

FCC ID: RXEWT30

OMRON

Model WT30

FA Wireless SS Terminals

ENG Instruction Sheet

Thank you for purchasing this OMRON product. Read this instruction sheet and thoroughly familiarize yourself with the functions and characteristics of the product before using it. This product is designed for use by qualified personnel with knowledge of electrical systems. Keep this instruction sheet for future reference.

OMRON Corporation

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1617569-7A

For detailed application procedures, refer to the *WT30 Operation Manual* (Cat. No. N138).

Safety Precautions

Definition of Precautionary Information

WARNING

Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

English	Hereby, Omron Corporation, declares that this WT30 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Finnish	Omron Corporation vakuuttaa täten että WT30 tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Dutch	Bij deze verklaart Omron Corporation dat deze WT30 voldoet aan de essentie'le eisen en aan de overige relevante bepalingen van Richtlijn 1999/5/EC.
French	Par la présente Omron Corporation déclare que l'appareil WT30 est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE. Par la présente, Omron Corporation déclare que ce WT30 est conforme aux exigences essentielles et aux autres dispositions de la directive 1999/5/CE qui lui sont applicables.
Swedish	Härmed intygar Omron Corporation att denna WT30 står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
Danish	Härmed intygar Omron Corporation att denna WT30 står i överensstämmelse med de væsentlige egenskapskrav og övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
German	Hiermit erklärt Omron Corporation, dass sich dieser/diese/dieses WT30 in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie 1999/5/EG befindet*. (BMWV) Hiermit erklärt Omron Corporation die Übereinstimmung des Gerätes WT30 mit den grundlegenden Anforderungen und den anderen relevanten Festlegungen der Richtlinie 1999/5/EG. (Wien)
Greek	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ ΟΜΡΟΝ Corporation ΔΗΛΩΝΕΙ ΟΤΙ WD30-ME/-SE ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ WT30 Σ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ
Italian	Con la presente Omron Corporation dichiara che questo WT30 è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Spanish	Por medio de la presente Omron Corporation declara que el WT30 cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Portugues	Omron Corporation declara que este WT30 está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Norwegian	Omron Corporation erklærer herved, at følgende utstyr WT30 overholder de vesentlige krav og øvrige relevante bestemmelser i direktiv 1999/5/EF.
Hungarian	Alulírott, Omron Corporation nyilatkozom, hogy a WT30 megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.
Czech	Omron Corporation tímto prohlašuje, e tento WT30 je ve shodě se základními po adavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
Polish	Niniejszym Omron Corporation deklaruje, że dane urządzenie WT30 spełnia wymagania zasadnicze i inne stosowne postanowienia Dyrektywy 1999/5/EC.

Wireless standards have been met for the following countries. The product cannot be used in any other countries.

Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, UK, USA

FCC Notice

This device complies with part 15 of the FCC Rules. 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.

Caution

To ensure that the WLAN transmitter complies with current FCC regulations limiting both maximum RF output power and human exposure to radio frequency radiation, a separation distance of at least 20 cm must be maintained between the unit's antenna and the body of the user and any nearby persons at all times and in all applications and uses.

Note: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Suitability for Use

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of the products in the customer's application or use of the product. Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.

Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

See also Product catalog for Warranty and Limitation of Liability.

Precautionary Information

WARNING

Always provide protective circuits in the network. Without protective circuits, malfunctions may possibly result in accidents that cause serious injury or significant property damage. Provide double or triple safety measures in external control circuits, such as emergency stop circuits, interlock circuits, or limit circuits, to ensure safety in the system if an abnormality occurs due to malfunction of the product or another external factor affecting the product's operation.

Design the system to ensure safety in the event of temporary interruptions in communications due to interference with the electromagnetic waves used for communications caused by the ambient environment and application methods.

Do not use this product for real-time control.

Using the FA Wireless SS Terminal near a pacemaker or other medical device may affect the operation of the medical device, possibly resulting in serious injury. Never use the FA Wireless SS Terminal near pacemakers or other medical devices.

