

# Electromagnetic Inductive RFID System V670

## High-Speed, Long-Life, Battery-less RFID System







- High-speed communications requiring only 14 ms to read or write 128 bytes of data.
- Long-life battery-free tags to read and write data 1,000 million times.
- Versatile functions, such as auto repeat, repeat input trigger, and tag specification.
- Self-execution mode for data processing with no host controller intervention.

**Note:** The V670 conforms to the FCC Rules and EU Directives, allowing it to be used in a wide variety of countries. In other countries, it may be subject to radio regulations and EMC restrictions. Contact your Omron representative for details.

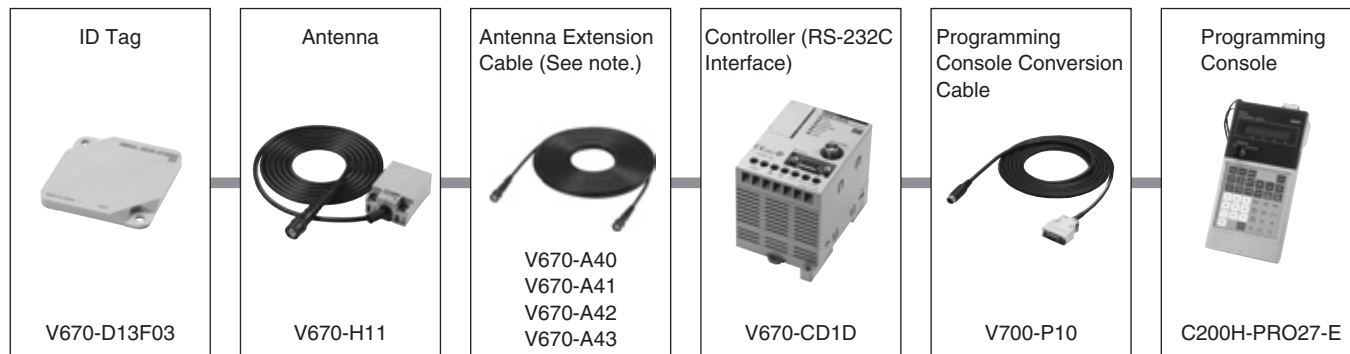


## Ordering Information

### ■ List of Models

Item	Description	Model
 ID Tag	40 × 40 × 4.5 mm 128 bytes	V670-D13F03
 Antenna	40 × 53 × 23 mm 2-m cable	V670-H11
 Controller	90 × 66 × 75 mm RS-232C interface operating at 24 VDC with a single antenna connector	V670-CD1D
 Antenna Extension Cables	3 m	V670-A40
	10 m	V670-A41
	18 m	V670-A42
	28 m	V670-A43
 Programming Console	Operation monitor, set value display, communications, test communications, and error log functions.	C200H-PRO27-E
 Programming Console Conversion Cable	2 m Connects the V670-CD1D and C200H-PRO27-E.	V700-P10

## System Configuration



**Note:** When extending the antenna cable, do not use any cable other than the Antenna Extension Cables from OMRON.

## Specifications

### ■ ID Tags

Item	V670-D13F03
<b>Memory capacity</b>	128 bytes
<b>Memory type</b>	FeRAM
<b>Memory life</b>	Number of accesses: 1,000 million times (See note.)
<b>Data storage time</b>	10 years (after the data is written or read)
<b>Ambient temperature</b>	Operating: -10 to 70°C
<b>Ambient temperature</b>	Storage: -10 to 70°C
<b>Ambient humidity</b>	Operating: 35% to 85%
<b>Degree of protection</b>	IEC60529 IP67
<b>Vibration resistance</b>	10 to 2,000 Hz, 1.5-mm double amplitude at 150 m/s <sup>2</sup> acceleration with 10 sweeps in X, Y, and Z directions for 15 minutes each
<b>Shock resistance</b>	500 m/s <sup>2</sup> in X, Y, and Z directions 3 times each (18 times in total)
<b>Material</b>	Filled with ABS/Epoxy resin
<b>Weight</b>	Approx. 6 g

