RFID SYSTEM

V680 Series
User's Manual

FL Remote ID

V680-HAM42-FRT

Antenna

V680-HS63-SP

ID Tag

V680-D1KP66T-SP

Introduction

Thank you for purchasing a V680-series RFID System. This manual describes the functions, performance, and application methods needed for optimum use of the V680-series RFID System.
Please observe the following items when using the RFID System.

• Allow the RFID System to be installed and operated only by qualified specialist with a sufficient knowledge of electrical systems.

• Read and understand this manual before attempting to use the RFID System and use the RFID System correctly.

• Keep this manual in a safe and accessible location so that it is available for reference when required.

Warranty, Limitations of Liability

< WARRANTY >

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

< LIMITATIONS OF LIABILITY >

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

Application Considerations

< SUITABILITY FOR USE >

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of the products in the customer's application or use of the products.

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this manual.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

< PROGRAMMABLE PRODUCTS >

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

Disclaimers
< PERFORMANCE DATA > Performance data given in this manual is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.
< CHANGE IN SPECIFICATIONS > Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.
< DIMENSIONS AND WEIGHTS > Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.
< ERRORS AND OMISSIONS > The information in this manual has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.

1. Meanings of Signal Words

The following signal words are used in this manual.

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.

	Indicates general prohibitions for which there is no specific symbol.

⚠ WARNING

This product is not designed or rated for ensuring safety of persons.
Do not use it for such purposes.

Regulations and Standards

The V680-HAM42-FRT and V680-HS63-SP conform to the following overseas regulations and standards.

1. Japan

Japan Radio Law

Equipment using high frequencies: Inductive Reading/Writing Communications Equipment

Conforming standards: Inductive Reading/Writing Communications Equipment; Standard: ARIB STD-T82

2. The United States, Canada

FCC Rules (Federal Communications Commission), IC Rules (Industry Canada)

This product complies with Part 15 Subpart C and Part 15 Subpart B of the FCC Rules and IC Rules.

FCC Part15 subpart C, RSS-Gen

FCC ID : E4E6CYSIDV6800507

IC : 850J-V6800507

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.

(2) This device must accept any interference received, including interference that may cause undesired operation.

FCC Part15 subpart B

NOTICE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

ICES-003

This class A digital apparatus complies with Canadian ICES-003.

WARNING

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

Do not remove the ferrite core (TDK Type ZCAT2032-0930) installed on the cables to suppress RF interference.

3. Europe

EC Declaration of Conformity

Hereby, OMRON Corporation declares that this RFID System, Antenna V680-HS63-SP and Amplifier V680-HAM42-FRT. Amplifier and Antenna are in compliance with essential requirements and other relevant provisions of Directive 1995/5/EC, and satisfy tests for the appropriate requirements of the following relevant standards.

Radio : EN 300 330-2V1.1.1 (06-2001)
EN 300 330-1V1.3.2 (12-2002)

EMC : EN 301 489-3V1.4.1 (08-2002)
EN 301 489-1V1.5.1 (11-2004)

Safety : EN 61010-1: 2001 (2nd Edition)

CE

English	Hereby, Omron, declares that the RFID System, V680-HS52 Series, V680-HS63 Series, and V680-HA63A Series are in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Finnish	Omron vakuuttaa täten että RFID Säännös, V680-HS52 Series, V680-HS63 Series, V680-HA63A Series tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Dutch	Hierbij verklaart Omron dat het toestel de RFID Systeem, V680-HS52 ¨Serie, V680-HS63 ¨Serie, V680-HA63A ¨Serie in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
French	Par la présente Omron déclare que la RFID Système, V680-HS52 Série, V680-HS63 Série, V680-HA63A Série sont conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Swedish	Härmed intygar Omron att den RFID System, V680-HS52 Serie, V680-HS63 Serie, V680-HA63A Serie står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
Danish	Undertegnede Omron erklærer herved, at følgende den RFID System, V680-HS52 Serie, V680-HS63 Serie, 680-HA63A Serie overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
German	Hiermit erklärt Omron, die RFID System, V670-H11 Serie, V680-HS63 Serie, V680-HA63A Serie in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie 1999/5/EG befindet. (BMWi)
Greek	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ Omron ΔΗΛΟΝΕΙ RFID ΟΥΟΓΗΜΑ, V680-HS52 ΟΕΙΡΑ, V680-HS63 ΟΕΙΡΑ, V680-HA63A ΟΕΙΡΑ ΣΥΜΜΟΡΦ ΟΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
Italian	Con la presente Omron dichiara che la RFID Sistema, V680-HS52Serie, V680-HS63 Serie, V680-HA63A Serie sono conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Spanish	Por medio de la presente Omron declara que el RFID Sistema, V680-HS52 Serie, V680-HS63 Serie, V680-HA63A Serie esta conforme a los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Portuguese	Omron declara que a RFID Sistema, V680-HS52 Série, V680-HS63 Série, V680-HA63A Série ser conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Romanian	Prin prezenta, Omron declarã cã acest V680-HS52,V680-HS63, V680-HA63A este conform cu cerin¡ele principale çi cu celelalte prevederi relevante ale Directivei 1999/5/EC.

