

OMRON

Model
V780-HMD68-ETN-US

UHF RFID System Reader/Writer

Instruction Sheet

This instruction sheet primarily provides precautions required in installing and operating the product. Before installing or operating the product, read this instruction sheet thoroughly to acquire sufficient knowledge of the product. For your convenience, keep this instruction sheet where it will be available when needed.

• For detailed information, refer to the user's manual (Cat. No. ZXXX-E1).



OMRON Corporation

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PRECAUTIONS FOR SAFE USE

Observe the following precautions to ensure safety.

- Transportation**
 - The Reader/Writer may be damaged if it falls from a high location. When you transport Reader/Writers, do not stack them too high.
 - Injury may occur if the Reader/Writer falls. Do not let the Reader/Writer fall when you carry it.
- Installation and Removal**
 - Use slip-resistant gloves when you install the Reader/Writer and hold the Reader/Writer securely at the depressions with both hands.
- Wiring**
 - The Reader/Writer may be damaged. Wire it correctly.
 - The Reader/Writer may be destroyed. Do not exceed the rated voltage range.
 - The cables may break. Confirm cable specifications and do not bend cables past their normal bending radius.
 - The Reader/Writer may be damaged. Never use an AC power supply.
 - Connect the Ethernet cable to a host device (e.g., Switching Hub or PLC) that supports STP and ground the host device to a ground resistance of 100 Ω or less.
- Usage**
 - The communications range depends on the operating and installation environment. Use the Reader/Writer only after sufficiently testing operation onsite.
 - If multiple Reader/Writers are installed near each other, communications distances may decrease due to mutual interference. Refer to *Reader/Writer Mutual Interference (Reference Data)* in the appendices to the user's manual (Cat. No. ZXXX-E1) and check to make sure there is no mutual interference between Reader/Writers.
- Errors and Failures**
 - If an error is detected in the Reader/Writer, immediately stop operation and turn OFF the power supply. Consult with an OMRON representative.
- Maintenance**
 - Using thinner, benzene, acetone, or kerosene may adversely affect the plastic parts and case coating. Refer to *Chemical Resistance of the Reader/Writer in the appendices to the user's manual (Cat. No. ZXXX-E1)* and do not use chemicals that would have a negative effect.
- Disposal**
 - Dispose of the Reader/Writer as industrial waste.

1. Ratings and Performances

V780-HMD68-ETN-US

• General Specifications

Item	V780-HMD68-ETN-US
Dimensions	250 × 250 × 70 mm (W×H×D, excluding protruding parts and cables)
Supply voltage	24 VDC (-15% to +10%)
Power consumption	10 W max.
Ambient operating temperature	-10 to 55°C (with no icing)
Ambient operating humidity	25% to 85% (with no condensation)
Ambient storage temperature	-25 to 70°C (with no icing)
Ambient storage humidity	25% to 85% (with no condensation)
Insulation resistance	20 MΩ min. (at 500 VDC/mega) between cable terminals and case
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between cable terminals and case
Vibration resistance	No abnormality after application of 10 to 500 Hz, double amplitude: 1.5 mm, acceleration: 100 m/s ² , 10 sweeps in each of 3 axis directions (up/down, left/right, and forward/backward) for 11 minutes each
Shock resistance	No abnormality after application of 500 m/s ² , 3 times each in 6 directions (Total: 18 times)
Degree of protection	IP54 (IEC 60529:2001)
Materials	Plastic case: PBT Metal case: Die-cast aluminum (ADC12)
Weight	Approx. 3 kg
Mounting method	Four M6 bolts
Host communications interface	Ethernet 10BASE-T/100BASE-TX
Host communications protocol	Modbus/TCP
Accessories	Instruction Sheet (1), IP address label (1), and Startup Guide (1)
Regulations	FCC 15.247 (United States) ISED RSS-247 (Canada)

• Tag Communications Specifications

Item	V780-HMD68-ETN-US
Applicable countries	United States and Canada
Output power	15 to 27 dBm (Switchable in 1-dB increments.)
Transmission speed from Reader/Writer to RF Tag	40 kbps (fixed)
Transmission speed from RF Tag to Reader/Writer	• 80 kbps (High-speed Mode) *1 • 31.25 kbps (Standard Mode) *1
Used frequencies	50 channels (902.75 to 927.25 MHz) FHSS
Communications method with RF Tags	Miller-modulated subcarrier
Tag communications protocol	ISO/IEC 18000-63:2013 (EPCglobal Class-1 Generation-2)
Polarization characteristic	RHCP

*1. The default setting is for Automatic Mode. The Reader/Writer will automatically change to High-speed Mode or Standard Mode depending on the interference waves.

