

## RFID UNIT2 Setup Manual

This procedure: "RFID UNIT2 Setup Manual" includes the declaration that RFID UNIT complies with the following standards, which are described in the user manuals.

U.S.A:	FCC Rules Part 15 Subpart C
Canada:	ISED Rules RSS-Gen Issue 5 / RSS-210 Issue 10
Europe (EU/UK):	RE Directive (2014/53/EU)
Japan:	ARIB STD-T82

### (A) FCC Rules and ISED Rules

Item (Referenced from KDB 996369 D03)	Verdict
2.1 General	Applicable
2.2 List of applicable FCC rules	Applicable
2.3 Summarize the specific operational use conditions	Applicable
2.4 Limited module procedures	Not Applicable
2.5 Trace antenna designs	Not Applicable
2.6 RF exposure considerations	Applicable
2.7 Antennas	Not Applicable
2.8 Label and compliance information	Applicable
2.9 Information on test modes and additional testing requirements	Not Applicable
2.10 Additional testing, Part 15 Subpart B disclaimer	Applicable
2.11 Note EMI Considerations	Applicable
2.12 How to make changes.	Applicable

### 2.1 General

This user manual describes the integration procedure per Sec. 2.2 to 2.12 of KDB 996369 D03.

### 2.2 List of applicable FCC rules

This device complies with below part 15 of the FCC Rules.  
Part 15 Subpart C

## 2.3 Summarize the specific operational use conditions.

### (1) Installation environment

Avoid installing in the following locations.

- Locations outside the operating specifications of this device.
- Places exposed to direct sunlight.
- A hot and humid place.
- Places with a lot of mechanical vibration.
- Locations where there are devices that generate strong magnetic lines of force or shock voltage.
- Locations where explosive gases are generated or stored.
- Places where there are sudden temperature changes and condensation.
- A place surrounded by metal.
- Places where electrically charged objects come close to antennas or signal terminal connectors.

### (2) Precautions for use

This product is an electronic device consisting mainly of semiconductors.

Please note that depending on the environment and usage conditions, the following problems may occur. Breakdowns and performance deterioration caused by these are not covered by the warranty.

- Element deterioration due to overvoltage and overcurrent.
- Element deterioration due to long-term stress in places with high ambient temperatures.
- Deterioration of insulation or poor contact of connectors due to humidity and dust.
- Poor connector contact and element corrosion due to corrosive gas.
- Corrosion due to chemicals and element deterioration.

## 2.6 RF exposure considerations

To complying with FCC and ISED rules, display the following sentences must be included in a user manual of final product.

- Properly shielded and grounded cables and connectors must be used for connection to host computers and / or peripherals in order to meet FCC emission limits.
- This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.
- FCC CAUTION : Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

(English)

- This device complies with part 15 of the FCC Rules and RSS-Gen of ISED 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, including interference that may cause undesired operation.

(Français)

- L'émetteur est conforme à la partie 15 des règles FCC et RSS-Gen des règles ISED. L'exploitation est soumise aux deux conditions suivantes: (1) L'appareil ne doit pas produire de brouillage et (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

(English)

- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines and RSS-102 of the ISED radio frequency (RF) Exposure rules.

This equipment should be installed and operated keeping the radiator at least 20cm or more away from person's body.

(Français)

- Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour un environnement non contrôlé et respecte les règles d'exposition aux fréquences radioélectriques (RF) CNR-102 de l'ISDE et les directives d'exposition aux radiofréquences (RF) de la FCC.

Cet équipement doit être installé et utilisé en gardant une distance de 20 cm ou plus entre le radiateur et le corps humain.

## 2.8 Label and compliance information

Display the following on the final product.

- Contains Transmitter Module FCC ID: UOE-MR1130MB and IC: 8250A-MR1130MB.

## 2.10 Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant (FCC Part 15 Subpart C), and the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.

The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

## 2.11 Note EMI Considerations

We recommend to use "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties.

The host manufacturer is responsible for ensuring compliance with the applicable FCC rules for the transmitters operating individually and simultaneously. This includes compliance for the summation of all emissions from all outputs occupying the same or overlapping frequency ranges, as defined by the applicable rules.

## 2.12 How to make changes

Only the grantee may make authorized changes.

Please contact us at the address below.

