General Specifications
Model AW810D
Wide Area Communication Router

[Release 6]

General
Specifications

Wide Area Communication Router (WAC Router) is the hardware equipment to connect Vnet/IP domains via Wide Area Network (WAN). Operations and monitoring of the FCS/SCS that are distributed in remote areas can be realized. Satellite communications can also be used as a WAN.

STANDARD SPECIFICATIONS

About the installation and environmental conditions of the WAC Router, refer to “Integrated Production Control System CENTUM VP System Overview” (GS 33J01A10-01EN), which is common with the WAC Router.

- Communication specifications
  Vnet/IP Communication Interface (*1):
    Dual-Redundant
  WAN Communication Interface:
    Single or Duplexed (100BASE-TX)
  *1: For more details, refer to “Integrated Production Control System CENTUM VP System Overview” (GS 33J01A10-01EN).

- Hardware configuration
  Power Supply Module (PW441, PW442, or PW444):
    Two modules for dual-redundant configuration
  Communication Module (VI461):
    Two modules for dual-redundant configuration
  Note: No single configuration is available.

- Mounting type
  19-inch Rack-mount (M5 x 4 screws)
  Insulation bushes are used as accessory.

- Connection terminal specifications
  Power Supply: M4 screw terminal connection
  Grounding: M4 screw terminal connection
  Vnet/IP (BUS1/BUS2):
    RJ-45 Modular jack
    (ISO8877-compliant)
  WAN (WAN1/WAN2):
    RJ-45 Modular jack
    (ISO8877-compliant)

- Power supply voltage and frequency
  100-120 V AC: 80 VA
  220-240 V AC: 110 VA
  24 V DC: 1.7 A
  Power supply by a single power line or dual power line is available.

- Weight
  Approx. 5.0 kg

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1st Edition Feb. 1, 2015 (YK)
**WAN Requirements**

One-way transmission bandwidth: 0.5 Mbps and faster (*1)
One-way transmission delay: 500 ms or less
Transmission quality: 1x10⁻⁶ or less (*2)

*1: In case the WAC Router is used with the bandwidth less than 0.5 Mbps, please contact YOKOGAWA for more details.

*2: This is the bit error rate (BER) between the WAC Routers. It is equivalent to the packet loss rate of 5x10⁻⁵ for the packet length of 64 byte and 1x10⁻² for 1518 byte.

**Performance and Functions**

- **Transmission data capacity**

<table>
<thead>
<tr>
<th>Bandwidth</th>
<th>Transmission data capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 Mbps</td>
<td>500 data/second</td>
</tr>
<tr>
<td>1 Mbps</td>
<td>1,000 data/second</td>
</tr>
<tr>
<td>1.5 Mbps</td>
<td>1,500 data/second</td>
</tr>
<tr>
<td>2 Mbps</td>
<td>2,000 data/second</td>
</tr>
<tr>
<td>2.5 Mbps or more</td>
<td>2,500 data/second</td>
</tr>
</tbody>
</table>

Note: Transmission data capacity may be changed by the specification of WAN.

- **Frame filters function**

By using Frame filters function, the transmission data is filtered on the WAC Router. This function reduces the control communication frames to be transmitted, enabling efficient use of the limited bandwidth of the WAN. The specified type of message and time stamps can be transmitted among specified domains and stations.

- **Time synchronization function**

Time synchronization function maintains the time differences among the Vnet/IP domains within 5 seconds via the WAC Routers. With an SNTP server installed in each Vnet/IP domain, this time differences to less than 5 seconds.

- **The Bandwidth Limit Function and Preferential Forwarding of Control Communication Frames Function**

Bandwidth Limit Function suppresses the Control Communication Frame data volume to interexchange among the WAN within the limit of the specified bandwidth or less. Data overflow among the WAN exceeding the contracted bandwidth is prevented.

When the Bandwidth Limit Function is activated, the Preferential Forwarding of Control communication Frames Function also becomes activated. In case the transmission request to exceed the bandwidth limit occurs, the control communication frame is transmitted by giving the priorities based on the below table. Even when the WAC Router abandons any data exceeding the bandwidth limit by its Bandwidth Limit Function, however, transmission of important control communication frames can be protected.