**Note:** The number of accesses is the total number of read or write communications.

### ■ Antenna



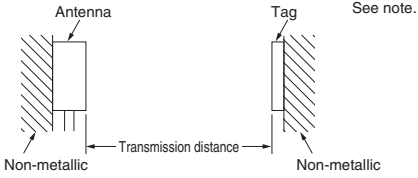
Item	V670-H11
<b>Oscillation frequency</b>	13.56 MHz
<b>Ambient temperature</b>	Operating: -10 to 70°C
<b>Ambient humidity</b>	Operating: 35% to 85%
<b>Ambient temperature</b>	Storage: -25 to 85°C
<b>Ambient humidity</b>	Storage: 35% to 85%
<b>Insulation resistance</b>	20 MΩ min. (at 1,000 VDC) between the terminals and case
<b>Dielectric strength</b>	1,000 VAC for 1 minute between the terminals and case with a current leakage of 1 mA
<b>Degree of protection</b>	IEC60529 IP67
<b>Vibration resistance</b>	10 to 150 Hz, 0.7-mm double amplitude at 50 m/s <sup>2</sup> acceleration with 10 sweeps in X, Y, and Z directions for 8 minutes each
<b>Shock resistance</b>	150 m/s <sup>2</sup> in X, Y, and Z directions 3 times each (18 times in total)
<b>Material</b>	Filled with ABS/Epoxy resin
<b>Cable length</b>	2 m
<b>Weight</b>	Approx. 160 g

**Note:** The connector is not watertight.

## ■ Controller

Item	V670-CD1D
Host interface type	RS-232C
Number of connectable antennas	1
Power supply voltage	24 VDC ±10%
Power consumption	7 W max.
Ambient temperature	Operating: 0 to 55°C (with no icing)
Ambient humidity	Operating: 35% to 85% (with no condensation)
Ambient temperature	Storage: -20 to 75°C (with no icing)
Ambient humidity	Storage: 35% to 85% (with no condensation)
Insulation resistance	20 MΩ min. (at 1,000 VDC) 1. Between ground terminal and both power supply terminals 2. Between both power supply terminals and both output terminals 3. Between both power supply terminals and case 4. Between both output terminals and ground terminal 5. Between both output terminals and case 6. Between ground terminal and case
Dielectric strength	1,000 VAC for 1 minute in all the above combinations with a maximum leakage current of 5 mA
Degree of protection	Panel mounted
Vibration resistance	10 to 150 Hz, 0.2-mm double amplitude at 15 m/s <sup>2</sup> acceleration with 10 sweeps in X, Y, and Z directions for 8 minutes each.
Shock resistance	150 m/s <sup>2</sup> in X, Y, and Z directions 3 times each (18 times in total)
Ground	Ground at a resistance of less than 100 Ω
Material	PC/ASA resin
Weight	Approx. 270 g

## ■ Transmission Distance Specifications

Antenna/Controller	ID Tag	Transmission distance (mm)		Measurement conditions	
		Without Extension Cable	With Extension Cable		
		5.0 to 23.0 (axial offset: ±1)	A40 (3 m)	5.0 to 21.5	
			A41 (10 m)	5.0 to 21.0	
			A42 (18 m)	5.0 to 20.5	
			A43 (28 m)	5.0 to 20.0	

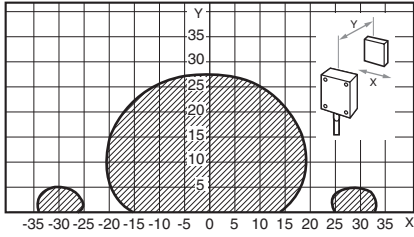
**Note:** 1. When the background object of the antenna is metal, the communications area is almost the same. If the tag is attached on metal without a gap, no communications will be possible. For details, refer to the *V670 User's Manual (Z148-E1)*.

2. The transmission distance is reduced if an Extension Cable is used. Also, the transmission distance varies with the type of Extension Cable.

# Characteristic Data (Typical)

## Transmission Range

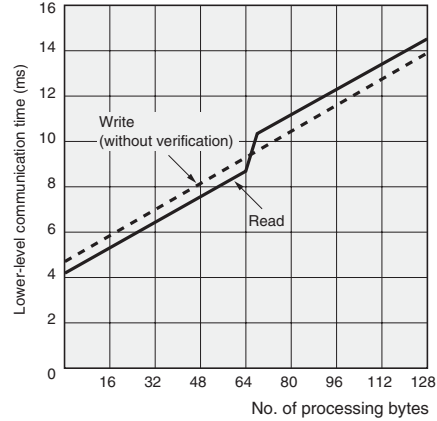
Combination of V670-H11 and V670-D13F03



**Note:** The above data applies only if an Extension Cable is not used.

## Transmission Time (Reference)

Communications time is a period required for communications between the antenna and ID Tag.