- Website address: <https://www.maxell.co.jp/>
- Grantee Name: Maxell, Ltd.
- Mailing Address: 1 Koizumi, Oyamazaki, Oyamazaki-cho, Otokuni-gun
- City/State: Kyoto
- Zip code: 618-8525
- Country: Japan
- Contact Name: AKIRA MIYAKE
- Telephone Number: +81-75-951-1465
- Fax Number: +81-75-952-5860
- E-mail: a-miyake@maxell.co.jp

(B) RE Directive

We, the manufacturer (Hitachi High-Tech Corp.) hereby declare that this equipment (cobas8000 c702), model c702 unit is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.

(C) ARIB STD-T82

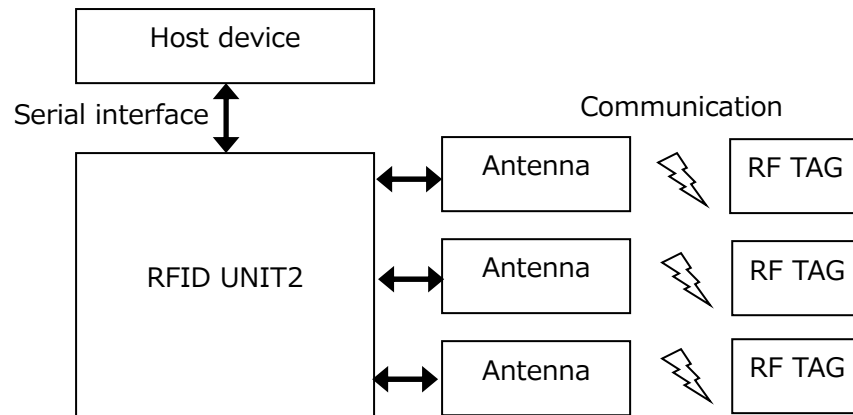
By Japanese radio law, the specific model type has given to R/W modules used in RFID UNIT2.

R/W Module Type: TR3-C202

Specified No.: FC-10002

# == RFID UNIT2 Interface Specification ==

## ◆Schematic block diagram



## ◆Serial interface specification

Item	Specification
Communication method	2-wire half-duplex serial
Synchronization method	Start-stop synchronous type
Communication speed	9600/19200/38400
Data length	8bit
Start bit	1bit
Stop bit	1bit
Parity bit	None
Flow control	None
Byte interval during communication	Communication time between bytes must be within 1 second *If the byte interval is longer than 1 second, it will be treated as a separate packet.

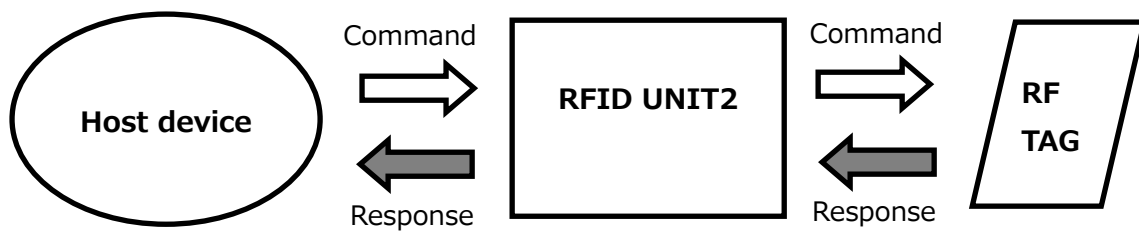
◆ Overview of reader/writer operating modes

ISO15693 compliant RF tag always returns a response to the reader/writer after receiving a command from the reader/writer.

1. Command mode

This mode executes processing according to commands from the host device.

Use this mode when executing ISO15693 related commands.



