UHF RFID System

V780 Series  Conforms to ISO/IEC 18000-63:2013

Long range object identification
Long-range RFID for easy identification of large objects like car bodies

UHF RFID System
V780 Series

Increasing high-mix low-volume production and modular production lines

Challenges when introducing RFID

<table>
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<th>Improve your high-mix production line</th>
<th>V780 Series</th>
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<td>Reliable RF tag reading from several meters away</td>
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<td>Can be used for a production line on which objects with various heights are conveyed</td>
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<table>
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<th>Quickly install and tune</th>
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<tr>
<td>Automatic setting adjustment according to environment</td>
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<td>Can be installed without RFID expertise</td>
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<th>Benefit from simplified troubleshooting</th>
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<td>Visualizing causes from 8,000 logged results</td>
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<td>Helps reduce troubleshooting time</td>
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Reliable long distance communications
Stable communications even in high-mix production lines

**Stable detection of objects with different heights**
The system’s wide communication range makes it easy to identify objects of various sizes such as a sequence of objects of different sizes.

**Focus Mode prevents misreads and reads only target tags**
Even when two or more RF tags exist in the communication range, the reader/writer can read the target tag just in front of it. It reads RF tags in the order in which they are conveyed while ignoring RF tags on pallets around the line.

RF tags conforming to ISO/IEC 18000-63 are available
In addition to V780 RF Tags, the RF tags that conform to ISO/IEC 18000-63 (ISO/IEC 18000-6 Type C) can be used.

Contact your Omron representative for details.

Flexible expansion of communication range

**Connect up to 8 reader/writers to expand range**
Multi-Reader/Writer function *2

One reader/writer is set as a master, and others are set as slaves. When the host device sends commands to the master reader/writer, the reader/writers work like one reader/writer that has a wide communication range.

**Applications**

**Detection of passing pallets**
When simultaneously inspecting all stacked pallets passing through a portal, install the reader/writers on both the left and right sides of the portal to read an RF tag placed on either the left or right side of each pallet.

**Location of vehicles**
It takes time to locate a defective vehicle outside the assembly line or a finished vehicle ready for shipment by using the on-board paper. Place an RF tag on the dashboard of each vehicle and install reader/writers on the vehicle waiting space to read the tags, which reduces the time to locate vehicles.

**Cost-effective slave reader/writer**
Use the V780-HMD68-ETN□□□□□□-S Slave Reader/Writer as a slave to inexpensively create a system with the Multi-Reader/Writer function that expands the communication range.

* See page 9 for details.

*1. PATENT PENDING/PATENTED means that the patent was applied for or the patent was granted. (As of August 2019)  *2. Version 3 or later provides this function.
No RFID expertise required for installation
Automatic setting adjustment to match the environment

**Automatic transmission power tuning**

The transmission power required for communications between the reader/writer and RF tags are measured and automatically set to appropriate values. The set power will be large enough to communicate with RF tags and minimize interference with other reader/writers. This function is useful when multiple reader/writers are installed in one factory. The transmission power can be easily set via the web browser.

**Reception Level Monitor shows reception levels over time for installation/adjustment**

This function visualizes reception levels, helping adjust installation positions of reader/writers and RF tags and check communication ranges. When RF tags on two or more objects are read for adjustment, connect your PC with the reader/writer to check a time series graph of the reception levels via the web browser.

**LED indicators help you adjust installation positions**

In addition to the web browser, the flashing speed of the LED indicators on the reader/writer provides a visual indication of the reception level. This makes it easier to install and adjust a reader/writer or RF tag at a production site.

Easy troubleshooting during operation
Visualizing causes from 8,000 logged results

**Monitor communication status via the web browser**

By connecting a PC, you can set parameters and monitor communication status, noise levels, and communication log via the web browser. This facilitates maintenance and troubleshooting.

- **RF communications diagnostics log (displayed as a list or graph)**

  The latest 8,000 communication diagnostic results are listed in a table. When communications are unstable, the probable causes and workarounds are displayed to make troubleshooting easier. Also, a graph shows RSSI levels and noise levels to aid identify the causes of unstable communications. The diagnostic results can be output to CSV files.

- **Channel monitor**

  Noise levels in the operating environment are displayed to allow you to check radio interference. You can identify noise sources and take measures to stabilize operation.

