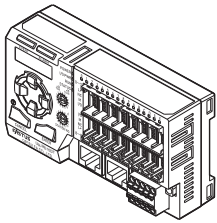


IO-Link Master

**UR-ME16DT****OPTEX FA CO.,LTD.**

Thank you for purchasing the UR-ME16DT IO-Link Master.

This manual includes the information required to use the UR-ME16DT IO-Link Master. Please read this manual carefully before use, and fully understand the functions and performance before using this product correctly. Also, keep this manual in a safe place after reading it, and always keep it handy.

## Safety Precautions

Safety precautions for ensuring safe operation of this product are displayed as follows with the following symbols.

Precautions listed here describe important information about safety. Make sure to follow them accordingly.

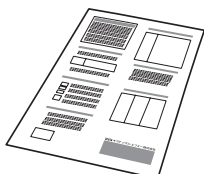
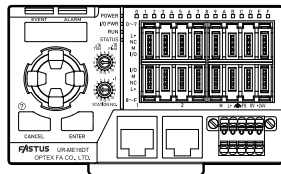
## Safety Symbols

	<b>WARNING</b>	Indicates that any improper operation or handling may result in moderate or minor injury, and in rare cases, serious injury or death. Also indicates a risk of serious property damage.
	<b>CAUTION</b>	Indicates that any improper operation or handling may result in minor injury or property damage.

<b>WARNING</b>	
	Do not disassemble, repair, modify, deform under pressure, or attempt to incinerate this product. Doing so may cause injury or fire.
	Do not use this product in water or in a location where it may be exposed to water. Do not use this product if wet. Doing so may cause a fire or damage the product.
	This product is not explosion-proof and should not be used around flammable or explosive gases or liquids. Doing so may cause ignition resulting in an explosion or fire.
	Do not use air dusters or any spray that uses flammable gas around the product or on the inside of the product. Doing so may cause ignition resulting in an explosion or fire.
	Do not use this product in environments other than industrial environments. If used in other environments, it may cause induction and radiation interference.
	Do not install this product or its cables in any of the following locations. Doing so may cause a fire, damage, or a malfunction. 1. Locations where dust, salt, iron powders, or vapor (steam) is present. 2. Locations subjected to corrosive gases or flammable gases. 3. Locations where water, oil, or chemical splashes may occur. 4. Locations where heavy vibrations or impacts may occur. 5. Locations where the ambient temperature exceeds the rated range. 6. Locations subject to rapid temperature changes (or where condensation occurs). 7. Locations with strong electric or magnetic fields. 8. Outdoor locations or locations subject to direct light.
	Do not use the product at voltages or with AC power supplies that exceed the rated voltage. Doing so may cause a fire or damage the product.
	If the CC-Link IE Field/TSN fails, the process output data is held or cleared according to the "IO-Link and network error handling" of the Master parameters in this product. It also holds or turns off PNP / NPN output data. At this time, take safety measures outside this product so that the system works on the safe side.
	If the IO-Link communication fails, the process input data is held or cleared according to the "IO-Link and network error handling" of the Master parameters in this product. At this time, take safety measures outside this product so that the system works on the safe side.
	What to do in the event of a malfunction such as smoke being emitted from the product If you detect any malfunction including emission of smoke, abnormal smells or sounds, or the body becoming very hot, immediately stop operating the product and turn off the power. Failure to do so can cause fire. Repairing the product is dangerous and should in no way be performed by the customer. Contact an OPTEX FA sales representative for repairs.
	What to do if water enters the product If water or any other liquid enters the product or the cable, immediately stop operating the product and turn off the power. Using the product in this condition may cause a fire.