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

Do not remove the ferrite core (TDK Type ZCAT2030-0930A) installed on the cables to suppress RF interference.

Precautions for Safe Use

Be sure to observe the following precautions to ensure safe use of the Products.

1. Do not use the Products in environments with flammable, explosive, or corrosive gasses.
2. Do not attempt to disassemble, repair, or modify any Product.
3. Tighten mounting screws securely.
4. If any cable has a locking mechanism, make sure that it has been locked before using the cable.
5. Do not allow water or pieces of wire to enter from openings in the case. Doing so may cause fire or electric shock.
6. Turn OFF the Controller power supply before mounting or removing an Antenna or Amplifier.
7. If an error is detected in any Product, immediately stop operation and turn OFF the power supply. Consult with an OMRON representative.
8. Dispose of the Products as industrial waste.
9. Observe all warnings and precautions given in the body of this manual.
10. Do not touch the product immediately after usage at high temperatures. Doing so may occasionally result in burning.

Precautions for Correct Use

Always observe the following precautions to prevent operation failures, malfunctions, and adverse effects on performance and equipment.

1. Installation Location

Do not install the product in the following locations:

・ Locations subject to corrosive gases, dust, dirt, metal powder, or salt

・ Locations where the specified ambient operating temperature range is exceeded
・ Locations subject to extreme temperature changes that may result in condensation
・ Locations where the specified ambient operating humidity range is exceeded

・ Locations where the product would be directly subjected to vibration or shock exceeding specifications
・ Locations subject to contact with water, oil, or chemicals

2. Installation

・ The product uses the 13.56MHz frequency band to communicate with Tags. Some devices, such as some tranceivers, motors, inverters, and switch mode power supplies, generate electromagnetic waves (i.e., noise) that can affect communications with the Tags. If any of these devices are nearby, communications with Tags may be affected or Tags may be destroyed, If the product is to be used near such devices, check the effects on communications before using the product.

・ To minimize the general influence of noise, follow the following precautions:

(1)Ground the earth terminal of this product and any metallic material located around the product to 100 Ω or less.
(2)Keep product wiring away from high voltage or heavy current.

・ Attach the accompanying ferrite core (Type:ZCAT2032-0930 made by TDK Corp.) around the cables that are connected with the power and grounding terminals.
・ The product does not provide a water-proof structure. Do not use it where mists are present.
・ Communications performance may be reduced due to mutual interference if more than one Read/Write Antenna is installed in the same vicinity.

Refer to this Manual and confirm that there is no mutual interference between Read/Write Antennas.

3. Storage

Do not store the product in the following locations:

・ Locations subject to corrosive gases, dust, dirt, metal powder, or salt

・ Locations where the specified ambient storage temperature range is exceeded

・ Locations subject to extreme temperature changes that may result in condensation

・ Locations where the specified ambient storage humidity range is exceeded

・ Locations where the product would be directly subjected to vibration or shock exceeding specifications

・ Locations subject to contact with water, oil, or chemicals

4. Cleaning

・ Do not use thinners for cleaning. Resin materials and the case coating will be dissolved by thinners, benzenes, acetones and kerosenes.

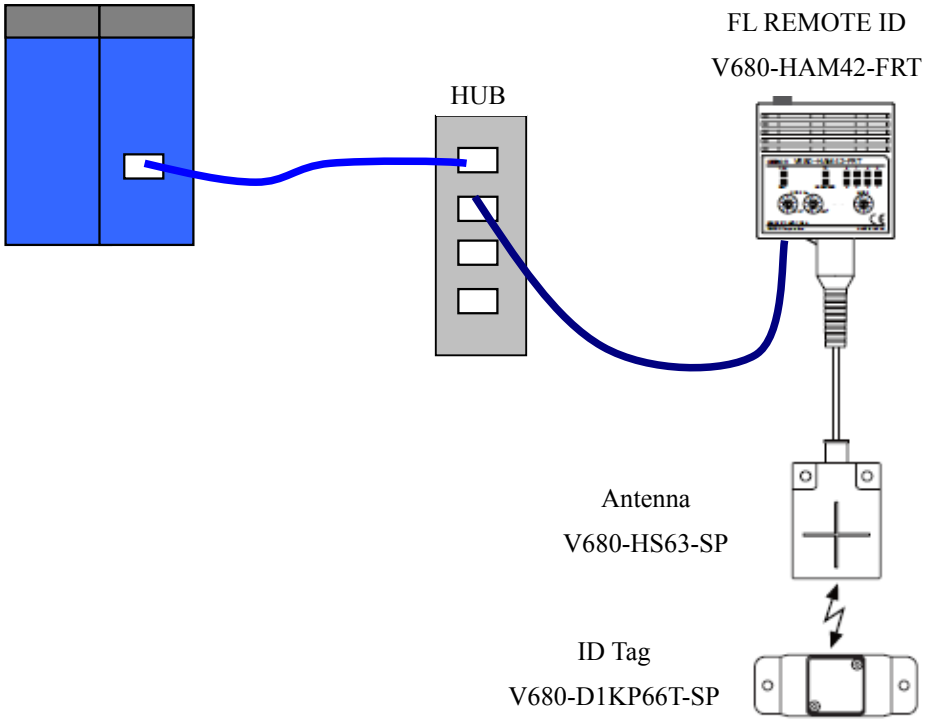
1. Product overview

1.1. Features

The RFID system: V680 series employs the electromagnetic induction type, and is a product in accordance with International Standard ISO/IEC18000-3(ISO/IEC15693) of the RFID system.

