

# TW-800R-EXS

Manual V1.10

Please use this operation manual correctly on reading well. Please keep it carefully to be able to read immediately, when required.

## Contents

■General outline .....	1
■Main part and accessories .....	2
■Safety concerns .....	4
■Specification .....	5
■Communication .....	6
■Name and function of each part .....	8
■Setting .....	9
■How to use .....	12
■Note on use .....	14
■Dimensional drawing .....	15
■After service and Warranty .....	16



## ■ General outline

[TW-800R-EXS] is a product to be fixed expansion unit of RS232C output to [TW-800R].

This manual is described about only a function of expansion unit. Please read [TW-800 manual] about transmitter [TW-800T] and receiver [TW-800R] and wireless specification.

We don't make a sale only expansion unit. If you want to add an expansion unit with TW-800R, please inform our sales department.

### <Feature>

◆TW-800R-EXS can communicate a number of transmitters by doing "Pairing".

The number of transmitters which can register pairing to one set of a receiver does not have restriction.

Receiver doesn't remember ID number of transmitter. (It cannot read from a receiver ID of the transmitter which is registered pairing, and how many set pairing is registered.)

◆Receiver outputs the RS-232C data receiving from transmitter for special protocol.

Receiver sounds a buzzer simultaneously, when doing RS-232C output and it turns on a relay output.

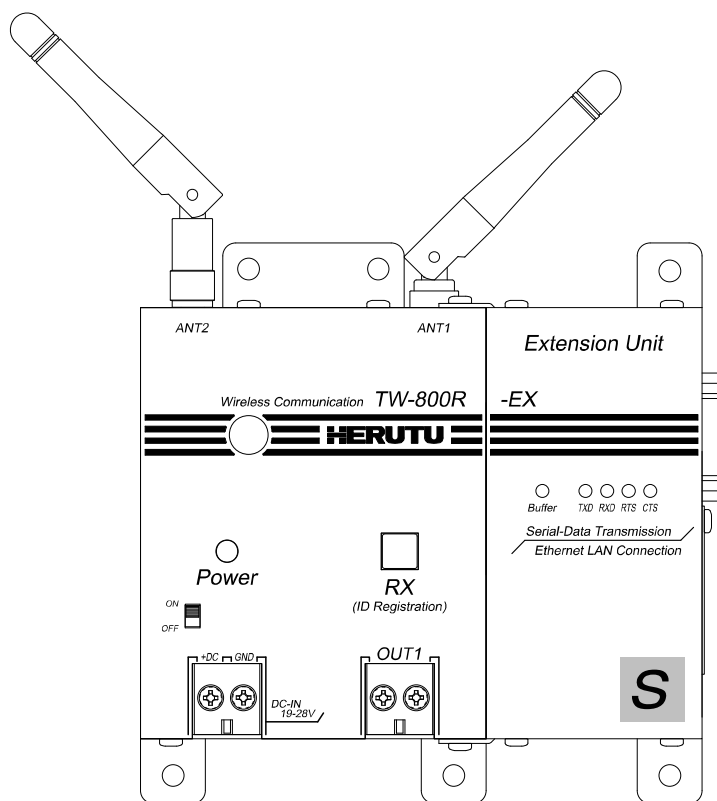
(Buzzer sounds or not and relay out time is set by dip switch)

◆The RS-232C output from a receiver is performed by effluence. A flow control (RTS/CTS) is performed with connection apparatus.

\* "Pairing" used within this operation manual means the work which registers a transmitter and a receiver.

# ■Main part and accessories

## Receiver TW-800R-EXS



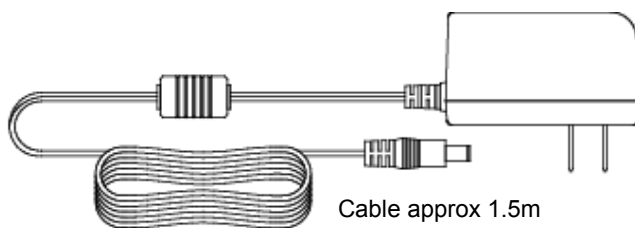
TW-800R-EXS ×1

(Dipole antenna for ANT2 is set at shipment)

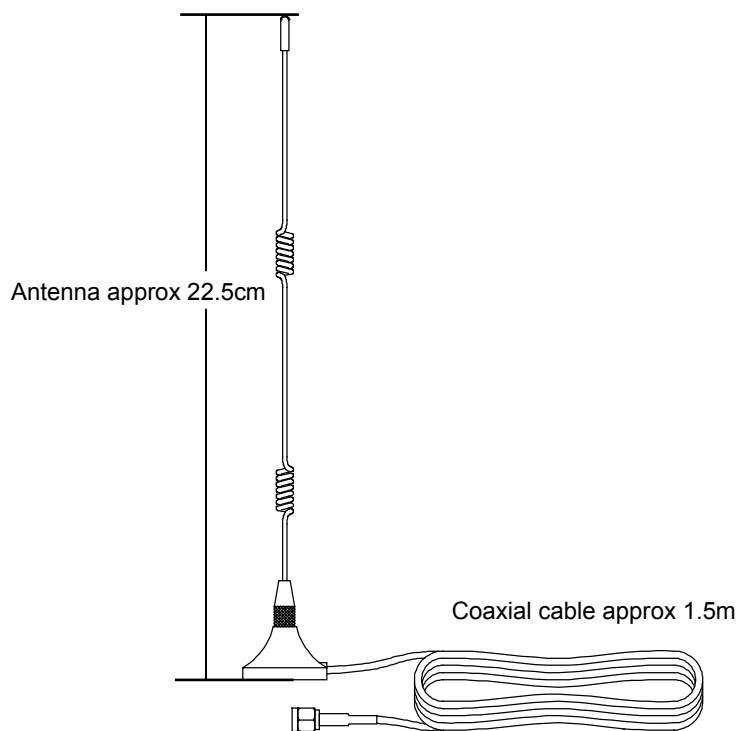
※ANT2 is fixed by resin before shipment by regulation of FCC/IC in an applicable country.

