

# **Manual**

## *Personal Reader/Writer*

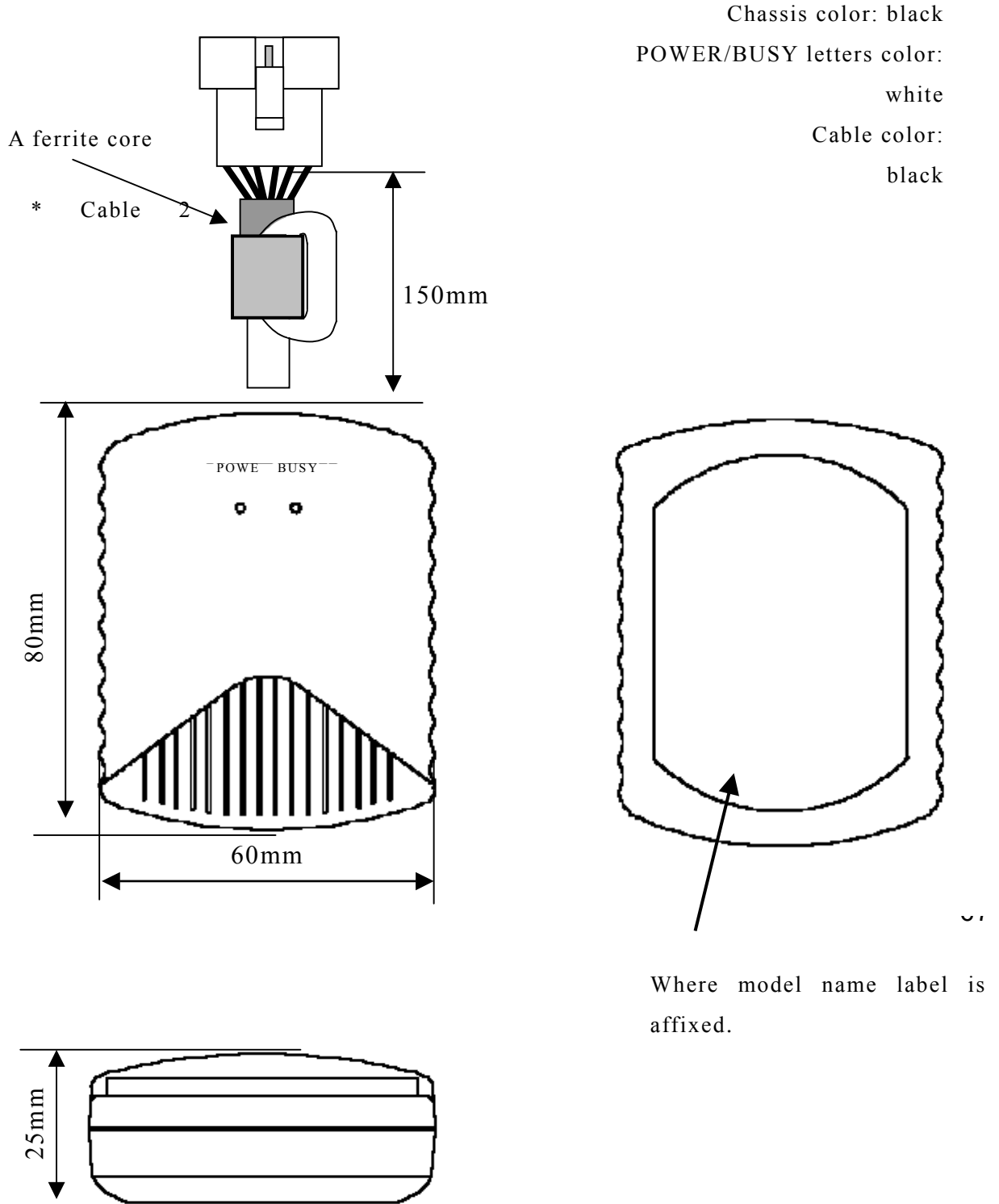
ME-PM01-RA-SG(BK)

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### **Notice**

### 1. External Appearance

The product's external appearance and principle dimensions are shown below.



Personal Reader / Writer (ME-PM01-RA-SG(BK)) with ferrite core must be used for RF interference suppression.

