User's Manual
TR3X-SD01-24-CS141

TAKAYA

Manual No.TDR-MNL-SD01-24-CS141-EN-100

Introduction

Thank you for purchasing a TR3X-SD01-24-CS141 RFID READER/WRITER.

Be sure to read this manual before using the product.
After reading it, store the manual in a convenient place for future reference.

Regulations and Standards

FCC

This product is conform to the FCC standards.
FCC Rules (Federal Communications Commission)
This product complies with Part 15 Subpart B and C of the FCC Rules.
FCC ID : MK4SD01-24-CS141

FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC WARNING

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

This equipment must be professionally installed to ensure compliance with Part 15.

Antennas not allowed are strictly prohibited for use with This equipment.
This equipment is to be professionally installed by professional service trained personnel only.
SMB sockets are provided in the equipment for connecting the external antenna.

The following sentence has to be displayed on the outside of the device in which the transmitter module is installed : “Contains FCC ID: MK4SD01-24-CS141”

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
The antenna(s) used for this transmitter must not be collocated or operating in conjunction with any other antenna or transmitter within a host device,
except in accordance with FCC multi-transmitter product procedures.

The final system integrator must ensure there is no instruction provided in the user manual or customer documentation indicating how to install or remove the transmitter module except such device has implemented two-ways authentication between module and the host system.

FCC §15.27 b) - Special Accessories –
If a device requiring special accessories is installed by or under the supervision of the party marketing the device, it is the responsibility of that party to install the equipm ent using the special accessories.
For equipment requiring professional installation, it is not necessary for the responsible party to market the special accessories with the equipment.
However, the need to use the special accessories m ust be detailed in the instruction manual, and it is the responsibility of the installer to provide and to install the required accessories.

Japan Radio Law
Equipment using high frequencies: Inductive Reading/Writing Communications Equipment Conforming standards: Inductive Reading/Writing Communications Equipment; Standard: ARIB STD-T82
RoHS is support
Restriction **o**f **H**azardous **S**ubstances
Waste
Dispose of the Products as industrial waste.

Safety Precautions

The following symbols are used in this manual to indicate precautions that must be observed to ensure safe use of this product. The precautions provided here contain important safety information. Be sure to observe these precautions.

The following signal words are used in this manual.

⚠ WARNING	Failure to comply with a WARNING may result in serious injury or death.
⚠ CAUTION	Failure to comply with a CAUTION may result in injury to the operator, or damage to the items involved.

⚠ WARNING

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

Decomposition of this product and cable, repair, remodeling, please strictly prohibited. There is the possibility of fire or electric shock injuries.

This product is using the RFID reader writer radio equipment. Therefore, depending on where the applications you use may affect medical equipment. To minimize the impact of medical equipment for use, please observe the following countermeasure. The Japan Automatic Identification Systems Association (JAISA) guidelines are as follows: RFID antennas from implanted cardiac pacemakers or other medical devices please 22cm apart. We recommend that you paste "RFID sticker" at equipment.

← RFID Sticker

⚠ CAUTION

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

Installation and storage environment
1. Do not use the Products in sunlight.
2. Do not use the Products in environment of spray of water, oil or chemicals.
3. Do not use the Products in environments with flammable, explosive, or corrosive gasses.
4. Do not use the Products in environment of hot humid.
5. Do not use the Products in environment of vibration or shock.
6. Do not use the Products in environment of condensation.
7. Do not use the Products in environment of around the metal is covered.
8. Do not use the Products in environment of high temperature.
9. Do not use the Products in environment that has a device that generates magnetic field and shock voltage.
10. Do not use the Products in unstable place.
11. If there is failure, discontinue use immediately, please contact us or the distributor.

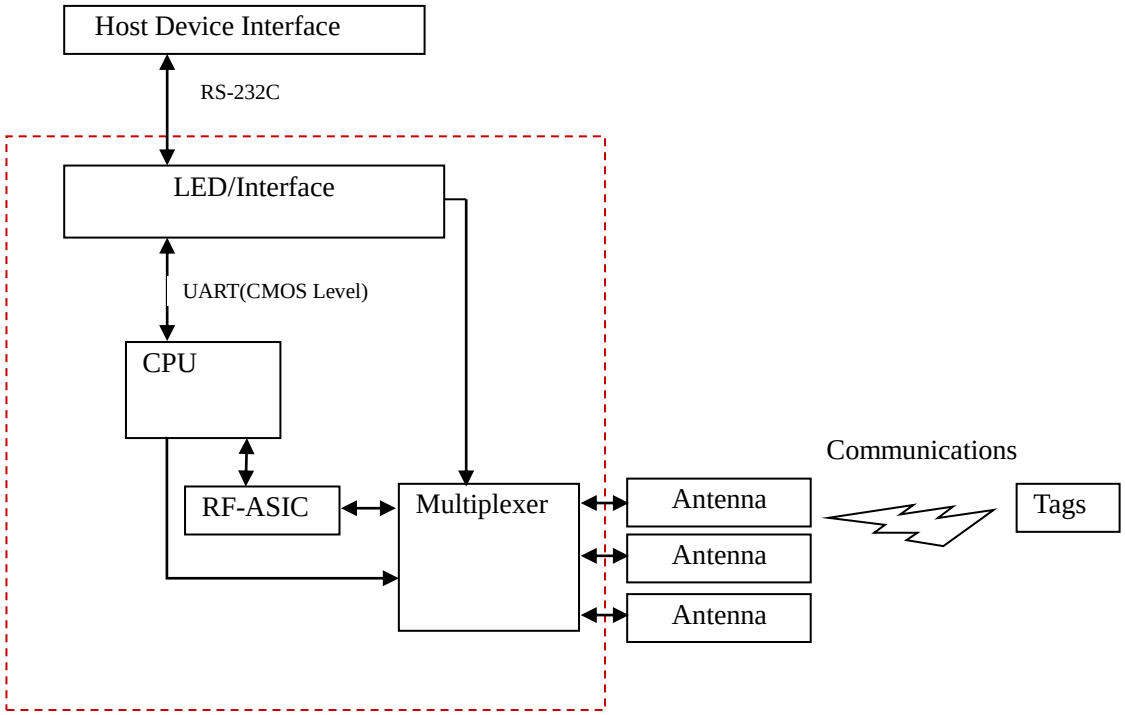
Installation
1. Turn off the power before installation or removing.
2. The following effects may not work correctly.
   - Near 13.56MHz radio device
   - Near speakers , Inverter, motor and Plasma Display
3. The communication range may vary due to environment and conditions.

