General Specifications

Model A2MMM843, A2MDV843 I/O Modules (for N-IO)

CENTUM VP

GS 33J62F20-01EN

[Release 6]

■ GENERAL

This general specifications (GS) contains hardware specifications of I/O modules (for N-IO) that can be mounted on the base plates for N-IO I/O (A2BN3D, A2BN4D, or A2BN5D).

■ STANDARD SPECIFICATIONS

For the installation environmental standards and combination of base plates, I/O modules, I/O adaptors, and I.S. barriers for mounting of this products, refer to the GS "N-IO system overview" (GS 33J62A10-01EN).

● Analog digital I/O module

Analog digital I/O module (A2MMM843) has an analog I/O function and a digital I/O function for each channel. The analog input function, analog output function, digital input function, and digital output function can be switched by software setting for each channel. A dual-redundant configuration is available by mounting two units of the same modules. The function for each channel can be extended by mounting an I/O adaptor on the base plate for adaptor (A2BN3D).

Common specifications

Item	Specifications	
Model	A2MMM843	
Number of channels	16 (isolated) (*1)	
Maximum current consumption	700 mA (24 V DC) (When all channels are set to the digital I/O function and the source load is 20 mA)	
Withstanding voltage (*2)	Between input/output and system	: 1500 V AC for 1 minute : 42 V DC, continuous
Weight	Approx. 0.41 kg	

Note: A zener barrier cannot be connected with this module.
　　　 For configuring an intrinsic safety explosion protection, an isolation barrier must be used.
*1: Analog input function, analog output function, digital input function, or digital output function is available for each channel setting.
*2: This specification is applicable when the A2MMM843 is used by itself. When the A2MMM843 is mounted on the base plate for adaptor (A2BN3D), refer to the GS "Base Plates (for N-IO)" (GS 33J62F40-01EN).

Analog input functional specifications (current input)

Item		Specifications
Rated input range (maximum guaranteed accuracy range)		4 to 20 mA
Allowable input range		0 to 24 mA
Input resistance	**Power ON**	250 Ω (4-wire type DC, typical)
	Power OFF/ Dual-redundant standby side	500 kΩ or higher
Accuracy (Power supply voltage = 24 V)		±12 µA (23°C ±2°C) ±24 µA (0°C to 60°C) ±40 µA (-40°C to 70°C)
Transmitter power supply (2-wire type)		15.0 V or higher (20 mA) 24.0 V or lower (0 mA)
Setting of 2-wire or 4-wire transmitter		Can be set for each channel
Data update period		8 ms
HART communication		Support for HART7
Current limitation (2-wire type)		26 mA or lower

Analog output functional specifications (current output)

Item	Specifications
Rated output range (maximum guaranteed accuracy range)	4 to 20 mA
Allowable load resistance	0 to 750 Ω (20 mA), 0 to 600 Ω (23 mA)
Output burnout detection	0.65 mA or lower
Accuracy (Power supply voltage = 24 V)	±48 µA (23°C ±2°C) ±64 µA (0°C to 60°C) ±80 µA (-40°C to 70°C)
Data update period	8 ms
HART communication	Support for HART7
Current limitation	23 mA or lower

Digital input functional specifications

Item		Specifications
Input format		Dry contact input (*1)
Maximum absolute input		30.0 V DC
External resistance when input ON		1 kΩ or lower (6 mA continuous)
External resistance when input OFF		10 kΩ or higher (2.4 mA or lower)
Input current		6 mA ±20%
Contact rating		30 V DC or higher 10 mA or higher
Function	**Status input**	For detecting ON/OFF status
	Pushbutton input	For counting the pushbutton edges
	SOE input	For capturing the SOE data
Data update period		Status input: 2 ms Pushbutton input: 8 ms
Input response time		11 ms or less (for status input)
Minimum ON detection time		20 ms (for pushbutton input)
Maximum ON/OFF cycle		25 Hz (for pushbutton input)
Current limitation		7.2 mA or lower

*1: The digital input adaptor (A2SDV105) is used for a voltage input or isolating analog I/O signals from other channels. For details, refer to the GS "I/O adaptors (for N-IO)" (GS 33J62F30-01EN).