• Recommended Power Supply (24 VDC)

Item	Condition
Supply voltage	24 VDC -15% to +10%
Output current	500 mA min.
Safety standard	SELV (Safety Extra Low Voltage)

PRECAUTIONS ON SAFETY

• Meaning of Signal Words

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.

• Alert Statements

WARNING

The V780-HMD68-ETN-US can be used only in the United States and Canada.

Falling when working in high locations may result in injury. Do not work anywhere that the footing is not stable.

Injury may occur if the Reader/Writer falls and strikes a person. Observe the following precautions when installing the Reader/Writer.

- Do not work when there are persons below you.
- Observe all torque specifications for bolts.

PRECAUTIONS FOR CORRECT USE

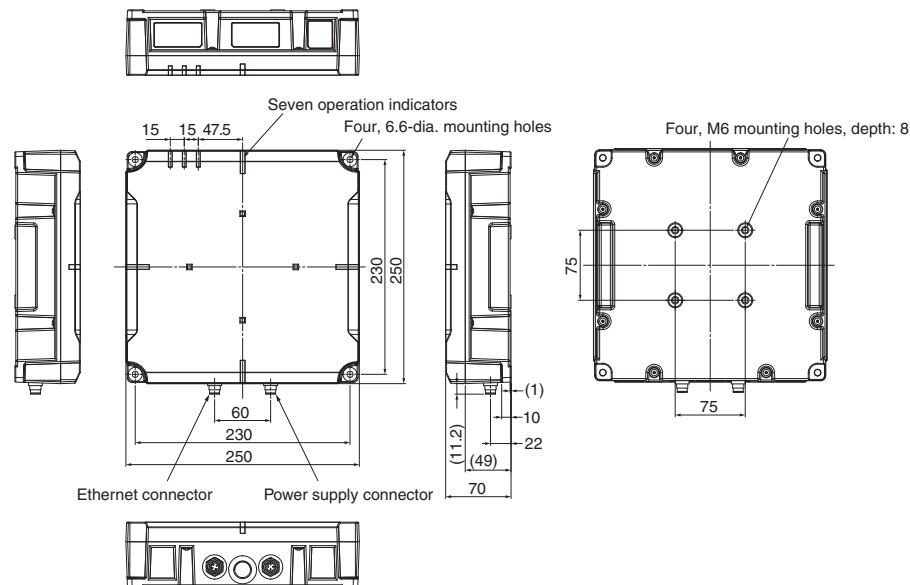
Always observe the following precautions to prevent operation failures, malfunctions, and adverse effects on the Reader/Writer.

- Transportation**
 - Always use the packing box that comes with the Reader/Writer when you transport it, and do not subject it to excessive vibration or shock.
- Installation**
 - After you tighten the bolts, make sure that the Reader/Writer is securely attached.
- Installation and Storage Environment**
 - Do not use or store the Reader/Writer in the following locations.
 - Locations subject to combustible gases, explosive gases, corrosive gases, dust, dirt, metal powder, salt, or oil
 - Locations where the specified ambient temperature or ambient humidity range is exceeded
 - Locations subject to extreme temperature changes that may result in condensation
 - Locations where the Reader/Writer would be directly subjected to vibration or shock exceeding specifications
 - Locations subject to water exposure that exceeds the specifications
- Storage Methods**
 - Injury or damage may occur if the Reader/Writer falls. Implement safety measures so that the Reader/Writer will not fall.
- Wiring**
 - To use the Reader/Writer in RUN mode, connect the control signal to the +24V of the power supply. If you connect the control signal to the 0-V side of the power supply, the Reader/Writer will start in Safe Mode.
- Usage**
 - The Reader/Writer may fail if it is used with a damaged cable. Do not subject the cable to strong forces or place heavy objects on the cable.
 - Observe the tightening torque specifications for the power supply and communications connectors.
 - The Reader/Writer may fail if heat cannot be dissipated sufficiently. Ensure that heat can be dissipated around the Reader/Writer.
 - Do not use the Reader/Writer outdoors.
 - Do not attempt to disassemble, repair, or modify the Reader/Writer.
- Maintenance**
 - Perform inspections both daily and periodically.
 - The Reader/Writer may fail if it or its wiring is replaced while the power supply is ON. Always turn OFF the power supply before you replace the Reader/Writer or its wiring.