Contents

1 Product Overview

1.1 Features

This product uses the 13.56MHz frequency. This product is the electromagnetic induction type non-contact IC can read and write RFID tag data.
This Product is designed to be embedded and integrated within OEM devices and finished products such as label printers, cashless payment terminals or any other device that can benefit from integrated RFID capabilities.



TR3X-SD01-24-CS141
Block Diagram

■ Conform to international standards
ISO/IEC15693 and ISO/IEC18000-3(Mode1) is supports.

■ Software
- ☐ TR3-series common communication protocol
- ☐ Software Development Kit

■ Multiplexer
Select the RF output.

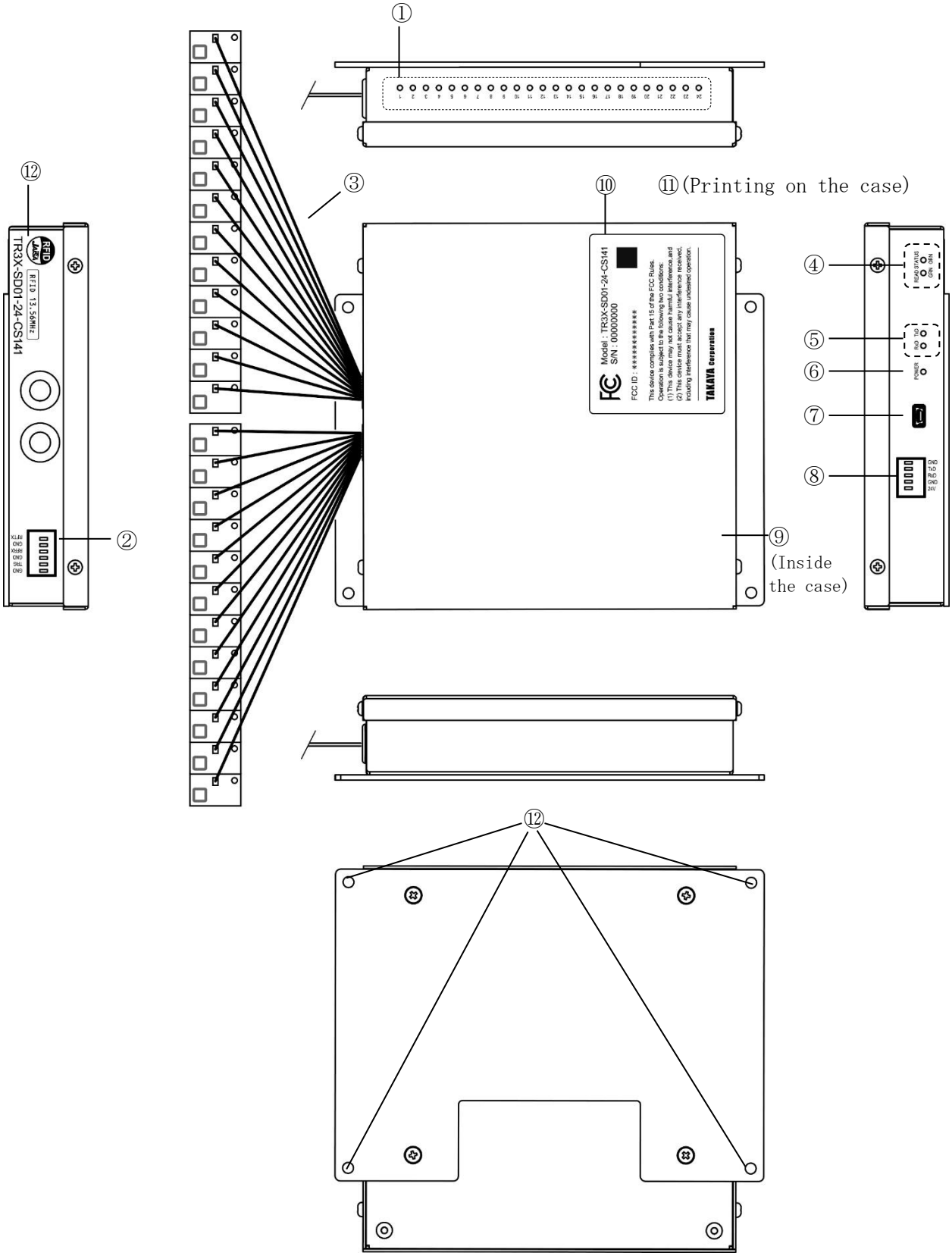
■ Useful
- ☐ Continuous inventory mode
  UID of the tag automatically sends Host Device.
- ☐ RDLoop mode
  UID or User Data of the tag automatically sends Host Device.

For more information please refer to the TR3-PROTOCOL manual.

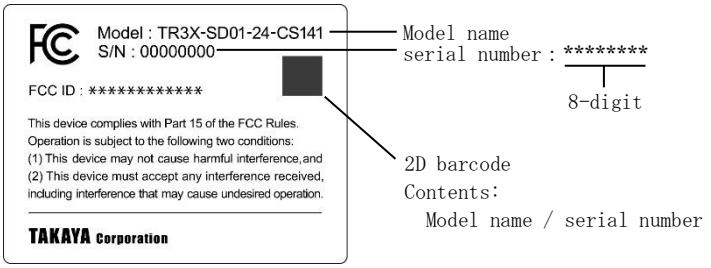
■ Environmentally
EU RoHS(2002/95/EC) Support.
And 10 substances prohibited by (EU) 2015/863 are below the standard value.

