Operation Guide

UT52A/MDL, UT32A/MDL
Digital Indicating Controller
(DIN Rail Mounting and Wireless Communication Type)
Operation Guide

UTAdvanced

Functional Enhancement

IM 05P01C81-41EN

YOKOGAWA ◆
Yokogawa Electric Corporation

«Standard Code Model»   5th Edition: April 2021

Manuals can be downloaded or viewed at the following URL.

⬇ **http://www.yokogawa.com/ns/ut/im/**

Contents

Introduction

Thank you for purchasing the UT52A/MDL, UT32A/MDL Controller.
The UT52A-00B-11-00/x/MDL and UT32A-00B-11-00/x/MDL controllers can only be used in the US.
The UT32A-00C-11-00/x/MDL controller can only be used in the Republic of Korea.
This operation guide describes the installing, wirings, and setup flow related to the wireless communicaiton function of the UT52A/MDL and UT32A/MDL.
For configuring the 920 MHz wireless communication and descriptions not covered in this manual, see the 920 MHz Wireless Communication User's Manual (IM 04L51B01-41EN), provided as an electronic manual.
The guide should be provided to the end user of this product. Be sure to read this operation guide before using the product in order to ensure correct operation.
Before using the product, refer to the table of Model and Suffix Codes to make sure that the delivered product is consistent with the model and suffix codes you ordered.
Also make sure that the following items are included in the package.

1. Safety Precautions

The following symbol is used on the instrument. It indicates the possibility of damage to the instrument, and signifies that the user must refer to the operation guide or user's manual for special instructions. The same symbol is used in the operation guide and user's manual on pages that the user needs to refer to, together with the term "WARNING" or "CAUTION."

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

⚠ **CAUTION**
Calls attention to actions or conditions that could cause injury to the user or damage to the instrument or property and indicates precautions that should be taken to prevent such occurrences.

■ Notes on 920 MHz Wireless Communication

- 920 MHz wireless communication can be used only in the US or Korea.
- Only US FCC standards and UL standards or Korea KC marking are supported.
- This product has obtained FCC certification or KC marking. As such, the following acts may be punishable by law.
  - Disassembling or altering the product
  - Removing the certification label
  - Using an antenna other than the specified option
- Communication may not be possible in the following locations due to radio signal reflection.
  - Where strong magnetic field, static electricity, or radio interference occurs
  - Rooms with metallic walls (including rooms containing metal reinforcement material), inside cabinets, etc.
- If another wireless device using the same radio frequency band as this product is present in the communication area of this product, data rate degradation or communication errors may occur, preventing normal communication.
- Because this product uses radio signals, bear in mind that communication may be intercepted by third parties.
- Communication errors can occur when wireless communication is temporarily interrupted due to environmental factors such as radio interference.

■ FCC CAUTION

- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.
- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines. This equipment has very low levels of RF energy that is deemed to comply without testing of specific absorption rate(SAR).

Notice

NO RIGHTS OR LICENSES, EXPRESS OR IMPLIED, ARE GRANTED TO USE THIRD-PARTY DEVICES IN COMBINATION WITH THESE PRODUCTS IN A WIRELESS MESH NETWORK, OR TO USE THIRDPARTY SERVICES TO ACCESS, MONITOR OR CONTROL THESE PRODUCTS IN A WIRELESS MESH NEWORK VIA THE INTERNET OR ANOTHER EXTERNAL WIDE AREA NETWORK.

Patent Marking

Covered by one or more claims of patents: http://sipcollc.com/patent-list/ and http://intusiq.com/patent-list/.

⚠ **WARNING**
Using 920 MHz wireless communication
- Do not install or use inside aircrafts or hospitals or in areas where the use of wireless devices is prohibited.
- Do not install or use near automatic doors, fire alarms, and other automatically controlled equipment.
  The radio signals from this product may affect the equipment and may cause a malfunction.
- Do not install or use near cardiac pacemakers or electronic devices that involve highly accurate control or minute signals. Doing so may cause them to malfunction.
- Do not use the product in medical equipment or other applications that require high level of safety or in systems (e.g., trunk line communication equipment, computer systems) that require extremely high reliability.
  Malfunction or failure may cause life-threatening accidents or great social disruption.

⚠ **CAUTION**
This instrument is an EMC class A product. In a domestic environment this product may cause radio interference in which case the user needs to take adequate measures.
이 기기는 업무용 (A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며 , 가정외의 지역에서 사용하는 것을 목적으로 합니다 .

