NFC Reader/Writer

Product Specification

Ver1.00

Model:TM20-B/QQ

GL Solutions

Automatic Recognition Business Division

JUNE 2020

Technology Headquarters		
Approved by	Checked by	Prepared by

Request

The contents of this document are subject to future changes.

We have made eery effort to ensure the contents of this document . However, please contact us if you find any unclear points, errors or omissions. Please contact us by the fax number shown elow.

Please note that we should not be held liable for results from your operating the product.

FAX:+81-3(3862)5255

Change historiy

Section	Date	Ver.	Change description
1	JUN 28,2020	1.00	Prepared the first edition.

Contents

1. Overview

The NFC Reader/Writer “TM20-B/QQ”(hereinafer called “this equipment” or “Reader/Writer”) is a reader/writer to read the serial number(alled “tag ID” unless otherwise specified) of an ISO15693 tag or card (called “tag”) and read and write data in the tag.

・Extaernal control equipment such as a PC can control this equipment via RS-232C.
・It is reader/writer to read and write data in a tag within the access area of the antenna built into this equipment.

Features of thes equipment include

・Compact and lightweigh, equipment-integrated (antenna- integrated) type.
・Compactible with IcodeSLIX tags.
・The power supply voltage is DC5V±10% input.
・Connected to an external control device by serial communication (RS-232C).
・Lead free ad RoHS Directivecompliant.

For details of the communication specifications between tis equipment and an exernal control device, please refer to the “NFC Reader/Writer Communication Specification.

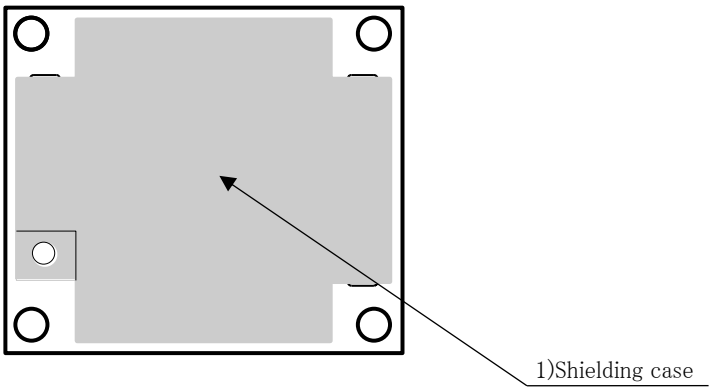
2. General Specifications

Item	Specification	Unit
Rated input voltage	DC5V±10%	V
Power supply noise	13.56MHz for sinusoidal components, not containing the harmonic components	-
Maximum consumption current	250(RF ON)	mA
Average consumption current (reference value)	50(RF OFF)	mA
Operationg frequency	13.56	MHz
Modulation method	ASK	-
Access distance(Note1)	25	mm
Operating temperature ange	0 - 50	℃
Operating humidity range	30 - 85 (Non-condensing)	%RH
Storage temperature range	-20 - 75 (Non-condensing)	℃
Storage humidity range	5 - 95 (Non-condensing)	%RH
Outside dimensions	40(W)x35(D)x13(H)	mm
Interface	RS-232C	-
Communication speed	9600	bps
Connection connector	For external control device:S4B-EH	-

[note]
Measurement is performed using the ICODE SLIX tag in an environment of normal temperature and bumidiy.
For an electromagnetic field near 13.56MHz, the distance is redusec if the nise increases.