2 Names of Parts and Functions

2.1 TR3X-SD01-24-CS141

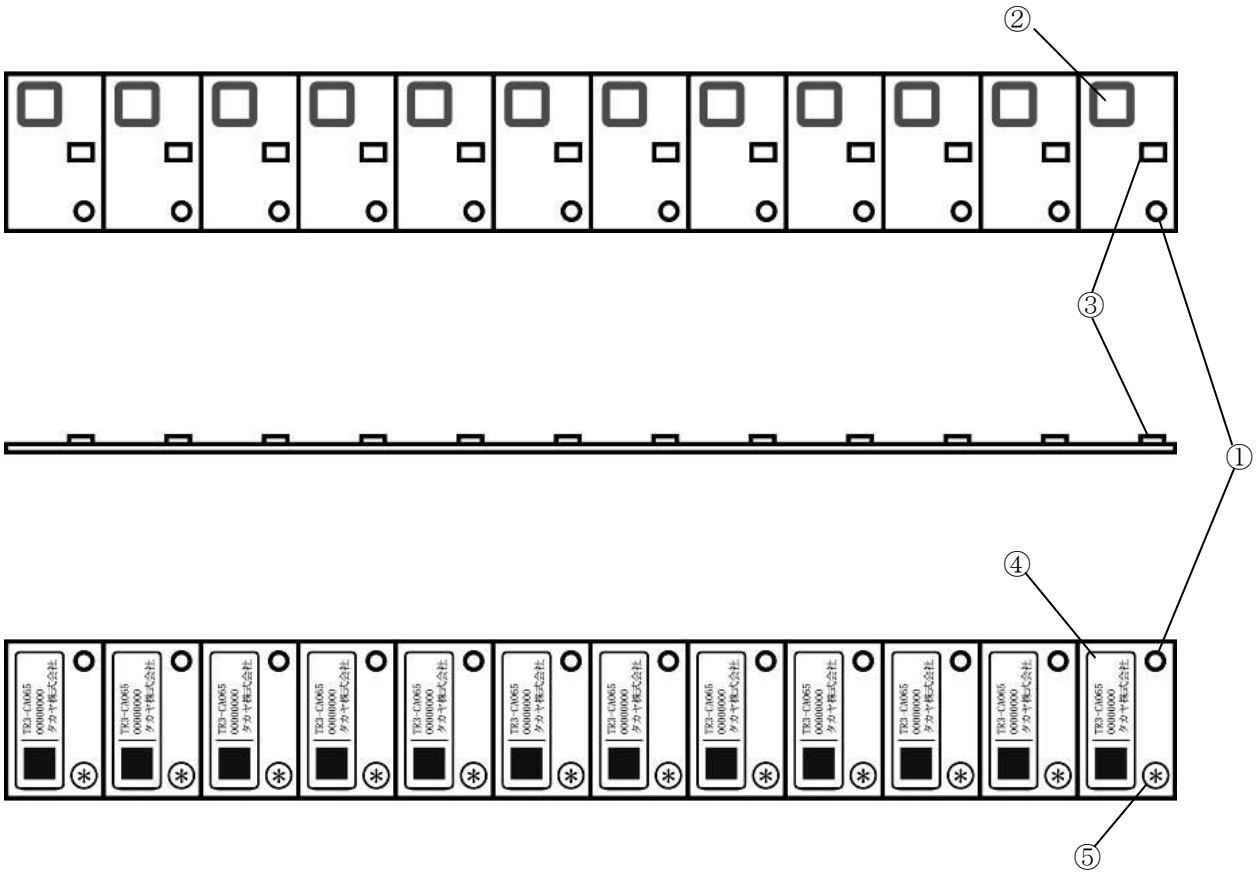


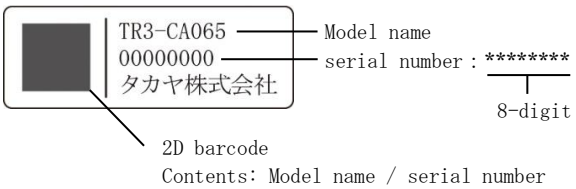
No	Name	Feature Description
①	LED to indicate the presence or absence of RF tag	Displays the status of 24 antennas. Lit: There is an RF tag on the antenna. Off: There is no RF tag on the antenna.
②	Terminal block for checking radio wave condition	It is a terminal block for checking the radio wave condition. You can check the status of RF transmission / reception radio waves by inserting an electric wire into this terminal block and connecting an external measuring instrument (oscilloscope). In addition, it is equipped with a trigger signal that rises at the timing of the RF transmission signal, and can be used as an aid in observing transmitted and received radio waves.
③	Antenna connection cable	It is a cable for connecting the antenna. Antenna 1CH to 24CH (antenna switching: up to 24 units) Cable length：580mm±30mm (from the end face of the case to the antenna connector) CH can be identified by the mark band.
④	LED for checking the operating status	It is an LED for checking the operating status. It has the following A.B. functions. A. Reading performance confirmation display Lights up with a dedicated command during inspection. The reading status of the RF tag is displayed with the following lighting pattern. -Only orange lights up: Not read -Only green lights up: Stable reading -Lit orange / green: Reading status is unstable B. Displaying abnormal input voltage When the input voltage of the main unit becomes 20V or less, the operation of the main unit shifts to the operation when the voltage is abnormal, and orange flashes. During operation when the power supply is abnormal (blinking orange), the main unit will not be able to accept all commands. Turn off the power once and then turn on the voltage of 24V ± 10% again to return to normal operation.
⑤	Communication status display LED with host device	Displays the communication status (send / receive) with the host device. Off: Not communicating Blinking: Communicating
⑥	Power ON / OFF display LED	Lights green while the power is on.
⑦	Connector for writing firmware	It is a connector for writing firmware. Connector type: Mini USB Type-B
⑧	Terminal block for connecting to host device	A terminal block for connecting to a host device. Input 24V DC to pin 1. Connect GND to pin 2. Connect the RS232C cable to pins 3-5.
⑨	Over current protection	A fuse (socket type) is mounted on the power supply line.

No	Name	Feature Description
⑩	Serial number label	The serial number will be an 8-digit serial number. 
⑪	Printing on the case	Silk print showing the model of this product, pin assignment of each connector, LED number, etc.
⑫	Nameplate RFID sticker	Production numbers. Specify that the RFID radio waves are radiated.
⑬	Screw holes	M4 holes.

2.2 TR3-CA065 (12)

CA033 is combined by 2 loop sub antennas and a coupler board.



No	Name	Feature Description
①	Mounting holes	M2 holes.
②	Antenna pattern	An antenna that communicates with RF tags.
③	Connector	Connect the antenna cable. Connector model number: U.FL-R-SMT-1
④	Serial number label	The serial number is an 8-digit serial number. 
⑤	Silk for imposition position identification	It is a silk print to confirm the position of the imposition on the sheet board at the time of manufacture. (Print number: 1 to 96) It is used to investigate the cause when a manufacturing defect occurs. * Please note that this is not an antenna number. **※ Please note that this is not an antenna number.**

3 Setting and connection

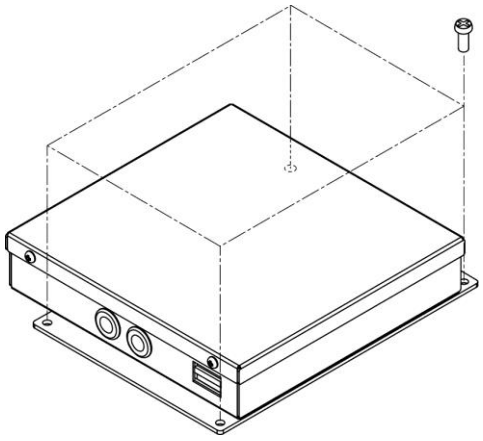
This RFID Reader/Writer product is to be professionally installed by authorized, qualified and service-trained installation personnel only.