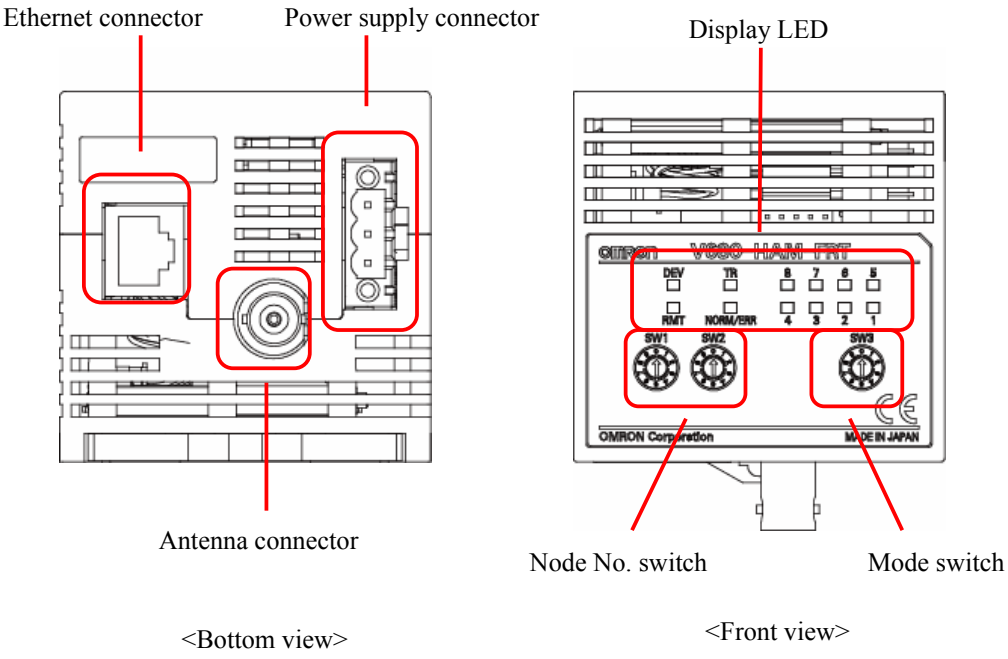
1.2. System Configuration

PLC: FL REMOTE Master unit



2. Part names and functions

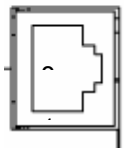
2.1. Part names



<Bottom view>

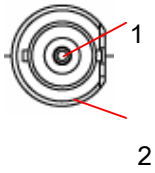
<Front view>

- Ethernet Connector: Connector for FL REMOTE



PIN No	Name	Description	I / O
1	TX_D1+	Tranceive data +	output
2	TX_D1-	Tranceive data -	output
3	RX_D2+	Receive data +	input
4	-	-	-
5	-	-	-
6	RX_D2-	Receive data -	input
7	-	-	-
8	-	-	-
Hood	-	FG	-

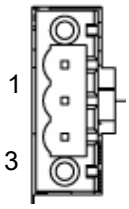
- Antenna connector: connector for antenna



PIN No	Name	Description	I / O
1	S	Signal	-
2	GND	Analog ground	-

- Power supply connector: connected to the 24VDC power supply

  Please use the bundled connector.



PIN No	Name	Description	I / O
1	24V	24VDC terminal	-
2	GND	Ground terminal	-
3	GR	Functional earth terminal	-

Please use recommended power supply unit: S8VS-03024.

- Display LED

>~~DEV (Device Status indicator)~~

Status		Meaning
	Green	Normal
	Red	Serious malfunction
	Red(blinking)	Slight malfunction
	Unlit	Power off

>~~RMT (Remote Status indicator)~~

Status		Meaning
	Green	Connected to network/ Transferring FL Remote IO
	Green (blinking)	Connected to network/ No transferring FL Remote IO
	Green and Red (blinking)	Connected to network/ Setting error
	Red	Duplicate node address
	Red (blinking)	Not connected to network
	Unlit	Not connected to network

>TR(ID transmission indicator)

Status		Meaning
	Yellow	Communicating to ID Tag
	Unlit	Standby

>NORM / ERR(ID transmission result indicator)

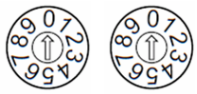
Status		Meaning
	Green	Communication normal finish
	Red	Communication error
	Unlit	standby

>DATA(Data indicator)

Status		Meaning
	Green	Indicate communicating data contents
	Red	Indicate error code
	Unlit	standby

- Node No. switch

Please set node no. with the Node No. switch that is used as the low rank value of Internet Protocol address. 192.168.250. **.



Item	Description
Setting method	two BCD rotary switches
Setting range	01 to 31

- Mode switch

Please set the mode of FL REMOTE ID with the mode switch.

