MX7（2－INPUT） User Manual

MATRIX
● The contents of this manual are correct as of February 2015. ● The contents of this manual, including product specifications, are subject to change without notice due to improvements.

Index

Safety Precautions for Use

If you find any abnormality (failure, unusual smell or sound, etc.), immediately stop using the Product. Continued use may cause fire or electrocution. Unplug the equipment and request repair.

🚫	Indicates a prohibition.
❗	Indicates a compulsory instruction that must be followed.

Warning	
🚫	**Do not alter or disassemble the Product.** It may cause electrocution or failure, since the Product contains high-voltage parts.
🚫	**Do not subject the Product to strong shock.** It may cause breakage or failure.
🚫	**Do not install the Product in a location within reach of children.** Install the Product in a location that cannot be reached by children, so as to prevent accidents.
🚫	**Do not put any foreign object inside the Product.** Do not insert or drop into the Product any metallic or flammable object. It may cause fire or electrocution.
🚫	**Do not use wiring devices beyond their specified range of use.** Use of wires beyond their prescribed ratings, by inserting too many plugs into a single outlet or for any other reason, may cause fire or electrocution.
❗	**Be sure to fully insert the power plug.** Insufficient insertion may generate heat and cause fire.
🚫	**Do not place any container holding liquid on the Product.** The entry of liquid inside the Product may cause fire or electrocution. If liquid enters the Product, immediately pull out the power plug and contact us.
🚫	**Do not use the Product in a place where liquid may enter or the Product may become wet.** It may cause fire or electrocution. Be particularly careful about using the Product when it is raining or snowing, by the sea or near water.
🚫	**Do not break the power cord or power plug.** Scratching, manipulating, heating, forcibly twisting, bending or pulling the power cord or power plug, placing it under the Product, putting an heavy object on it, or placing it near a heating device may cause exposure of the cord core, short circuiting or disconnection, resulting in fire or electrocution.
🚫	**Do not place the Product in an unstable location.** If placed on an unstable table or an uneven floor, the Product may turn over or fall, which may cause injury.
🚫	**Do not place a heavy object on the Product.** It may turn over or fall, causing injury or breakage.
🚫	**Do not stand on the Product.** The Product may turn over or collapse, causing injury.
🚫	**Do not place the Product in a location that is humid or dusty, or exposed to oily smoke or steam.** Placing the Product near a cooking counter or humidifier may cause fire or electrocution.

	Do not use any AC adapter other than the designated AC adapter. It may cause failure, fire, or electrocution.

Caution	
(!)	**Check the storage location.** Avoid use or storage in a location that is: ● exposed to direct sunlight, ● hot and humid, ● unstable, so that the Product may fall down, ● subject to rapid temperature change, ● prone to vibration or dusty, ● easily affected by static electricity, or ● likely to generate corrosive or flammable gas
(!)	**Maintenance of the Product** Use a dry, soft cloth. When the Product becomes especially dirty, immerse the cloth in water with a neutral detergent and then squeeze out the water. Then wipe the dirt off with it. Finally remove the remaining moisture with a dry cloth. * Contact with a chemical, alkaline agent or solvent may cause deterioration or breakage.
(!)	**Conduct daily checkups and periodic inspections.** To keep the Product functioning normal, be sure to conduct daily checkups and periodic inspections.