Digital input functional specifications (NAMUR standard compliant)

Item		Specifications
Input format		NAMUR (IEC 60947-5-6) standard compliant ON level detection: 2.1 mA or higher OFF level detection: 1.2 mA or lower Burnout detection: 50 µA or lower Short-circuit detection: Load resistance 100 Ω or lower
Function	**Status input**	For detecting ON/OFF status
	Pushbutton input	For counting the pushbutton edge
Data update period		Status input: 2 ms Pushbutton input: 8 ms
Input response time		11 ms or less (for status input) 15 ms or less (for status input, when burnout or short-circuit diagnosis is enabled)
Minimum ON detection time		20 ms (for pushbutton input)
Maximum ON/OFF cycle		25 Hz (for pushbutton input)
Current limitation		16 mA or lower

Digital output functional specifications

Item			Specifications	
Output format			Current sink	Current source
Rated applied voltage			24 V DC	—
Maximum absolute rating			30 V	—
Output ON voltage maximum value			2 V DC (100 mA)	—
Output voltage			—	Typical: 24.6 V (0 mA) Maximum: 28 V (0 mA) Minimum 19.2 V (20 mA)
Leak current maximum value when output OFF			0.1 mA	
Minimum load current			—	1 mA (when disconnection diagnosis is enabled)
Maximum load current			100 mA	20 mA
Function	**Status output**		ON/OFF status output	
	Pulse output	**Pulse width output**	One-shot pulse width output	
		Time-proportioning output	Time-proportioning ON/OFF output	
Data update period			Status output: 2 ms Pulse output: 8 ms	
Output response time			6 ms or less (for status output) 12 ms or less (for pulse output)	
Pulse width (for pulse output)			8 ms to 7200 s	
Pulse width resolution (for pulse output)			8 ms, but ON/OFF delay of maximum 1 ms is added	
Current limitation			—	25 mA or lower

—: Not applicable

● Digital I/O module

Digital I/O module (A2MDV843) has a digital I/O function for each channel. The digital input function and digital output function can be switched by software setting for each channel. A dual-redundant configuration is available by mounting two units of the same modules. The function for each channel can be extended by mounting an I/O adaptor on the base plate for adaptor (A2BN3D). This module is supported by CENTUM VP R6.04 or later.

Common specifications

Item	Specifications
Model	A2MDV843
Number of channels	16 (isolated) (*1)
Maximum current consumption	700 mA (24 V DC) (When all channels are set to the digital I/O function and the source load is 20 mA)
Withstanding voltage (*2)	Between input/output and system : 1500 V AC for 1 minute : 42 V DC, continuous
Weight	Approx. 0.41 kg

Note: A zener barrier cannot be connected with this module.
　　　For configuring an intrinsic safety explosion protection, an isolation barrier must be used.
*1:　Digital input function or digital output function is available for each channel setting.
*2:　This specification is applicable when the A2MDV843 is used by itself. When the A2MDV843 is mounted on the base plate for adaptor (A2BN3D), refer to the GS "Base plates (for N-IO)" (GS 33J62F40-01EN).

Digital input functional specifications

Item		Specifications
Input format		Dry contact input (*1)
Maximum absolute input		30.0 V DC
External resistance when input ON		1 kΩ or lower (6 mA continuous)
External resistance when input OFF		10 kΩ or higher (2.4 mA or lower)
Input current		6 mA ±20%
Contact rating		30 V DC or higher 10 mA or higher
Function	Status input	For detecting ON/OFF status
	Pushbutton input	For counting the pushbutton edges
	SOE input	For capturing the SOE data
Data update period		Status input: 2 ms Pushbutton input: 8 ms
Input response time		11 ms or less (for status input)
Minimum ON detection time		20 ms (for pushbutton input)
Maximum ON/OFF cycle		25 Hz (for pushbutton input)
Current limitation		7.2 mA or lower

*1:　Digital input adaptor (A2SDV105) is used for isolating voltage input from other channels.
　　　For details, refer to the GS "I/O adaptors (for N-IO)" (GS 33J62F30-01EN).

Digital input functional specifications (NAMUR standard compliant)

Item		Specifications
Input format		NAMUR (IEC 60947-5-6) standard compliant ON level detection: 2.1 mA or higher OFF level detection: 1.2 mA or lower Burnout detection: 50 µA or lower Short-circuit detection: Load resistance 100 Ω or lower
Function	Status input	For detecting ON/OFF status
	Pushbutton input	For counting the pushbutton edge
Data update period		Status input: 2 ms Pushbutton input: 8 ms
Input response time		11 ms or less (for status input) 15 ms or less (for status input, when burnout or short-circuit diagnosis is enabled)
Minimum ON detection time		20 ms (for pushbutton input)
Maximum ON/OFF cycle		25 Hz (for pushbutton input)
Current limitation		16 mA or lower

