

# Smart-Reader Module Specification

## 1. About the Smart-Reader

### 1.1. Equipment name and model name

Model Number : Smart-Reader

### 1.2. Module specifications

#### ■ Specifications

| Specifications       | Item                                                                                                                                                                      | Parameter                                                                                                                                                                                                                                               |           |                   |                        |                   |          |           |       |          |                   |           |  |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------|------------------------|-------------------|----------|-----------|-------|----------|-------------------|-----------|--|
| Applicable Standards | Japan Radio Law                                                                                                                                                           | ARIB STD-T82                                                                                                                                                                                                                                            |           |                   |                        |                   |          |           |       |          |                   |           |  |
|                      | RoHS                                                                                                                                                                      | EU RoHS(2002/95/EC) Supports                                                                                                                                                                                                                            |           |                   |                        |                   |          |           |       |          |                   |           |  |
| Radio Frequency      | Carrier frequency                                                                                                                                                         | 13.56MHz $\pm$ 50ppm(Ta=25℃) or less                                                                                                                                                                                                                    |           |                   |                        |                   |          |           |       |          |                   |           |  |
|                      | Transmit power or power range                                                                                                                                             | 10~100mW $\pm$ 20%(Ta=25℃, VCC=5.0V)                                                                                                                                                                                                                    |           |                   |                        |                   |          |           |       |          |                   |           |  |
|                      | Standards                                                                                                                                                                 | ISO/IEC 15693、ISO/IEC18000-3(Model1)                                                                                                                                                                                                                    |           |                   |                        |                   |          |           |       |          |                   |           |  |
|                      | Tags                                                                                                                                                                      | Tag-it HF-I, my-d, I-CODE SLI, MB89R118(※1)                                                                                                                                                                                                             |           |                   |                        |                   |          |           |       |          |                   |           |  |
|                      | Data rate                                                                                                                                                                 | <table><tr><th></th><th>Speed</th><th>Data rate</th></tr><tr><td rowspan="2">Reader/Writer⇒Tag</td><td>1/4</td><td>26.48kbps</td></tr><tr><td>1/256</td><td>1.65kbps</td></tr><tr><td>Tag⇒Reader/Writer</td><td colspan="2">26.69kbps</td></tr></table> |           | Speed             | Data rate              | Reader/Writer⇒Tag | 1/4      | 26.48kbps | 1/256 | 1.65kbps | Tag⇒Reader/Writer | 26.69kbps |  |
|                      |                                                                                                                                                                           | Speed                                                                                                                                                                                                                                                   | Data rate |                   |                        |                   |          |           |       |          |                   |           |  |
| Reader/Writer⇒Tag    | 1/4                                                                                                                                                                       | 26.48kbps                                                                                                                                                                                                                                               |           |                   |                        |                   |          |           |       |          |                   |           |  |
|                      | 1/256                                                                                                                                                                     | 1.65kbps                                                                                                                                                                                                                                                |           |                   |                        |                   |          |           |       |          |                   |           |  |
| Tag⇒Reader/Writer    | 26.69kbps                                                                                                                                                                 |                                                                                                                                                                                                                                                         |           |                   |                        |                   |          |           |       |          |                   |           |  |
| Modulation           | <table><tr><th></th><th>Parameter</th></tr><tr><td>Reader/Writer⇒Tag</td><td>ASK 10%(※2) / ASK 100%</td></tr><tr><td>Tag⇒Reader/Writer</td><td>ASK, FSK</td></tr></table> |                                                                                                                                                                                                                                                         | Parameter | Reader/Writer⇒Tag | ASK 10%(※2) / ASK 100% | Tag⇒Reader/Writer | ASK, FSK |           |       |          |                   |           |  |
|                      | Parameter                                                                                                                                                                 |                                                                                                                                                                                                                                                         |           |                   |                        |                   |          |           |       |          |                   |           |  |
| Reader/Writer⇒Tag    | ASK 10%(※2) / ASK 100%                                                                                                                                                    |                                                                                                                                                                                                                                                         |           |                   |                        |                   |          |           |       |          |                   |           |  |
| Tag⇒Reader/Writer    | ASK, FSK                                                                                                                                                                  |                                                                                                                                                                                                                                                         |           |                   |                        |                   |          |           |       |          |                   |           |  |
| Anti-collision       | Support                                                                                                                                                                   |                                                                                                                                                                                                                                                         |           |                   |                        |                   |          |           |       |          |                   |           |  |

※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.

MB89R118 is a registered trademark of FUJITSU Japan.

