Before performing distributed temperature measurement:

- Ensure that the environment complies with the DTSXL system specifications, and
- Perform temperature calibration of the sensor optical fiber with DTSXL system.

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- The following third-party software is used in the software included in the accompanying CD-R (or DVD-ROM).
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User's Manuals and General Specifications

■ List of User's Manuals and General Specifications for the Product

- IM 39J06A40-01E: DTSXL Distributed Temperature Sensor Long Range System Read Me First
- IM 39J06B40-01E: DTSXL Distributed Temperature Sensor Long Range System Guide
- IM 39J06B40-02E: DTSX3000 Communications(Modbus) Guide
- IM 39J06B40-03E: License Agreement for DTSX3000 Software
- IM 39J06B40-04E: DTSX3000 Terms and Conditions of Open Source Software
- IM 39J06G40-01: Before using DTSX
- IM 39J06G40-02: Installing Distributed Temperature Sensor
- IM 39J06G40-03: Installing Optical Switch Module for DTSXL
- IM 39J02B40-01E: DTAP3000 DTSX3000 Control Visualization Software Guide
- IM 39J02B40-02E: DTAP3000 DTSX3000 Control Visualization Software Las2.0 Data Conversion Guide
- IM 39J02B40-03E: DTAP3000D DTSX3000 Data Conversion Software WITSML1.3.1.1 Guide
- IM 39J02B40-05E: DTAP3000 Installation Manual
- IM 39J02B40-06: DTAP3000 CHECKING PACKAGE CONTENTS
- IM 39J02B40-07E: DTAP3000 Software License Agreement
- IM 39J02B40-08E: DTAP3000D Installation Manual
- IM 39J02B40-09: DTAP3000D CHECKING PACKAGE CONTENTS
- IM 39J02B40-10E: DTAP3000D Software License Agreement
- IM 39J02B40-11E: DTAP3000/DTAP3000D Update Module Installation Manual
- IM 34P02Q01-01E: STARDOM FCN/FCJ Guide
- GS 39J06B40-01E: DTSXL Distributed Temperature Sensor Long Range System
- GS 39J02B40-01E: DTSXL Distributed Temperature Sensor Long Range System (Software)
- GS 34P02Q12-01E: FCN Autonomous Controller Hardware
- GS 34P02Q13-01E: FCN-RTU Low Power Autonomous Controller Hardware

TIP

These documents can be downloaded on the following URL for online query.
http://www.yokogawa.com/ofs/

Revision Information

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■ For Questions and More Information
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