Ensure that the trigger mat is not rolled when conducting an operation check. If automatic tuning is performed when the mat is rolled, sufficient output cannot be obtained for the trigger magnetic field after the mat is unrolled.	
Do not place the trigger mat on a manhole cover or other iron plate. Sufficient output cannot be obtained due to the impact of the metal on the trigger magnetic field.	
Be sure to **press the trigger adjustment switch for at least three seconds** to conduct automatic tuning when: ● a trigger mat is installed, ● a trigger mat is moved after tuning, or ● a rolled trigger mat is unrolled and made flat.	Press for at least three seconds.
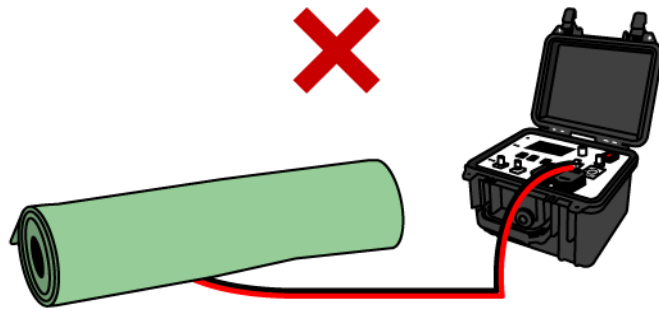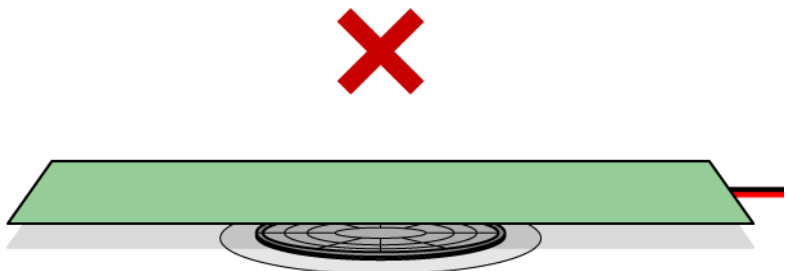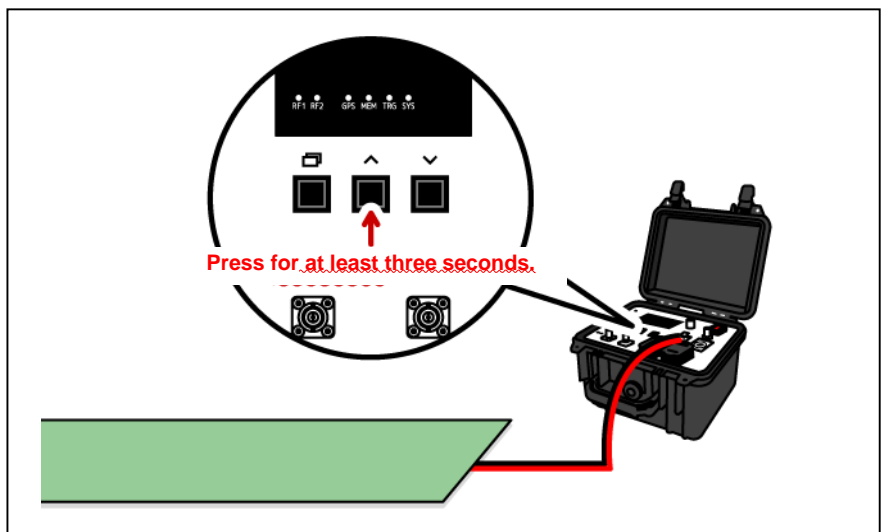
Part Names
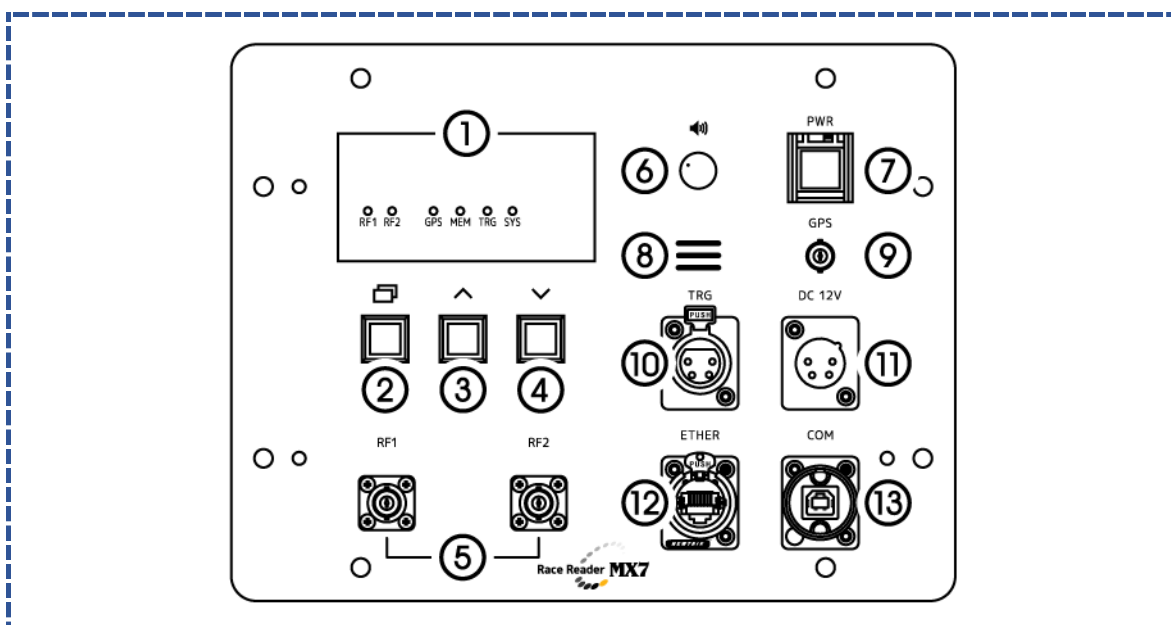
No.	Name	Function	Note
1	**VFD display**	Displays various information.	
2	**Display change switch**	Switches VFD displays.	
3	**Trigger adjustment switch**	Adjusts the trigger volume.	• Press for three or more seconds: starts automatic tuning • Hold down: Lowers the output level by one notch.※1
4	**Trigger adjustment switch**	Adjusts the trigger volume.	Hold down: Lowers the output level by one notch.※1
5	**RF IN 1/ RF IN 2**	Reception antenna input	
6	**Buzzer volume**	Adjusts the tag data reception buzzer sound volume.	Turn right to increase the sound volume.
7	**Power switch**	Power ON/OFF switch	• ON : LED inside switch lights up. • OFF : LED inside switch lights off.
8	**Buzzer**	Sounds when tag data is received.	
9	**GPS**	GPS antenna input	
10	**TRG**	Trigger output	
11	**DC12V**	External DC power input	
12	**ETHER**	TCP/IP communication	
13	**COM**	USB communication （serial conversion system ）*2	As an option, RS232C communication may be selected. In such case, the USB connector is not installed.