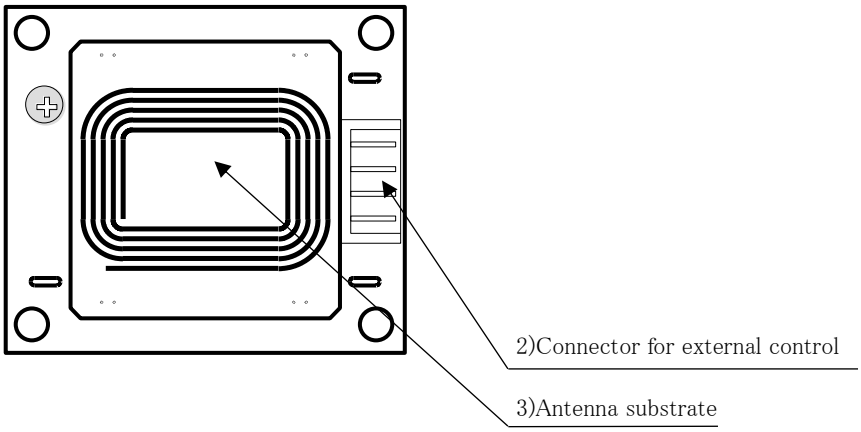
3. Names and functions of each part

3.1. Front Side



1)Shielding case
Covers to protect an electronic circuit

3.2. Back Side

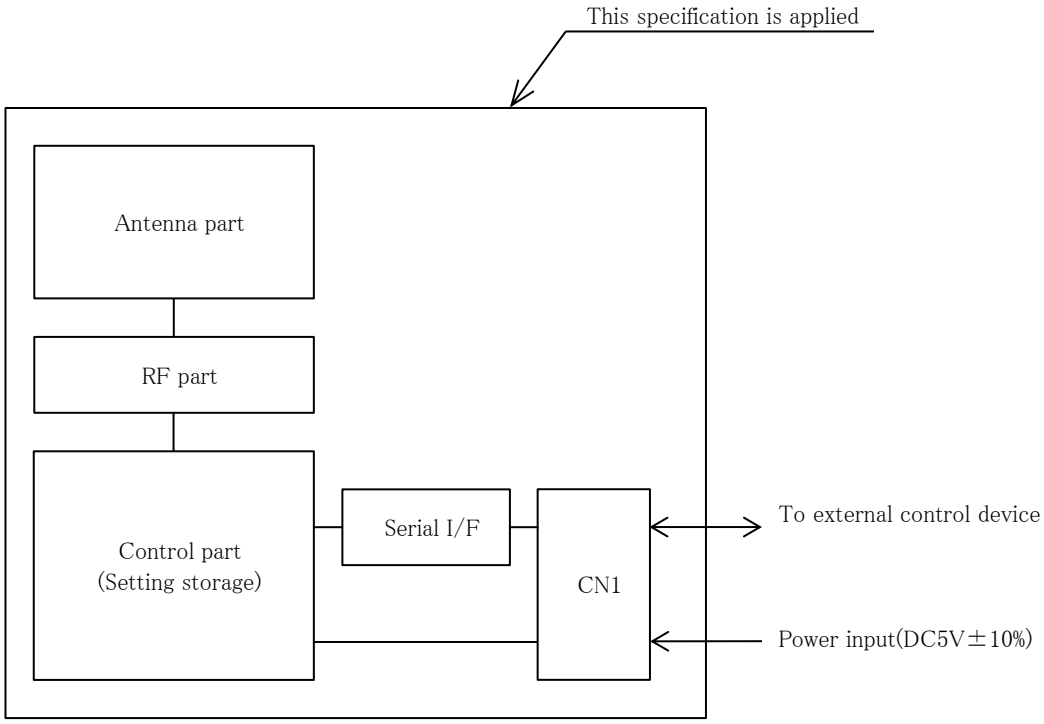


2)Connector for external control device
Connector to connect an external control device

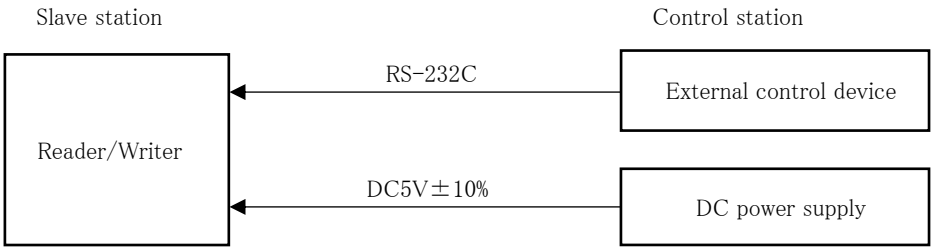
3)Antenna substrate
Antenna part to communicate with a tag
Do not touch it with bare hands