<b>CAUTION</b>	
	Do not touch this product or the cable with wet hands. Doing so may damage the product.
	When wiring this product, do so properly according to this manual and specified instruction manuals. Incorrect wiring can cause product failure or malfunction.
	Connect only specified cables to this product. Use of cables other than those specified can cause malfunction.
	Keep wiring separate from high voltage and motor circuits. Using the same wiring can cause malfunction or failure. If this is unavoidable, shield with a conductor such as an earthed conduit.
	Install this product as far away as possible from high-voltage equipment, equipment that generates large switching surges and equipment that generates noise, such as welding machines or inverter motors.
	Use this product with the included end plate mounted to the DIN rail. Make sure locking mechanisms are locked before use.
	Tighten the mounting screws of the power terminal block to a torque value of 0.25 N·m or less.
	Do not apply torsional stress to cables. Doing so can cause cables and connectors to malfunction. Secure the communications cable drawn out of this product within lengths of 30 cm to ensure no load is applied to the product.
	Do not drop this product or subject it to strong impact or vibrations. Doing so can cause malfunction.
	This product generates heat during operation, so do not maintain physical contact for long periods of time. Doing so can cause low-temperature burns, etc.
	Use this product within the rated range.
	Do not cut power during communication.
	Make sure to turn OFF the power before connecting or disconnecting cables and connectors. Connection or disconnection while running can cause malfunction
	Always hold the connector when connecting or disconnecting cables and do not apply excessive force to cables.
	When removing a connector, do not touch the terminals inside the connector or allow foreign objects to get inside.
	Do not connect an actuator that does not support IO-Link to the channel of this product set to IO-Link mode. Depending on the operation of establishing IO-Link communication, the actuator may repeat ON/OFF operation with an unintended short cycle.
	Make sure to turn OFF the I/O power supply before replacing the IO-Link device.
	When the program in the host master station processes the process input data in IO-Link mode, make sure to confirm that the IO-Link Ready flag is ON before executing the program.
	When using power cables or commercially available switching regulators, make sure the frame ground (FG) is grounded.
	Wait until after transient state (approx. 2 sec.) when power is turned ON before use.
	Make sure to attach the protective cap when the connector of this product is not attached to a cable.
	Make sure to use an isolation transformer for DC power supply.
	If a surge occurs in the power supply used, use a surge absorber for the source of generation.
	If this product used in a manner not specified by the manufacturer, the protection provided this product may be impaired.

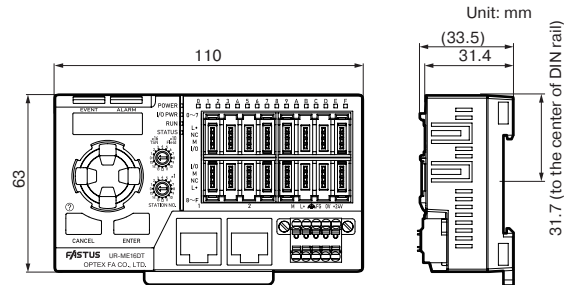
## 1. Included items



- UR-ME16DT unit
- Power terminal block
- Ferrite core
- This instruction manual
- 2x Protective cap for RJ45 connector: (attached to the unit)

\*If the terminal block is lost or damaged, order the following model.  
power terminal block: UR-FP5P

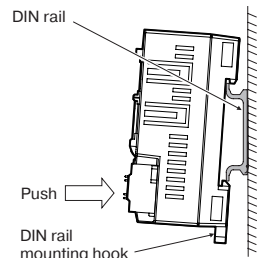
## 2. Dimensions



## 3. Installation

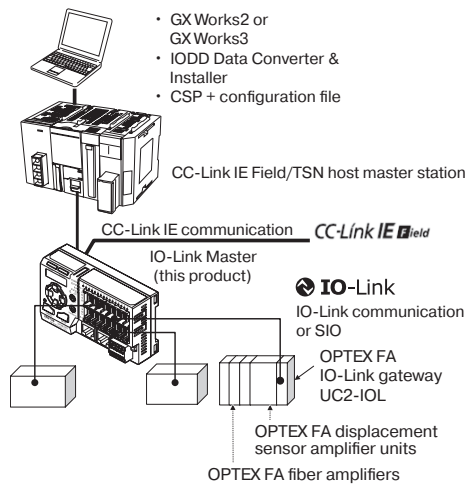
Follow the steps below to install this product.