2. Dimensions

V780-HMD68-ETN-US

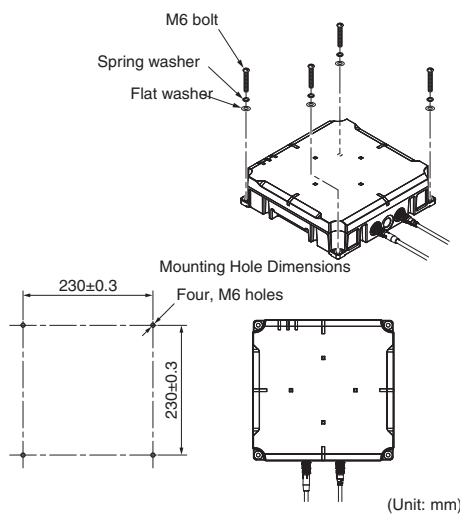
(Unit: mm)



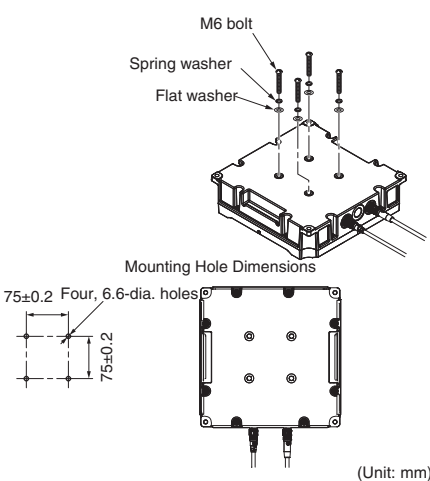
3. Installation

Install the Reader/Writer with four M6 bolts. Use both spring washers and flat washers. Recommended tightening torque: 4.3 N·m

• Front Mounting



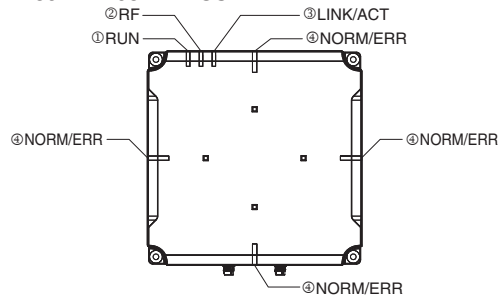
• Rear Mounting *1



*1. An M6 bolt engagement length of 6 to 8 mm is necessary for rear mounting. The bolts may be hard to tighten. Tighten them to the recommended tightening torque.