No	Name	Description
0	Trigger mode	When the trigger signal is input from the plc, FL REMOTE ID begins the communication with the ID tag, and outputs the communication result to the plc.
1	Auto mode	When the ID tag approaches the antenna front, FL REMOTE ID begins the communication with the ID tag, and outputs the communication result to the plc.
2	Test mode	FL REMOTE ID repeatedly executes the ID Tag read of eight bytes from 00 addresses without the control from the plc
others	-	mode error

2.2. I/O Specifications

2.2.1. Allocated I/O

The V680-HAM42-FRT occupies 64 input bits (4 words) and 64 output bits (4 words) of the Programmable Controller. The occupied CIO varies according to the node number that is set by the Node No. switch of V680-HAM42-FRT.

<Master unit to Slave unit>

	Output bits															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CIO +0				OUTPUT TIME	WR PROTECT	VERIFY	HISPD	TRG/ ~INHIBIT	CMD				LEN			
									3	2	1	0	3	2	1	0
CIO +1	ADDR															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CIO +2	OD1								OD0							
	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
CIO +3	OD3								OD2							
	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0

<Slave unit to Master unit>

	Input bits															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CIO +0	TEST MODE						BUSY	RUN				ERR				NORM
												3	2	1	0	
CIO +1										ERR_SUB						
										6	5	4	3	2	1	0
CIO +2	ID1								ID0							
	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
CIO +3	ID3								ID2							
	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0

2.2.2. Signal functions

<Master unit to Slave unit>

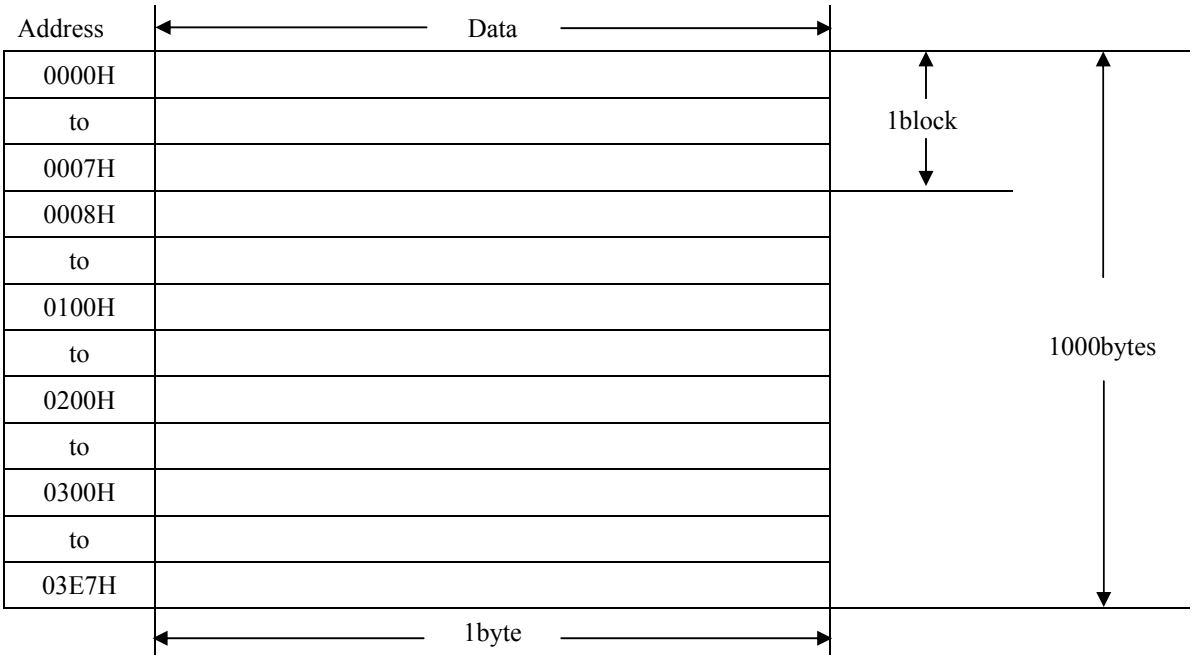
Signal	Name	Description
OD0-0 to 7	Data output	Output write data to the ID tag
OD1-0 to 7		
OD2-0 to 7		
OD3-0 to 7		
ADDR0 to 15	Address	Specify start address for reading or writing. Setting range: 0000H to FFFFH
LEN0 to 4	Data length	READ, WRITE; specify the data length by the number of bytes Setting range: 1H to 4H DATA FILLI; specify the data length by the number of blocks Setting range: 0H to FH
CMD0 to 3	Command	Specify the executing command 0000B Data read 0001B Data write 0010B Bit set 0011B Bit clear 0100B Data fill 1111B Noise measurement
TRG/~INHIBIT	Trigger input/~Inhibit Input	Trigger mode When this signal is "1", FL REMOTE ID begins the communication with the ID tag
		Auto mode When this signal is "0", FL REMOTE ID stops the communication with the ID tag
HISPD	High-speed Data Transmission setting	"0" Normal mode "1" High speed mode
VERIFY	Write verification	"0" With write verification "1" Without write verification
WR PROTECT	Write protection function disable	"0" Enabled "1" Disabled
OUTPUT TIME	Output time setting	"0" 100ms "1" 500ms