※1　Effective only when [Trigger] is set for the VFD display. Be sure to conduct automatic tuning before adjustment.
※2　Download a USB driver appropriate for the environment by accessing the address below, and install it.

　　http://www.ftdichip.com/Drivers/D2XX.htm

Start-up
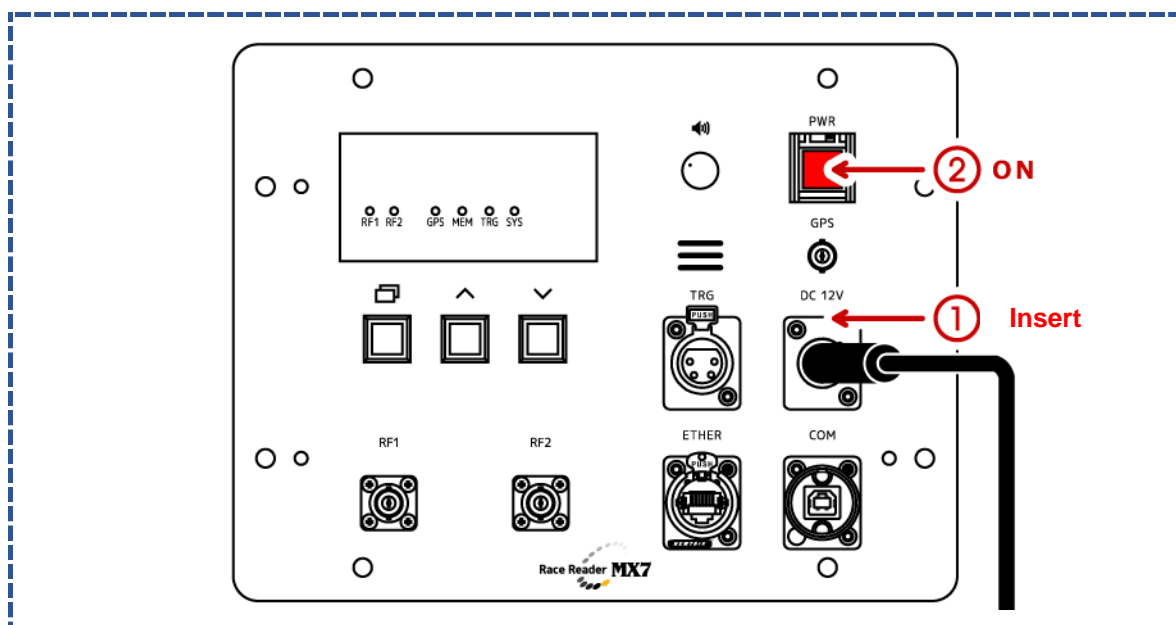
VFD screen
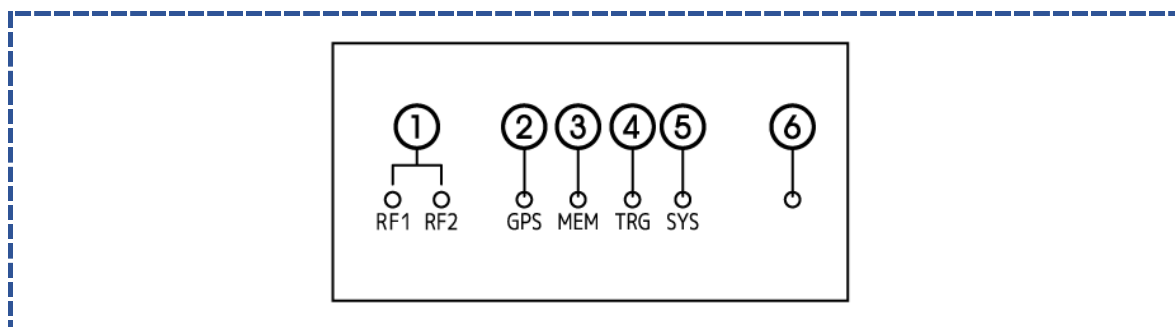
No.	Name	Function	Note
1	**LED（1・2）**	Lights when tag data is received.	
2	**GPS**	GPS receiving status	• Off: normal reception • Blinking: reception error
3	**MEM**	Status of memory for reception log data storage[1]	• Off : Normal • Blinking : Abnormal (initialization required)
4	**TRG**	Trigger output status[2]	• Off : Normal • Blinking : Level abnormally lowered Trigger abnormality detection buzzer (beep, beep, beep…)
5	**SYS**	System status inside the reader[3]	• Off : Normal • Blinking : Abnormality arising in system
6	**Reset button**	Resets when pressed for three seconds or longer (the item to be reset varies depending on the current VFD screen).	See explanations for each screen.

※1 Judgment is made during the memory check at start-up. Abnormality is not detected during start-up (in operation). If an abnormality occurs, initialize the log data from the web browser. (p. 15 Tag item [Log Data])

※2 Blinks also when automatic tuning is not performed.

※3 If a system abnormality arises, it may indicate a failure. Contact us to request repair.