1. Hook the upper hook on the back of the product to the DIN rail.
2. Push the lower side from the front.
3. Push the DIN rail mounting hook up to lock the product in place.



Install this product at least 10mm away from an adjacent device and structure.

## 4. System Configuration



\*1: The following conditions are required to connect up to 16 IO-Link devices to this product.

The size of the process data with the connected IO-Link devices of this product :

Input: Up to 32 words in total for all channels

Output: Up to 32 words in total for all channels

## 5. Station Number Setting

Use the front rotary switches to set the station number (i.e., Station No.) of this product as a slave of the host CC-Link IE Field/TSN network.

Station number setting  
Rotary switches

CC-Link IE Field	CC-Link IE TSN
The value of upper switch represents tens digit of station number.	Add the value of upper switch multiplied by 16 and the value of lower switch.
The value of lower switch represents ones digit of station number.	

## 6. Switching settings between CC-Link IE Field and CC-Link IE TSN

Switch between the CC-Link IE Field and CC-Link IE TSN by operating the user interfaces on the front of this product.

\* Refer to the user's manual for details.

## 7. Connection

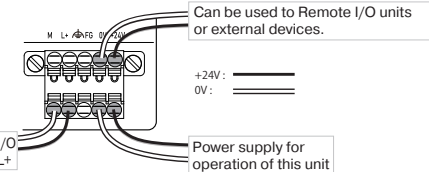
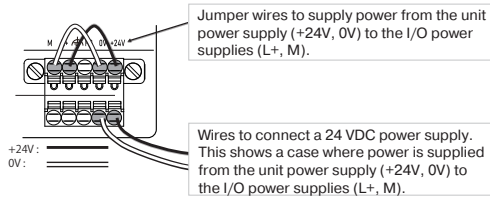
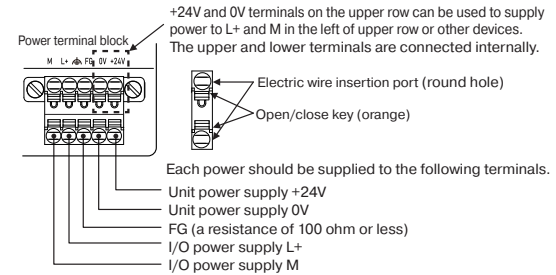
When inserting or removing wires from the terminal block, press the open/close key (orange part) while inserting/removing.

In the case of ferrules, they can be inserted without pressing the open/close key, but when pulling them out, press it in while doing so. Pulling out without pressing in the key may damage the terminal block.

The recommended crimping tool is CRIMPFOX 6 from PHOENIX CONTACT. When using a crimping tool other than the recommended one, use a type that crimps from the top and bottom (2 directions).

If other tools are used to crimp and insert the terminal block, the terminal block may be damaged when pulling it out.

### ■ Wiring to the Power Terminal Block



Applicable wires should be between AWG 24 to 16 with a rated temperature of 75°C or higher.

A ferrule, single or stranded wire can be inserted to the terminal hole. The stripped length of single or stranded wire should be 10 mm.

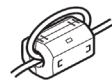
Cable length: Maximum 30 m (between power supply and IO-Link master)

The recommended ferrule is AI 0.5-10 WH (AWG20) from PHOENIX CONTACT. For dimensions and ferrules other than AWG20, refer to the UR-MS16DT/UR-ME16DT User's Manual.