3.1 Setting

3.1.1 DeskTop

⚠ WARNING

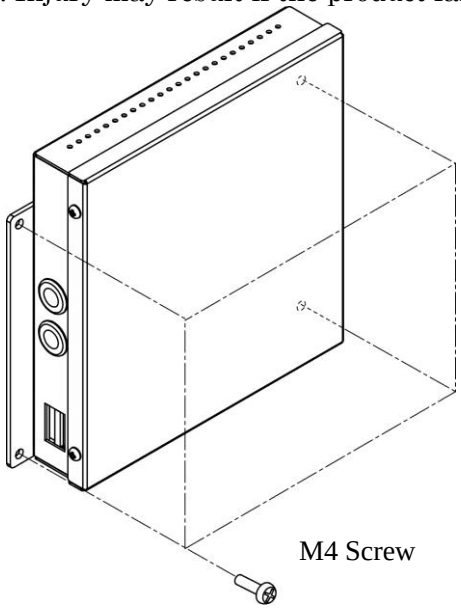
Don't drop the product. Injury may result if the product falls or is dropped.



3.1.2 Wall Mounting

⚠ WARNING

Must be fastened securely the product with the screws.
Don't install to the high place. Injury may result if the product falls or is dropped.



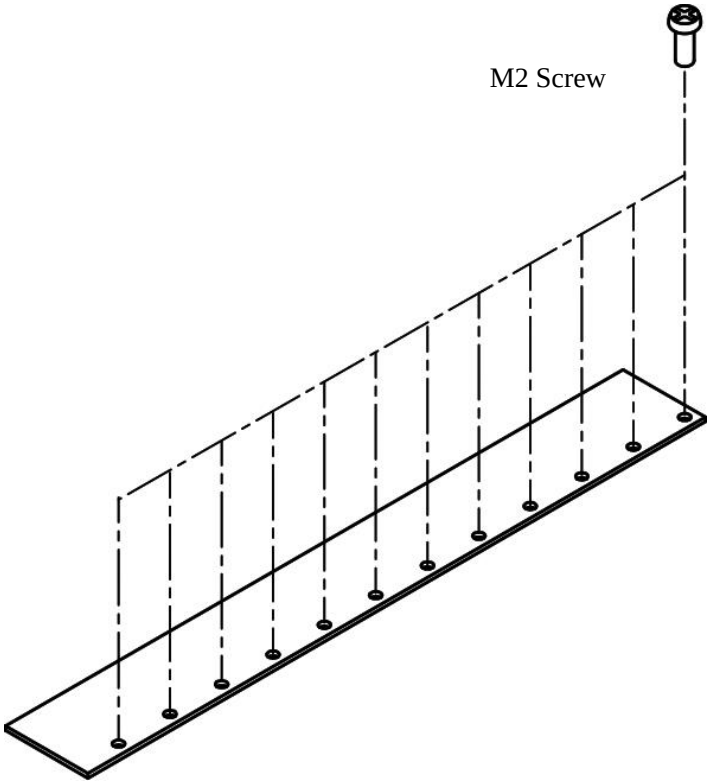
3.2 Antenna installation into a host device

⚠ WARNING

Incorporate the antenna in enclosure by all means.

3.2.1 Installation example by Screw holes

・TR3-CA065(12)