Main

Turning the power ON displays the start-up logo first, and then the main screen.

```
2015/02/15 18:51:17
-------------------------------------
T-Lvl ▮▮▮▮▮▮▮▮▮▯▯ 157
```
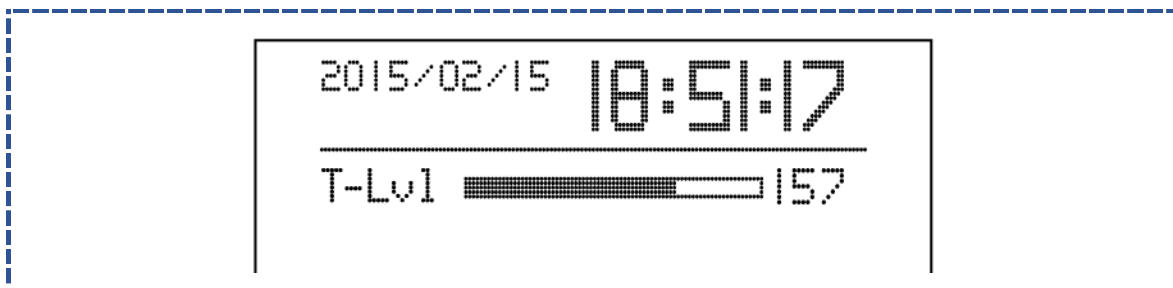
Display modes

The display mode can be changed using the display change switch.

1	**Main**	Displays the date, time, and trigger level.
2	**Tag**	Displays the received tag mode, the number of tags received, etc.
3	**Trigger**	Displays the trigger level, volume, etc.
4	**Network**	Displays the IP information.
5	**GPS**	Displays the number of satellites captured.
6	**Check**	Displays the reader status.

1.Main

```
2015/02/15  18:51:17
────────────────────────
T-Lvl ▰▰▰▰▰▰▱▱ 157
```

Displays the date, time	
T-Lvl	Displays the trigger level

2.Tag

```
Tag
────────────────────────
Mode  16bit
Data  02267/314/OK
```
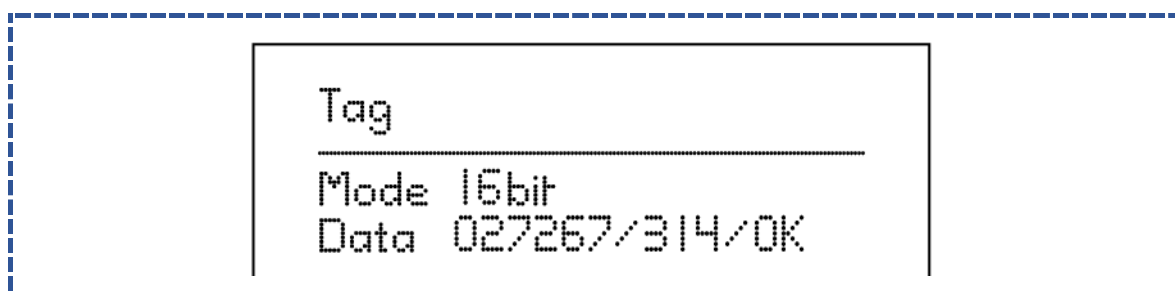
Mode	Received tag mode		• [16bit] : 16bit mode • [24bit] : 24bit mode
Data	Last received tag information [ID / Freg / Batt] from the left	ID	• [16bit] : Decimal number • [24bit] : Hexadecimal number
		Freg（Frequency of last received tag）	• [304MHz] • [309MHz] • [314MHz]
		Batt（Remaining tag battery level of last received tag)	• [OK] • [NG]

Action of Reset button

16bit／24bit（Mode change）

> 1. **The display blinks when the mode is changed.**
> 2. **Rebooting (power switch OFF → ON) while the display is blinking enables mode change.**
>   *** Resetting again while the display is blinking returns to the former mode. (Blinking stops.)**