CAUTION

Make sure that the direction and polarity (+/-) are correct when connecting terminal blocks and connectors. Turning ON the power to I/O circuits with the I/O cables connected in reverse, may result in a blown output fuse.

Do not apply a voltage or connect a load to the outputs that exceeds the maximum switching capacity. Leave the protective label in place when wiring the product. After completing wiring, always remove the protective label to enable proper heat dissipation. Fire may occasionally result if this precaution is not observed.

Do not allow pieces of metal, wire clippings, or fine metallic shavings or filings from installation to enter the product. Doing so may occasionally result in minor electric shock, fire, or malfunctions.

Do not attempt to disassemble, repair, or modify the product, or touch the internal parts of the product. Doing so may occasionally result in minor electric shock, fire, or malfunctions. In Japan, disassembly and modification is also prohibited under Japan's Radio Law and may be punishable by law.

Precautions for Safe Use

Be sure to observe the following precautions to ensure safe use of the product.

- Transport the product in the box in which the product was packaged, making sure the product is not subjected to excessive vibrations or shock, or dropped.
- Store the product within the specified environment. Allow the product to warm up to room temperature for at least 3 hours after it has been stored at -10 °C or lower.
- Use the product within the specified temperature and humidity ranges.
- Do not use the product in the following locations.
 - Locations subject to extreme temperature changes resulting in condensation
 - Locations subject to static electricity, excessive noise, or electric fields
 - Locations where the product may come into contact with water, oil, or chemicals
 - Locations where corrosive gases or flammable gases are present
 - Locations where large amounts of dust or dirt are present
 - Locations subject to spatters, iron chips, or filings
- Do not install the product outdoors (outside a control panel).
- Use tape, cord, or other means to hold the product while adjusting the installation position to prevent the product from damage due to falling.
- Do not install the product in areas where it will be subject to excessive external force, or in walkways.
- Tighten the mounting screws to the specified torque of 0.5 to 0.6 N·m.
- Provide sufficient space around the product for heat dissipation.
- Do not install the product in walkways or locations subject to traffic when installing the product outside a control panel.
- Do not reverse the power supply connection or connect the product to an AC power supply.
- Use the correct power supply voltage.
- Use AWG22 to AWG16 to connect wires for post terminals. For solid or standard wires, however, use AWG20 to AWG16 (0.52 to 1.5 mm²). The length of exposed wire is 10 mm.
- Do not apply voltage to the inputs exceeding the rated voltage range.
- Use communications cables (RS-232C cables) with a length of 15 m maximum and a load of 2,500 pF maximum.
- Do not lay communications cables (RS-232C cables) and antenna cables near other high-voltage cables or power lines.
- Use the specified cables for communications cables (RS-232C cables).
- Be sure to perform communications tests to confirm operation after wiring before using the product.
- Always set the product after it is installed or replaced. Set the product correctly according to the manual, and be sure to perform the tests provided with the product (e.g., communications tests) before operating it.
- When operating the product without checking serial numbers, check whether an existing system is present, and design the system carefully to prevent radio interference.
- Do not apply excess vibrations or shock to this product. Do not drop this product.
- Make sure that wiring and switch settings are correct before starting operations.
- Other wireless devices operating within the same frequency band may interfere with this product or be adversely affected by this product. Therefore, be sure to perform the tests provided with the product (e.g., installation tests) before operating it.
- Make sure that the antenna is not disconnected during operation.
- Do not use this product near other devices that may malfunction due to the electromagnetic waves emitted by this product.
- Turn OFF the power supply before performing any wiring or replacing devices.
- Do not touch the product with wet hands.
- Dispose of the product as industrial waste.

Precautions for Correct Use

Always heed these precautions to prevent faulty operation, malfunction, or adverse affect on the product's performance and functionality.