Digital output functional specifications

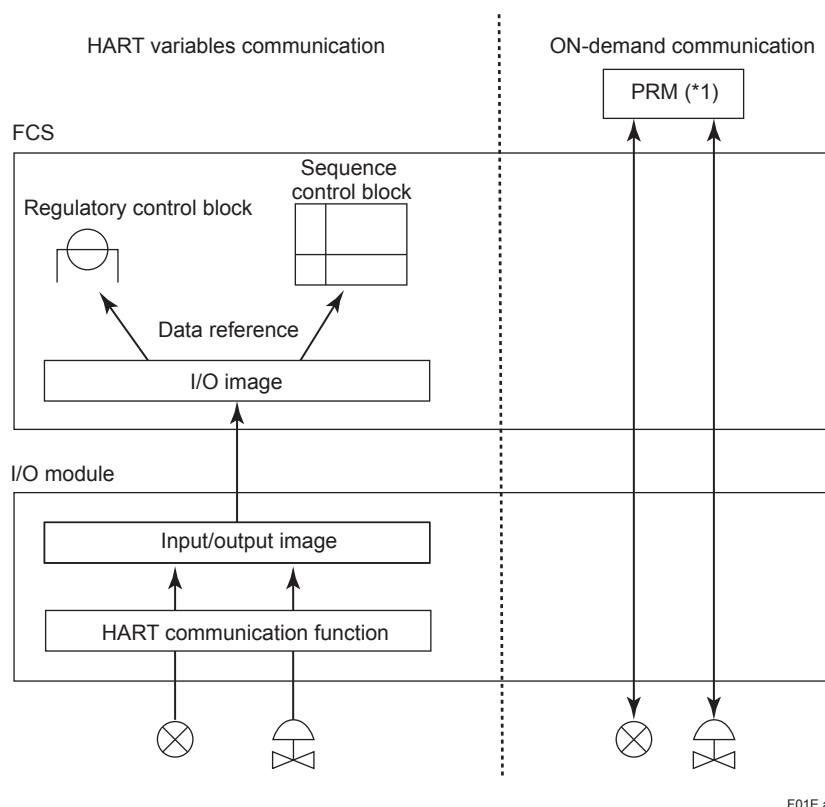| Item			Specifications	
Output format			Current sink	Current source
Rated applied voltage			24 V DC	—
Maximum absolute rating			30 V	—
Output ON voltage maximum value			2 V DC (100 mA)	—
Output voltage			—	Typical: 24.6 V (0 mA) Maximum: 28 V (0 mA) Minimum 19.2 V (20 mA)
Leak current maximum value when output OFF			0.1 mA	
Minimum load current			—	1 mA (when disconnection diagnosis is enabled)
Maximum load current			100 mA	20 mA
Function	Status output		ON/OFF status output	
	Pulse output	Pulse width output	One-shot pulse width output	
		Time-proportioning output	Time-proportioning ON/OFF output	
Data update period			Status output: 2 ms Pulse output: 8 ms	
Output response time			6 ms or less (for status output) 12 ms or less (for pulse output)	
Pulse width (for pulse output)			8 ms to 7200 s	
Pulse width resolution (for pulse output)			8 ms, but ON/OFF delay of maximum 1 ms is added	
Current limitation			—	25 mA or lower

—: Not applicable

■ HART COMMUNICATION

A field control station (FCS) communicates with HART communication transmitters and valve positioners using the HART communication function of the I/O Module (*1) and receives HART variable (*2) in addition to 4 to 20 mA analog input/output data. On-demand communication is also available.

> *1: The I/O module is the following four types.
> - Analog digital I/O module (A2MMM843) + Current input/voltage input adaptor (A2SAM105)
> - Analog digital I/O module (A2MMM843) + Current output/voltage output adaptor (A2SAM505)
> - Analog digital I/O module (A2MMM843) + Pass-through I/O signal adaptor (A2SMX801)
> - Analog digital I/O module (A2MMM843) + Pass-through I/O signal adaptor (A2SMX802)
>
> *2: HART variables can be read by HART commands.

● Communication with HART devices

The I/O modules communicate with HART field devices and stores HART variables together with analog data in the input/output image area. The FCS refers to the input/output image by accessing the I/O module. The FCS utilizes HART variables via I/O terminals of the function block (Regulatory Control Block and Sequence Control Block) in the same way as other analog/digital I/O signals.

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> *1: For further details of corresponding PRM revision and contents, refer to the GS "Plant resource manager" (GS 33Y05Q10-32E).

Figure Process data flow of HART communications

● HART communication functional specifications

The I/O modules are equipped with HART modems which enable HART communication (*1) by connecting HART field devices directly to the modules without modems and so on.

No. of HART devices: Max. 16 devices/module
HART variables: Max. 32 points/module
HART variables can be treated as ordinary process input data via %Y terminal connection.
HART multi-drop connection (*2): Max. 5 devices/channel
HART variables data minimum refresh cycle time: 0.5 sec/device

> *1: I/O modules handle HART variables communication and on-demand communication of HART communication. Hand held terminal (HHT) can also be available. Auxiliary devices must be applicable for HART communication when I/O modules are to perform HART communication with HART field devices via the auxiliary devices such as barriers.
> *2: A2SAM505 do not support HART multi-drop connection because only input devices can be connected.
> 4 to 20 mA analog data value and burst function are not supported.