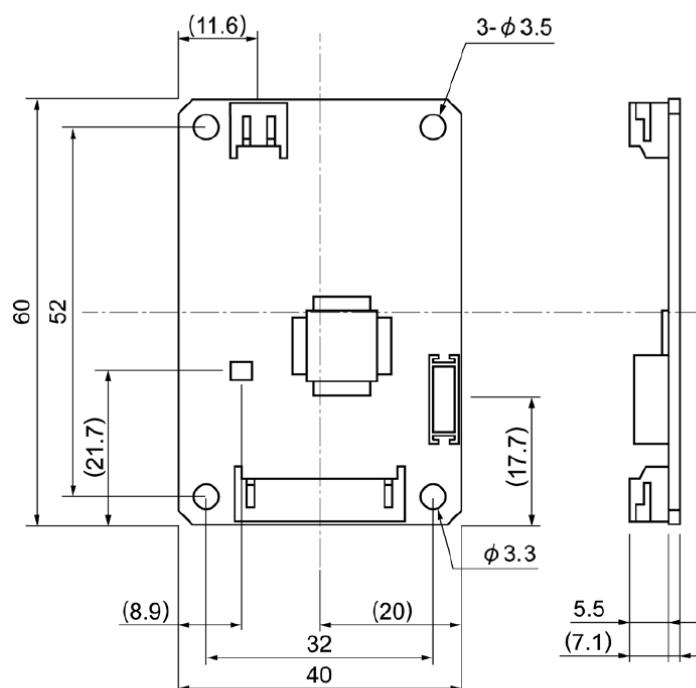
※2 : initialization

| Specifications | Item           | Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
|----------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|----------|---------|--------------|---------------|-----------|-----|--------|------|----------|-----|--------------|------|-----|---|----|----------------------|---|----|-------------------------|---|------|--------------|---|-----|----------------------------------------------------------|---|-----|-------------------------------------------------|----|-----|--------------|
| Control        | Command        | Please refer to the TR3-Protocol-Manual.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
|                | Host Interface | UART(CMOS) <table><tr><th>Item</th><th>Parameter</th></tr><tr><td rowspan="3">Speed</td><td>9600bps</td></tr><tr><td>19200bps(※2)</td></tr><tr><td>38400bps</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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Item     | Parameter | Speed    | 9600bps | 19200bps(※2) | 38400bps      | Data bits | 8   | Parity | None | Stop bit | 1   | Flow control | None |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| Item           | Parameter      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| Speed          | 9600bps        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
|                | 19200bps(※2)   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
|                | 38400bps       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| Data bits      | 8              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| Parity         | None           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| Stop bit       | 1              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| Flow control   | None           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
|                | LED1           | 1pc (3 colors, red/green/orange)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| Connector      | CN1            | Connector : JST S10B-PH-SM4-TB(LF)(SN)<br>Housing : JST PHR-10<br>Contact : JST SPH-002T-P0.5S<br><br>Pin assignment <table><tr><th>Pin No.</th><th>Symbol</th><th>Function</th></tr><tr><td>1</td><td>VCC</td><td>Power</td></tr><tr><td>2</td><td>VCC</td><td>Power</td></tr><tr><td>3</td><td>GND</td><td>GND</td></tr><tr><td>4</td><td>GND</td><td>GND</td></tr><tr><td>5</td><td>Rx</td><td>Received data signal</td></tr><tr><td>6</td><td>Tx</td><td>Transmitted data signal</td></tr><tr><td>7</td><td>VCC2</td><td>Power output</td></tr><tr><td>8</td><td>IO1</td><td>Input/Output or Detection signal<br/>output H : Detection</td></tr><tr><td>9</td><td>IO2</td><td>Input/Output or Trigger input<br/>L : Trigger ON</td></tr><tr><td>10</td><td>IO3</td><td>Input/Output</td></tr></table> | Pin No.  | Symbol    | Function | 1       | VCC          | Power         | 2         | VCC | Power  | 3    | GND      | GND | 4            | GND  | GND | 5 | Rx | Received data signal | 6 | Tx | Transmitted data signal | 7 | VCC2 | Power output | 8 | IO1 | Input/Output or Detection signal<br>output H : Detection | 9 | IO2 | Input/Output or Trigger input<br>L : Trigger ON | 10 | IO3 | Input/Output |
|                | Pin No.        | Symbol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Function |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| 1              | VCC            | Power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| 2              | VCC            | Power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| 3              | GND            | GND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| 4              | GND            | GND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| 5              | Rx             | Received data signal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| 6              | Tx             | Transmitted data signal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| 7              | VCC2           | Power output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| 8              | IO1            | Input/Output or Detection signal<br>output H : Detection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| 9              | IO2            | Input/Output or Trigger input<br>L : Trigger ON                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| 10             | IO3            | Input/Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
|                | CN2            | Connector : JST S2B-PH-SM4-TB(LF)(SN)<br>Housing : JST PHR-2<br>Contact : JST SPH-002T-P0.5S<br><br>Pin assignment <table><tr><th>Pin No.</th><th>Symbol</th><th>Function</th></tr><tr><td>1</td><td>RF</td><td>Analog signal</td></tr><tr><td>2</td><td>GND</td><td>GND</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Pin No.  | Symbol    | Function | 1       | RF           | Analog signal | 2         | GND | GND    |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| Pin No.        | Symbol         | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| 1              | RF             | Analog signal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |
| 2              | GND            | GND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |          |           |          |         |              |               |           |     |        |      |          |     |              |      |     |   |    |                      |   |    |                         |   |      |              |   |     |                                                          |   |     |                                                 |    |     |              |