- Communications performance will vary according to the operating environment. Always check operations before using the product.
- Do not install the antenna in a location surrounded by metal, such as in a control panel.
- Install the antenna so that it is as far away as possible from and not parallel to electric wires or metal plates.
- Do not use this product in areas exposed to extremely high humidity, near televisions or radios, near motors or drills that emit sparks, near strong magnets, or near fluorescent lights.
- Make sure that the terminal blocks, communications cables (RS-232C cables), and other items with locking devices are properly locked into place.
- Do not pull or bend cables with force.
- Do not change the mode selection switch during operation.

Conformity to Safety Standards

Always use a Class 2 power supply to conform to UL standards.

Use a DC power line less than 3 m to conform to EN standards. If a power line of 3 m or longer is required, extend the length at the Switching Power Supply's primary side (i.e., the AC power line).

Available Models

WT30 Terminal model	Type	Specifications (No. of I/O points)
WT30-M01-FLK	Serial Master	RS-232C
WT30-SID16	I/O Slaves	16 DC inputs (NPN/PNP)
WT30-SMD16		8 DC inputs (NPN/PNP) + 8 transistor outputs (NPN)
WT30-SMD16-1		8 DC inputs (NPN/PNP) + 8 transistor outputs (PNP)

Note: An Antenna is not included with the FA Wireless SS Terminals.

Accessories

Antennas

Model	Type
WT30-AT001	Magnet-base Antenna (2 antennas per set)
WT30-AT002	Flat Diversity Antenna (1 antenna)
WT30-AT003	Pencil Antenna (2 antennas per set)

Communications Cables

Model	Length	Application
XW2Z-0100U-3	1 m	For personal computer
XW2Z-0200U-3	2 m	
XW2Z-0500U-3	5 m	For PLC
XW2Z-0200U-5	2 m	
XW2Z-0500U-5	5 m	

Other

Model	Type
WT30-FT001	DIN Rail Mounting Bracket (for TH35-7.5)
WT30-FT002	DIN Rail Mounting Bracket (for TH35-15)
WT30-FT003	Surface Mounting Bracket (screw-mounting) (2 brackets per set)
WT30-FT011	Flat Diversity Antenna Mounting Brackets (with magnets)
WT30-CA2M	Antenna Extension Cable (1 cable, 2 m)

Specifications

Ratings

Item	WT30-M01-FLK Serial Master	WT30-SID16/SMD16/SMD16-1 I/O Slaves
Power supply (wireless communications power supply)	Rated voltage	24 VDC
	Allowable voltage range	20.4 to 26.4 VDC
	Power consumption	3 W max.
Error output/output power supply (for output circuits)	Rated voltage	24 VDC
	Allowable voltage range	20.4 to 26.4 VDC
Insulation resistance	20 MΩ min. (at 100 VDC) between the power supply and chassis	20 MΩ min. (at 100 VDC) between the power supply and all I/O power supply and between the power supply and chassis
Dielectric strength	1,500 VAC for 1 min between power supply and chassis	1,500 VAC for 1 min between the powersupply and all I/O and I/O power supply and between the power supply and chassis
Noise immunity	IEC61000-4-4. 1 kV (power supply line)	
Vibration resistance	JIS C0040 Frequency: 10 to 55 Hz; Amplitude of 0.35 mm or acceleration of 50 m/s ² , whichever is smaller (DIN Rail mounting: single-amplitude of 0.1 mm or acceleration of 15 m/s ²) 10 sweeps of 8 min each (i.e., 80 min in total) in X, Y, Z directions	
Shock resistance	Conforms to JIS C0041: 300 m/s ² 3 times each in X, Y, and Z	
Ambient operating temperature	-10 to 55°C (with the Terminal mounted with the dust-proof label facing up)	Number of simultaneously ON I/O points 10 max.: -10 to 55 °C 16 max.: -10 to 50 °C (with the Terminal mounted with the dust-proof label facing up)
Ambient operating humidity	25% to 85% (with no condensation or icing)	
Ambient environment	No corrosive gases	
Storage temperature	-25 to 65 °C (with no condensation or icing)	
Degree of protection	IP20	
Terminal construction	Power supply	Screwless terminal block (Phoenix Contact FFKDS/V1-5.08 or equivalent)
	Serial	D-sub, 9-pin (female) Inch screws (OMRON XM2F-0910-132 or equivalent)
Weight	330 g max.	
EEPROM write life	Approx. 1 million writes	

Note: Use the WT30-FT003 Surface Mounting Bracket when installing the WT30 in environments subject to vibration.