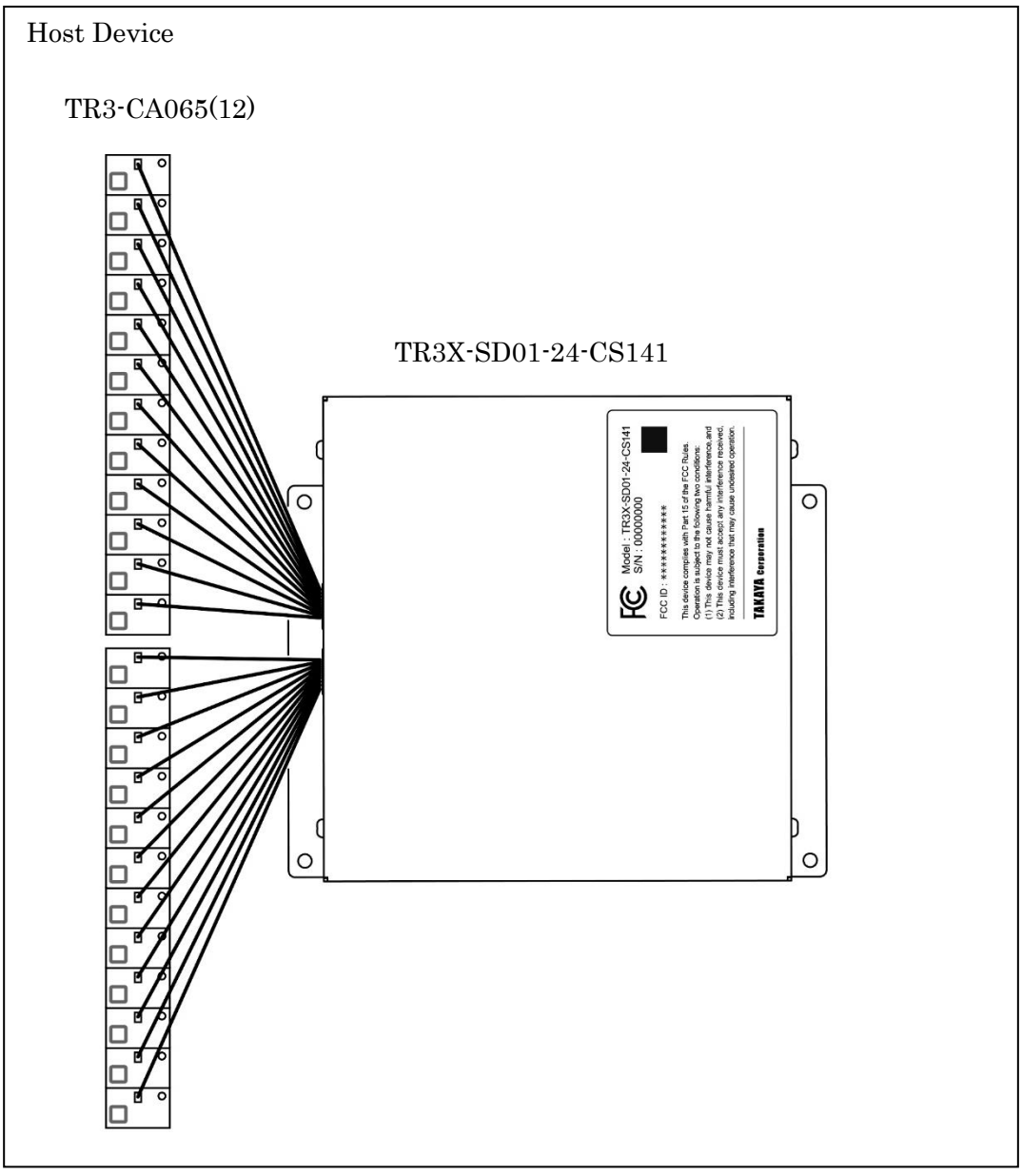


3.3 Connection

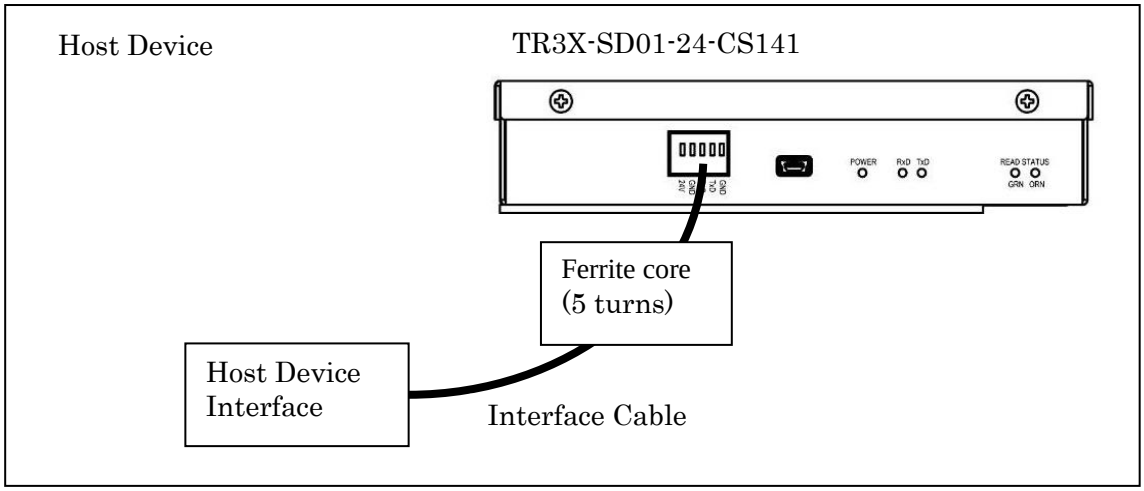
This product will connect with the antenna.
This product connects with Host Device with the cable.

Type of ferrite core and number of turns are specified by compliance for FCC.
When we offer this product, we also offer a ferrite core.When connecting to a host device, be sure to wrap the interface cable around the provided ferrite core as described in Section 3.3.2.
Don't change the type of ferrite core and number of turns of the cables (Power supply cable, RS-232C cable).

3.3.1 Attaching the Cable and Antenna



3.3.2 Direct connection to the Host Device Interface.



Item	Models	Manufacturer
Ferrite core	MSFC13KEX	MORIMIYA ELECTRIC CO., LTD.

4 Specifications

4.1 TR3X-SD01-24-CS141

<table>
<tr><th>Specification</th><th>Item</th><th>Contents</th></tr>
<tr><td rowspan="3">Conformity standard</td><td>Japan Radio Law (※1)</td><td>Standard number:
ARIB STD-T82
Standard name:
Inductive read / write communication equipment
(Wireless card system, etc.)
Model designation number:
FC-21001
(model name: TR3-C202-24CH)</td></tr>
<tr><td>FCC
(※2)(※3)</td><td>FCC Part15 Subpart B,C
FCC ID : MK4SD01-24-CS141 (TBC)</td></tr>
<tr><td>RoHS</td><td>Compliant with the EU RoHS (2002/95/EC)

However, the 10 substances prohibited by (EU) 2015/863 are below the standard value.</td></tr>
<tr><td rowspan="6">Radio Frequency</td><td>Carrier frequency</td><td>13.56MHz ±50ppm(Ta=25℃)</td></tr>
<tr><td>Transmit power or power range</td><td>40mW±30%(Ta=25℃) (Low Power) ※Default value
100mW±30%(Ta=25℃) (High Power)</td></tr>
<tr><td>Air interface standard</td><td>ISO/IEC15693、ISO/IEC18000-3(Mode1)</td></tr>
<tr><td>Operation confirmed RF tag</td><td>ISO/IEC15693、ISO/IEC18000-3(Mode1)
・ICODE SLI</td></tr>
<tr><td>Data rate</td><td>ISO/IEC 15693、ISO/IEC18000-3(Mode1)
<table>
<tr><th></th><th>Speed</th><th>Data rate</th></tr>
<tr><td rowspan="2">Product⇒Tag</td><td>1/4 (Default value)</td><td>26.48kbps</td></tr>
<tr><td>1/256</td><td>1.65kbps</td></tr>
<tr><td>Tag⇒Product</td><td colspan="2">26.69kbps</td></tr>
</table></td></tr>
<tr><td>Modulation</td><td>ISO/IEC 15693、ISO/IEC18000-3(Mode1)
<table>
<tr><th></th><th>Parameter</th></tr>
<tr><td>Product⇒Tag</td><td>ASK10%</td></tr>
<tr><td>Tag⇒Product</td><td>ASK
FSK(Default value)</td></tr>
</table></td></tr>
</table>

※1：Tag-it HF-I is a registered trademark of Texas Instruments Incorporated.
my-d is a registered trademark of Infineon Technologies AG.
I･CODE SLI is a registered trademark of NXP Semiconductors.

<table>
<tr><th>Specifications</th><th>Item</th><th>Parameter</th></tr>
<tr><td rowspan="2"></td><td>Anti-collision</td><td>
<table>
<tr><th>Standards</th><th>Anti-collision</th></tr>
<tr><td>ISO/IEC 15693
ISO/ISC 18000-3
(Mode1)</td><td>YES</td></tr>
</table>
</td></tr>
<tr><td>Host Interface</td><td>RS-232C
<table>
<tr><th>Item</th><th>Parameter</th></tr>
<tr><td>Speed</td><td>9600bps
19200bps
38400bps(※2)</td></tr>
<tr><td>Data bits</td><td>8</td></tr>
<tr><td>Parity</td><td>None</td></tr>
<tr><td>Stop bit</td><td>1</td></tr>
<tr><td>Flow control</td><td>None</td></tr>
</table>
</td></tr>
<tr><td rowspan="3">Control</td><td>LED</td><td>1 LED (green)</td></tr>
<tr><td>BUZZER</td><td>1 BUZZER</td></tr>
<tr><td>Antenna
Connector</td><td>Connector
SMB(J)×24
<table>
<tr><th></th><th>Symbol</th><th>Function</th></tr>
<tr><td>Center Contact</td><td>RF</td><td>RF output</td></tr>
<tr><td>Shell</td><td>GND</td><td>GND</td></tr>
</table>
</td></tr>
<tr><td rowspan="2">Connector</td><td>RS-232C</td><td>Connector
D-SUB 9Pin

