MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

YOKOGAWA

ANT421-50 S1

OPTICAL ESB BUS REPEATER MASTER MODULE

Used with the applicable CENTUM VP configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Yokogawa GS 33J60F55-01EN

General Specifications

GS 33J60F55-01EN

Models ANT421, ANT522
Optical ESB Bus Repeater
Module for 4 km
(for N-IO/FIO Multimode Fiber)

CENTUM VP

[Release 6]

■ GENERAL

The Optical ESB Bus Repeater Module converts the ESB bus to an optical signal and transmits it. The ESB bus transmission distance can be extended within the range of up to 4 km by connecting the ANT421 Optical ESB Bus Repeater Master Module and ANT522 Optical ESB Bus Repeater Slave Module with an optical fiber cable.

These modules can replace existing ER bus and RIO bus to the optical ESB bus by utilizing the existing multimode fiber cables.

● ANT421 Optical ESB Bus Repeater Master Module for 4 km

This module can be installed in the Field Control Unit (AFV30☐/AFV40☐, A2FV50☐/A2FV70☐), Unit for Optical ESB Bus Repeater Module (ANT10U), ESB Bus Node Unit (ANB10☐), and Optical ESB Bus Node Unit (ANB11☐).

To branch the ESB bus at the ANT421, specify “Connector unit for ESB Bus” (option code “/CU1N”). To terminate the ESB bus at the ANT421, specify “Connector unit with terminator for ESB Bus” (option code “/CU1T”).

● ANT522 Optical ESB Bus Repeater Slave Module for 4 km

ANT522 is installed as standard in the Optical ESB Bus Node Unit (ANB11☐) as a slave module of the optical ESB bus. It can also be installed in the Unit for Optical ESB Bus Repeater Module (ANT10U).

To branch the ESB bus at the ANT522, specify “Connector unit with ESB Bus connector” (option code “/BU1A” or “HU1A”). To not connect the ANT522 to the ESB bus, specify “Connector unit” (option code “/BU1B” or “/HU1B”).

To monitor the temperatures and fans in the cabinet, specify “With HKU interface” (option code “/HU1A” or “/HU1B”).

● Installation Position

The following table shows the units and numbers of slots in which ANT421 and ANT522 can be installed.

For the installation positions corresponding to the slot numbers, see “FIO System Overview” (GS 33J60A10-01EN), “N-IO System Overview” (GS 33J62A10-01EN), and “Field Control Unit, Cabinet Utility Kit (for RIO System Upgrade)” (GS 33J64E10-01EN).

Table ANT421 Optical ESB Bus Repeater Master Module for 4 km

	Installable Unit and Slot Number		
	AFV30☐, AFV40☐, A2FV50☐, A2FV70☐	**ANB10☐, ANB11☐**	**ANT10U**
Single configuration (*1)	IO1, 3, 5	IO1, 3, 5, 7	IO1, 3, 5, 7, B1
Dual-redundant configuration (*2)	IO1 to 6	IO1 to 8	IO1 to 8, B1, 2

*1: A dummy cover is to be attached to the even-numbered slot of a pair of slots in which the module is installed.
*2: Install the module in the slots with the following numbers: IO1-2, IO3-4, IO5-6, IO7-8, and B1-2

Table ANT522 Optical ESB Bus Repeater Slave Module for 4 km

	Installable Unit and Slot Number	
	ANB11☐	**ANT10U**
Single configuration (*1)	B1	IO1, 3, 5, 7, B1
Dual-redundant configuration (*2)	B1, 2	IO1 to 8, B1, 2

*1: A dummy cover is to be attached to the even-numbered slot of a pair of slots in which the module is installed.
*2: Install the module in the slots with the following numbers: IO1-2, IO3-4, IO5-6, IO7-8, and B1-2

● HKU Interface (ANT522 Option)

When ANT522’s option code /HU1A or /HU1B is specified, the environmental information of the cabinet where the modules are installed can be transmitted to FCU via optical ESB bus.

The FCU monitors the connected cabinet’s environmental conditions and displays HKU’s operating status as well as system alarm on HIS.