■ EXTERNAL DIMENSIONS

A2MMM843 Analog digital I/O module
A2MDV843 Digital I/O module

Unit: mm

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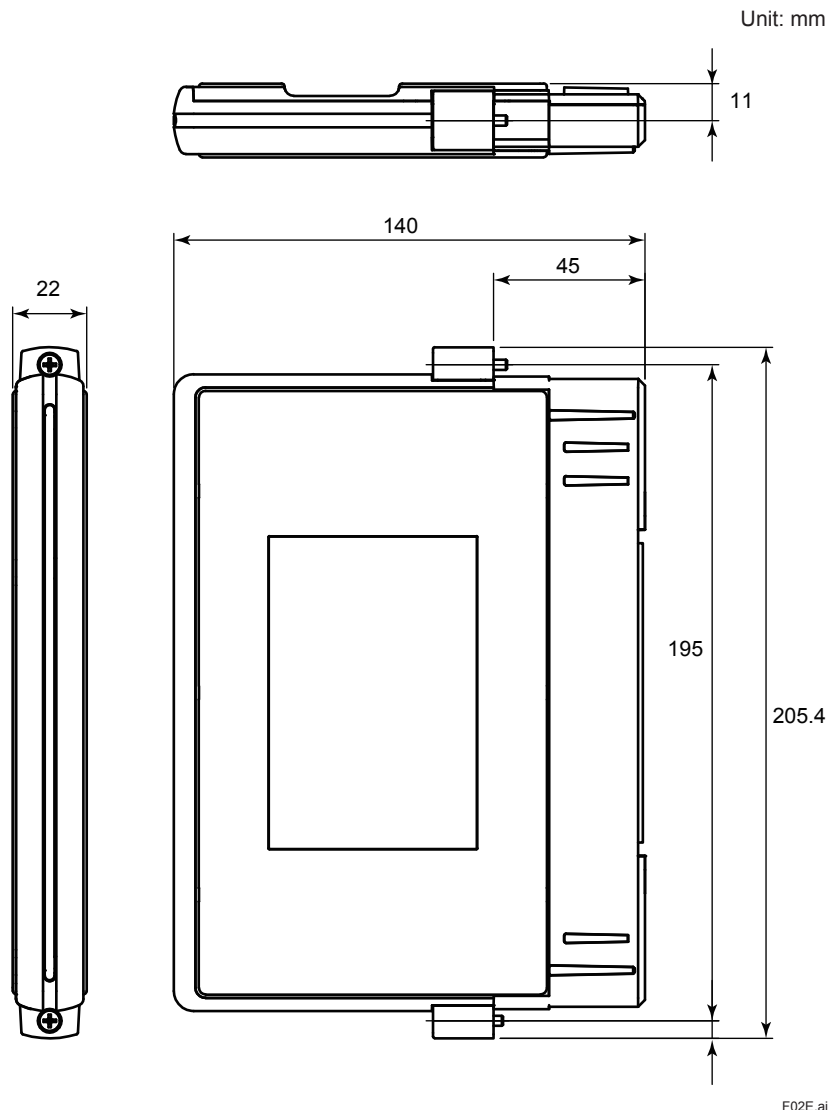
Nominal tolerances :
Nominal tolerance is ± 0.8 mm for the dimensions of 0.5 mm or more and 120 mm or less, and the combined nominal tolerance is ± 1.5 mm.
The nominal tolerance is in accordance with JEM 1459 for the dimensions over 120 mm.

■ MODEL AND SUFFIX CODES

Analog digital I/O module

		Description
Model	A2MMM843	Analog digital I/O module (16-channel, Isolated)
Suffix Codes	-S	Analog I/O function standard type
	S	Digital I/O function standard type
	1	Always 1
	0	With no explosion protection
	1	With explosion protection
	0	Basic type
	1	With ISA standard G3 option
	2	With temperature (-40 to 70 °C) option
	3	With ISA standard G3 option and temperature (-40 to 70 °C) option
	0	Always 0

Digital I/O module

		Description
Model	A2MDV843	Digital I/O module (16-channel, Isolated)
Suffix Codes	-0	Always 0
	S	Digital I/O function standard type
	1	Always 1
	0	With no explosion protection
	1	With explosion protection
	0	Basic type
	1	With ISA standard G3 option
	2	With temperature (-40 to 70 °C) option
	3	With ISA standard G3 option and temperature (-40 to 70 °C) option
	0	Always 0

■ APPLICABLE STANDARDS

Refer to the GS "Integrated production control system CENTUM VP system overview" (GS 33J01A10-01EN).

■ ORDERING INFORMATION

Specify model and suffix codes when ordering.

For selecting the right products for explosion protection, please refer to TI 33Q01J30-01E without fail.

■ TRADEMARKS

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