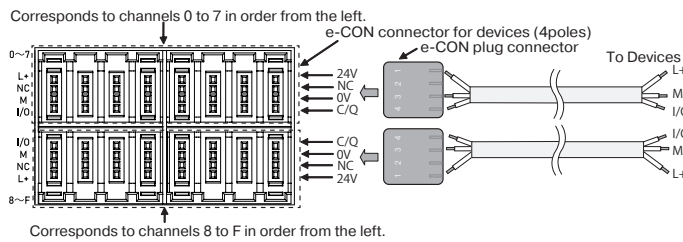
### Ferrite core

Install the ferrite core, NFT-13S made by TAKEUCHI INDUSTRY CO., LTD., that is included in the product package, to the cables connected to Unit Power Supply terminals.

Wrap the power cables around the ferrite core as shown in the picture below



### ■ Wiring to the e-CON connector for devices



Use wires with a temperature rating of 75°C or higher.

The size of the stranded wire should match the specifications of the e-CON plug connector used.

Cable Length: Maximum 20 m (between IO-Link master and IO-Link device)

- **Connectors and Cables**

## • Network Topology

- CC-Link IE Field:  
Line connection, star connection, mixed star connection and line connection, or ring connection  
For details, refer to the user's manual on each host master station.
- CC-Link IE TSN:  
Line connection, star connection, or mixed star connection and line connection  
For details, refer to the user's manual on each host master station. Also refer to the "CC-Link IE TSN Installation Manual" available from the CC-Link Association website ([www.cc-link.org](http://www.cc-link.org)).

No.	Name	Function
(1)	EVENT LED (yellow)	Blinks while an event is occurring on one of the connected IO-Link devices.
(2)	ALARM LED (red)	Blinks while this product is detecting an error.
(3)	POWER LED (green)	Lights when the unit power of this product is supplied.
(4)	I/O PWR LED (green)	Lights when the I/O power supply is 17VDC or higher. Blinks when it is 10V or more and less than 17V, and turns off when it is less than 10V.
(5)	RUN LED (green)	Lights when the internal IC of CC-Link IE Field/TSN starts up.
(6)	STATUS LED (green)	Displays the communication status of CC-Link IE Field/TSN. Lights when CC-Link IE Field/TSN communication is established. Blinks when the communication fails, and turns off before the communication is established.
(7)	Display	Displays various information.
(8)	[ ↑ ] button	Buttons to operate from the front.
(9)	[ ← ] button	
(10)	[ → ] button	
(11)	[ ↓ ] button	
(12)	[CANCEL] button	
(13)	[ENTER] button	
(14)	Station number setting switch	Set the station number of CC-Link IE Field or CC-Link IE TSN. With the CC-Link IE Field, the station number is the sum of the upper switch multiplied by 10 and the value of the lower switch. With the CC-Link IE TSN, the station number is the sum of the upper switch multiplied by 16 and the value of the lower switch.
(15)	Ethernet connector P1	PORT1 connector (RJ45 connector) for CC-Link IE Field/TSN connection.
(16)	Ethernet connector P2	PORT2 connector (RJ45 connector) for CC-Link IE Field/TSN connection.
(17)	LINK LED (green)	Lights during the link-up of the CC-Link IE Field/TSN communication.
(18)	LINK LED (green)	
(19)	L ER LED (yellow)	Lights when receiving abnormal data of CC-Link IE Field or during loop-back error.
(20)	L ER LED (yellow)	
(21)	0 to F LEDs (orange)	Display the ON/OFF status of inputs or outputs.

No.	Name	Function
(22)	e-CON connector for devices	L+ :Supplies 24 VDC to input/output devices. M :Supplies 0 V to input/output devices. I/O :Supplies signals to input/output devices.
(23)	Power terminal block (0V, +24V)	Supplies unit power (+24V, 0V), FG, and I/O power (L+, M).
(24)	DIN rail mounting hook	The part where the lower hook on the back of this product slides for attaching/removing the product to/from the DIN rail.
(25)	?	Pressing this button will show an error message on the display.