4. Functional descriptions

4.1. Configuration diagram



5. Connection with external control device



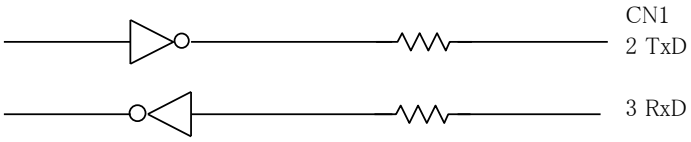
5.1. Connector(CN1) to connect external control device

1)Connection with external control device
CN1 use connector;S4B-EH(manufactured by JST)

Terminal No.	Signal name	I/O	Function
1	VCC	-	Power
2	TxD	O	Transmitted data from Reader/Writer
3	RxD	I	Received data from Reader/Writer
4	GND	-	Ground

5.2. I/O Interface

1)RS-232C



Max232 equivalent

6. Handling precautions

When using the Reader/Writer and a card, please note the precautions shown below. Make sure to follow them since misuse may cause an abnormal operation, leading to a product failure.

Please note that we shall not be held liable for any incidental damage that occurs to the recorded contents of the Reader/Writer due to its failure, malfunction or defect.

Before use

Please describe the follon items in the Instruction Manual or Delivery Specification, etc., for the deviCe with this Reader/Writer built in:

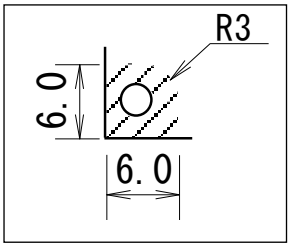
1) This device includes the communication equipment which uses a radio fiequency of 13.56. MHz, 3 generally available ISM bandwidth. Therefore, interference may occur depending on the use application or place. In order to reduce the effect due to this interference, it is requested to mutually perform an advanced check before introducing this device.
   Please pay special attention to use in such an environment since it may affect radio astronomy or a medical device.
2) Persons with an implanted medical device should keep the device's fitting portion more than 22 cm away fi'om the antenna portion of the RFID equipmmt.

Mounting on enclosure

When mounting a substrate on the enclosure, please follow the dimensions shown below.

Metal is available only in the shaded area around the mounting hole.

(Using a metal screw may shorten the access distance to a card. Therefore, use a metal screw afler verification.)



Square mounting hole

Model specifications

This Reader/Writer is specified regarding the model of the guided read/write communication equipment.

Accordingly, please describe as such in the Instruction Manual or Delivery Specification, etc., for the device with this Reader/Writer built in. The model specified number is indicated by a seal on the shielding case of this Reader/Writer.

JAISA indication

Aflix a JAlSA (Japan Automatic Identification Systems Association) indication sticker to a location RFI D which is clearly identified from the exterior portion of the equipment body including this Reader/Writer in order to demonstrate the product for persons fitted with an implanted medical device.

Persons fitted with a medical device should keep the device's fitting portion more than 22cm away

This equipment is RFID (radio fiequency identification) equipment which uses radio waves Therefore, It may afi'ect a medical device depending on the use application or place. In order to minimize the efi'cct', please observe the following during operation:

Persons fitted with an implanted medical device should keep the fitting portion more than 22 cm away from the antenna portion of this equipment.

Carefully perform such operation as changing attribution or key of card

The card must securely stay in the Reader/Writer detection area while the card attribute or key IS being changed. Should this special data area be destroyed due to insufiicient power supply, access to this card will not be available.

Keep a metal body away from a card and Reader/Writer

The Reader/Writer supplies power to a card by electromagnetic waves to communicate with it. Ifthere is a metal body near a card or on the antenna portion of the Reader/Writer, electromagnetic waves will he cut off or absorbed Therefore, conununicatic'm with the card or. sufficient power supply may become difficult to perform. As a result, the access area will be reduwd or the eqmpm'ent will fall mto an inaccessible state.

When operating the Reader/Writer, keep a metal body away from the antenna portion of the Reader/Writer: (The circuit board IS equivalent to a metal body. Be carefiil when mounting positions of the antenna portion and another substrate)

Do not use Reader/Writer in a place where strong electromagnetic waves are produced

The Reader/Writer supplies power to a card by electromagnetic waves to communicate with the card. Therefore, the access area may be reduced or the equipment may fall into an inaccessible state due to difficult communication between the Reader/Writer and a card if there are strong electromagnetic waves (especially near 106 kHz, 847 kHz, or 13.56 MHz) near the Reader/Writer or a card.