**Real-time communication status indication**

You can immediately check the communication status with the indicators of the reader/writer. The indicators using high-brightness LED can be easily seen even from a distance.
Effortless yet flexible system configurations

When connecting one reader/writer to host device

Reader/Writer
V780-HMD68-ETN□□
V780-HMD68-EIP□□

RF Tag □
V780-A-JIME-Z3BLI-10 □

PLC/machine automation controller
Modbus TCP (V780-HMD68-ETN□□)
EtherCAT/IP (V780-HMD68-EIP□□)
Ethernet cable □
Cat.5e/STP
K55W-T4□□□□□□□□ (recommended)

Power cable □
XS5F-D42□□□□□□□□ (recommended)
(This photo above is of the S8VK-S.)

Power supply
DC24V

When using Multi-Reader/Writer function

This function enables up to eight reader/writers to communicate as if they are one reader/writer.

Master
Slave ▲ Up to 7 reader/writers

Standard Reader/Writers
V780-HMD68-ETN□□
V780-HMD68-EIP□□
RF Tag □
V780-A-JIME-Z3BLI-10 □

Power cable □
XS5F-D42□□□□□□□□ (recommended)
Ethernet cable □
Cat.5e/STP
K55W-T4□□□□□□□□ (recommended)

Industrial switching hub
W4S1□□□□□□□□ (recommended)

PLC/machine automation controller
Modbus TCP (V780-HMD68-ETN□□)
EtherCAT/IP (V780-HMD68-EIP□□)

PC

Slave Reader/Writers
V780-HMD68-ETN□□ *5

Note. The maximum number of reader/writers that can be connected to the Ethernet port depends on the host device. Contact your Omron representative for details.

When connecting two or more reader/writers to host device

Reader/Writer
V780-HMD68-ETN□□
V780-HMD68-EIP□□

RF Tag □
V780-A-JIME-Z3BLI-10 □

PLC/machine automation controller
Modbus TCP (V780-HMD68-ETN□□)
EtherCAT/IP (V780-HMD68-EIP□□)
Ethernet cable □
Cat.5e/STP
K55W-T4□□□□□□□□ (recommended)

Power cable □
XS5F-D42□□□□□□□□ (recommended)

Power supply
DC24V

Note. The maximum number of reader/writers that can be connected to the Ethernet port depends on the host device. Contact your Omron representative for details.

*1. The maximum extension length of the Ethernet cable is 100 m.
*2. The maximum extension length of the power cable is 60 m.
*3. The RF tags that conform to ISO/IEC 18000-63 (ISO/IEC 18000-6 Type C) can be used.
*4. Contains 10 RF Tag per package.

When connecting one reader/writer to host device

Reader/Writer
V780-HMD68-ETN□□
V780-HMD68-EIP□□

Power cable □
XS5F-D42□□□□□□□□ (recommended)

Modbus TCP
EtherCAT/IP

When connecting two or more reader/writers to host device

Reader/Writer
V780-HMD68-ETN□□
V780-HMD68-EIP□□

Power cable □
XS5F-D42□□□□□□□□ (recommended)

Modbus TCP
EtherCAT/IP

When using Multi-Reader/Writer function

This function enables up to eight reader/writers to communicate as if they are one reader/writer.
RFID systems as well as mobile phones and TVs must comply with national radio regulations. The V780 Series currently complies with radio regulations in many countries. For the list of countries where the V780 is available, please contact your Omron representative.

Applications in automotive and other industries

Automotive body assembly
Reliable detection and tracking of auto body components and complete assemblies throughout the production process.
The wide communication range and focus mode enable body components and assemblies to be reliably detected from several meters away.

Parts transportation
Accurately track parts even in high-mix production.
Transport racks or pallets are detected while in motion as they pass the RFID reader/writer, with LED indicators providing visual confirmation in real time that the targeted items have been read.

Handling materials in containers
Quickly set up detection of individual containers.
The Reception Level Monitor graphically shows tag data reception levels which helps guide installation.

Hanging conveyance
Facilitate diagnostics and system status for difficult to access Reader/Writer.
High-brightness LED indicators that provide clear status indication can be seen from a distance.

