GENERAL

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.

HARDWARE SPECIFICATIONS

About the installation and environmental conditions of the WAC Router, refer to "Integrated Production Control System CENTUM VP System Overview (Vnet/IP Edition) (GS 33K01A10-50E)," which is common with the WAC Router.

- Communication specifications
  - Vnet/IP Communication Interface (*1):
    - Dual-Redundant
  - WAN Communication Interface:
    - Single or Duplexed (100BASE-TX)

- 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

- Regulatory compliance
  - Safety Standards
    - [CSA] (for 100-120 V AC power supply)
    - [CE Marking] (for 100-120 V AC, 220-240 V AC and 24 V DC power supply)
  - EMC Conformity Standards
    - [CE Marking] (for 100-120 V AC, 220-240 V AC and 24 V DC power supply)
    - [C-Tick Marking] (for 220-240 V AC and 24 V DC power supply)
    - [KC Marking] (for 100-120 V AC, 220-240 V AC and 24 V DC power supply)
  - For the detailed information of following standards, refer to “System Overview (Vnet/IP Edition) (GS 33K01A10-50E).”
- **WAN Requirements**
  
  One-way transmission bandwidth: 0.5 Mbps and faster (*1)
  
  One-way transmission delay: 500 ms or less
  
  Transmission quality: $1 \times 10^{-6}$ 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 $5 \times 10^{-6}$ for the packet length of 64 byte and $1 \times 10^{-2}$ for 1518 byte.

- **Performance and Functions**
  
  - **Transmission data capacity**
    
    | Bandwidth    | Transmission data capacity |
    |--------------|----------------------------|
    | 0.5 Mbps     | 500 data/second            |
    | 1 Mbps       | 1,000 data/second          |
    | 1.5 Mbps     | 1,500 data/second          |
    | 2 Mbps       | 2,000 data/second          |
    | 2.5 Mbps or more | 2,500 data/second        |

  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 difference is 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.

    | Priority | Communication frame types |
    |----------|---------------------------|
    | 1 (high) | Safety communication between SCSs |
    | 2        | Communication between FCSs by Inter-station connection link block (ADL), and process data setting. |
    | 3        | Messages (*1) |
    | 4 (low)  | Other than the above (1 to 3) |

  *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.

A pair of the WAC Routers are required for each connection between Vnet/IP domains.

Maximum of two layers can be configured for Vnet/IP domain communications using 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 via the WAC Router must be identified as a different project and 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

Unit: mm
MODELS AND SUFFIX CODES

Wide Area Communication Router

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>-A2</td>
<td>WAN Interface</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Single power system</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Dual power system</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Always 0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>100-120 V AC power supply</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>220-240 V AC power supply</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>24 V DC power supply</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Basic type with no explosion protection</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>With ISA Standard G3 option with no explosion protection</td>
<td></td>
</tr>
</tbody>
</table>

Note: CENTUM VP software R5.03 or later revision is required. For compliance with EMC Standards, AW810D must be installed in a keyed metallic cabinet.

ACCESSORIES

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

ORDERING INFORMATION

Specify model and suffix codes.

TRADEMARK

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