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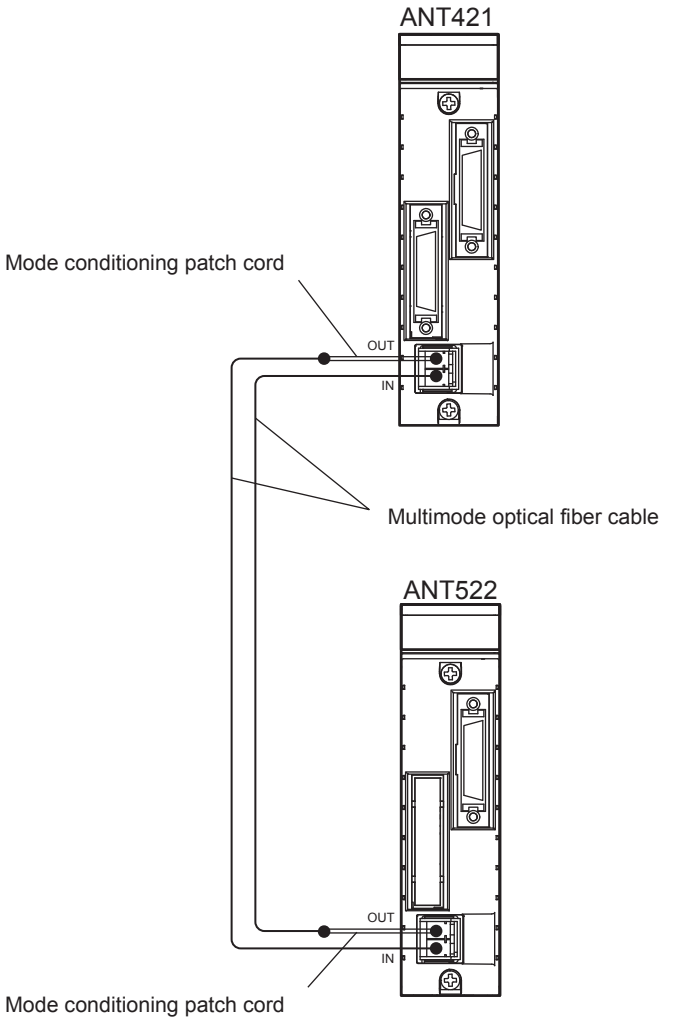
■ STANDARD SPECIFICATIONS

Function: ESB bus optical transport
Topology: chain and star connection
Maximum number of hops: 2 hops (for chain connection)
Maximum number of hops for each FCU (*1):
AFV30☐ or AFV40☐: 8 hops (for chain and star connection
A2FV50☐: 16 hops (for chain and star connection) (*2)
A2FV70☐: 8 hops (for chain and star connection)
Maximum transmission distance (*3): 4 km (one hop)
Optical connector type: LC (IEC61754-20-compliant)
Number of optical fiber cores: 2
Current consumption: 0.5 A
Weight: Approx. 0.25 kg (main body only)

*1: The number of paired connection between Master Module and Slave Module.
*2: Up to 24 hops are possible only when A2FV50☐ is used for FCU and star connection is configured with ANT4☐1 via EC402. (Supported by CENTUM VP R6.06 or later.)
*3: Depending on the characteristics of the optical fiber cable, the maximum transmission distance is different. Please refer to the section “Optical fiber cable specifications”.

■ CONNECTING OPTICAL FIBER CABLE

The figure below shows how optical fiber cables are connected. A single mode fiber side of a mode conditioning patch cord has to be connected to an output side of ANT421 and ANT522.



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● Optical fiber cable specifications

Maximum permissible optical loss		0 to 7 dB @ 1.3 µm (*1)
Optical Fiber	**Type**	Quartz multimode fiber GI 50/125 (*2) GI 62.5/125 (*3)
	Transmission bandwidth	Up to 2 km transmission distance : 200 MHz · km or over @1.3 µm (*1)
		2 to 4 km · transmission distance : 400 MHz · km or over @1.3 µm (*1)

*1: In case existing optical fiber cables are used, check that these has not deviated from the specifications by aging degradation.
*2: IEC 60793-2A1a-compliant
*3: IEC 60793-2A1b-compliant