<Slave unit to Master unit>

Signal	Name	Description
ID0-0 to 7	Data input	Input read data from the ID tag
ID1-0 to 7		
ID2-0 to 7		
ID3-0 to 7		
RUN	RUN	Turns "1" when FL REMOTE ID is operating normally and the communications are possible with the plc
BUSY	BUSY	Output when a tag communications continues
NORM	Normal output	Output when communications with the ID tag are completed normally
ERR0	Error 0 output	Output when communications with the ID tag are not completed normally
ERR1	Error 1 output	Output when the command is illegal
ERR2	Error 2 output	Output in the mode error
ERR3	Error 3 output	Output when FL REMOTE ID is inoperative
ERR_SUB0	Error sub 0	No tag error
ERR_SUB1	Error sub 1	ID tag communication error
ERR_SUB2	Error sub 2	ID tag address error
ERR_SUB3	Error sub 3	Write protect error
ERR_SUB4	Error sub 4	Verification error
ERR_SUB5	Error sub 5	System error
ERR_SUB6	Error sub 6	System error

2.3. Memory map

ID tag has a memory area of up to 1 Kbytes. Each address of the memory area specifies one byte. A single byte of data can be written to one address.



2.4. ID tag communication functions

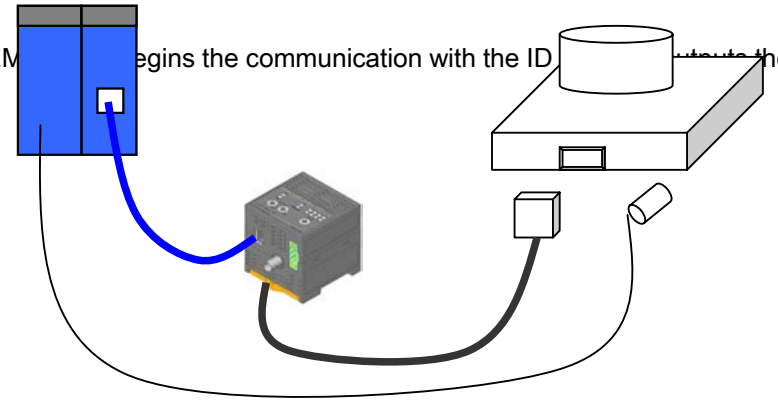
FL remote ID sets the operating mode with the mode switch, selects the command, adds the option that operates the command, and communicates with the ID tag.

2.4.1. Operational mode

In the operating mode, there are three modes.

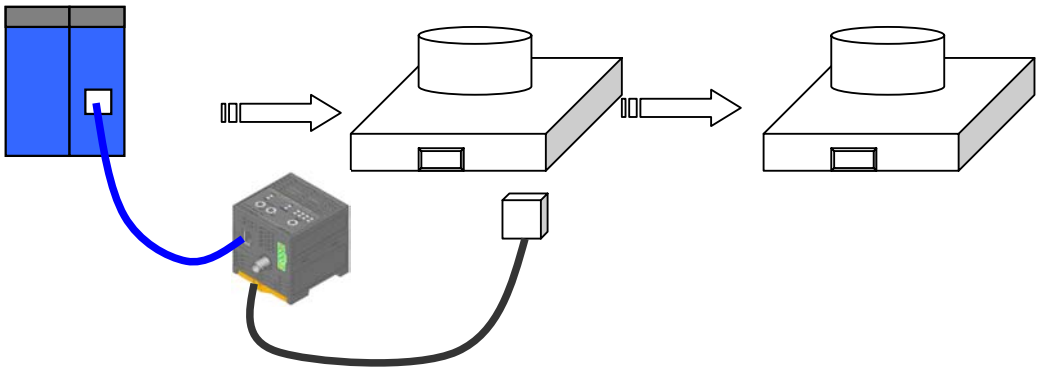
2.4.1.1. Trigger mode

The ID tag installed in work or the palette is detected in the communication area of the antenna by the sensor or the switch, and the control signal (trigger signal) is output from the plc to FL REMOTE ID. This FL REM egins the communication with the ID utputs the result to the plc by the signal.



2.4.1.2. Auto mode

When the ID tag installed in work or the palette enters in the communication area of the antenna, FL REMOTE ID begins the ID tag and the communication, and outputs the result to the plc.