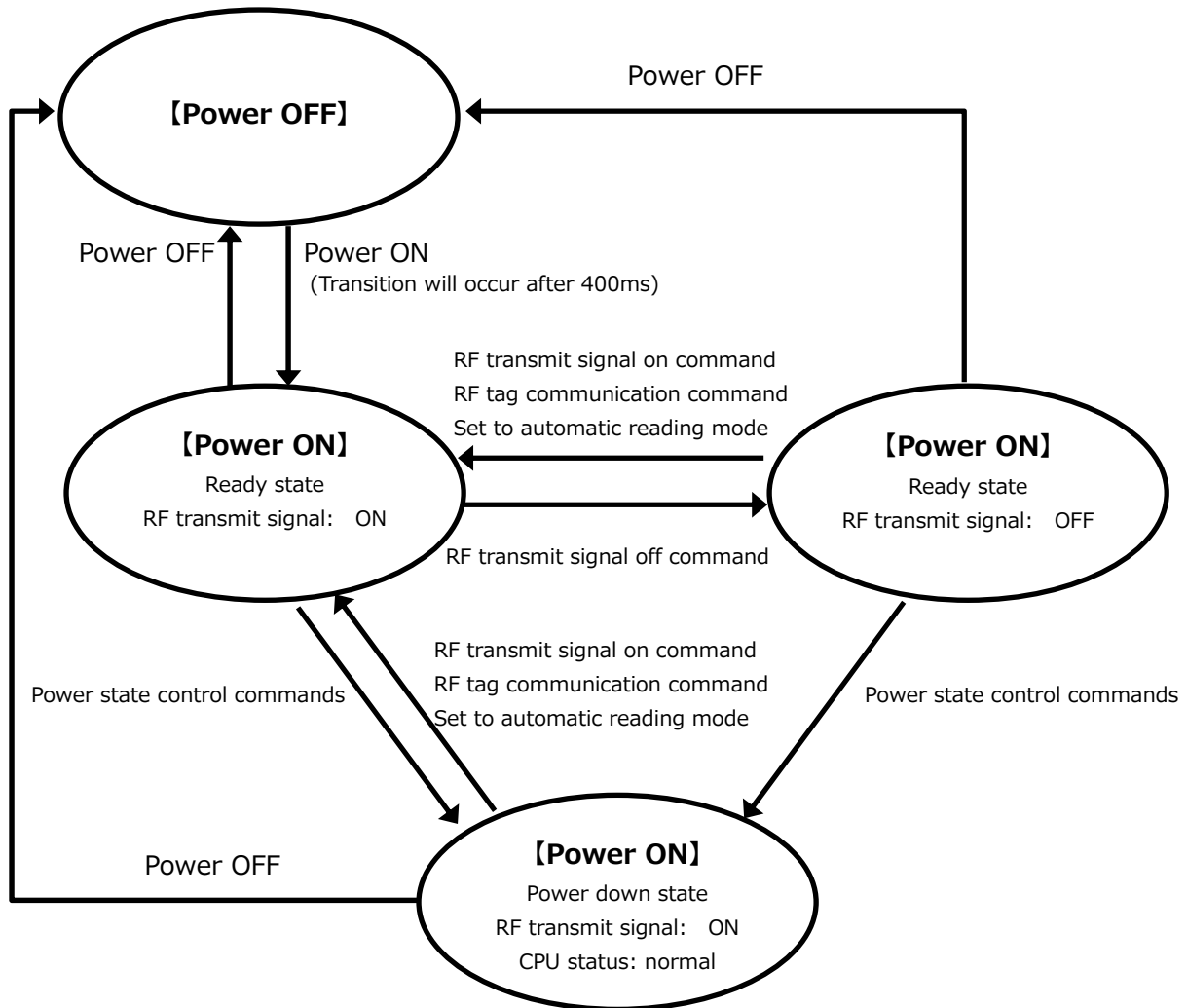
This mode executes processing according to commands sent from the host device.

Used to perform the following operations.

- When executing reader/writer control commands
- When executing the reader/writer setting command
- When executing RF tag communication command

◆Reader/writer state transition

The state transition of a reader/writer whose RF transmission signal setting is set to "ON at startup" is as shown in the figure below.



After the reader/writer is powered on, it starts up in the "ready state: RF transmission signal ON" state. The transition between RF transmission signal ON/OFF is performed using the RF transmission signal control command.

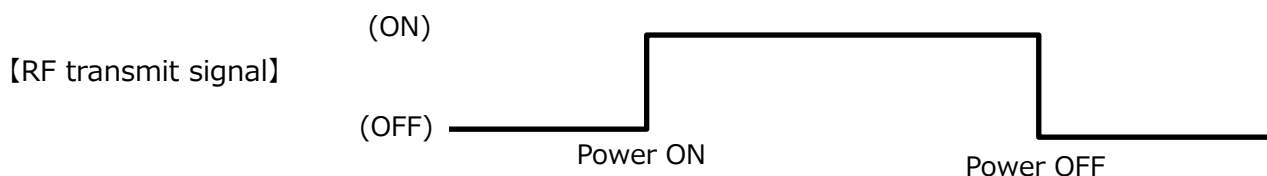
(You can also transition to the RF transmission signal ON state by executing the RF transmission signal ON command or the RF tag communication command.)