Paper roll management
Monitors for potential impact due to external RF noise generating devices.
Automated logging and visualization of up to 8000 data points can help pinpoint the causes of potential reader/reader RF interference, helping with system troubleshooting.

Regulations for UHF wireless
(radio regulations)
RFID systems as well as mobile phones and TVs must comply with national radio regulations. The V780 Series currently complies with radio regulations in many countries. For the list of countries where the V780 is available, please contact your Omron representative.

Accessories
See the Data Sheet for additional details

**RF Tag**

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Memory capacity</th>
<th>Size (mm)</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 KB</td>
<td>150 x 14 x 6</td>
<td>V780-A-JIME-Z3BLI-10 *</td>
</tr>
</tbody>
</table>

*Contains 10 RF Tags per package. See Data Sheet (Q279I-E-02) for further details.

**RF Tag Attachment**

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Material</th>
<th>Size (mm)</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Polycarbonate plastic</td>
<td>180 x 50 x 30</td>
<td>V780-A-TA-133-10 *</td>
</tr>
</tbody>
</table>

*Contains 10 RF Tag attachments per package. See Data Sheet (Q279I-E-02) for further details.

**Cables**

**Recommended Ethernet Cables** (Connection between Host Device and Reader/Writer)
Use STP (shielded twisted pair) cable of category 5 or higher

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Size (m)*</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wire Gauge and Number of Pairs: AWG22, 2-pair Cable</td>
<td>Cable with Plug on One End and Socket on Other End (M12 Straight/RJ45)</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
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<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

*3m and 15m cables are also available. See Data Sheet (Q279I-E-02) for further details.

**Recommended Power Cables** (Connection between Power Supply and Reader/Writer)

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Cable length (m)</th>
<th>Cable outer diameter (mm)</th>
<th>Straight Connectors</th>
<th>Angled Connectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire-retardant, Robot Cable</td>
<td>3m</td>
<td>6</td>
<td>XS5F-D421-80-F</td>
<td>XS5F-D421-80-F</td>
</tr>
<tr>
<td></td>
<td>5m</td>
<td></td>
<td>XS5F-D421-80-F</td>
<td>XS5F-D421-80-F</td>
</tr>
<tr>
<td></td>
<td>10m</td>
<td></td>
<td>XS5F-D421-80-F</td>
<td>XS5F-D421-80-F</td>
</tr>
</tbody>
</table>

**Recommended Industrial Switching Hubs**

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Functions</th>
<th>No. of ports</th>
<th>Failure detection</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Service (QoS): EtherNet/IP control data priority: Broadcast storm and LSI error detection 10/100BASE-TX, Auto-Negotiation</td>
<td>3N</td>
<td>No</td>
<td>W4S1-03B</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5N</td>
<td>No</td>
<td>W4S1-05B</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5Y</td>
<td>Yes</td>
<td>W4S1-05C</td>
<td></td>
</tr>
</tbody>
</table>

*3m and 15m cables are also available. See Data Sheet (Q279I-E-02) for further details.
Controllers & I/O
- Machine Automation Controllers (MAC) • Motion Controllers
- Programmable Logic Controllers (PLC) • Temperature Controllers • Remote I/O

Robotics
- Industrial Robots • Mobile Robots

Operator Interfaces
- Human Machine Interface (HMI)

Motion & Drives
- Machine Automation Controllers (MAC) • Motion Controllers • Servo Systems
- Frequency Inverters

Vision, Measurement & Identification
- Vision Sensors & Systems • Measurement Sensors • Auto Identification Systems

Sensing
- Photoelectric Sensors • Fiber-Optic Sensors • Proximity Sensors
- Rotary Encoders • Ultrasonic Sensors

Safety
- Safety Light Curtains • Safety Laser Scanners • Programmable Safety Systems
- Safety Mats and Edges • Safety Door Switches • Emergency Stop Devices
- Safety Switches & Operator Controls • Safety Monitoring/Force-guided Relays

Control Components
- Power Supplies • Timers • Counters • Programmable Relays
- Digital Panel Meters • Monitoring Products

Switches & Relays
- Limit Switches • Pushbutton Switches • Electromechanical Relays
- Solid State Relays

Software
- Programming & Configuration • Runtime