## ■ General Specifications

Item		Specifications
Communication method		CC-Link IE Field or CC-Link IE TSN (switchable in system menu)
Station type		Remote device station
Transfer speed		1 Gbps
Total cable extension		Between Field Network master station and this unit: 100m Between this product (IO-Link Master) and IO-Link devices: 20m
Station number setting		1 to 120 (CC-Link IE Field) 1 to 254 (CC-Link IE TSN)
Maximum number of connected I/O devices		16 Units
Network connection		Field network: RJ45 connector Power supply: Spring clamp terminal block, 5 positions x 2 rows Input/output: 16x 4-pole e-CON connector for devices
Indicators		POWER LED (green), I/O PWR LED(green), RUN LED(green), STATUS LED(green), EVENT LED (yellow), ALARM LED (red) , I/O LED (orange)
Display		OLED (Display language: English, French, German, Italian, Japanese, Korean, Portuguese, Simplified Chinese, Spanish, Traditional Chinese)
Power supply voltage		24 VDC including ripple (p-p) +/-15% (SELV and LIM or Class 2)* 1
Current consumption		220mA
Maximum Inrush Current		There is a current limit (0.5A) by the over-current protection function.
OFF Output leakage current		0.1 mA or less (NPN output only 0.2 mA or less)
Maximum output voltage drop (when ON)		PNP: 1.8 V, NPN: 1.6 V
IO-Link Minimum cycle time		0.3 ms
Surge suppressor		Zener diode
Output response time		0.1 ms or less
Internal response time		0.6 ms or less
Input/output polarity		NPN/PNP switchable per channel
Insulation resistance		5 MΩ or more (between external power supply and unit power supply at 500 VDC)
Input/output common		Sink/source switchable per channel
Environmental resistance	Operating temperature/humidity	0 to +55°C/5 to 95% RH *2 (no freezing or condensation)
	Storage temperature/humidity	-25 to +75°C/5 to 95% RH (no freezing or condensation)
	Vibration resistance	IEC61131-2 compliant
	Shock resistance	IEC61131-2 compliant
	Atmosphere	No corrosive gas
	Operating altitude	0 to 2000 m
	Installation location	In door use
	Degree of protection	IP20 (not UL certified)
Overvoltage category		II or less
Pollution degree		2 or less
Device class		Class I
Applicable regulations	EMC	EMC (2014/30/EU)
	Environment	RoHS directive (2011/65/EU), China RoHS (Regulation 32)
Applicable standard		IEC 61131-2
NRTL certification		UL Listed Programmable Controllers Certified for US and Canada
Company standards		Noise resistance: Feilen Level 3 cleared
Compatible DIN rail		TH35-7.5Fe, TH35-7.5Al
Compatible wire		Power terminal block: AWG 24 to 16 e-CON connector for devices: Depends on e-CON plug specifications
Material		Housing: PC Keys and DIN rail mounting hook: POM Terminal block: PA e-CON connector for devices: LCP
Weight		Approx. 165 g (Including terminal block, when not wired)

Item	Specifications
Included accessories	Instruction manual, Ferrite core Power terminal block, 2x Protective cap for RJ45 connector (attached to the unit)

\*1. Use a Class 2 power supply or a power supply compliant with SELV (Safety Extra-Low Voltage) circuit and LIM (Limited Energy Circuit) circuit standards.

\*2. When used as a UL certified product, the following must be applied.