By using the power state control command, the reader/writer transitions to the power down state.



◆RF transmit signal settings(ON at startup)

This is a setting to start outputting the RF transmission signal when the reader/writer is powered on.



◆S6700 compatibility mode

By setting RFID NUIT2 to S6700 compatibility mode, it can operate in the same way as the previous model RFID UNIT.

1. Verify processing

RFID UNIT2 performs verification processing when writing data to the RF tag and locking it.

•Verify processing

Performing read processing after writing data and performing lock processing, and confirming that the processing is complete.

•Commands targeted for verification processing

Verification processing is performed only on RF tags for which option\_flag = 0 when performing data writing and lock processing.

Verification processing is performed using the following command.

- ① Write Single Block
- ② Lock Block
- ③ Write AFI
- ④ Write DSFID
- ⑤ Write Bytes
- ⑥ Simple Write

2. NACK response command

RFID UNIT2 is designed to always receive a NACK response when LockAFI or LockDSFID is executed on an RF tag with option\_flag = 0.

3. Retry processing

When using S6700 compatibility mode, it operates with the same specifications as the previous model RFID UNIT.

4. About ISO15693ThroughCmd

ISO15693Throughcmd cannot be used in S6700 compatibility mode.

## ◆Communication format

## 1. Command/response communication format

The communication formats for commands sent from the host device to the reader/writer and responses returned from the reader/writer are as follows.

Label	STX	Address	Command	Data length	Data section	ETX	SUM	CR
Bytes	1	1	1	1	0-255	1	1	1

## 2. Communication format details

Label name	Bytes	Detailed content
STX	1	[02h] Code indicating the beginning of the packet
Address	1	[When sending command] Normally, set "00h". All reader/writers will execute command processing and return a response, regardless of the reader/writer ID.
		[When receiving a response] Normally "00h" is set.
Command	1	See command code list
Data length	1	[00h~FFh] This is the number of bytes of data stored in the "data section label." The length of the entire packet is data length + 7.
Data section	variable	Depends on the command.
ETX	1	[03h] Code indicating the end of the packet
SUM	1	[Sum value from STX to ETX]
CR	1	[0Dh] Line break code

## 3. Data array

Data is sent LSB first (lower byte first).

When reading RF tag data, the lower byte of the lower block is set first.

When writing RF tag data, set the lower byte of the lower block first.

## 4. Command response

The reader/writer returns responses to commands from the host device.

When sending commands consecutively, be sure to send the next command after receiving the response of the previous command.

Note: that some commands do not return a response.

## ◆Command code list

## 1. RF tag communication command

Command name	Command (3rd byte)	Detailed command (5th byte)
ISO15693 command		
Inventory	78h	01h
Stay Quiet		02h
Read Single Block		20h
Write Single Block		21h
Lock Block		22h
Read Multi Block		23h
Write Multi Block		24h
Select Tag		25h
Reset To Ready		26h
Write AFI		27h
Lock AFI		28h
Write DSFID		29h
Lock DSFID		2Ah
Get System Info		2Bh
Get M Block Sec St		2Ch
Takaya original command		
Inventory2	78h	F0H
Read Bytes		A0h
Write Bytes		A1h
Lock Bytes		F6h
RDLOOP Cmd		F2h
Simple Read	52h	-
Simple Write	4Ah	-

== RFID UNIT2 Setup Procedure ==

The following shows the setup procedure for RFID UNIT2.

1. Confirm that the model and the type of RFID UNIT2 are correct.

To setup "RFID UNIT2", attach the ferrite core 20cm from Antenna with 3 turns.

2. Attach the mold and the packing to the reader's antenna. Then, fix the reader's antenna to the holding plate.

3. Fix the RFID UNIT2 to c702 using M4 screws.

4. Hold power line and serial line with clamps. Then, connect P13 connector to J13 connector of 232DIST2 circuit board on c702.

5. Hold the reader's antenna cable with clamps. Then, fix the reader's antenna assembly to c702 (1ch) using M3 screws.

6. Similar to the step 5 above, fix the reader's antenna assembly to c702 (2ch and 3ch) using M3 screws.

7. Attach all covers to c702.

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