## Onerous option

•AC Adapter ADB24050-C(With connecting cable 1.8m)

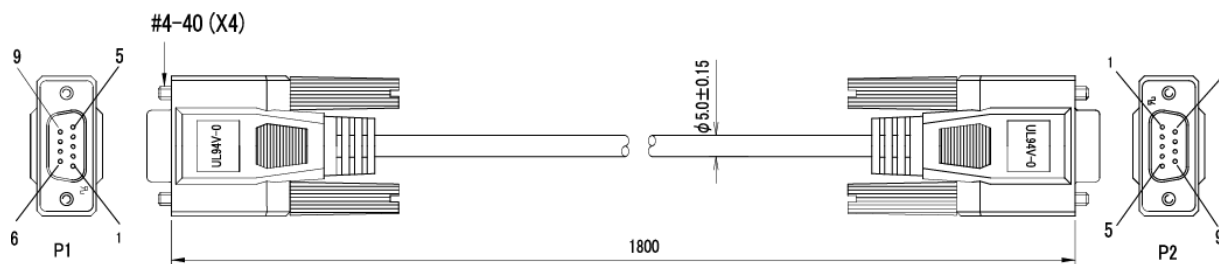


- External antenna MB-13F(With magnet base/Coaxial cable approx 1.5m)



※ANT2 is fixed by resin before shipment by regulation of FCC/IC in an applicable country.

- RS-232C Cable(Straight) 6232-9F9F-06(approx 1.8m)  
D-sub 9 pin(Female) <=> D-sub 9 pin(Female)



## ■ Safety concerns

### Safety concerns (Be sure to read)

To prevent human injury of user or damage in property from occurring, be sure to observe the precautions shown below.

- The degree in safety hazard and damage generated by the wrong usage while ignoring the descriptions is classified by the following displays.



**Warning**

Using in an improper way while ignoring this pictorial symbol might cause a death or serious human injury.



**Caution**

Using in an improper way while ignoring this pictorial symbol might cause a human injury or property damage.

- About use environment and safekeeping environment

● Because it may cause trouble and malfunction, characteristic deterioration, a fire, the electric shock, please avoid the use at the following place and the safekeeping.

- The use at a place getting the direct rays of the sun and safekeeping
- The use at the place where a liquid and an alien substance, corrosive gas or flammable gas may be in in a product and safekeeping
- A place and lamp soot having high moisture, dust, the use at the place with much sand and safekeeping
- Use at the unstable place including the top of the stand which shook and the place that declined
- Use at the place with the vibration



Warning

- For handling this machine:

● In the use that extremely high reliability affecting human life is required, please do not become the use.



Warning

- During use, I outrun a power supply plug from an outlet, and, please ask store or us for repair because it causes a fire, the electric shock when abnormality occurred.

● Do not use this product for the application needing the high reliability related to human lives.



● Do not use this product in a place where it is uncertain about whether or not radio waves reach.



When you use this machine, please be sure to read "cautions on safety and use" of "TW-800 operation manual" before using it.

# ■ Specification

## ● Receiver TW-800R-EXS

Items	Specification
Interface	RS-232C*1
Output	Contact output* 1point (Terminal block:M3(2P)) Contact mechanism MOS-FET/1a Rated load voltage AC/DC30V per point Rated load current 0.5A per point
Buzzer	Piezoelectric Buzzer 95dB/m
Display	LED for receiving(Green) * 1point (Combination lighting switch for pairing) Power LED(Red) * 1point Communication monitor LED * 5point
Power source	DC24V±20%(DC19-28V) Terminal block: M3(2P)
Consumption current	Under 90mA(At receiving standby under 50mA)
Operation temperature range	Temperature 0-50 degree    Humidity Under 80%
Dimension	130W*100H*30Dmm(Except projection)
Weight	Approx 450g
Antenna	Dipole antenna(Diversity type) ※ANT2 is fixed by resin before shipment by regulation of FCC/IC in an applicable country.
Switch	Power switch *1 point 6 DIP switch for setting * 2point

\*SMA Connector antenna type for ANT2 is "M3.5-S SMA-P-MALE"

## ■Communication

### Connector

It is used D-sub 9 pin (Male) connector.