Wireless Interface Specifications

Item	Specifications
Wave type	Spread Spectrum (direct sequence; SS-DS)
Communication method	Simplex
Frequency band	2,401 to 2,480.2 MHz
Number of channels	67 channels (based on switching)
Transmitter output power	10 mW/MHz
Baud rate between wireless stations	100 kbps
Relay functions	One stage using I/O slave for the serial master configuration.
Number of stations per area	10 sets max. (recommended)
Number of I/O Slaves connected	64 max.
Error detection method	CRC-CCITT (16 bits)

Package Contents

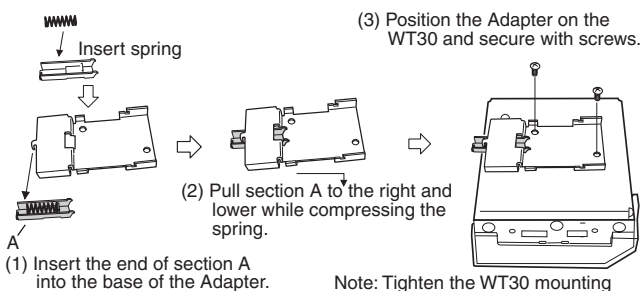
WT30 FA Wireless SS Terminal Instruction Sheet
Terminal labels (slaves only)
Adhesive non-slip feet (master only)

Installation

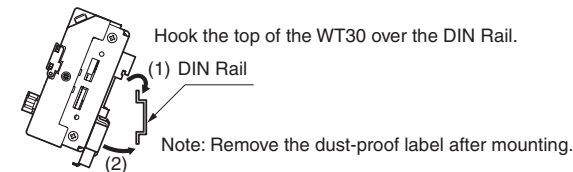
Using a DIN Rail

Note: Do not install the product in a metal panel. Doing so will decrease the wireless performance. To install the product in a panel, use either a Magnet-base Antenna or Flat Antenna and install the Antenna on the outside of the panel.

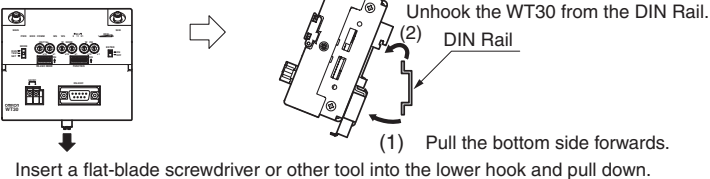
Using a DIN Rail Adapter (Installation Tool: WT30-FT001 or WT30-FT002)



Mounting Method



Removal Method



Using a Surface Mounting Bracket

Mounting hole dimensions (Unit: mm)