● Mode conditioning patch cord specifications

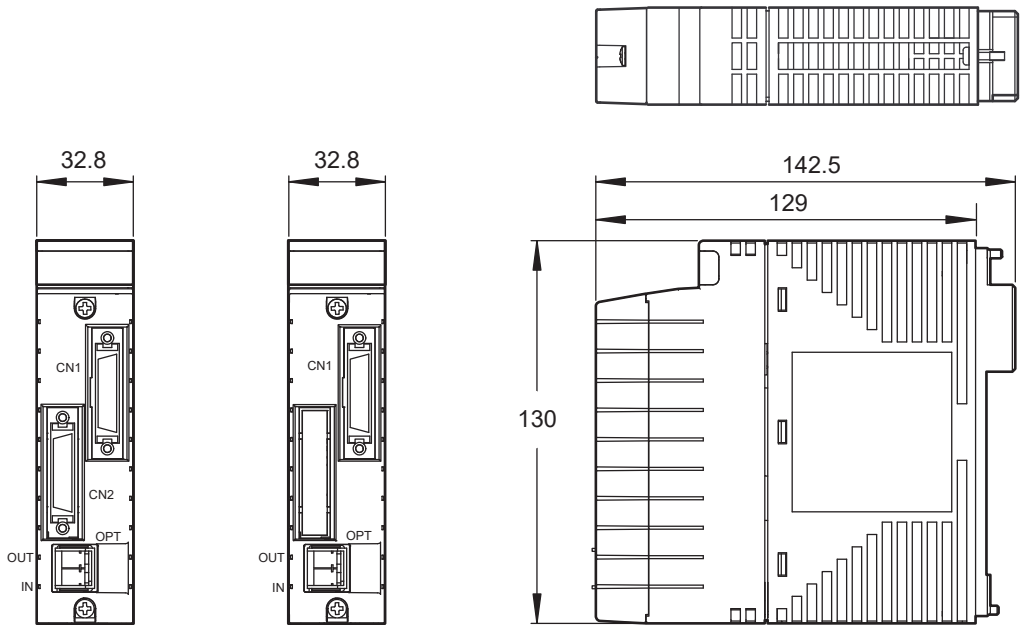
Item	GI 62.5/125	GI 50/125
Maximum insertion loss (*1)	0.5 dB	0.5 dB
Coupled power ratio (CPR) (*1)	28 dB < CPR < 40 dB	12 dB < CPR < 20 dB

*1: IEEE 802.3z-compliant

■ EXTERNAL DIMENSION

● Optical ESB Bus Repeater Master Module for 4 km (ANT421)

Unit: mm



ANT421-5E/CU1N
(Connector unit for ESB Bus)

ANT421-5E/CU1T
(Connector unit with terminator for ESB Bus)

F02E.ai

Nominal Tolerances :
Nominal tolerance is ± 0.8 mm for the dimensions of 0.5 mm or more and 120 mm or less, and the combined nominal tolerance is ± 1.5 mm.
The nominal tolerance is in accordance with JEM 1459 for the dimensions over 120 mm.

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■ MODEL AND SUFFIX CODES

Optical ESB Bus Repeater Master Module (for Multimode Fiber)

		Description
Model	ANT421	Optical ESB Bus Repeater Master Module 4 km (for Multimode Fiber)
Suffix Codes	-5	Standard type with no explosion protection
	-E	Standard type with explosion protection
	0	Basic type
	3	With ISA Standard G3 option and temperature (-20 °C to 70 °C) option
Option Codes	/CU1N	Connector unit for ESB Bus
	/CU1T	Connector unit with terminator for ESB Bus

Optical ESB Bus Repeater Slave Module (for Multimode Fiber)

		Description
Model	ANT522	Optical ESB Bus Repeater Slave Module 4 km (for Multimode Fiber)
Suffix Codes	-5	Standard type with no explosion protection
	-E	Standard type with explosion protection
	0	Basic type
	3	With ISA Standard G3 option and temperature (-20 °C to 70 °C) option
Option Codes	/BU1A	Connector unit with ESB Bus connector
	/BU1B	Connector unit
	/HU1A	Connector unit with ESB Bus connector and HKU I/F
	/HU1B	Connector unit with HKU I/F

Node Unit for Single ESB Bus with Optical Repeater (for Multimode Fiber)

This model is the optical ESB bus node unit equipped with ANT522.

For standard specifications, limitations of installation and notices for installation, external dimensions, and standard accessories, conform to ANB11 optical ESB bus node unit (GS 33J60F30-01EN).

		Description
Model	ANB11S	Node Unit for Single ESB Bus with Optical Repeater
Suffix Codes	-5	Single power supply, for 4 km multimode optical repeater (*1)
	-6	Dual-redundant power supply, for 4 km multimode optical repeater (*1)
	1	100 - 120 V AC power supply (*2)
	2	220 - 240 V AC power supply (*2)
	4	24 V DC power supply (*2)
	5	Basic type with no explosion protection
	6	With ISA standard G3 option, temperature (-20 ˚C to 70 ˚C) option, and no explosion protection
	E	Basic type with explosion protection
	F	With ISA standard G3 option, temperature (-20 ˚C to 70 ˚C) option, and explosion protection
Option Codes	/BU1A	Connector unit for ESB Bus
	/BU1B	Connector unit with terminator for ESB Bus
	/HU1A	Connector unit for ESB Bus with HKU I/F (*3)
	/HU1B	Connector unit with terminator for ESB Bus with HKU I/F (*3)
	/ATDOC	Explosion Protection Manual (*4)

*1: Model of Optical ESB Bus Repeater Slave Modules is ANT522.
*2: To meet the safety standards and EMC standards, the unit must be installed in a keyed metallic cabinet.
*3: Monitoring of temperatures and fans in the cabinet to be installed needs to be specified.
*4: Select the option code "/ATDOC" to follow the ATEX Directive for use in potentially explosive atmospheres.

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