Screw for fixed: Inch screw #4-40

Pin specification (For DCE)

Pin No.	Signal	Name	Reference
1	CD	Career	No using
2	RD	Data output	Data transmission(Receiver->connecting equipment)
3	TD	Data input	Data receiving(connecting equipment->Receiver) *No using
4	DTR	Data terminal ready	No using
5	SG	Signal ground	Signal ground
6	DSR	Data set ready	No using
7	RTS	Request to send	Connecting equipment input "ON" level at input data.
8	CTS	Clear to send	Receiver output "ON" level at input the data
9	RI	Ring indicator	No using

Receiver is DCE (Data Communication Equipment) type.

It is connected by straight cable with DTE (Data Terminal Equipment) equipment.

When it is not used flow control, "CTS"(8 pin) outputs "HIGH" signal continuously.



## Communication Specification

·RS-232C protocol

Items	Contents
Baud rate	19200bps/38400bps
Parity	None
Data length	8 bit
Stop bit	1 bit
Flow sequence	RTS CTS/none

Data format

Preamble	STX	Transmitter ID number	Tightening information Test switch information	ETX	Check sum
----------	-----	-----------------------	---	-----	-----------

Data name	Explanation	Byte
Preamble	FFH,FFH,FFH	3
STX	02H	1
Transmitter ID number	ID number 10 digit is converted to ASCII data(Hexadecimal) For example:"010100004A" (30H,31H,30H,31H,30H,30H30H,30H,34H,41H)	10
Tightening information Test switch information	2 byte ASCII data Transmission Limit switch signal "01"(30H,31H) Transmission test switch(Battery voltage OK) "02"(30H,32H) Transmission test switch(Battery voltage low) "12"(31H,32H)	2
ETX	03H	1
Check sum	Calculated XOR from "Transmitter ID" to "ETX". And it is converted to ASCII data for 2byte.	2

\*It takes 9.9ms at 19200bps baud rate.

\*Sample of Check sum calculated

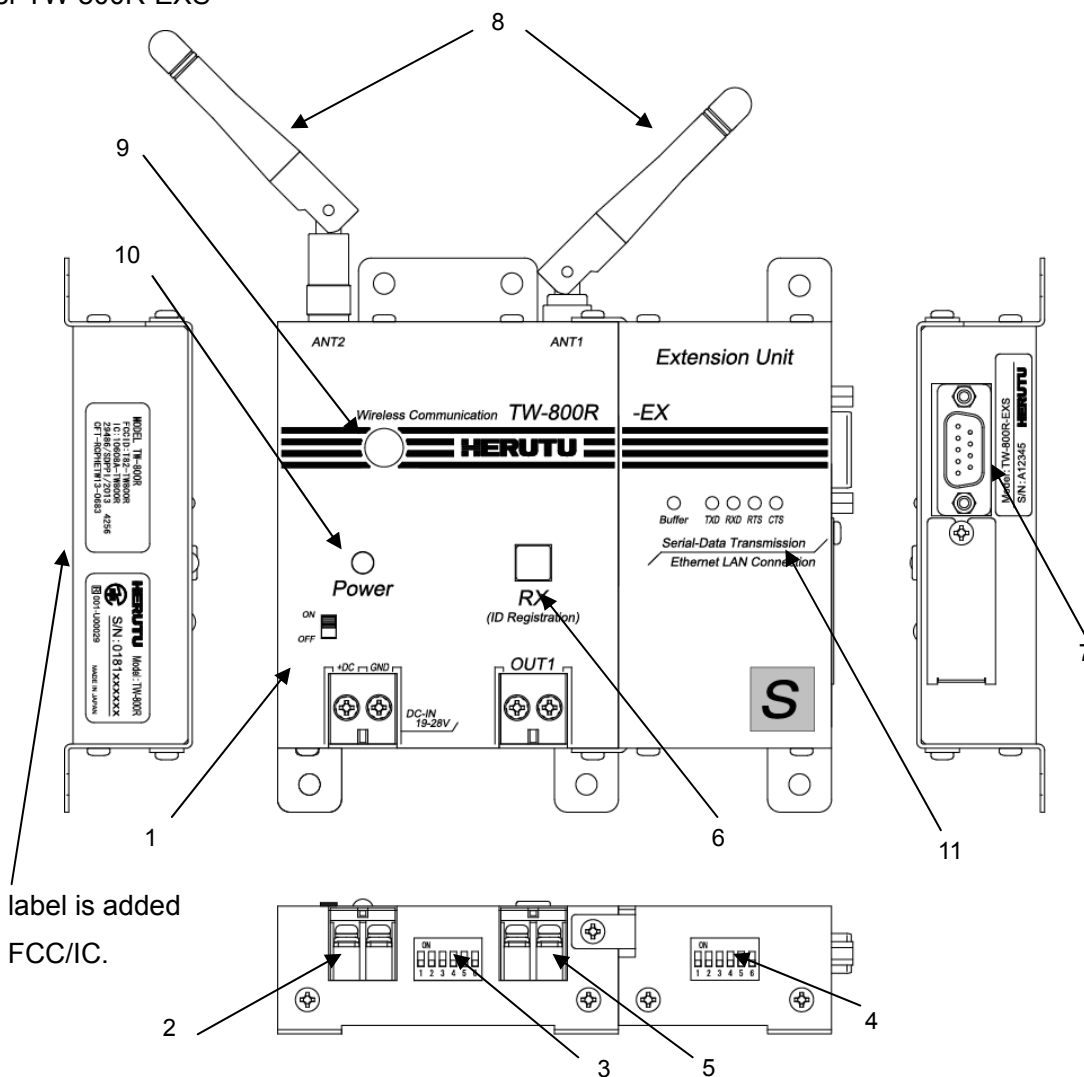
Transmitter ID number : 010100004A

Tightening information : Transmission Limit switch signal "01"(30H,31H)

Check sum→(37H,37H)

# ■Name and function of each part

## ●Receiver TW-800R-EXS



This label is added  
For FCC/IC.