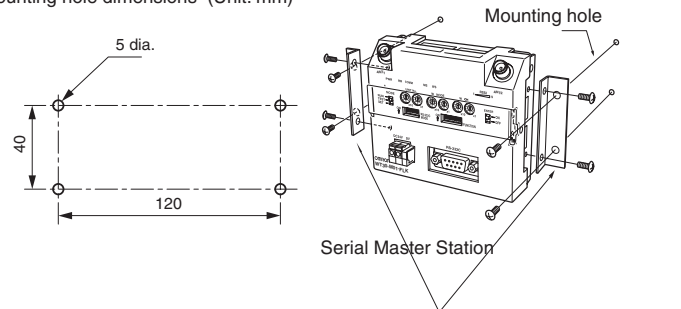
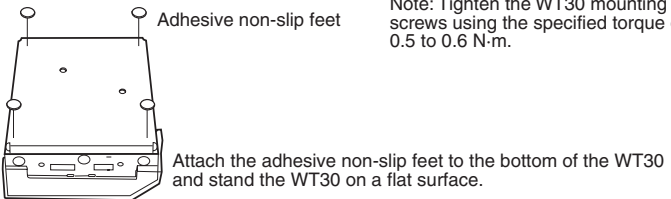
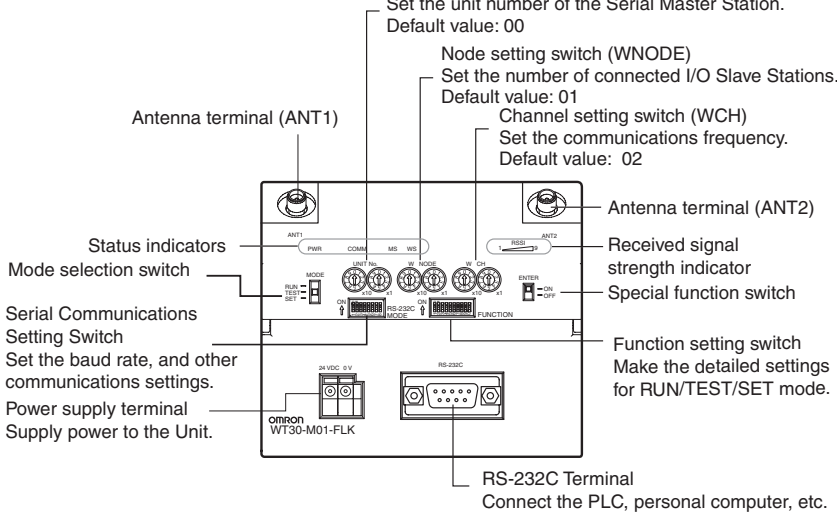