## 2. Application

These specifications apply to the ME-PM01-RA-SG (BK) reader/writer for RFID (radio frequency identification) delivered by Maxell Seiki, Ltd. (hereinafter referred to as “Maxell”) to the SEGA Corporation (hereinafter referred to as “Sega”) via Kaga Devices Co., Ltd.

## 3. Product Outline

This product is a reader/writer that reads and writes the contents of the ME-Y1001\*\* (special-purpose token), a card mounted with RFID chip made by Maxell. It is connected to and used with devices prepared by Sega.

Using a host connection cable (with 7pin SM connector attached), this product is connected to a host control board (hereinafter “host”) manufactured by Sega. Requisite data processing takes place through radio communications with a card-mounted RFID chip.

## 4. Specifications

4.1 Rated voltage	DC 5V±0.25V (Ripple voltage 100mVpp or less)
4.2 Rated consumption current	500mA maximum
4.3 Host I/F	UART 18.75kbps
4.4 Host connector	SM-7pin connector (SMR-07V-N made by J.S.T. Mfg Co., Ltd.)
4.5 External dimensions	60mm (W) x 80mm (D) x 25mm (H) Host cable approx. 150mm
4.6 Weight	Approx. 150g
4.7 Applicable media	ME- Y1001** (Special-purpose token)

## 5. Ambient Conditions

### 5.1 Application ambient

- (1) Ambient temperature 0~50°C
- (2) Relative humidity 20~80% (However, no condensation)

### 5.2 Storage temperature

- (1) Ambient temperature -10~60°C
- (2) Relative humidity 20~80% (However, no condensation)

\* This module must not be soaked in water, oil or other fluid at Sega.

## 6. Performance

### 6.1 Operational performance

No	Item	Standard
6.1.1	Operational power supply voltage	5±0.25V (ripple voltage 100mVpp or less)
6.1.2	Consumption current	Maximum 500mA (carrier output status)
6.1.3	Antenna output frequency (carrier wave)	13.56MHz ±20ppm. or less
6.1.4	Data rate	26.48kbps (Reader/Writer Module ↔ RFID chip)
6.1.5	Host side communications format Communication speed Synchronization Start bit Data count Stop bit Parity	UART half duplex 18.75kbps Asynchronous 1 bit 8 bit 1 bit 1 bit/even number
6.1.6	Reception circuit parameter setting	Resister settings by command <ul style="list-style-type: none"> <li>▪ Slice level setting 4 stage</li> <li>▪ Amp gain setting 16 stage</li> </ul> (For details, see the communications IC data sheet.)

#### <Automatic adjustment of reception amp gain>

At the development evaluation stage, determine the gain setting for minimum error in communications and set this gain as the default value. If there has been an error in communications and communications still cannot be established even after retrying, run software so that the value set for gain is raised or lowered automatically.

It is recommended that the value be raised or lowered from the default value in consideration of the operational environment (power supply voltage, ambient temperature), disparities in communication distances, and disparities in communication performance on the tag side.

(Example)

Default “2A” → 2C → 28 → 2E → 26 → 2B → 29 → 2D → 27 → 2F

→ return to default value)

(Multiple retries take place for each gain.)

## 6.2 Environmental performance

There must be normal operation under the environmental conditions of use given in Section 5.

The rate at which carrier output is on must be **50% or below**.

## 6.3 Safety

No	Item	Standard
6.3.1	The Radio Law	For equipment operating on faint radio waves.
6.3.2	EMC	
6.3.3	Over-current protection	Establish over-current protection against abnormal current in the power supply unit as provided by Sega. (Standard range is 1.5A to 2A.)

\* When assembling the chassis, heat can be generated due to accidental shorts between module components, so ensure that heat will not be transmitted to other components.

## 7. Materials

The materials used are listed below.

Component name	Material (Maker's name)
Main base plate	FR-4 UL 94V-0
Antenna base plate	FR-4 UL 94V-0
Interface cable	Cable: UL1007 AWG28x7 / UL20276 AWG28x7 SM-7pin connector (SMR-07V-N made by J.S.T. Mfg. Co., Ltd.)
Chassis	ABS, NH-0825,94V-2 made by CHEIL INDUSTRIES INC

**●FCC WARNING**

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

**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.

Personal Reader / Writer (ME-PM01-RA-SG(BK)) with ferrite core must be used for RF interference suppression.

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

This class [B] digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe[B] est conforme a la norme NMB-003 du Canada.