1.Power switch	For power ON and OFF
2.Terminal block of power source	Terminal block for power source of DC24V(M3)
3.DIP Switch1	DIP switch for setting (6 selection)
4.DIP Switch2	DIP switch for setting (6 selection)
5.Output terminal block	Photo-mos relay output terminal block(M3)
6.RX light switch : Green (for Paring switch)	Led lights at receiving the signal from transmitter for OUT1 normally. Also RX light switch is used for paring.
7.RS-232C connector	Connector for RS-232C .D-sub 9 pin (Male)
8.Antenna	2 antennas for Diversity type. Antennas is dipole type. One is all-in-one, one is possible to take off. When it is set external antenna, it is set by means of taking off ANT2. ※ANT2 is fixed by resin before shipment by regulation of FCC/IC in an applicable country.
9.Buzzer	Buzzer sounds at receiving the signal from transmitter. It is possible to set sounds on and off, or big and small. Sound pressure 95dB/m
10.Led of Power(Red)	It lights at power ON.
11.LED of communication monitor	It is LED for monitoring communication situation.

## ■Setting

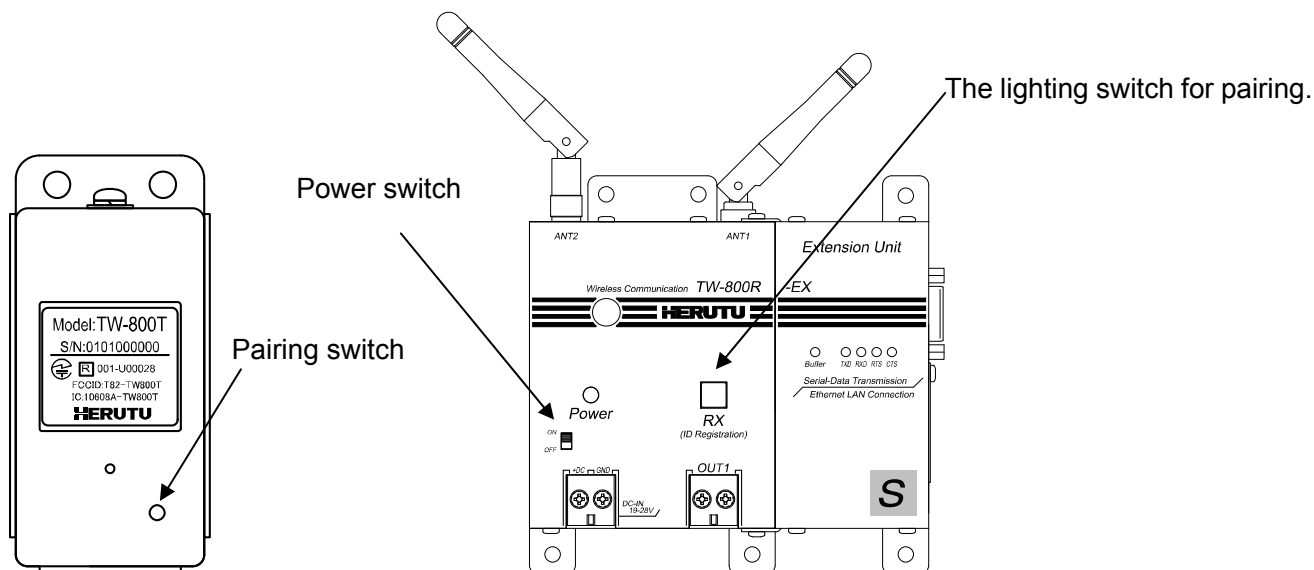
It needs doing “pairing” a transmitter and a receiver before using. The number of transmitters which can register pairing to one set of a receiver does not have restriction.

ID number of receiver is memorized in transmitter. Transmitter transmits the signal included ID number of receiver. Receiver can receive the signal attached ID number itself.

### ●Pairing (Registration)

1. Power Switch is turned on pushing the lighting switch.

To enter “Pairing mode” only 10 seconds with flashing the lighting switch for pairing.



2. You continue pushing the “pairing switch” over 3seconds of transmitter by a long and slender thing.

3. It is completed the pairing between transmitter and receiver, then the lighting switch of receiver is turned off.

4. It can communicate with transmitter being pairing, you turn off the power switch of receiver once.

It needs to do a “Pairing” for every transmitter when you need to register a number of transmitters.