Table-top Mounting

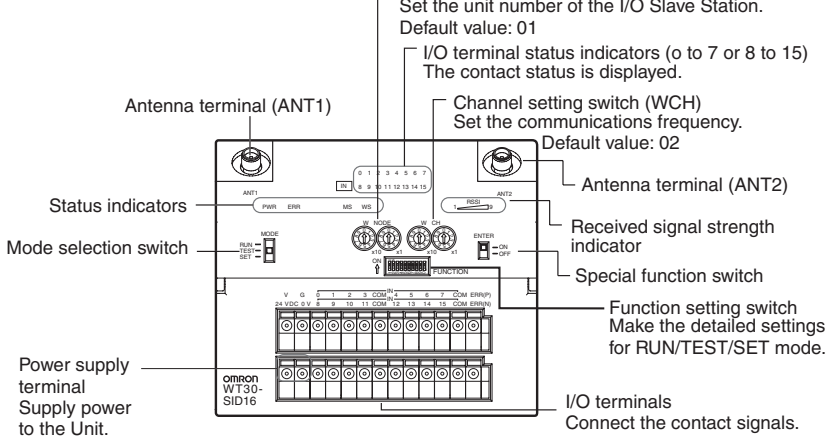


Names of Parts

Serial Master Station

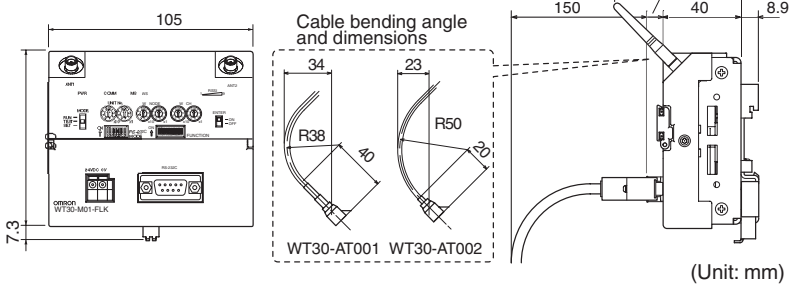


I/O Slave Station



Dimensions

Common Dimensions for Serial Master and I/O Slave Stations



Display

Indicator	Color	Status	Meaning (primary error)
PWR	Green	Lit	Power is being supplied.
		Not lit	Power is not being supplied.
ERR (I/O Slave Station)	Red	Lit	Error output ON: Wireless device error or wireless communications error.
		Not lit	Error output OFF
COMM (Master Station)	Yellow	Lit	Serial communications in progress.
		Not lit	No serial communications.
0 to 15 (I/O Slave Station)	Yellow	Lit/Not lit	ON/OFF status for input or output signals
RSSI	Red/Yellow/Green	Lit/All not lit	Received Signal Strength Indicator monitor: Number of indicators lit (received signal strength 1 to 9) Received signal strength less than 0 to 1.
		Green	Communications are normal.
		Flashing	TEST mode or SET mode has been activated.
		Red	Lit: A fatal error has occurred that cannot be recovered from. Replace the WT30 Terminal. Flashing: A non-fatal error has occurred that can be recovered from by resetting the system.
MS (Module Status)	---	Not lit	Power is not being supplied or the system is resetting.
		Lit	The station has joined the wireless network.
		Flashing	Permission to join wireless network received from Serial Master Station (Slave Stations)
WS (Wireless Status)	Red	Lit	A fatal error has occurred that cannot be recovered from.
		Flashing	Error from which recovery is possible
		Not lit	Wireless communications are not in progress.

Function Setting Switch

Serial Master Station

Applicable mode	ON functions	OFF functions
1 RUN mode	Holds I/O status data when a communications error occurs. Enables scan list	Clears I/O status data when a communications error occurs. Disables scan list
2	Relays used	Relays not used
3	Signal strength monitor disabled	Signal strength monitor enabled
4 TEST mode	All channels automatically selected	Specified channel selected
5	---	---
6	---	---
7 SET mode	Scan list recognition	Nothing done
8	Registers specified I/O Slave	Registers all I/O Slaves automatically
9	Recognizes serial numbers (See note.)	Ignores serial numbers
10 Not used	---	---

Note: The serial number refers to the product's unique number.

I/O Slave Station

No.	Applicable mode	ON functions	OFF functions
1	RUN mode	Holds I/O status data when a communications error occurs.	Clears I/O status data when a communications error occurs.
2		Input hold	Normal mode
3		Input filter: 100 ms	Input filter: 10 ms
4	TEST mode	Signal strength monitor disabled	Signal strength monitor enabled
5		All channels automatically selected	Specified channel selected
6		Installation test function	Nothing done
7 to 10	Not used	---	---

Serial Communications Setting Switch

No.	Function	ON	OFF
1	Communications setting selection	Detailed settings (settings for No. 2 to 8 used)	Default settings (baud rate: 9,600 bps; data length: 7 bits; parity: even; stop bits: 2) Settings for No. 2 to 8 are ignored.
2	Baud rate (bps) (See note.) Total value = 0: 1,200 = 1: 2,400 = 2: 4,800 = 3: 9,600 = 4: 19,200 = 5: 38,400 = 6: 57,600 = 7: 115,200	1	0
3		2	0
4		4	0
5		8 bits	7 bits
6	Parity	None	Yes
7		Odd	Even
8	Stop bits	1 bit	2 bits

Note: For example, if pins number 2, 3, and 4 are all ON, the total is 7, which corresponds to a baud rate of 115,200 bps.

Received Signal Strength Indicator

Field strength	Weak	Medium	Strong
Number of levels	0	1 2 3 4 5 6 7 8 9	
RUN mode	Unstable communications range		Stable communications range
TEST mode	Range in which specified channel can be used.		Range in which specified channel cannot be used.
Field strength monitor	Unstable communications range		Stable communications range
Installation/confirmation test	Unstable communications range		Stable communications range

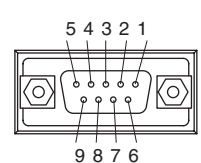
The received signal strength is indicated using 10 levels. Check the communications status, referring to the field strength level.