3. Communicating with the plc

3.1. Command correspondence

3.1.1. Data read

<Master unit to Slave unit>

Signal	Length	Data	Description
CMD	4	0000B	Data read
LEN	4	1H to 4H	Data length
ADDR	16	0000H to FFFFH	Start address

<Slave unit to Master unit>

Signal	Length	Data	Description
NORM	1	0 or 1	Normal completion
ERR*	1	0 or 1	Abnormal completion
ERR_SUB*	1	0 or 1	Abnormal completion for ID tag communication
ID	32	-	Read data

<Example>

Data read of 3 bytes from 120H addresses

	Output bits															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CIO+0	0	0	0	*	*	*	*	*	0	0	0	0	0	0	1	1
		Fixed		Change the setting if necessary						Data read				3 bytes		
CIO+1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0
CIO+2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
								120H address								
								Fixed								
CIO+3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
								Fixed								

3.1.2. Data write

<Master unit to Slave unit>

Signal	Length	Data	Description
CMD	4	0001B	Data write
LEN	4	1H to 4H	Data length
ADDR	16	0000H to FFFFH	Start address
OD	32	-	Write data

<Slave unit to Master unit>

Signal	Length	Data	Description
NORM	1	0 or 1	Normal completion
ERR*	1	0 or 1	Abnormal completion
ERR_SUB*	1	0 or 1	Abnormal completion for ID tag communication

<Example>

Data write of 3 bytes from 321H addresses

	Output bits															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CIO+0	0	0	0	*	*	*	*	*	0	0	0	1	0	0	1	1
		Fixed		Change the setting if necessary						Data write				3 bytes		
CIO+1	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	1
								321H address								
CIO+2	0	1	1	1	1	0	0	0	0	0	0	1	0	0	1	0
				78H								12H				
CIO+3	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	1
				Fixed								ABH				

3.1.3. Bit set

<Master unit to Slave unit>

Signal	Length	Data	Description
CMD	4	0010B	Bit set
LEN	4	1H to 4H	Data length
ADDR	16	0000H to FFFFH	Start address
OD	32	-	Bit set data

<Slave unit to Master unit>

Signal	Length	Data	Description
NORM	1	0 or 1	Normal completion
ERR*	1	0 or 1	Abnormal completion
ERR_SUB*	1	0 or 1	Abnormal completion for ID tag communication
ID	32	-	Data after bit set

<Example>

Bit set of 1 byte from FFH addresses

	Output bits															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CIO+0	0	0	0	*	*	*	*	*	0	0	1	0	0	0	0	1
		Fixed		Change the setting if necessary						Bit set				1byte		
CIO+1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
								FFH address								
CIO+2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
				Fixed								05H				
CIO+3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Fixed								Fixed				

3.1.4. Bit clear

<Master unit to Slave unit>

Signal	Length	Data	Description
CMD	4	0011B	Bit clear
LEN	4	1H to 4H	Data length
ADDR	16	0000H to FFFFH	Start address
OD	32	-	Bit clear data

<Slave unit to Master unit>

Signal	Length	Data	Description
NORM	1	0 or 1	Normal completion
ERR*	1	0 or 1	Abnormal completion
ERR_SUB*	1	0 or 1	Abnormal completion for ID tag communication
ID	32	-	Data after bit clear

<Example>

Bit clear of 4 bytes from FH addresses

	Output bits															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CIO+0	0	0	0	*	*	*	*	*	0	0	1	1	0	1	0	0
		Fixed		Change the setting if necessary						Bit clear				4 bytes		
CIO+1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
								FH address								
CIO+2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
				02H								01H				
CIO+3	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0
				08H								04H				

3.1.5. Data fill

<Master unit to Slave unit>

Signal	Length	Data	Description
CMD	4	0100B	Data fill
LEN	4	1H to 4H	Data length
ADDR	16	0000H to FFFFH	Start address
OD0	8	-	Data fill data

<Slave unit to Master unit>

Signal	Length	Data	Description
NORM	1	0 or 1	Normal completion
ERR*	1	0 or 1	Abnormal completion
ERR_SUB*	1	0 or 1	Abnormal completion for ID tag communication

<Example>

Data fill of 16 bytes from 6H addresses

	Output bits															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CIO+0	0	0	0	*	*	*	*	*	0	1	0	0	0	0	1	0
		Fixed		Change the setting if necessary						Data fill				2 blocks		
CIO+1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
								6H address								
CIO+2	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				Fixed								FFH				
CIO+3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Fixed								Fixed				