### ●Delete the pairing

At receiver is not “Paring situation”, transmitter cancels the paring information (registration information on a receiver) when the paring switch is pushed over 3 seconds continuously. By this operation, transmitter can not communicate a receiver is registered “Paring”.

●Setting of receiver

You can set “relay output time”, “Double count protect time”, “Behavior of buzzer” by six dipswitch.

Please set by your operation.

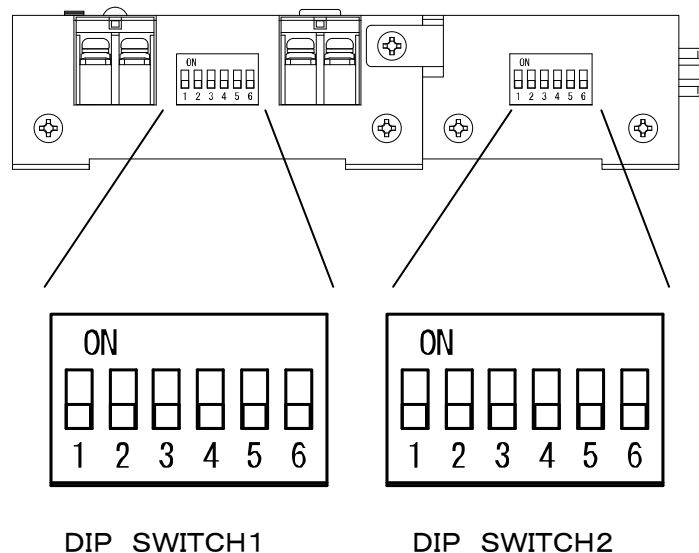
DIP SWITCH1(Main body side)

◆Buzzer ON/OFF

DIPSW	1
Buzzer does not sound	ON
Buzzer sounds	OFF

◆Relay output time (4 kinds)

DIPSW	2	3
50ms	OFF	OFF
200ms	ON	OFF
400ms	OFF	ON
1S	ON	ON



◆Double count protect time (4 kinds)

DIPSW	4	5
10ms	OFF	OFF
200ms	ON	OFF
1S	OFF	ON
2S	ON	ON

\*When “Relay output time” is set 50ms and “Double count protect time is set 10ms, Buzzer sounds 50ms. Buzzer sounds 100ms ordinarily.

◆Buzzer sounds Big/Small

DIPSW	6
Small	ON
Big	OFF

## DIP SWITCH2(Expansion unit side)

## ◆Baud rate setting

DIP SW	1
38400bps	ON
19200bps	OFF

## ◆Flow control

DIP SW	2
Flow control no using	ON
Flow control(RTS/CTS) using	OFF

\*DIP SWITCH2 3-6 is not used.