2. Model and Suffix Codes

■ UT52A «Standard Code Model»

Model	Suffix code					Option code	Description
UT52A						/MDL (Required)	Digital Indicating Controller (Power supply: 100-240 V AC) (provided with retransmission output or 15 V DC loop power supply, 3 DIs, and 3 DOs) (*1)
Type 1: Basic control	-0						Standard type
Type 2: Functions		0					None
		B					Wireless communication (with serial gateway function) (*2)
Fixed code			-1				Temperature unit: deg C & deg F
Case color				1			Black (Light charcoal gray)
Fixed code					-00		Always "-00" (for standard code model)
Option codes						/MDL (Required)	Mount on DIN rail (without the display parts and keys) (*3)
						/DC	Power supply 24 V AC/DC
						/CT	Coating (*4)

*1: UT52A has a panel mount type (without option /MDL). Please see the Operation Guide (IM 05P01C31-11EN).
*2: UT52A-00B-11-00/x/MDL can only be used in the US.
When the wireless communication is specified, the UT52A does not conform to the safety standard (CSA) and CE marking (UT52A-00B-11-00/x/MDL is not intended for EEA-market).
*3: When the /MDL option is specified, the model and the suffix codes are as follows: UT52A-00B-11-00/x/MDL
*4: When the /CT option is specified, the UT52A does not conform to the safety standards (UL and CSA) and CE marking (Products with /CT option are not intended for EEA-market).

■ UT32A/MDL «Standard Code Model»

Model	Suffix code					Option code	Description
UT32A						/MDL (Required)	Digital Indicating Controller (Power supply: 100-240 V AC) (provided with retransmission output or 15 V DC loop power supply, 2 DIs, and 3 DOs) (*1)
Type 1: Basic control	-0						Standard type
Type 2: Functions		0					None
Type 3: Open networks		B					Wireless communication (with serial gateway function) (*2) <For the US>
		C					Wireless communication (with serial gateway function) (*3) <For the Republic of Korea>
Fixed code			-1				Temperature unit: deg C & deg F
Case color				1			Black (Light charcoal gray)
Fixed code					-00		Always "-00" (for Standard Code Model)
Option codes						/MDL (Required)	Mount on DIN rail (without the display parts and keys) (*4)
						/DC	Power supply 24 V AC/DC
						/CT	Coating (*5)
						/CV	Terminal cover

Footnotes (right column)

*1: UT32A has a panel mount type (without option /MDL). Please see the Operation Guide (IM 05P01D31-11EN).
*2: UT32A-00B-11-00/x/MDL can only be used in the US.
When the wireless communication is specified, the UT32A does not conform to the safety standards (CSA) and CE marking (UT32A-00B-11-00/x/MDL is not intended for EEA-market).
*3: UT32A-00C-11-00/x/MDL can only be used in Republic of Korea.
When the wireless communication is specified, the UT32A does not conform to the safety standards (UL and CSA) and CE marking.
*4: The /MDL option is specified, the model and suffix codes are follows: UT32A-00B-11-00/x/MDL, UT32A00C-11-00/x/MDL
*5: When the /CT option is specified, the UT32A does not conform to the safety standards (UL and CSA) and CE marking (Products with /CT option are not intended for EEA-market).

■ Accessories (sold separately)

The following is an accessory sold separately.
- Terminal Cover
  For UT52A/MDL and UT32A/MDL (with the wireless communication): Model UTAP004
- Antenna
  Sleeve antenna (indoor use): Part no. A1061ER
  Roof top antenna (indoor and outdoor use, cable length: 2.5 m): Part no. A1062ER
- Wall mount bracket
  For UT52A/MDL and UT32A/MDL: Model UTAP005

3. How to Install
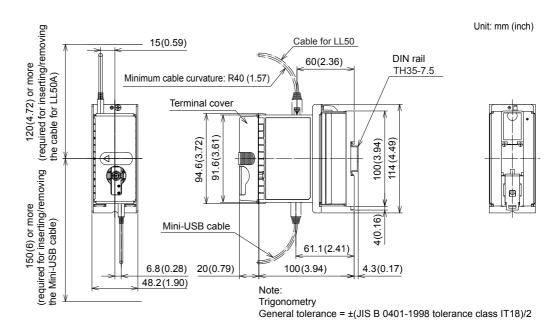
■ External Dimensions

When using the sleeve antenna

Unit: mm (inch)

Note:
Trigonometry
General tolerance = ±(JIS B 0401-1998 tolerance class IT18)/2

When using the roof top antenna

Unit: mm (inch)

Note:
Trigonometry
General tolerance = ±(JIS B 0401-1998 tolerance class IT18)/2

4. Hardware Specifications

■ Safety and EMC Standards
- The UT52A/MDL's 920 MHz wireless communication (with serial gateway function) and UT32A/MDL's 920 MHz wireless communication (with serial gateway function) comply with the US FCC standard and are approved by UL standard.
- The UT32A/MDL's 920 MHz wireless communication (with serial gateway function) comply with the KC mark.
- Wireless communication standard: IEEE 802.15.4g compliant
- FCC Part 15 Subpart C compliant (§15.247)
- KC mark certification: KN301 489-1/-3, KN11, KN61000-6-2
- UL standard: See the Operation Guide for UT35A/UT32A (IM 05P01D81-11EN) or UT55A/UT52A (IM 05P01C81-11EN).