Keep precision electronic equipment affected by electromagnetic waves away

Electromagnetic waves (near 13.56 MHz) are always output fiom the Reader/Writer: Therefore, bringing precision electronic equipment afl'ected by electromagnetic waves close to the Reader/Writer may cause the malfirnction or failure of the equipment. When operating the Reader/Writer, keep such precision electronic equipment away-from it.Should you need to bring precision electronic equipment close to the Reader/Writer, take countermeasures s'ixch as by shielding the precision electronic equipment wifl1 a metal body. In addition, make sure to commit a test to verify that there is no eflect.

Installation of multiple Readers/Writers at close range

The Reader/Writer supplies power to a card by electromagnetic waves to communicate with the card. Therefore, electromagnetic waves (near 13.56 MHz) are always output from the Reader/Writer. Therefore, installing multiple Readers/Writers at close range causes mutual interference, making communication between the card and each Reader/Writer unavailable. ' , _' When installing them at close range, check the presence or absence of interference before operating them.

Do not attempt to access multiple cards at the same time.

This Reader/Writer is manufactured on the precondition that there are no multiple cards in the access area of the Reader/Writer at the same time. If you attempt to accees multiple cards at the same time, normal access may not be made or card detectiOn may become unavailable, although this depends on the relative positions of the Reader/Writer and'mnltiple cards.

Prevent touching with bare hand

The Reader/Writer has areas which produce high voltage during its operation. Therefore, design the structure does not easily allow touching with bare hands or foreign objects, etc. This may ease electric shocks. Make sure to follow this instruction since failure to do so may cause a product failure. Please note that we shall not be held liable for any incidental damage caused by a failure, malfimction, or defect of the Readen'Writer.

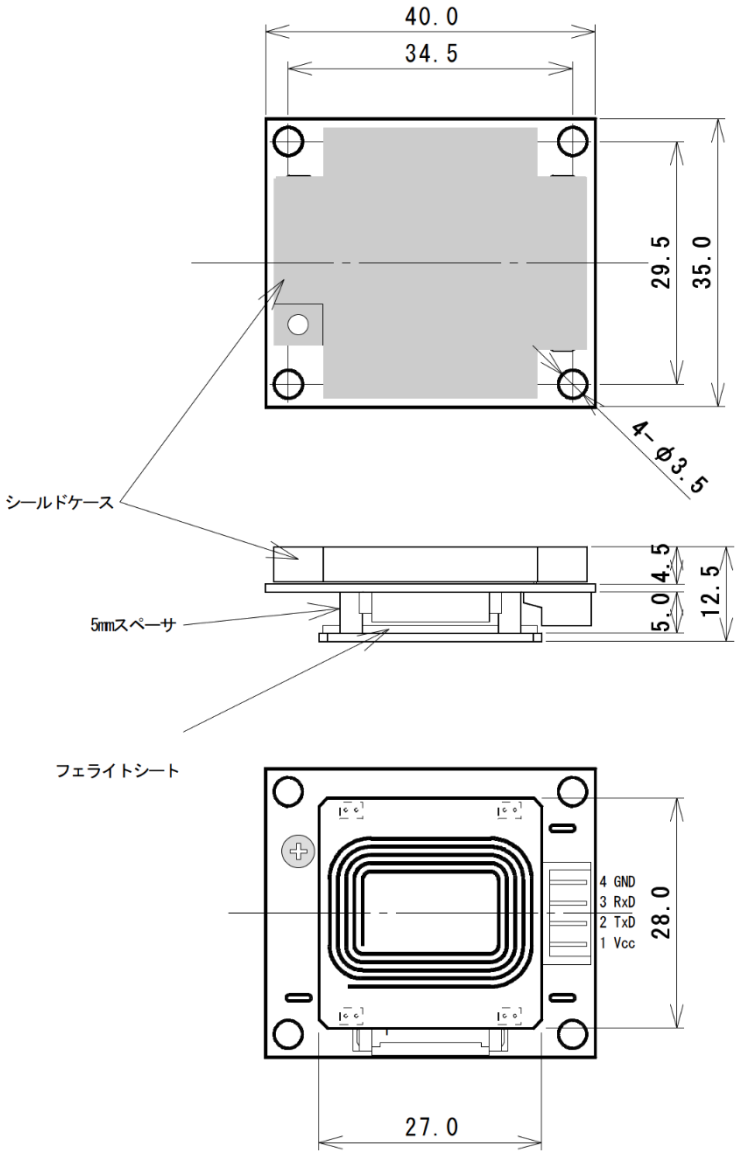
Do not push the body strongly

Do not pdsh the body of the Reader/Writer strongly since it may have an adverse efi'ect on mounted electronic parts. Malfimctions or breakage of the Reader/Writer may occur.