3.Trigger

```
Trigger

Level  ▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▢▢▢▢▢|57
Volume ▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉08/08
```
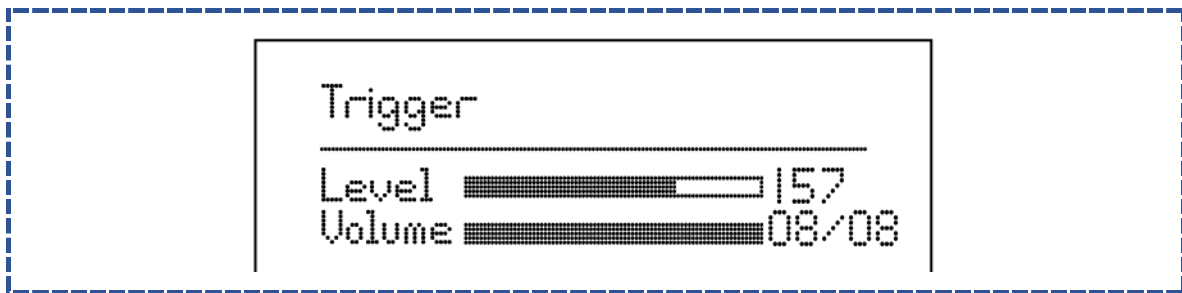
> **The trigger adjustment switch is designed to be operated while this trigger information screen is displayed.**

Level	Displays the trigger level.
Volume	Displays the set trigger volume value.

4.Network

```
Network

IP    192.168.2.215
```
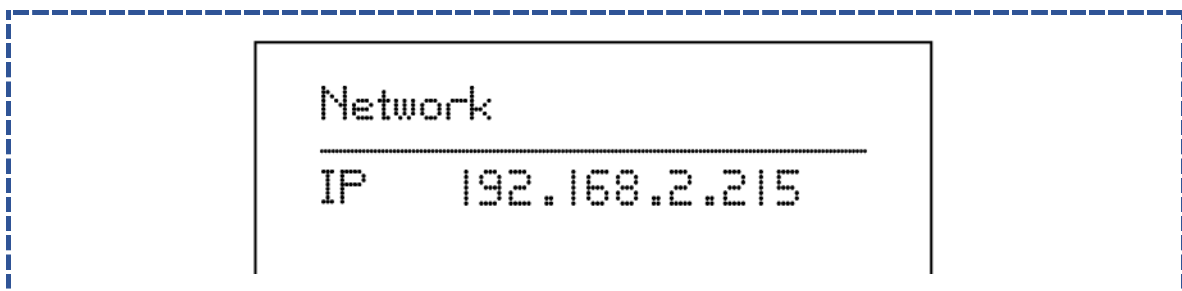
IP	Displays the IP information.

Action of Reset button

The set values in the table below will be initialized.

Item	Default
IP Address	Please refer to page 15.
Net Mask	
Default Gateway	
Host IP Address	
Host Connection Port	

5.GPS

```
GPS
─────────────────────────────
NoVS 0
```

NoVS	Displays the number of satellites captured.

6.Check

```
Check
─────────────────────────────
Trggr OK
Systm OK
```

		[OK]	Trigger level is normal
Trggr	Displays the trigger level status	[Not Tuned]	Trigger unadjusted
		[Level Over]	Indicates that the trigger level is too high. Connecting a normal trigger coil or lowering the level using the DOWN button is necessary.
		[Level Lower]	Indicates that the trigger level is too low. Connecting a normal trigger coil or raising the level using the UP button is necessary.
Systm	Displays the system status inside the reader	[OK]	Normal
		[0x@@@@@@@@]	Indicates abnormality arising inside. (@ will be replaced according to the status.)

Action of Reset button

Erasing System errors

Resetting is not necessary when the System displays "OK." If resetting is performed when an error code is displayed and the error code is displayed again, failure is likely.

Various Settings

Preparations

Various settings for the main system are made through a web browser using a LAN-connected PC.
* Do not allow access to a single MX7 from more than one PC at a time.

Setting an IP address for a PC

Ensure that the PC's IP address has the same segment as the IP address set for the MX7.