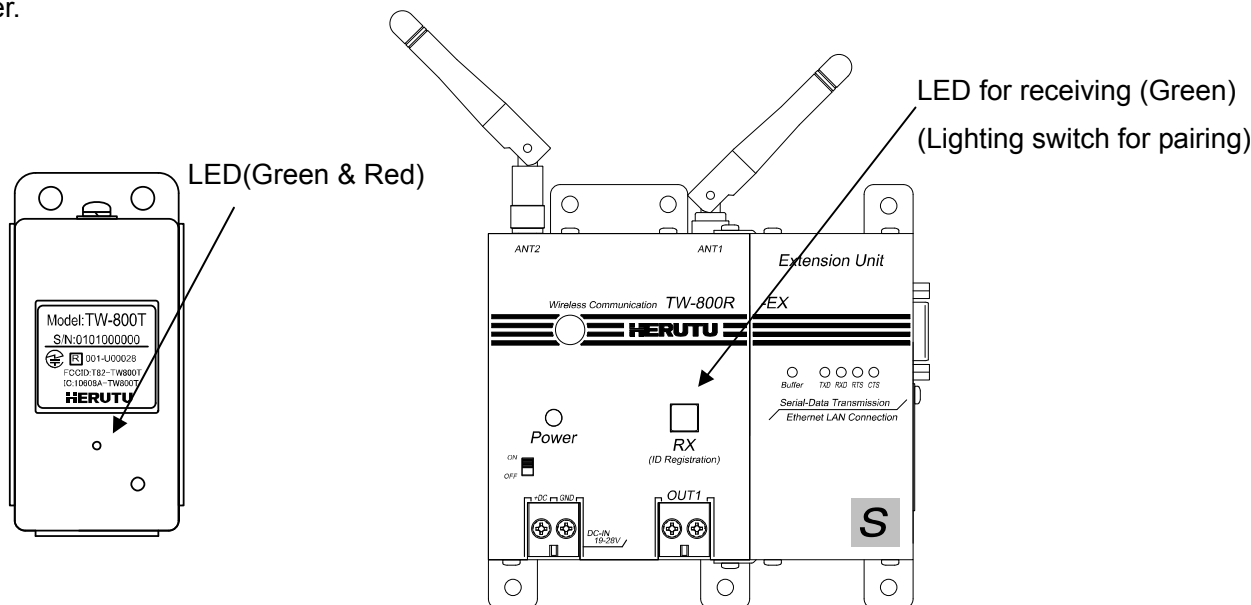
## ◆Caution

- When the signal from another transmitter is received while the receiver was carrying out the relay output, the relay output for transmitters received later is not performed. RS-232C output is performed respectively.
  - When a receiver receives the signal from same transmitter during double count prevention time, relay output time, and buzzer sound, a receiver does not process a signal but transmits the "BUSY" signal to a transmitter. When a transmitter receives "BUSY" signal to a receiver, Green LED of transmitter flashes 3 times.
  - When the signal from another transmitter is received while buzzer of receiver sounds, the buzzer sounds for transmitters received later is not performed.RS-232C output is performed respectively.
  - The receiver holds the data from a transmitter until each processing (a relay output and the prevention from a double count) is completed. A limit is among the quantity which a receiver can hold temporarily, and when the signal from the transmitter exceeding the number of maintenance limits of another ID is transmitted before each processing was completed, a receiver may transmit the "BUSY" signal to a transmitter.  
(When a transmitter receives "BUSY" signal to a receiver, Green LED of transmitter flashes 3 times.)
- When you set up relay output time and double count prevention time in long time, please be careful.

# How to use

1. Power switch of receiver is turned on. Please confirm the LED situation as turning off.

When the LED for receiving turns on, the transmitter is not registered by pairing. Please make a pairing with transmitter.



2. Transmitter transmits the signal at striking the limit switch by tightening the bolts from torque wrench.

When the communication is done normally, receiver output RS-232C output and receiver sounds the buzzer and output relay output according to setting. Green LED of transmitter turns on 1 time.

When the communication is not done normally, receiver doesn't move.

Red LED of Transmitter flashes 10 times

While the receiver output relay output or while receiver is in double count protect time or while buffer of receiver is full, receiver transmit the "BUSY" signal to transmitter. When the transmitter receives the "BUSY" signal, the Green LED of transmitter is flashed 3 times.

	Transmitter	Receiver
Communication OK	Green LED 1 time flashing	LED 1 time flashing
Communication NG	Red LED 10 times flashing	—
BUSY	Green LED 3 times flashing	—

Buzzer sound time is usually for 100ms. When the relay output is set 50msec and double count protect time is set 10msec, Buzzer sound time is 50msec.

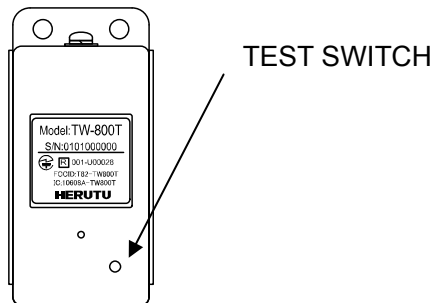
\*When the transmitter is not done "Pairing" transmits, Red LED will be flashing 3 times.

●TEST SWITCH

There is a test switch for checking the battery and communication. When the transmitter transmit the signal by test switch not limit switch, receiver doesn't output relay output. But LED of receiver only turns on.

Also transmitter make a checking the battery at pushing the test switch. You can know the battery situation by transmitter LED and Receiver LED

TEST SWITCH is combination with Pairing switch. To continue pushing the switch over 3 seconds, transmitter transmits the "paring signal". Please take care

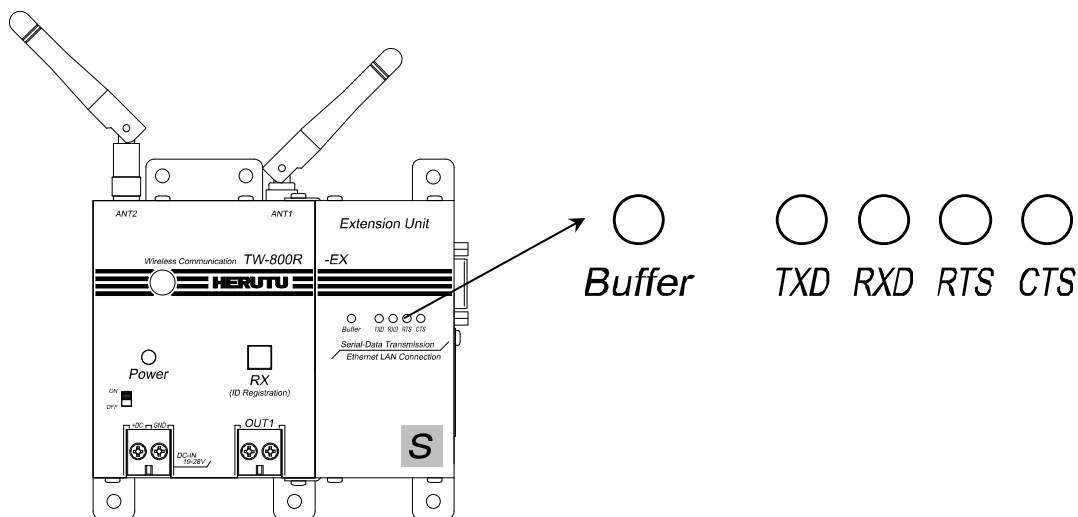


	Transmitter	Receiver
Communication check	OK: Green LED 1 time flashing NG: Red LED 10 times flashing	LED 1 time flashing
Battery power low level	Red LED 1 seconds lighting	LED 2 times flashing

\*Transmitter displays the situation of battery power low level after transmitter displays communication check result(OK or NG).