■ Construction
- External dimensions (mm):
  UT52A/MDL (with the wireless communication) and UT32A/MDL (with the wireless communication): 48.2 (width) x 114 (height) x 104 (depth)

■ Isolation
- Isolation specifications

PV (universal) input terminals / maintenance port USB port for 920 MHz wireless communication configuration		
Control, retransmission (analog) output terminals (not isolated between the analog output terminals)		
Control relay (contact point c) output terminals	Internal circuits	Power supply
Alarm-1 relay (contact point a) output terminals		
Alarm-2 relay (contact point a) output terminals		
Alarm-3 relay (contact point a) output terminals		
Contact input terminals (all) RS-485 communication terminals		

The circuits divided by lines are insulated mutually.
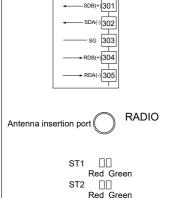
5. Terminal Wiring Diagrams

⚠ **CAUTION**
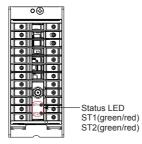Do not use an unassigned terminal as the relay terminal.

301-312 **E1-Terminal Area**

(Suffix code: Type 3=B or C)

920 MHz wireless communication (with gateway function)

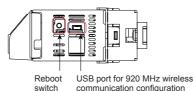| RS-485	RS485
←SDB(+)	301
←SDA(-)	302
SG	303
→RDB(+)	304
→RDA(-)	305

Antenna insertion port ○ **RADIO**

ST1 ☐☐
Red Green
ST2 ☐☐
Red Green

6. 920MHz Wireless Communication

Component Names of UT52A/MDL, UT32A/MDL (with 920 MHz wireless communication)

Status LED
ST1(green/red)
ST2(green/red)

Device front side

Reboot switch

USB port for 920 MHz wireless communication configuration

Device bottom side

Preparation, Configuration, and Operation Check

To configure (Modbus settings, wireless communication settings) of the UT52A/MDL or UT32A/MDL and check the operation of the UT, follow the procedure below.

⚠ **CAUTION**
Do not write parameters through wireless communication while running. Use only during maintenance.

1 Modbus communication (serial communication) configuration
Configure Modbus communication settings by referring to this manual, UT55A/UT52A User's Manual or UT35A/UT32A User's Manual, and 920 MHz Wireless Communication User's Manual (IM 04L51B01-41EN).
The UT52A/MDL and UT32A/MDL communication parameter settings are shown below. Do not change them from their default values. If you change them, communication will fail to work properly.
　　　Protocol: Modbus (RTU)
　　　Baud rate: 9600 bps
　　　Parity: None
　　　Stop bits: 1 bit
　　　Data length: 8 bits

2 Maintenance console preparation
Download the maintenance console from the following URL, and install it.
http://www.smartdacplus.com/software/smart920/en/
* The maintenance console is an application made by Oki Electric Industry Co., Ltd.

3 Configuration file preparation
Using the maintenance console, create a configuration file consisting of basic settings, protocols, communication settings, and other wireless network settings according to your wireless network configuration.
Do not change the wireless serial settings from their default values. If you change them, communication will fail to work properly.
　　　Bit rate: 115200 bps
　　　Bit length: 8 bits
　　　Stop bits: 1 bit
　　　Parity: None
You can also use the maintenance console to configure the UT52A/MDL or UT32A/MDL directly without creating a configuration file.
For details on the wireless communication settings, see the 920 MHz Wireless Communication User's Manual (IM 04L51B01-41EN).

4 Wireless communication configuration (network configuration)
Connect the UT52A/MDL or UT32A/MDL wireless communication configuration (network configuration) maintenance PC to the UT52A/MDL's or UT32A/MDL's wireless communication configuration port with a mini USB cable. Then, write the configuration file into the wireless module. After writing, press the reboot switch on the UT52A/MDL or UT32A/MDL or remove the mini USB cable to restart the system and apply the settings. (Hold down the reboot switch for several seconds until the status LED turns off.)