Frequency Table

CH	WCH setting		Center frequency (MHz)	CH	WCH setting		Center frequency (MHz)
	x 10	x 1			x 10	x 1	
1	0	1	2401.0	51	5	1	2402.2
2	0	2	2403.4	52	5	2	2404.6
3	0	3	2405.8	53	5	3	2407.0
4	0	4	2408.2	54	5	4	2409.4
5	0	5	2410.6	55	5	5	2411.8
6	0	6	2413.0	56	5	6	2414.2
...
32	3	2	2475.4	82	8	2	2476.6
33	3	3	2477.8	83	8	3	2479.0
34	3	4	2480.2				

Channels 35 to 50 cannot be set.
: The shaded channels cannot be used in China.

RS-232C Connector

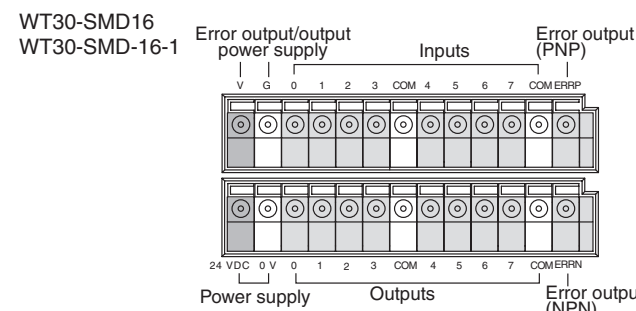
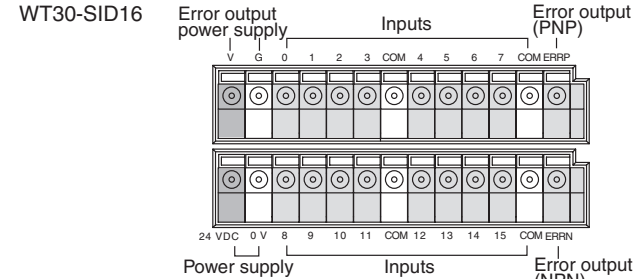


D-sub, 9-pin, Female End at WT30

Pin No.	Signal	I/O direction
1	---	---
2	RD	Output
3	SD	Input
4	---	---
5	SG	---
6	---	---
7	---	---
8	---	---
9	---	---

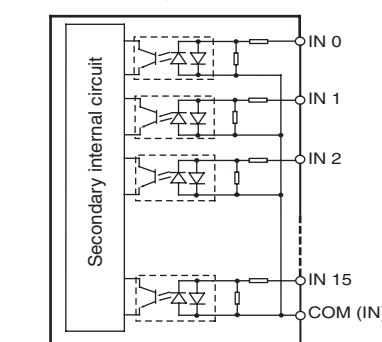
I/O Characteristics

I/O Slave Station

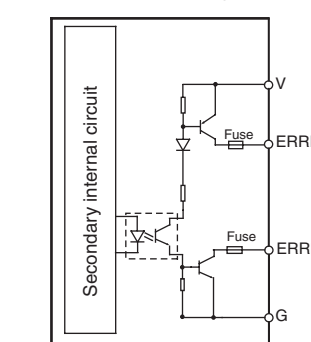


Item	Specifications
Input Characteristics	
Input voltage	24 VDC
Allowable voltage range	20.4 to 26.4 VDC
Input impedance	4.7 kΩ (typical)
Input current	5 mA (typical)
ON voltage/current characteristics	17.4 VDC, 3.0 mA min.
OFF voltage/current characteristics	5.0 VDC, 1.0 mA max.
Input filter	10 ms/100 ms (Depends on the software used. Selected using switch.)
Output/Error Output Characteristics	
Input voltage	24 VDC
Allowable voltage range	20.4 to 26.4 VDC
Max. switching current	100 mA max. per output (at 20.4 to 26.4 VDC) Simultaneous usage of error output NPN/PNP is not possible.
Leakage current	0.1 mA max.
Residual voltage	1.0 V max.
Fuse	One for every two outputs except for error output circuits, which have one for every NPN/PNP output. (No fuses can be replaced by the user.)