3.1.6. Noise measurement

<Master unit to Slave unit>

Signal	Length	Data	Description
CMD	4	1111B	Noise measurement

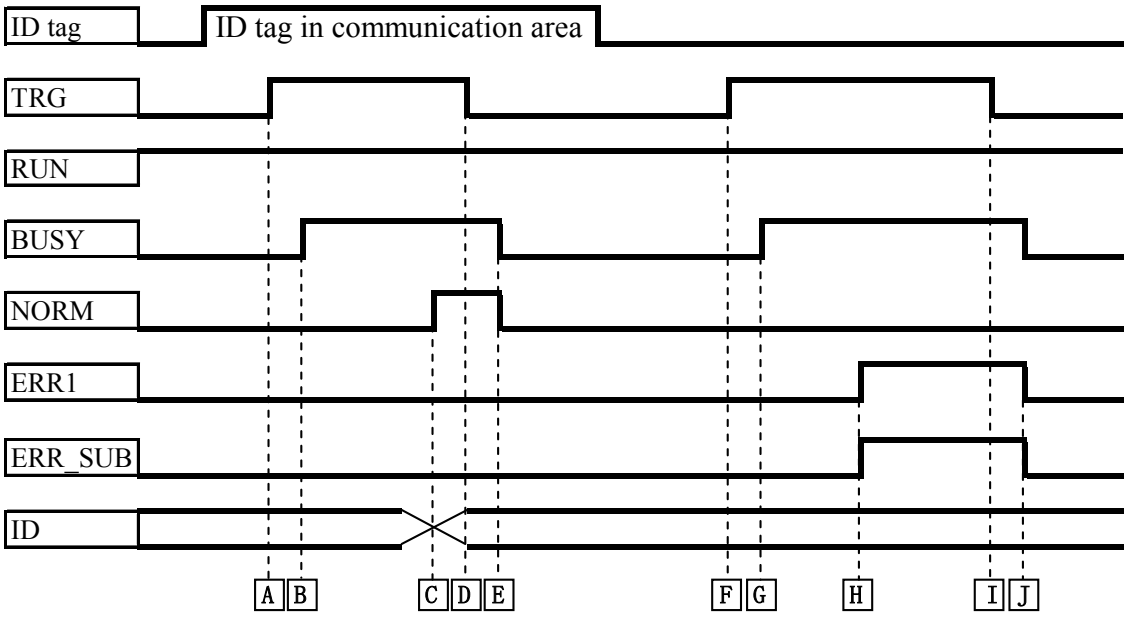
<Slave unit to Master unit>

Signal	Length	Data	Description
NORM	1	0 or 1	Normal completion
ERR*	1	0 or 1	Abnormal completion
ID	32	-	Measurement result ID0： Average value (00 ~ 63H) ID1： Maximum value (00 ~ 63H) ID2： Minimum value (00 ~ 63H) ID3： 00H fixed

<Example>

	Output bits															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CIO+0	0	0	0	*	*	*	*	*	1	1	1	1	0	0	0	0
		Fixed		Change the setting if necessary					Noise measurement					Fixed		
CIO+1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
								Fixed								
CIO+2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
								Fixed								
CIO+3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
								Fixed								

3.2. Timing chart



<When ID tag is in the communication area>

A : The plc makes TRG “1" (on) and directs the execution to FL REMOTE ID.

B : FL REMOTE ID fixes CMD (command), LEN (data length), and ADDR (start address), the communication with the ID tag begins, and BUSY is “1" (on).

C : When the communication with the ID tag completed normally, FL REMOTE ID makes NORM "1" (on).

D : Please make TRG “0" (off) after the NORM signal turn to 1" (on).

E : BUSY and NORM when FL REMOTE ID confirms TRG is turned off.

<When ID tag is outside the communication area>

F : The plc makes TRG “1" (on) and directs the execution to FL REMOTE ID.

G : FL REMOTE ID fixes CMD (command), LEN (data length), and ADDR (start address), the communication with the ID tag begins, and BUSY is “1" (on).

H : When the communication with the ID tag did not complete normally, FL REMOTE ID makes ERR1 and ERR_SUB0 Please make TRG “0" (off) after the ERR1 signal turn to 1" (on).

J : ERR1 and ERR_SUB0 when FL REMOTE ID confirms TRG is turned off.

4. Appendix

4.1. Specifications

- FL REMOTE ID V680-HAM42-FRT

Characteristic	Specification
Supply voltage	24VDC（20.4VDC to 26.4VDC） Protective conductor
Power consumption	Less than 6W
Ambient temperature	Operating:-10 to +55℃, storage: -25 to +65℃ (no freezing, no dew condensation)
Ambient humidity	Operating: 35 to 85%RH, storage: 35 to 85%RH (no freezing, no dew condensation)
Insulation resistance	20MΩmin. (with 500V DC megger) between protective terminal and other charging unit terminal
Withstand voltage	1000V AC, 50/60Hz, 1min Between protective terminal and other charging unit terminal
Vibration resistance	Mechanical durability: 10 to 150Hz, double amplitude: 0.2mm, with 10 sweep of 8 min each in 3 directions
Shock resistance	Mechanical durability: 150m/s^2, 3times each in 6 directions
Degree of protection	Panel-mounting (conforms to IP20)
Material	PC/ABS resin
Weight	Approx. 150g
Mounting method	DIN Track or M4 screws

- Antenna V680-HS63-SP

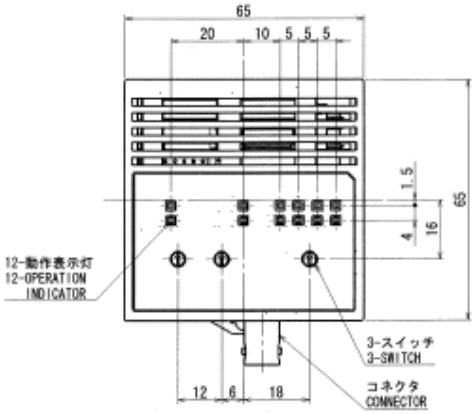
Characteristic	Specification
Ambient temperature	Operating:-10 to +60℃, storage: -25 to +75℃ (no freezing, no dew condensation)
Ambient humidity	Operating: 35 to 95%RH, storage: 35 to 95%RH (no freezing, no dew condensation)
Insulation resistance	20MΩmin. (with 500V DC megger) between the connector and the case
Withstand voltage	1000V AC, 50/60Hz, 1min Between the connector and the case
Vibration resistance	Mechanical durability: 10 to 500Hz, double amplitude: 1.5mm, with 10 sweep of 8 min each in 3 directions
Shock resistance	Mechanical durability: 500m/s^2, 3times each in 6 directions
Degree of protection	IP67(* The connector is not waterproof.)
Material	CASE PFA Filler Epoxy resin Cable TFE
Weight	Approx. 20g
Mounting method	M4 screws