Total value of I/O output load current: 2.0A/16 points or less, specified ambient temperature: 0 to 55°C

2.5A/16 points or less, specified ambient temperature: 0 to 50°C

### • Specifications of Connected Devices

Item	Specifications
Rated input voltage	24 VDC including ripple (p-p) +/-20% (SELV and LIM or Class 2)*1
Rated input current (typical)	PNP: 5.5 mA, NPN: 5.0 mA
Maximum rated load current	Per point: 0.2 A max. Total of 16 points: 2.5 A or less*2
Insulation method	Transformer, photocoupler insulation
Maximum number of simultaneous input points	100% simultaneous ON
Voltage and current at ON	PNP: 15V DC or higher, 5.5 mA or higher, NPN: 13 VDC or higher, 3.0 mA or higher Note: NPN is the voltage seen from the 24 V side.
Voltage and current at OFF	PNP: 10V DC or less, 2.0 mA or less, NPN: 8V DC or less, 2.0 mA or less Note: NPN is the voltage seen from the 24 V side.
Input resistance	PNP: 5.5 mA with constant current circuit load, NPN: 4.7 kΩ
Input response time	0 ms, 0.1 ms, 1 ms, 5 ms, 10 ms, 20 ms (default: 0 ms)

\*1: Use a class 2 power supply or a power supply that conforms to the SELV (Safety Extra-Low Voltage) and LIM circuit (Limited Energy Circuit)

\*2: When used as a UL certified product, the following must be applied.

Total value of I/O output load current: 2.0A/16 points or less, specified ambient temperature: 0 to 55°C

2.5A/16 points or less, specified ambient temperature: 0 to 50°C


Item		Specifications
Field network		Switchable in System Menu <ul style="list-style-type: none"> <li>• CC-Link IE Field</li> <li>• CC-Link IE TSN (Class B compliance)</li> </ul>
I/O assignment		Switchable in System Menu <ul style="list-style-type: none"> <li>• Disable mode</li> <li>• IO-Link communication mode</li> <li>• SIO(PNP input) mode</li> <li>• SIO(NPN input) mode</li> <li>• SIO(PNP output) mode</li> <li>• SIO(NPN output) mode</li> </ul>
IO-Link communication	IO-Link revision	1.1 and 1.0
	Communication rate	COM1(4800 bps) , COM2(38400 bps), or COM3(230.4kbps)
	Physical layer	IO-Link compliant
	Minimum cycle time	0.3 ms
Functions	Basic IO-Link communication	Cyclic communication, acyclic communication, event communication
	Allocation of process data of IO-Link devices to this product	Process data can be automatically allocated from the actual IO-Link devices or manually set for each channel.
	IO-Link devices verification	For each channel, the type of connected IO-Link device (*1) can be verified with that of the IO-Link device registered in this product. *1: Type ID only , type ID plus serial number, or type ID plus type name can be selected for each channel.
	I/O operation for communication errors	Holding or clearing process data or PNP/NPN output data can be specified when IO-Link communication or CC-Link IE Field/TSN is disconnected.
	IO-Link communication related	<ul style="list-style-type: none"> <li>• Process input condition: IO-Link Ready flag</li> <li>• process data sequence conversion</li> <li>• I/O synchronization operation: Network synchronization, I/O synchronization</li> <li>• Backup/restore of IO-Link device settings (to/from this product): manual backup/restore of settings, or automatic storage (backup/restore) of settings</li> </ul>
	Input related	<ul style="list-style-type: none"> <li>• Input hold time</li> <li>• input filter time</li> </ul>
	Condition monitoring	<ul style="list-style-type: none"> <li>• Number of IO-Link communication errors</li> <li>• I/O power supply flag</li> <li>• I/O Power supply voltage</li> <li>• Output overcurrent flag</li> </ul> <ul style="list-style-type: none"> <li>• Master operating time</li> <li>• Display drive time</li> <li>• Internal temperature</li> </ul>

For details, refer to the following manual.

Manual name	No.
IO-Link Master UR-MS16DT, UR-ME16DT User's Manual	UR-MS_UM-E-xxx-xxx

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

- Support for the China RoHS directive
-  For details on the support for the China RoHS (the Administrative Measure on the Control of Pollution Caused by Electronic Information Products), see the following website:  
[https://www.optex-fa.com/rohs\\_cn/](https://www.optex-fa.com/rohs_cn/)

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<https://www.optex-fa.com>