Other

1) Use the Reader/Wfiter m a place without the possibility of any organic solvent, oil, water, etc, splashing.
2) Use the Reader/Writer m a place without corrosive gas, poisonous gas, or flammable gas.
3) Do not use any consumables other than specified ones.
4) Do not give an external impact such as dropping. Breaking may occur.
5) Use the Reader/Writer in a place not exposed to direct sunlight.

12.External appearance



制御基板厚さ：1.2mm
ｱﾝﾃﾅ基板厚さ：1.2mm

単位：mm

NCC Notice

根據 NCC 低功率電波輻射性電機管理辦法規定：
第十二條　經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。
第十四條　低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。
此模組於取得認證後將依規定於模組本體標示審驗合格標籤， 並要求平台廠商於平台上標示『本產品內含發射器模組：CCXXxxLPyyyZzW』字樣。

FCC & ISED Notice

Required End Product Labeling

Any device incorporating this module must include an external, visible, permanent marking or label which states: “Contains FCC ID: VQ7TM20-B-QQ” and “Contains IC : 10795A-TM20BQQ”

Obligation d'étiquetage du produit final:

Tout dispositif intégrant ce module doit comporter un externe, visible, marquage permanent ou une étiquette qui dit: "Contient　IC : 10795A-TM20BQQ”

Additional testing, Part 15 Subpart B disclaimer

The TM20-B/QQ modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that 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.

FCC

This module has been tested and found to comply with the following requirements for Modular Approval.

- Part 15.225 - Operation within the bands 13.110-14.010 MHz.
- Part 2.1046 – Measurements required: RF power output

Test Modes

GL Solutions Inc. uses various test mode programs for test set up which operate

separate from production firmware. Host integrators should contact GL Solutions Inc. for assistance with test modes needed for module/host compliance test requirements.

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warming as shown in User manual.

In the end product, the antenna(s) used with this transmitter must not be co-located or operation in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures. User and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying the RF exposure compliance.

Federal Communications Commission (FCC) Statement

15.21

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC 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 of the device.

FCC RF Radiation Exposure Statement:

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. For body worn operation, this device has been tested and meets FCC RF exposure guidelines. When used with an accessory that contains metal may not ensure compliance with FCC RF exposure guidelines.

ISED

Canadian Notice

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. *This device may not cause interference.*
2. *This device must accept any interference, including interference that may cause undesired operation of the device.*

Avis Canadien

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. *L'appareil ne doit pas produire de brouillage;*
2. *L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

ISED RF Radiation Exposure Statement:

1. To comply with the Canadian RF exposure compliance requirements, this device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.
2. For body worn operation, this phone has been tested and meets RF exposure guidelines when used with an accessory that contains no metal. Use of other accessories may not ensure compliance with RF exposure guidelines.

Déclaration de l'exposition aux radiations RF:

1. Pour se conformer aux exigences de conformité RF canadienne l'exposition, cet appareil et son antenne ne doivent pas être co-localisés ou fonctionnant en conjonction avec une autre antenne ou transmetteur.
2. Pour le fonctionnement du corps, ce téléphone a été testé et répond aux directives d'exposition RF lorsqu'il est utilisé avec un accessoire qui ne contient pas de métal. Utilisation d'autres accessoires peut ne pas assurer le respect des directives d'exposition RF.

7. CE Notice

Hereby, GL Solutions Inc. declares that the radio equipment type NFC Reader/Writer Module is in compliance with Directive 2014/53/EU

The full text of the EU declaration of conformity is available at the following internet address: http://www.glsol.co.jp/

Radio Type / Description	Transmitter Frequency (MHz)	Maximum Output Power
NFC	13.56	62.7dBuV/m @3m