Pin assignment
<table>
<tr><th>Pin No.</th><th>Symbol</th><th>Function</th></tr>
<tr><td>1</td><td>NC</td><td>Not Connected</td></tr>
<tr><td>2</td><td>Rx</td><td>Received data signal</td></tr>
<tr><td>3</td><td>Tx</td><td>Transmitted data signal</td></tr>
<tr><td>4</td><td>NC</td><td>Not Connected</td></tr>
<tr><td>5</td><td>GND</td><td>GND</td></tr>
<tr><td>6</td><td>NC</td><td>Not Connected</td></tr>
<tr><td>7</td><td>NC</td><td>Not Connected</td></tr>
<tr><td>8</td><td>NC</td><td>Not Connected</td></tr>
<tr><td>9</td><td>NC</td><td>Not Connected</td></tr>
</table>
</td></tr>
<tr><td>DC JACK</td><td>Connector
9.5×external diameter φ5.5 internal diameter φ2.1

Pin assignment
<table>
<tr><th></th><th>Symbol</th><th>Function</th></tr>
<tr><td>Center electrode</td><td>GND</td><td>GND</td></tr>
<tr><td>External electrode</td><td>VCC</td><td>Power Input</td></tr>
</table>
</td></tr>
</table>

※2：initialization

Specification	Item	Contents
Radio Frequency	Communication distance	Maximum: Approximately 4 mm (Ta = 25℃) This is a reference value when the antenna (TR3-CA065) is connected and the RF tag "ST-5.5X5.5BPET-NN" manufactured by Star Engineering is used. The communication distance varies depending on the surrounding metal, noise, power supply, temperature and other usage environment, antenna used, and tag used.
	Anti-collision	Unsupported.
	Number of antenna connections	Up to 24ch (switching control)

<Regarding registered trademarks>

Proprietary nouns such as company names and product names described in this manual are trademarks or registered trademarks of each company.

The ICODE SLI series is a trademark or registered trademark of NXP Semiconductors.

※1 This product incorporates a reader / writer module that has been certified by the type designation stipulated by the Radio Law of Japan. Therefore, it is not necessary to apply for permission to install high-frequency equipment in Japan. However, please note that if you use it in a combination of equipment configurations that we do not approve, or if you modify it to emit illegal radio waves, it will be a violation of the Radio Law and you will be punished.

※2 This product is for domestic use only, and we do not provide maintenance service or technical support overseas.

※3 FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to whichthe receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

FCC WARNING

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

<table>
<tr><th>Specification</th><th>Item</th><th>Contents</th></tr>
<tr><td rowspan="3">Control</td><td>Communication command</td><td>Refer to "3.1.2 Communication Specifications" in this manual.</td></tr>
<tr><td>Initialization time (When the power is turned on)</td><td>Command processing is possible after 400 ms have passed since the power was turned on.
The same applies after executing the restart command.</td></tr>
<tr><td>Interface</td><td><Host device>
RS-232C
<table>
<tr><th>Item</th><th>Parameter</th></tr>
<tr><td>Speed</td><td>9600bps
19200bps
38400bps (Default value)
57600bps
115200bps</td></tr>
<tr><td>Data bits</td><td>8</td></tr>
<tr><td>Parity</td><td>None</td></tr>
<tr><td>Stop bit</td><td>1</td></tr>
<tr><td>Flow control</td><td>None</td></tr>
</table>

<For writing firmware>
USB2.0 / 1.1 (virtual COM port ※4)</td></tr>
</table>

<table>
<tr><th>Specification</th><th>Item</th><th>Contents</th></tr>
<tr><td>Control</td><td>Status display LED</td><td>
<table>
<tr><th>No.</th><th>Use</th><th>Display color</th><th>Function</th></tr>
<tr><td>1</td><td>Power ON / OFF</td><td>Green</td><td>Lit: Power on
Off: Power off</td></tr>
<tr><td>2</td><td>Communication status with the host device</td><td>Orange</td><td>1 each for sending and receiving
Off:
Standby (non-communication)
Blinking:
Communicating</td></tr>
<tr><td>3</td><td>Presence or absence of RF tag</td><td>Green</td><td>Antenna 24CH status display (24)
Lit: with tag
Off: No tag</td></tr>
<tr><td>4</td><td>For checking the operating status</td><td>Orange / Green</td><td>It has the following A.B. functions.

A.
Reading performance confirmation display ※

Only orange lights up:
Not read
Only green lights up:
Stable reading
Lights orange / green:
Reading is unstable

B.
Displaying abnormal input voltage

Orange / green off:
Normal operation
Blinking orange:
Operation when power supply is abnormal</td></tr>
</table>
※Lights only by a command dedicated to inspection.
</td></tr>
</table>

※4：Since USB is recognized as a virtual COM port, it is used as RS-232C from the upper side.
To write the firmware, supply 24V DC from the host device connection terminal block.