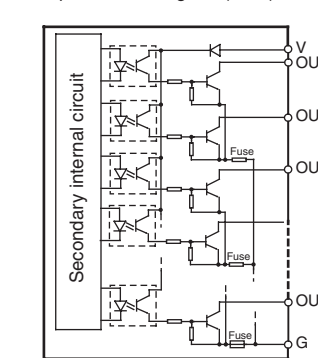
Input Circuit Diagram



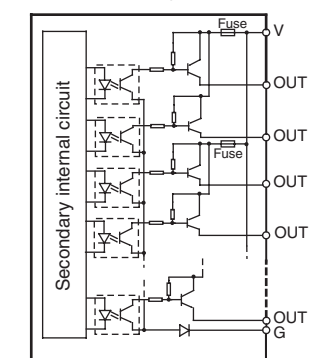
Error Output Circuit Diagram



Output Circuit Diagram (NPN)

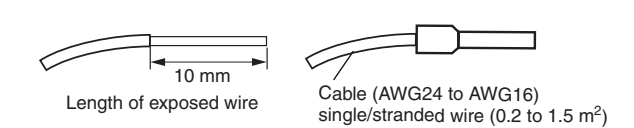


Output Circuit Diagram (PNP)



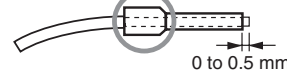
Wiring Precautions

- Wire the signal lines separately from power lines to prevent noise interference.
- Do not lay wiring close to the antenna.
- Turn OFF the power before performing any wiring.
- Wire the terminals using the following post terminals and cables.

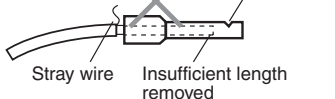


- Use a tool of the appropriate size to crimp the post terminal. Make an incision in the cable and remove the covering so that the cable is either the same length as or approximately 0.5 mm longer than the post terminal, as shown in the following diagram. Make sure that no stray wires are protruding and the post terminal is not damaged.

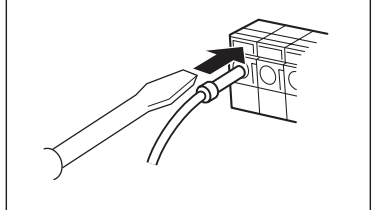
Correct Example



Incorrect Example

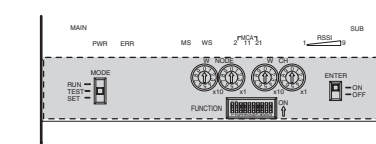


Insert a screwdriver into the screwless terminal block as shown below, and keeping the screwdriver inserted, pull out the post terminal.



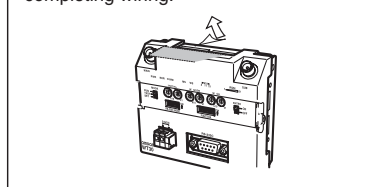
Attaching Terminal Labels (I/O Slaves Only)

Attach terminal labels to the positions shown in the following diagram.



Dust-proof Label

Remove the dust-proof label after completing wiring.



EC DECLARATION OF CONFORMITY

We hereby declare that the following product is in conformity with the requirements of the following ED Directive:

Product: Wireless SS Terminals
Type: WT30 series with/without ANTENNA AT-001, AT002 or AT003, Antenna Extension Cable WT30-CA2M in connection with the Wireless Terminals
No. of Directive: 99 / 5 / EC
Title of Directive: Radio and Telecommunications Terminal Equipment
No. of Directive: 89 / 336 / EEC
Title of Directive: Electromagnetic Compatibility
No. of Directive: 73 / 23 / EEC
Title of Directive: Low Voltage Equipment

This product is designed and manufactured in accordance with the following standards.

R&TTE: EN 300 440-2 V1.1.1
EN 50371: 2002
EMC: EN 301 489-3 V1.4.1
EN 301 489-17 V1.2.1
Safety: EN 60950-1: 2001

Year which the CE marking is affixed: 2005

Manufacturer: Omron Corporation, Wireless Components Department
Address: Shiokoji Horikawa, Shimokyo-ku, Kyoto, 600-8530 Japan
Date: 22. Dec. 2004

Signed: *T. Goto*
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