Default IP address of the MX7

192.168.2.215

Setting an IP address for a PC

192.168.2. (1～255 ※Choose a value that is not used within the same network.)
(E.g.) 192.168.2.1

Access through a Web browser

Enter the MX7's IP address in the address bar of the web browser and press the Enter key.

(E.g.) http://192.168.2.215

The setting screen will be displayed if there is no problem with the connection.

Status

Item	Description
Date Time	Displays the current time and date. ■ [---]: Not set ■ [RTC]: Time set by a built-in RTC (real time clock) ■ [GPS]: Time set by GPS ■ [CMD]: Time set by communication command ■ [WWW]: Time set from the WWW setting screen
Tag	Displays tag information. ■Mode: Tag reception mode (type) ● [16 bit] – 16 bit tag reception mode ● [24 bit] – 24 bit tag reception mode ■Count: Displays the number of tags received. ■Last Data: Displays the information of the last received tag (Tag No./frequency/battery data)
Trigger	Displays trigger information. ■Level - Current trigger level ■Volume - Position of the trigger level adjustment volume ■Tune- Position of the trigger tuning capacitor ■ON/OFF – ON/OFF status of the trigger output ■Sync- Trigger synchronization mode status ● [Master]: Displays master operation (normal operation)
Network	Displays network information. ■ Mode - Please refer to page 15（TCP Connection Mode）. ■ IP- IP Address ■ Gateway – Default Gateway ■ NetMask - SubnetMask ■ HostIP - Host IP (destination IP) * Displays only in [Client] mode
GPS	Displays GPS information. ■ NumOfVS - Displays the number of satellites captured ■ Latitude - Displays latitude ■ Longitude - Displays longitude ■ Altitude - Displays altitude ■ Last Sync - Displays the date and time of completion of the last GPS time synchronization
Etc	Displays other information. ■ PTime - Displays the date and time of the signal input into the reader DI. (Optional)
Check	Display for checking. (Items in which abnormality is found are displayed in red.) ■Trigger - Displays the trigger level status. ● [OK] : Trigger level is normal ● [Not Tuned] : Trigger unadjusted ● [Level Over] : Trigger level is too high ● [Level Lower] : Trigger level is too low ■System - Displays the status of the internal system. ● [OK] : Normal ● [0x@@@@@@@@] : System abnormality. Parameters vary depending on the type of abnormality.

Tag（Settings related to tag reception）

Item	Description	Minimum	Maximum	Default
Tag Operation	Sets the received tag mode ■ [16bit] : 16bit mode ■ [24bit] : 24bit mode	—	—	16Bit
Buzzer Time	Sets the buzzer sound time and operation mode when tag data is received (in increments of 10 milliseconds). ■[Normal] : [S] Buzzer sounds only when data is received. ■[Continuous] : Buzzer sounds whenever a tag is received.	0	200	20、Normal
Holding Time	[E] Sets the time to wait until issuance. (in increments of 10 milliseconds) ※ Do not change for normal operation.	1	300	50
Log Data	Displays the log location inside the reader. The log can be initialized (erased) using the [Erase] button. When the LED for [MEM] blinks, be sure to initialize the log by the method above before use.	—	—	—

Trigger（Settings trigger）

Item	Description	Minimum	Maximum	Default
Volume	Sets the trigger level adjustment (strong/weak) volume.	0	8	0
Tune (Manual)	Sets trigger manual tuning.	0	31	0
Tune (Auto)	Starts trigger automatic tuning.	—	—	—
Tune (StartUp)	Sets whether or not to start trigger automatic tuning at start-up.	—	—	off
Output On/Off	Sets the trigger output to ON/OFF.	—	—	on

Network（Settings network）

Item	Description	Minimum	Maximum	Default
MAC Address	Displays the MAC address of the device.	—	—	—
TCP Connection Mode	Sets the reader as Client or Server in TCP communication (connection with an application for log acquisition). ■[Client]: Contact from reader to PC (normal specification) ■[Server]: Contact from PC to reader	—	—	Server
Host IP Address	Sets the IP address of the destination PC (only when in Client mode).	—	—	192.168.2.1