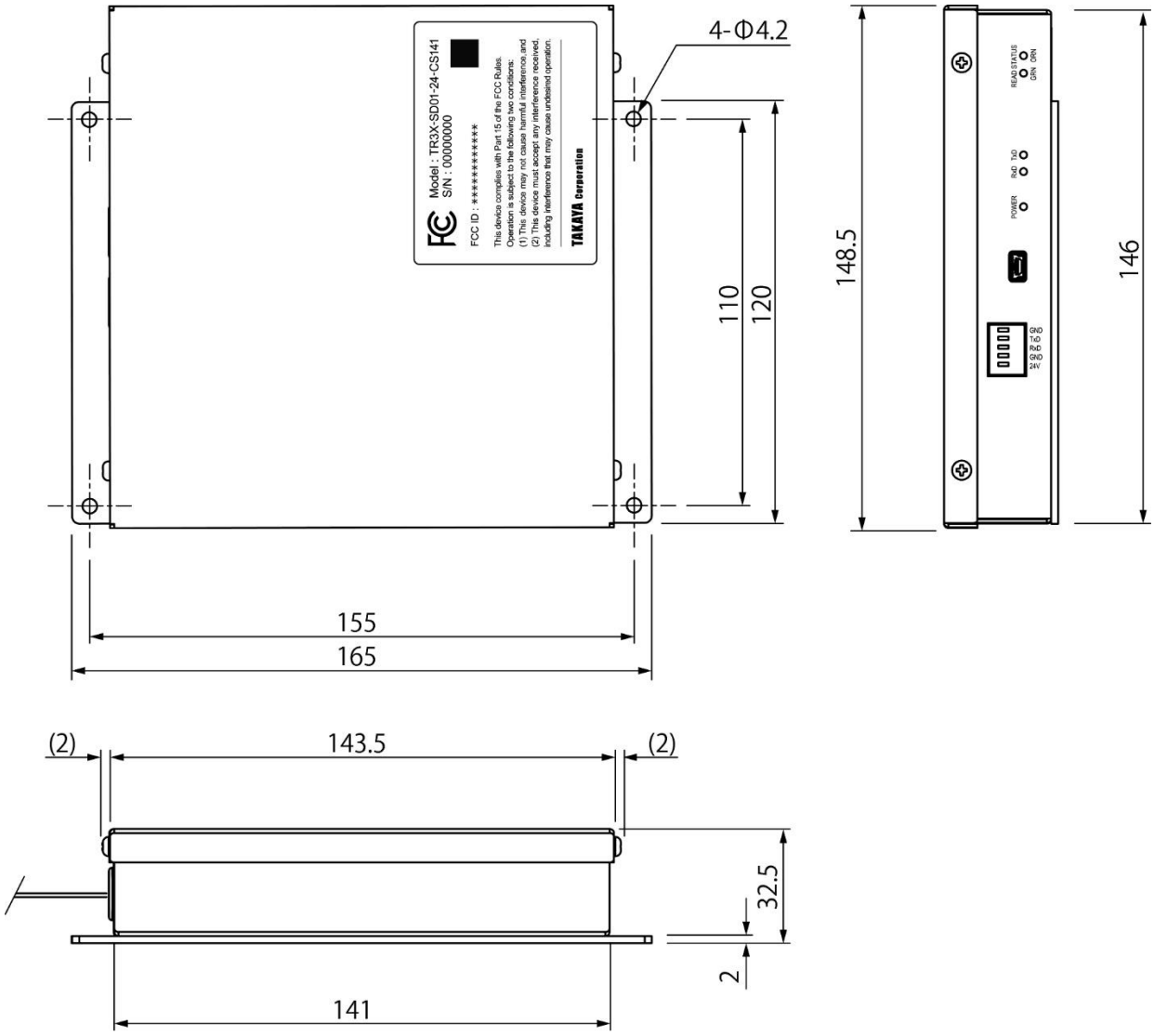
<table>
<tr><th>Specification</th><th>Item</th><th>Contents</th></tr>
<tr><td rowspan="3">Connector</td><td>For connecting to host device</td><td>Terminal block（Model：ML-700-NH-5P）
＜Pin assignment＞
<table>
<tr><th>Pin number</th><th>Symbol</th><th>Function</th></tr>
<tr><td>1</td><td>VCC</td><td>Power input (DC24V)</td></tr>
<tr><td>2</td><td>GND</td><td>GND</td></tr>
<tr><td>3</td><td>Rx</td><td>Received data signal</td></tr>
<tr><td>4</td><td>Tx</td><td>Transmission data signal</td></tr>
<tr><td>5</td><td>GND</td><td>GND</td></tr>
</table></td></tr>
<tr><td>For writing firmware</td><td>miniUSB Type-B connector (female)
＜Pin assignment＞
<table>
<tr><th>Pin number</th><th>Symbol</th><th>Function</th></tr>
<tr><td>1</td><td>Vbus</td><td>Power input (DC5V)※</td></tr>
<tr><td>2</td><td>-Data(D-)</td><td>Data line -</td></tr>
<tr><td>3</td><td>+Data(D+)</td><td>Data line +</td></tr>
<tr><td>4</td><td>NC</td><td>NC</td></tr>
<tr><td>5</td><td>GND</td><td>GND</td></tr>
</table>
※ This unit does not work even if power is supplied via USB.
Write the firmware after supplying 24V DC from the terminal block connected to the host device.</td></tr>
<tr><td>For checking radio wave condition</td><td>Terminal block（Model：ML-700-NH-6P）
＜Pin assignment＞
<table>
<tr><th>Pin number</th><th>Symbol</th><th>Function</th></tr>
<tr><td>1</td><td>RF-TX</td><td>RF transmission signal</td></tr>
<tr><td>2</td><td>GND</td><td>GND</td></tr>
<tr><td>3</td><td>RF-RX</td><td>RF received signal</td></tr>
<tr><td>4</td><td>GND</td><td>GND</td></tr>
<tr><td>5</td><td>RF-TRG</td><td>RF trigger signal</td></tr>
<tr><td>6</td><td>GND</td><td>GND</td></tr>
</table></td></tr>
<tr><td>Cable</td><td>Antenna cable</td><td>U.FL coaxial cable x 24
Cable length：580mm±30mm
(from the end face of the case to the antenna connector)
＜Pin assignment＞
<table>
<tr><th></th><th>信号名</th><th>機能</th></tr>
<tr><td>Central contact</td><td>RF</td><td>RF output</td></tr>
<tr><td>Shell</td><td>GND</td><td>GND</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Specification</th><th>Item</th><th>Contents</th></tr>
<tr><td rowspan="3">Mechanical data</td><td>Dimensions
(W x D x H)</td><td>165(W) x 148.5(D) x 32.5(H)mm (Protrusions except)
[Dimensional drawing] See below</td></tr>
<tr><td>Weight</td><td>Approx. 352g</td></tr>
<tr><td>Material</td><td>Aluminum
<table>
<tr><th>Name</th><th>Material</th></tr>
<tr><td>Top cover</td><td>A5052 1.0t
Anodic oxide coating</td></tr>
<tr><td>Lower case</td><td>A5052 1.0t
Anodic oxide coating</td></tr>
<tr><td>Base plate</td><td>A5052 2.0t
Anodic oxide coating</td></tr>
</table></td></tr>
<tr><td>Electrical data</td><td>Power</td><td>Supply Voltage : DC+24V ±10%
Current consumption : approx.70mA(Low Power)
approx.80mA(High Power)
Carrier off : approx.50mA
Power consumption : approx.1.7W(Low Power)
approx.1.9W(High Power)</td></tr>
<tr><td rowspan="4">Ambient Conditions</td><td>Temperature
Operating range</td><td>+5～50℃</td></tr>
<tr><td>Humidity
Operating range</td><td>30～80％RH (No condensation)</td></tr>
<tr><td>Temperature Storage range</td><td>-25～+55℃
-25～+70℃ (If the storage time does not exceed 24H)</td></tr>
<tr><td>Humidity Storage range</td><td>20～85％RH (No condensation)</td></tr>
</table>

■ Connectable devices

Product name	Product model number	Remarks
Antenna unit	TR3-CA065(12)	150(W) x 20(D) x 2.25(H) mm Can be divided into 12 antenna pieces. Dimensions after individual division: 12.5 (W) x 20 (D) x 2.25 (H) mm