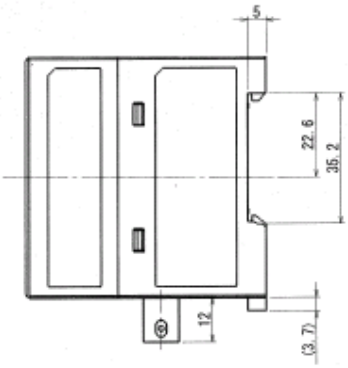
- ID Tag V680-D1KP66T-SP

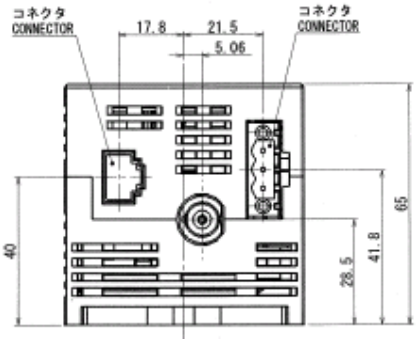
Characteristic	Specification
Memory capacity	1,000 bytes (user area)
Memory type	EEPROM
Data backup time	10 years after writing (85℃ or less)
Data overwrite count	100,000 times per address (25℃)
Ambient temperature	Operating:-25 to +70℃, storage: -40 to +110℃ (no freezing, no dew condensation)
Ambient humidity	Operating: 35 to 95%RH, storage: 35 to 95%RH (no freezing, no dew condensation)
Vibration resistance	Mechanical durability: 10 to 2,000Hz, double amplitude: 1.5mm, with 10 sweep of 15 min each in 3 directions
Shock resistance	Mechanical durability: 500m/s^2, 3times each in 6 directions
Degree of protection	IP67(* The connector is not waterproof.)
Material	PFA
Weight	Approx. 20g
Mounting method	M4 screws

4.2. Dimensions

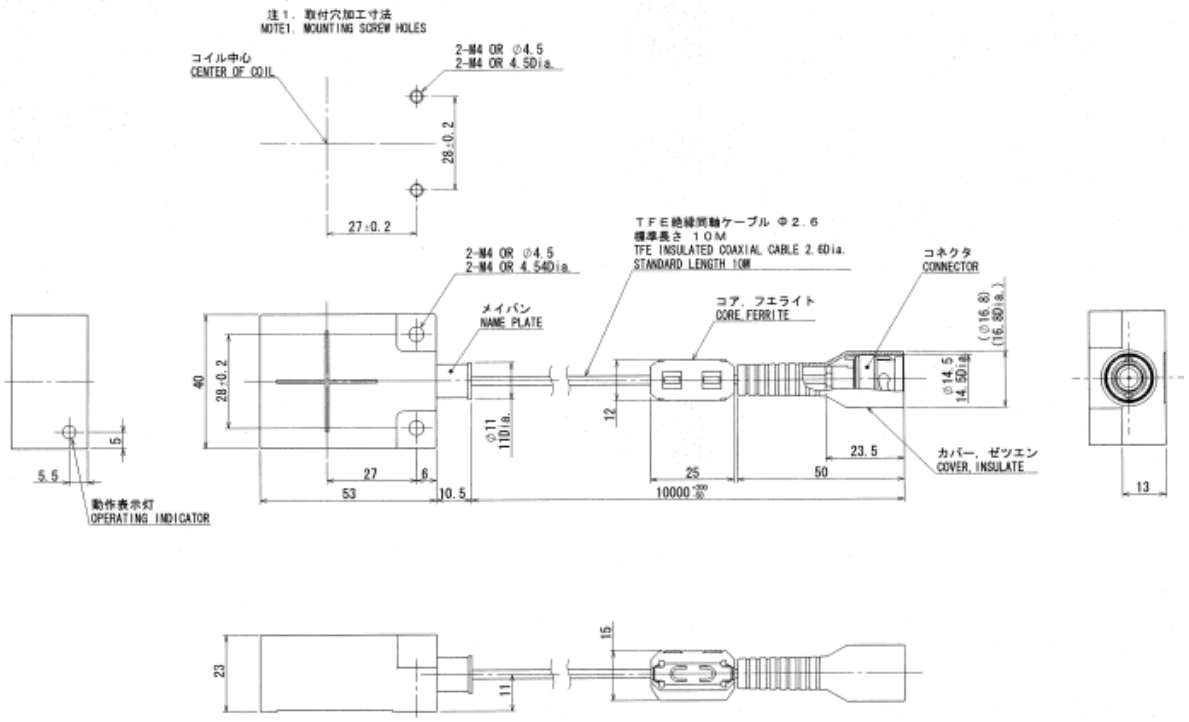
- FL REMOTE ID V680-HAM42-FRT







- Antenna V680-HS63-SP



- ID tag V680-D1KP66T-SP