<table>
<thead>
<tr>
<th>Priority</th>
<th>Communication frame types</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (high)</td>
<td>Safety communication between SCSs</td>
</tr>
<tr>
<td>2</td>
<td>Communication between FCSs by Inter-station connection link block (ADL), and process data setting.</td>
</tr>
<tr>
<td>3</td>
<td>Messages (*1)</td>
</tr>
<tr>
<td>4 (low)</td>
<td>Other than the above (1 to 3)</td>
</tr>
</tbody>
</table>

*1: SCS messages, FCS messages, HIS messages, and so on.

- **Security function**

In addition to the Vnet/IP’s security function, the WAC Router has the function to destroy packets (such data as unused protocols and unused port numbers) which are not used in the WAC Router to reduce vulnerability.
**SYSTEM CONFIGURATION**

This is to show a typical system architecture using a single-line WAN with the WAC Router.

- **WAN** is required for Vnet/IP and Ethernet.
- A PC with the system builder function is required for each Vnet/IP domain where the WAC Router is applied.
- A Vnet/IP domain connected by the WAC Router must be identified as a different project and let those projects connected via Multiple Project Connection function. YOKOGAWA strongly recommends that Vnet/IP domains to be connected with WAC routers are built as separate projects and connected by using the Multiple Project Connection package. If the single project configuration of Vnet/IP domains is required, please contact to YOKOGAWA for more details.

1. A digital service unit (DSU) is required for the communication in between a WAC Router and a wide area network, and the DSU is usually provided by the network service provider. Other network equipment such as a router, firewall, or network switch has to be installed as necessary.
## EXTERNAL DIMENSIONS

![Diagram of external dimensions](image.png)

Unit: mm

- Hole for mounting on a 19-inch rack
  (4 holes for M5 screws)

Note: The above drawings are for AW810D-A220.

Nominal Tolerances:
- When the reference dimension is over 0.5 mm and equal or less than 120 mm, its nominal tolerance is ± 0.8 mm, while its combination of nominal tolerance is ± 1.5 mm.
- When the reference dimension is over 120 mm, its nominal tolerance is in accordance with JEM 1459.

## MODELS AND SUFFIX CODES

**Wide Area Communication Router**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AW810D</td>
<td>Wide Area Communication Router (Duplexed Communication Module, Duplexed Power Supply)</td>
</tr>
</tbody>
</table>

### Suffix Codes

<table>
<thead>
<tr>
<th>Suffix Codes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-A2</td>
<td>WAN Interface (Common for both single and dual lines)</td>
</tr>
<tr>
<td>1</td>
<td>Single power system</td>
</tr>
<tr>
<td>2</td>
<td>Dual power system</td>
</tr>
<tr>
<td>0</td>
<td>Always 0</td>
</tr>
<tr>
<td>1</td>
<td>100-120 V AC power supply</td>
</tr>
<tr>
<td>2</td>
<td>220-240 V AC power supply</td>
</tr>
<tr>
<td>4</td>
<td>24 V DC power supply</td>
</tr>
<tr>
<td>5</td>
<td>Basic type with no explosion protection</td>
</tr>
<tr>
<td>6</td>
<td>With ISA Standard G3 option with no explosion protection</td>
</tr>
<tr>
<td>E</td>
<td>Basic type with explosion protection</td>
</tr>
<tr>
<td>F</td>
<td>With ISA Standard G3 option and explosion protection</td>
</tr>
</tbody>
</table>

### Option Code

<table>
<thead>
<tr>
<th>Option Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ATDOC</td>
<td>Explosion Protection Manual (*1)</td>
</tr>
</tbody>
</table>

Note:
- For compliance with EMC Standards, AW810D must be installed in a keyed metallic cabinet.
- *1: Select the option code `/ATDOC` to follow the ATEX Directive for use in potentially explosive atmospheres.
ACCESSORIES

<table>
<thead>
<tr>
<th>Parts Names</th>
<th>Parts Numbers</th>
<th>Quantity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulating bush</td>
<td>S9049PM</td>
<td>4</td>
<td>Accessory</td>
</tr>
</tbody>
</table>

APPLICABLE STANDARDS
Refer to the GS “Integrated Production Control System CENTUM VP System Overview” (GS 33J01A10-01EN).

ORDERING INFORMATION
Specify model and suffix codes.

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