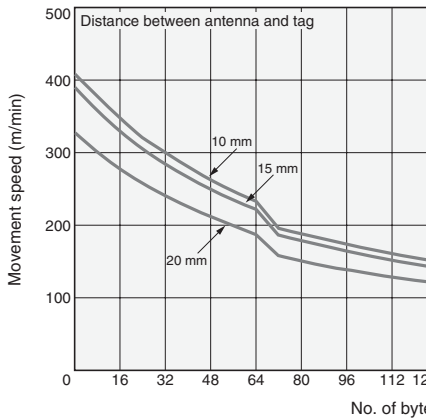
Operation	No. of bytes	Calculation formula
Read	1 to 64 bytes	$T = 0.07 \times N + 4.22$
	65 to 128 bytes	$T = 0.07 \times N + 5.64$
Write	1 to 128 bytes	$T = 0.07 \times N + 4.72$

**Note:** N: Number of bytes  
T: Communications time (ms)

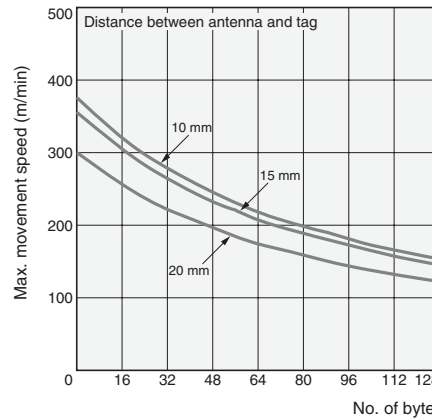
## Movement Speed (Reference)

Tag movement speed must be a maximum of 50% of the maximum movement speed according to the number of processing bytes to ensure the reliability of communications. Conduct proper on-site tests to determine the tag movement speed. (The following data applies only if an Extension Cable is not used.)

### Read



### Write



# Precautions

## Standard Conformity

The V670 conforms to the following standards.

### FCC Rules (Federal Communications Commission)

This Product Complies with Part 15 Subpart C of the FCC Rules.  
FCC ID: E4E6CYCIDV6700101

### EC Declaration of Conformity

Hereby, OMRON Corporation declares that this RFID System, V670-H11 Antenna, and V670-CD1D Controller are in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC, and satisfy tests for the appropriate requirements on the following relevant standards.

Radio: EN 300 330 V1.2.1 (May 1999)  
EMC: EN 301 489-3 (EN 301 489-1)  
Safety: EN 61010-1: 1993+A2

Countries of intended use:

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom

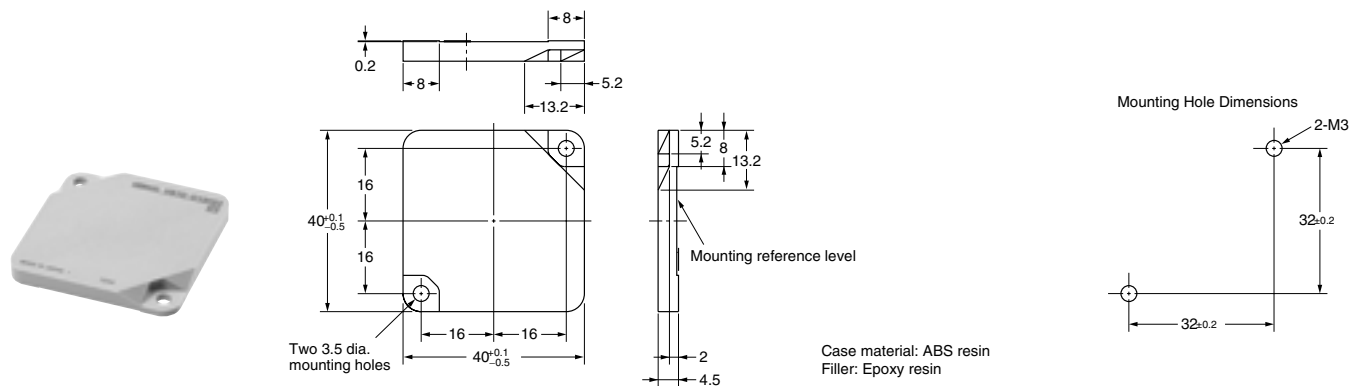


# Dimensions

**Note:** All units are in millimeters unless otherwise indicated.

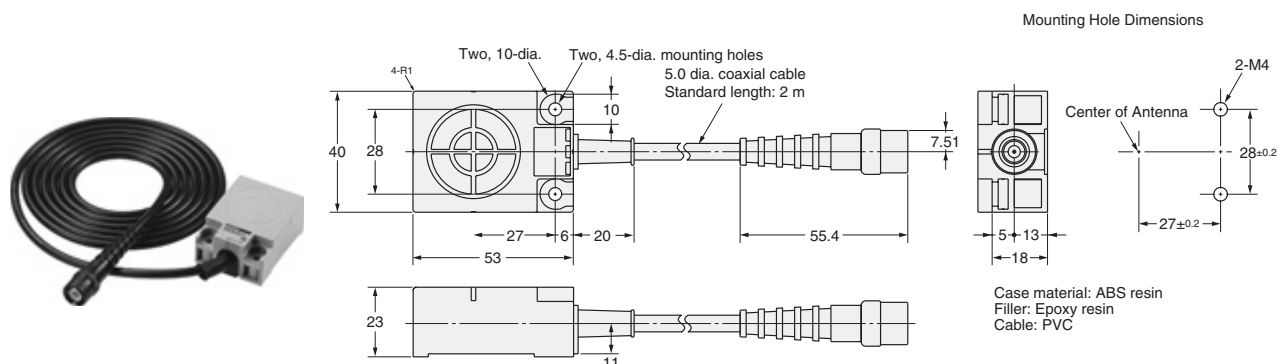
## ID Tag

### V670-D13F03



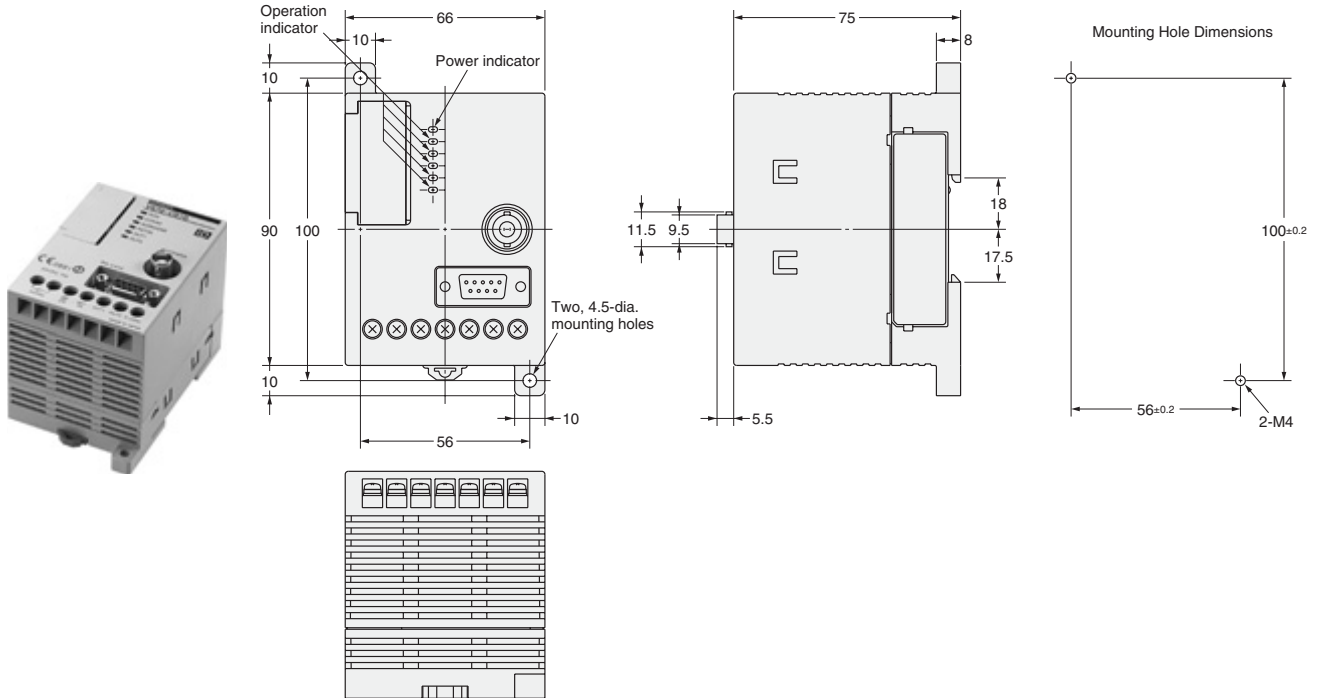
## Antenna

### V670-H11



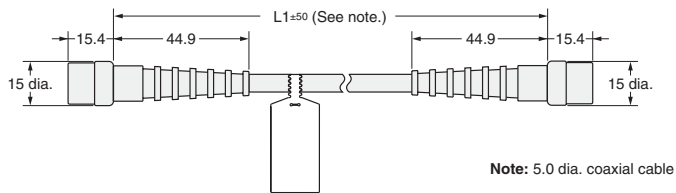
**Controller**

**V670-CD1D**



**Extension Cables**

**V670-A40/A41/A42/A43**



Model	Length
V670-A40	3 m
V670-A41	10 m
V670-A42	18 m
V670-A43	28 m

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.  
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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ALL DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters into inches, divide by 25.4

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