※2 : initialization

| Specifications     | Item                        | Parameter                                   |
|--------------------|-----------------------------|---------------------------------------------|
| Mechanical data    | Dimensions (W x D x H)      | 40 x 60 x 7.1mm                             |
|                    | Weight                      | approx. 12g                                 |
|                    | Installation                | M3 Screw<br>Screw is not included.          |
| Electrical data    | Power                       | Supply Voltage : DC+3.3V~+5.0V ±10%         |
|                    |                             | Current consumption : approx. 120mA (at 5V) |
|                    |                             | Carrier off : approx. 20mA (at 5V)          |
|                    |                             | Power down mode : approx. 10mA (at 5V)      |
|                    |                             | Consumption : max 1.0W (at 5V)              |
| Ambient Conditions | Temperature Operating range | 0 to 55 degree                              |
|                    | Humidity Operating range    | 30 to 80%RH                                 |
|                    | Temperature Storage range   | 0 to 55 degree                              |
|                    | Humidity Storage range      | 30 to 80%RH                                 |
| Other              | Accessories                 | None                                        |

■ Dimensions



Unit : mm  
Tolerance : ±1mm  
( ) is Recommended Dimension  
Screw hole depth : 3mm

## ■ Connections

| Names           | Model              | Notes                                                         |
|-----------------|--------------------|---------------------------------------------------------------|
| Antenna         | TR3-CA038          | 1ch                                                           |
|                 | TR3-CA038(16)      | 16ch                                                          |
| Cable           | CB-2A26-***-PH-GH  | *** puts the cable length.<br>9cm ~ 50cm cable are available. |
|                 | RFID Coaxial Cable | 10cm ~ 2000cm cable are available.                            |
| Interface board | TR3-IF-U1A         | USB interface                                                 |

## ■ Electrical Characteristics(CN1)

VDD=5V

| Item             | Condition      | MIN  | TYP  | MAX   | Unit |
|------------------|----------------|------|------|-------|------|
| H input voltage  | RX,IO1,IO2,IO3 | 2.5  |      | 5.0   | V    |
| L input voltage  | RX,IO1,IO2,IO3 | 0    |      | 1.0   | V    |
| H output voltage | IOH=-5mA,-20mA | 3.0  |      |       | V    |
| L output voltage | IOL=5mA,20mA   |      |      | 2.0   | V    |
| Pull-up resistor |                | 25.0 | 50.0 | 100.0 | kΩ   |

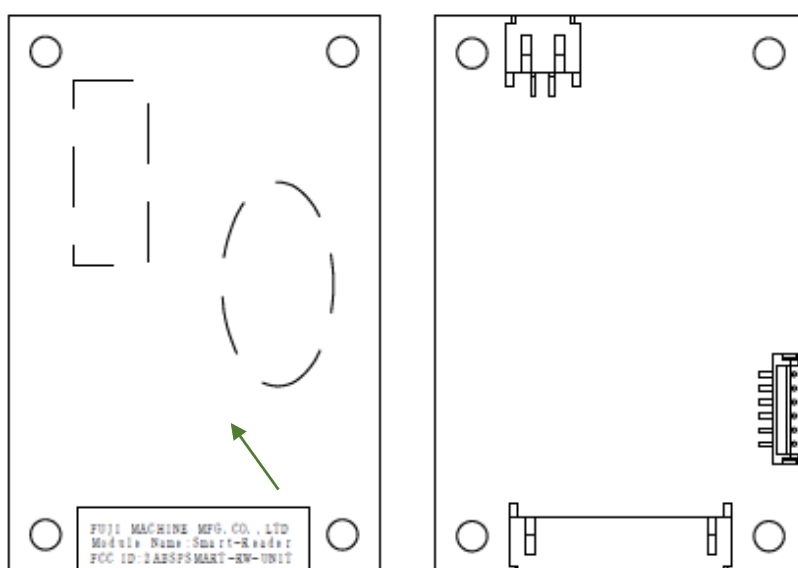
- TX, RX, IO1, IO2 and IO3 is, Pull-up resistor has been connected.
  - TX, RX, IO1, IO2 and IO3 is, 100 ohm resistor has been connected.
- Output port, LED is not driven. If the LED drive, please use the digital transistors.

## 1.3. Label drawing & Label Location Diagram

### Label drawing

|                                                                                       |
|---------------------------------------------------------------------------------------|
| FUJI MACHINE MFG. CO., LTD<br>Module Name: Smart-Reader<br>FCC ID: 2ABSPSMART-RW-UNIT |
|---------------------------------------------------------------------------------------|

### Label Location Diagram



(Back Side)

(Front Side)

LABEL