■Communication monitor

Receiver has a monitor LED of RS-232C output situation. It is displayed below according to communication situation.



LED	Explanation
Buffer(Green)	Green LED is turned on when data remains in the buffer.
TXD(Green)	Green LED is turned on when data is transmitting.
RXD(Red)	Red LED is turned on when data is receiving. *no using. If the data is received from connecting equipment, LED will be turned on. But the data is canceled.
RTS(Red)	Green LED is turned on when the situation is to be able to transmit.
CTS(Red)	Red LED is turned on when the situation is to be able to receive.

## ■Note on use

### ■Caution for wireless Law

○Radio device in this product has been certified by the Radio Law. It does not need a license of radio stations according to using this product.

○Do not use it close to a person with a cardiac pacemaker.

Electromagnetic interference may affect it, putting his/her life at risk.

○Do not use it close to medical equipment.

Electromagnetic interference may affect the cardiac pacemaker to cause loss of human life.

○Do not use it close to an electric oven.

Electromagnetic interference may affect the medical equipment to cause loss of human life.

○Radio device in this product has been certified by the Radio Law. Do not disassemble or modify this product.

### ■Caution for “Pairing”

The number of transmitters which can register pairing to one set of a receiver does not have restriction.

Receiver doesn't remember ID number of transmitter. It cannot read from a receiver ID of the transmitter which is registered pairing, and how many set pairing is registered.

### ■Caution for Radio Interference with 2.4GHz Wireless communication

**Take the following precautions for communication by 2.4GHz wireless communication.**

Within this product's frequency range, industrial, scientific, and medical equipment, such as electric oven, as well as RFID premises radio stations (license required) and specified low power radio station and ham radio station (license not required) used in factory manufacturing lines are operated.

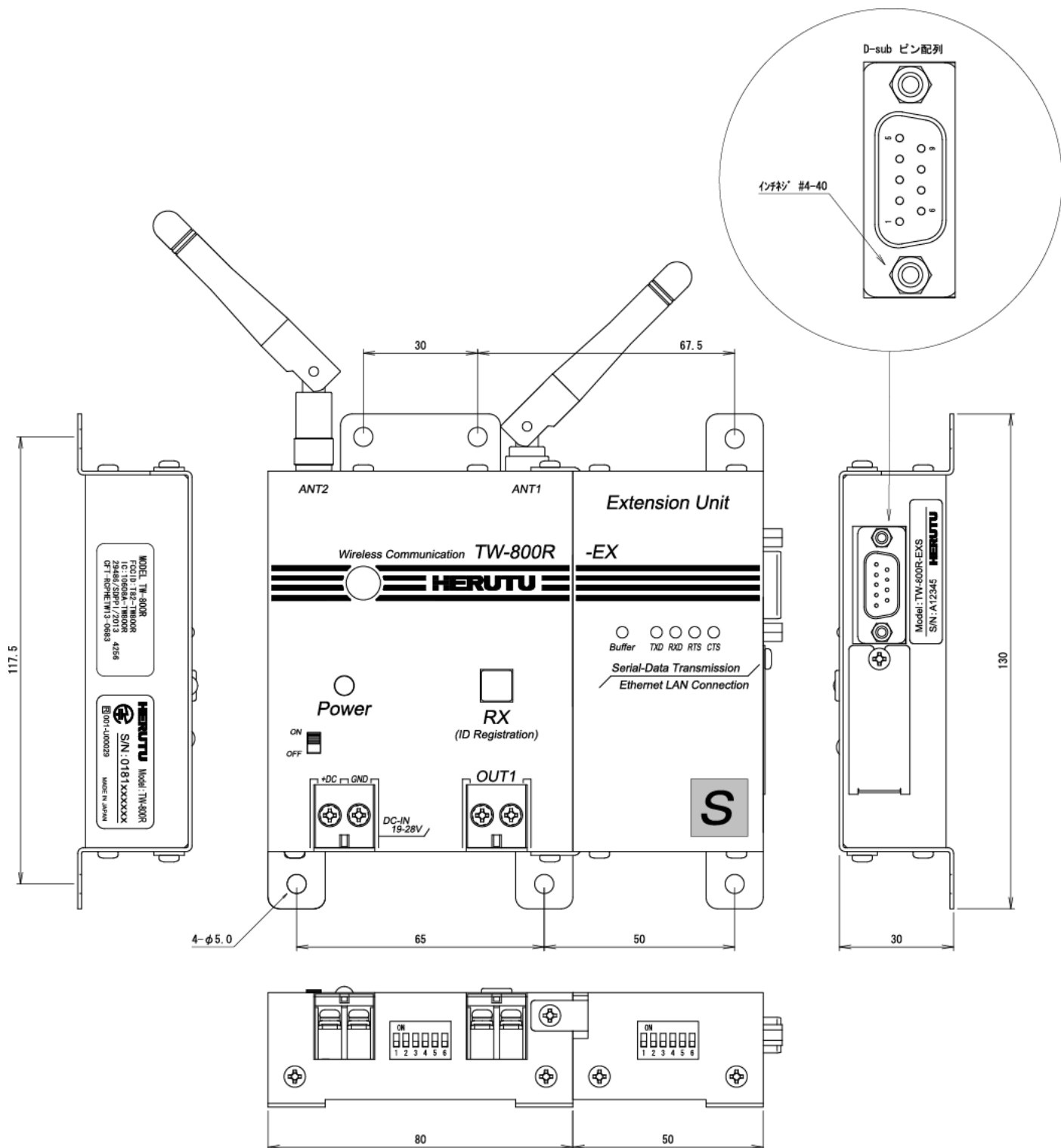
○Before using this device, confirm that no RFID premises radio station, specified low power radio station, or ham radio station is operating close to it.