Host Connection Port	Sets the listen port No. of the destination PC (only when in Client mode).	1024	65535	53125
IP Address Default Gateway Net Mask	Sets the reader's network address.	—	—	192.168.2.215 192.168.2.1 255.255.255.0
Machine ID	Reader's identification No. inside network (automatically created)	—	—	—

Date Time

Item	Description	Minimum	Maximum	Default
Get Date & Time	Displays the reader's present clock.	—	—	—
Set Date & Time	Sets the reader's clock. Use [Easy] to set the PC's present clock.	—	—	—
RTC Sync	Sets whether or not to automatically set the built-in RTC at start-up. If the reader is turned off for a long time, the backup battery of the built-in RTC will run out. Then the RTC may malfunction and display the incorrect time and date. The backup battery will be immediately charged when the reader is turned on. Note that the RTC clock is not highly precise.	—	—	Off
GPS Sync Mode	Set GPS time synchronization mode. ■ [Disabled] : No synchronization with GPS time ■ [Full Time] : Synchronization with GPS time at regular intervals ■ [Only Once] : Synchronization with GPS time only once after start-up	—	—	Full Time
GPS Time Offset (UTC)	Sets the offset time from GPS time (UTC time).	—	—	+9:00:00 (JST)
Latest Sync Time	Displays the time of the last GPS synchronization completed. If GPS time synchronization has never been completed, displays [--/--/-- --:--:--].	—	—	—

Advanced

Trigger

Item	Description	Minimum	Maximum	Default
Warning Buzzer	Settings for the trigger abnormality detection buzzer. When the trigger level is at [LvlLl Threshold] or lower, the warning buzzer sounds. **Note that the trigger level needs to have reached the [LvlLl Threshold] value once.**	—	—	On
LvlLl Threshold	Sets the threshold value at which trigger abnormality is detected.	0	200	50
Volume Button Mode	Sets the operation mode for the trigger level adjustment button (Up/Down). ■ [Nomal] : Operation available only when VFD screen shows [Trigger]. ■ [Always]: Operation available regardless of the VFD screen status.	—	—	Normal

Network

Item	Description	Minimum	Maximum	Default
OnConnect Command	Sets whether or not to notify the device ID (connection notice) to the PC. **Be sure to set this command to ON when using [MHCommTCP.dll] or [TagExplorer.NET].**	—	—	On
Rcv Command TMOUT	Sets (in seconds) the time for automatic disconnection of TCP communication when a command is not received. If a communication command (GetLog command, etc.) is not received within the set time, the reader disconnects the communication.	1	3600	20

Display（VFD）

Item	Description	Minimum	Maximum	Default
Initial Page	Sets the VFD screen at start-up. ■　[Main] : Main screen ■　[Tag]: Tag screen ■　[Trigger]: Trigger screen	—	—	Main

Etc

Item	Description	Minimum	Maximum	Default
Load Default Setting	Returns all settings to default values. Then automatically reboots the reader.	—	—	—

- **Click the "Save" button of each item to save the input values.**
- **For items with an asterisk next to the "Save" button, click "Reboot" button in the bottom left and restart the system.**

Spec

Model number	MXRD-RC-2-701
Number of reception input	2
Received frequency	304.2 MHz, 309.9 MHz, 314.26 MHz, received simultaneously
Power supply	DC12V
Current consumption	Maximum 2 A or less
Operating temperature range	-10 degrees Celsius - +50 degrees Celsius
Operating humidity range	10 - 90%Rh (No condensation allowed)
Communication type	USB / Ethernet
External dimensions (W×H×D)	270×174×246（mm） 270.0 174.0 246.0
Weight	approx. 3.5 kg
Accessories	AC adaptor, GPS antenna