4. Names and Functions of Operation Indicators

V780-HMD68-ETN-US

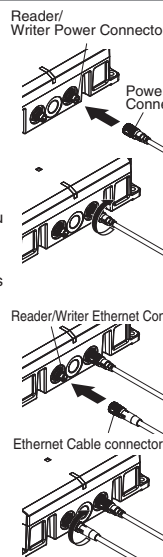


Number and name	Color	Status	Description
① RUN	Green	Flashing at 0.1-s intervals	Flashes quickly during startup.
		Flashing at 0.4-s intervals	Flashes during operation in Safe Mode.
	Cyan	Lit	Lit during operation in Run Mode.
	-	Lit	Lit during test operation.
② RF	-	Not lit	Not lit in the following cases. <ul style="list-style-type: none"> When power is not supplied When there is a watchdog timer (WDT) error
	Yellow	Lit	Lit when a radio wave is being output. (Lit during communications with RF Tag.)
③ LINK/ACT	-	Not lit	Not lit when a radio wave is not being output.
	Green	Flashing irregularly	Lit when a link has been established on the Ethernet port.
④ NORM/ERR	Green	Lit for 0.2 s	Lights once when processing a communications command or another command from the host device is completed normally.
		Lit for 0.2 s	Lights once each time an unstable communication is detected while communications diagnosis is enabled.
	Yellow	Lit for 0.2 s	Lights once when processing a communications command or another command from the host device ends in an error.
		Lit	Lit when a major fault has occurred. (Lit when a fatal error has occurred.)
	Red	Flashing at 0.4-s intervals	Flashes when a minor fault has occurred. (Flashes when a nonfatal error has occurred.)
		Flashing irregularly twice	Flashes when a minor fault has occurred. (Flashes when a network error occurs and the IP address becomes undetermined.)
⑤	Cyan	Flashing at 0.1-s intervals	Flashes during installation location notification.
		Flashing once every 3 s	Flashes during operation in the Focus Mode.
	-	Not lit	Not lit when the Reader/Writer is on standby.

5. Connecting and Disconnecting the Reader/Writer Power Cable and Ethernet Cable

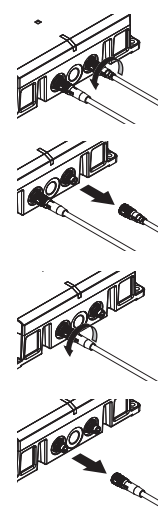
• Connecting the Cable

- Hold onto the connector on the Power Cable and insert it into the power connector on the Reader/Writer.
- Turn the connector on the Power Cable clockwise to lock it in place.
 - <For the Recommended Cable> Turn the cable connector clockwise until you hear it securely lock in place.
 - <Other Cables> Observe the tightening torque specifications for the cable connectors.
- Hold onto the connector on the Ethernet Cable and insert it into the Ethernet connector on the Reader/Writer.
- Turn the connector on the Ethernet Cable clockwise to lock it in place.
 - <For the Recommended Cable> Turn the cable connector clockwise until you hear it securely lock in place.
 - <Other Cables> Observe the tightening torque specifications for the cable connectors.



• Disconnecting the Cable

- Turn the connector on the Power Cable counterclockwise to unlock it.
- Hold onto the connector on the Power Cable and pull it straight out to remove it.
- Turn the connector on the Ethernet Cable counterclockwise to unlock it.
- Hold onto the connector on the Ethernet Cable and pull it straight out to remove it.



• Ethernet connector

Appearance	Size	Opening shape	Polarity
	M12	Receptacle	Male

Pin No.	Name	Description	I/O
1	TD+	Ethernet send + signal	OUT
2	RD+	Ethernet receive + signal	IN
3	TD-	Ethernet send - signal	OUT
4	RD-	Ethernet receive - signal	IN
Housing	FG	Frame ground	-

• Recommended Ethernet Cable (100 m max.)

XS5W-T42□□ME-K (made by OMRON)

• Power Supply Connector

Appearance	Size	Opening shape	Polarity
	M12	Receptacle	Male

Pin No.	Name	Description	I/O
1	24P	+24V	-
2	CONT	Control signal (operating mode signal) • Run Mode: Connect to 24 V and then start the Reader/Writer. • Safe Mode: Connect to 0 V and then start the Reader/Writer.	IN
3	24N	0V	-
4	-	-	-

• Recommended Power Cable (60 m max.)

XS5F-D42□□80-F (made by OMRON)

6. Regulations and Standards

1. United States

FCC ID	Model
E4EV78068	V780-HMD68-ETN-US

FCC CAUTION

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

Note: 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.

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines. This equipment should be installed and operated keeping the radiator at least 30cm or more away from person's body.

2. Canada

ISED ID	Model
850J-V78068	V780-HMD68-ETN-US

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

This device complies with ISED's licence-exempt RSSs. Operation is subject to the following two conditions:

- (1) This device may not cause interference; and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'ISDE 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'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the ISED radio frequency (RF) Exposure rules. This equipment should be installed and operated keeping the radiator at least 30cm or more away from person's body.

Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour un environnement non contrôlé et respecte les règles d'exposition aux fréquences radioélectriques (RF) CNR-102 de l'ISDE. Cet équipement doit être installé et utilisé en gardant une distance de 30cm

Suitability for Use

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT 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 PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

See also Product catalog for Warranty and Limitation of Liability.

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