○If this product caused radio interference with an RFID premises radio station, immediately change the product's frequency or stop radio emission, and contact representative for actions to take to prevent cross talk.



# ■Dimensional drawing

●Receiver TW-800R-EXS



## ■ After service and Warranty

If something is wrong. If you should find anything wrong with the machine when using it under normal conditions, check the following items and contact the outlet store through which you purchased the product or our Sales Office.

Product name / Serial No. / Working environment,  
External devices connected,  
Operating sequence to error initiation,  
Specific description of error, etc.

### ■ Provisions of warranty

The provisions of warranty are set forth by us for warranty of the product after shipment so that the product can be used with a sense of security after purchased. In case our product is out of order, we will provide repair or replacement under the provisions of warranty.

### ■ Warranty period

Besides, as long as there is not providing, the warranty period shall be 13 months after shipping the products. During the warranty period, we will provide free-of-charge repair subject to the provisions of warranty set forth in the warranty certificate.

If you have anything unclear about the repair or follow-up service during the warranty period, please contact the outlet store through which you purchased the product or our Sales Office.

### ■ Scope of warranty

If the product should get out of order under the normal conditions of use by the customer, we will repair the failed section(s) free of charge or exchange the new one free of charge subject to the provisions of warranty. Please contact the outlet store through which you purchased the product or our Sales Office.

Also, the warranty period shall be 13 months after shipping the product or shall be 6 months after shipping substituting goods. The warranty periods will be applied the period visited later.

Note, however, that free-of-charge repair under this warranty is limited to the hardware components of the product. Even during the warranty period, the customer shall be responsible for repair cost if any of the following applies:

1. Troubles or damages occurring due to improper handling by the customer, such as a fall, a shock, etc.  
During transportation or movement of the product by the customer.
2. Troubles caused by overhaul or remodeling of the main body by the customer.
3. Troubles or damages caused by fire, earthquake, flood damage, or other natural disasters, as well as by abnormal voltage.
4. Troubles resulting from any trouble of devices connected to the product, which Devices are other than those designated by us.
5. Troubles with the accessories (AC adapter, antenna, connection cables, or the like) except the main body.
6. Repairing, adjustment, modification by except our company
7. Replacement of consumables and limited-life items (including batteries).  
Consumables and limited-life items include, but not limited to:

- (1) Switches (limit switches, pushbutton switches, or the like)
- (2) Battery cells or batteries (dry batteries, button batteries, or the like)
- (3) Other items subject to consumption or limitation of life caused by use.

8. Troubles occurring due to handling against the use instructions or precautions specified in this operation manual.

■ Initial defects

The period within 30 days from the date of shipping the product is defined as the initial defect period for the product. The product will be replaced with a new one or repaired free of charge provided that it is returned to the outlet store through which you purchased the product or our Sales Office, checked, and recognized as having initial defects. For initial defects, we shall be responsible for the shipping cost.

But it is in Japan only. In case of purchasing the products out of Japan, it will be decided after conference about shipping cost for returning back, insurance cost, custom duty.

■ Disclaimer

We will assume no liability for any damages or monetary losses, direct or indirect, arising out of troubles, failures, or use of the product.

■ Repair service period

Only if we have the stock of parts for repairing, even if after finishing the warranty period, we will repair the product within 5 years after end of production for a fee. However, we reserve the right to use substitute parts or devices for repairing purposes if there are unavoidable reasons such as unavailability of service parts.

■ Others

- Independent of the warranty period, the product to be repaired shall in principle be brought into our site because of the necessity of using measuring instruments or the like for adjustments etc., and the shipping cost etc. incurred in bringing the product into our site shall be borne by the customer.
- In such cases where you request a trip to your place for repair or need substitute devices during the warranty period, please contact the outlet store through which you purchased the product or our Sales Office. We will correspond for a fee.
- We reserve the right to refuse replacement or repair if we are unable to reproduce the concerned failure at our engineering department after receipt of a request for repair.  
In addition, an additional charge may be made to the customer for the technical examination cost incurred in reproducing the failure.
- The information in this manual, our website, catalog we supply, is subject to change without prior notice. Please be forewarned.

## **HERUTU ELECTRONICS CORPORATION**

〒433-8103 62-1Toyooka-cho, Kita-ku, Hamamatsu-shi, Shizuoka-ken

(Sales dept) TEL.+81-053- 438-3555 FAX. +81-53- 438-3411

URL <http://www.herutu.co.jp> E-mail [webmaster@herutu.co.jp](mailto:webmaster@herutu.co.jp)