5 Network join confirmation
When the UT52A/MDL or UT32A/MDL joins a network,* the green status ST1 LED blinks slowly, and the green ST2 turns on.
* Turn the routers (UT52A/MDLs or UT32A/MDLs) on after starting the coordinator (GM10/CM2, GX20/CM2, GM10/CM3, GX20/CM3,or the like). This will make network connection authentication quicker.

Connection to the USB Port for 920 MHz Wireless Communication Configuration

A USB2.0 port (mini B type) is available.
It is for configuring the 920 MHz wireless communication.

Status LED Indication (*1)

ST1 ☐☐
Red Green
ST2 ☐☐
Red Green

Name	LED display		Status	Notes
	Green	Red		
ST1	Blinking in sync at 1 second intervals		Updating firmware	Transferring files
	On	On	Opening files	
	Blinking at 0.2 second intervals	Off	Normal	Not joined the network
	Blinking at 1 second intervals	Off	Normal	After IP is established upon joining network
	Off	Blinking at 1 second intervals	Failure	
	Alternate blinking of green and simultaneous green and red at 1 second intervals		Radio transmission time exceeded	
ST2	On	Off	Network join authentication success/normal	
	Off	Off	Network join authentication failure*2	
	Blinking in sync at 1 second intervals		No detour route*2	
	Alternate blinking at 1 second intervals		Wireless stopped	
	Blinking	Off	Transmitting/receiving serial communication	
	Off	Off	Not joined the network or disconnected from network	

*1 The above table does not apply when determining the radio condition using the maintenance console software.

*2 System error status. Using the maintenance console, correct the installation environment (such as the antenna direction) to an appropriate condition.

Connecting an Antenna to the UT52A/MDL or UT32A/MDL

Sleeve antenna

Sleeve antennas (not waterproof) are used indoors or inside a case. Sleeve antennas do not have directivity. They can also be bent and rotated to change the antenna direction. As such, they can be used anywhere indoors.
While turning the antenna to the right, attach the antenna to the antenna connection port.

Antenna connection port

Sleeve antenna

Roof top antenna

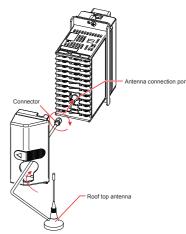Roof top antennas (waterproof) are used when you want to install only the antenna in a remote location.
There is a magnet on the bottom side, so they can be attached to metal boxes and the like.

⚠ **CAUTION**
- To bring out the full performance of the roof top antenna, install it on top of a metal rectangle board that is at least 10 × 20 cm long.
- Install antennas as far as possible from metal objects and other obstacles. The communication quality may deteriorate if they are close.
- When installing the antenna, make sure no foreign matter gets caught between the bottom side of the antenna and the installation plane.
- Do not bend the antenna cable more than the allowable bend radius of 3 cm.
- When installing the antenna in an area subject to lightning, be sure to install the antenna at a position safe from lightning and at a position lower than the height of other cases.

While turning the antenna connector to the right, attach the antenna to the antenna connection port.
* Use a torque wrench (wrench width 5/16 inches, tightening torque 0.56 to 0.90 N•m).

Connector

Antenna connection port

Roof top antenna

- Printed Manuals

Model	Description
UT52A/MDL, UT32A/MDL Digital Indicating Controller (DIN Rail Mounting and Wireless Communication Type)	IM 05P01C81-41EN
UTAP005 Wall Moount Bracket User's Manual	IM 05P06A31-02Z1

- Electronic Manuals

You can download the latest manuals from the following website:
URL: http://www.yokogawa.com/ns/ut/im/

Model	Description
UT52A/MDL, UT32A/MDL Digital Indicating Controller (DIN Rail Mounting and Wireless Communication Type)	IM 05P01C81-41EN
UTAP005 Wall Moount Bracket User's Manual	IM 05P06A31-02Z1
920MHz Wireless Communication User's Manual	IM 04L51B01-41EN

- General Specification

Model	Description
UT52A/MDL, UT32A/MDL Digital Indicating Controller (DIN Rail Mounting and Wireless Communication Type)	GS 05P01C81-41EN
UT32A/MDL Digital Indicating Controller (DIN Rail Mounting and Wireless Communication Type)	GS 05P01D81-43EN

* The last two characters of the manual number and general specification number indicate the language in which the manual is written.

■ QR Code
The product has a QR Code pasted for efficient plant maintenance work and asset information management. It enables confirming the specifications of purchased products and user's manuals.
For more details, please refer to the following URL.
https://www.yokogawa.com/qr-code
QR Code is a registered trademark of DENSO WAVE INCORPORATED.