■ Dimensions



Unit: mm
Dimensional tolerance: ± 1.5mm
() Is a reference dimension

4.2 TR3-CA065(12)

■ Specifications

<table>
<tr><th>Specification</th><th>Item</th><th>Contents</th></tr>
<tr><td>Conformity standard</td><td>RoHS</td><td>Compliant with the EU RoHS (2002/95/EC)

However, the 10 substances prohibited by (EU) 2015/863 are below the standard value.</td></tr>
<tr><td rowspan="3">Antenna</td><td>Antenna resonance frequency</td><td>13.56MHz ±0.5MHz[Ta=25℃ (※1)]</td></tr>
<tr><td>Communication distance</td><td>4mm or more ※1

[Conditions]
RF tag:
"ST-5.5X5.5BPET-NN" made by Star Engineering.
Reader/writer:
TR3X-SD01-24-CS141</td></tr>
<tr><td>Antenna Type</td><td>LOOP ANTENNA
External 50 ohms (Unbalanced)</td></tr>
<tr><td>Connector</td><td>CN1</td><td>Connector model number:
U.FL-R-SMT-1(01)
Made by Hirose Electric
Cable side contact model number:
U.FL-LP(P)-068A2
Made by Hirose Electric

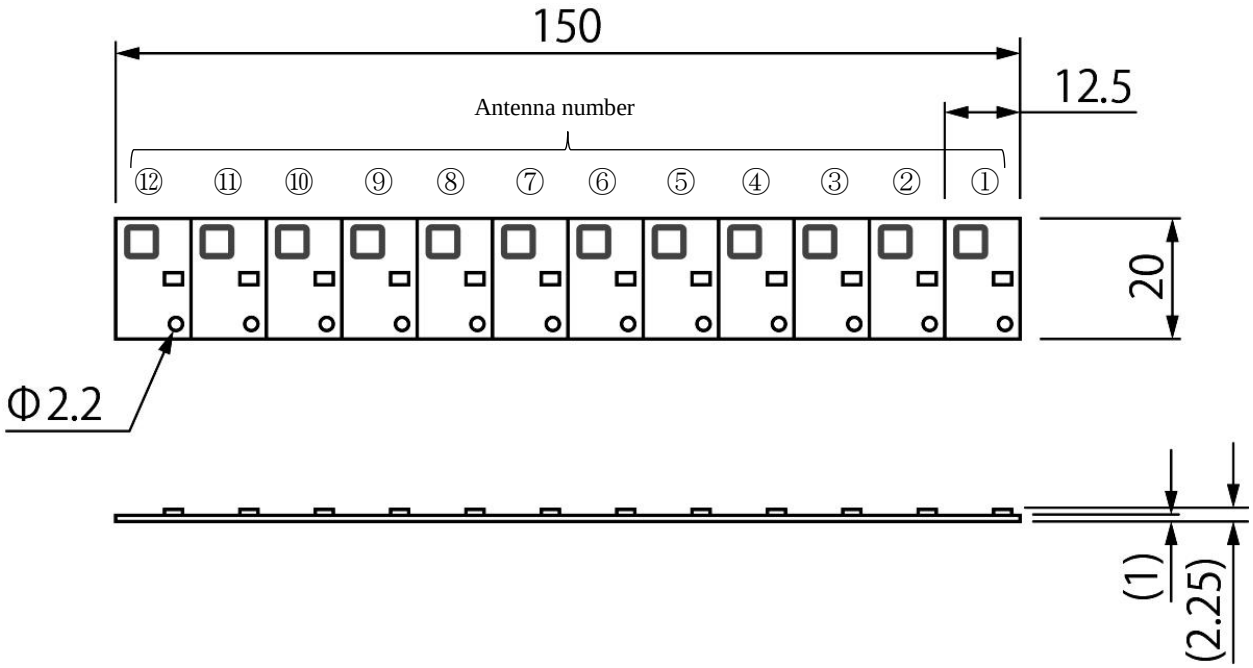
＜Pin assignment＞
<table>
<tr><th></th><th>Symbol</th><th>Function</th></tr>
<tr><td>Central contact</td><td>RF</td><td>RF output</td></tr>
<tr><td>Shell</td><td>GND</td><td>GND</td></tr>
</table></td></tr>
<tr><td rowspan="2">Mechanical data</td><td>Dimensions
(W x D x H)</td><td>150(W) x 20(D) x 2.25(H) mm

After splitting into individual pieces:
12.5(W) x 20(D) x 2.25(H) mm</td></tr>
<tr><td>Weight</td><td>12g

After splitting into individual pieces: 1g</td></tr>
<tr><td rowspan="4">Ambient Conditions</td><td>Temperature
Operating range</td><td>+5～50℃</td></tr>
<tr><td>Humidity
Operating range</td><td>30～80％RH (No condensation)</td></tr>
<tr><td>Temperature
Storage range</td><td>-25～+55℃
-25～+70℃ (If the storage time does not exceed 24H)</td></tr>
<tr><td>Humidity Storage range</td><td>20～85％RH (No condensation)</td></tr>
</table>

※1: There are no conditions that affect the antenna.

■ Dimensions



Unit: mm
Board dimensional tolerance: ± 1.0 mm
Board thickness: 1.0 mm

■ Connectable devices

Product name	Model number
RFID reader / writer unit	TR3X-SD01-24-CS141

5 Accessories

5.1 Ferrite Core

■ Specifications

Item	Models	Manufacturer
Ferrite core	MSFC13KEX	MORIMIYA ELECTRIC CO., LTD.

6 Maintenance

This product is mainly used in electronic components and semiconductors.
Therefore, the long-term stable operation, the environment and conditions are expected to defect, as shown below.

- Device degradation due to overvoltage and overcurrent.
- Device degradation due to high temperature and long-term stress.
- Poor contact of the connector and cause deterioration of insulation by moisture or dust.
- Connector corrosion by corrosive gases.

In order to use this product at its best, please conduct routine or periodic inspections.

Item		Maintenance	Criteria
Ambient conditions	Temperature	Temperature Operating range	+5～50℃
	Humidity	Humidity Operating range	30～80％RH (No condensation)
	Enclosure rating	Check the dusty	None
	Corrosive	Check the corrosion	None
Power	Input	Check the voltage	Input Voltage : DC24V±10%
	Voltage fluctuation	Check the Voltage fluctuation	
Attachment	Product	Check the Screw	Checking and verifying
		Check the Connector	
	Cable	Check the Cable break	None
Performance		Check the Performance	Work

Revision History

Revision code	Date	Revised contents
1.00	2022/02/22	Original production

TAKAYA
[URL] https://www.takaya.co.jp/
[Mail] rfid@takaya.co.jp