General Specifications

Analog I/O Modules (for FIO)

CENTUM VP

GS 33M50F30-40E

■ GENERAL

This GS covers the hardware specifications of the Analog I/O Modules (for FIO) that can be installed in the Node Unit for ESB Bus (Local Node) (ANB10S, ANB10D), the Node Unit for ER Bus (Remote Node) (ANR10S, ANR10D) and Compact Field Control Unit (for FIO) (AFF50S, AFF50D, AFV10S, AFV10D).

■ STANDARD SPECIFICATIONS

● Current/Voltage Input Modules (Non-Isolated)

These modules mainly receive 4 to 20 mA DC or 1 to 5 V DC standardized signal from 2-wire/4-wire transmitters. They can be used in dual redundant configuration.

Items		Specifications		
Model		**AAI141 (*1)**	**AAV141**	**AAV142**
Number of input channels		16, non-isolated	16, non-isolated (differential input)	16, non-isolated
Input signal		4 to 20 mA DC	1 to 5 V DC (allowable common mode voltage ± 1 V or less)	-10 to 10 V DC
Allowable input current/voltage		27 mA	±7.5 V	±13 V
Withstanding voltage		—	—	—
Input resistance	**Power ON**	400 Ω (at 20 mA) to 1000 Ω (at 4 mA) (*2)	1 MΩ or more	1 MΩ or more
	Power OFF	500 kΩ or more	340 kΩ or more	660 kΩ or more
Accuracy		±16 μA	±4 mV	±20 mV
Data update period		10 ms		
Step response time		100 ms		
Transmitter power supply		14.8 V or more (at 20 mA) (*3) 26.4 V or less (at 0 mA) (output current limit: 27 mA)	—	—
Setting of 2-wire or 4-wire transmitter		For each channel by setting pin	—	—
Drift due to ambient temperature change		±16 μA/10 °C	±4 mV/10 °C	±20 mV/10 °C
Maximum current consumption		310 mA (5 V DC), 450 mA (24 V DC)	350 mA (5 V DC)	350 mA (5 V DC)
Weight		0.2 kg	0.2 kg	0.2 kg
External connection		Pressure clamp terminal, KS cable, MIL connector cable		
HART communication (*4)		Available	—	—

*1: This module does not allow a Zener barrier to be connected. If the module is to be used in intrinsically safe applications, use an isolation barrier.

*2: Viewed from the terminals, module input resistance is, depending on the current flowing:

$$250\ \Omega + \frac{\text{voltage drop (3 V maximum) in the input protection circuit}}{\text{current value}}$$

F07E.ai

*3: This voltage is developed between connecting terminals for this module's 2-wire transmitter. When calculating if transmitter minimum operating voltage requirement will be satisfied, remember to allow for voltage drop in external wiring.

*4: When installing the module with HART function to a remote node, the firmware of EB401 must be Rev 2 or later. For HART function specifications, refer to "HART Communication Package (for A□I□□□-H) (GS 33M15F30-40E)."

YOKOGAWA

Yokogawa Electric Corporation
2-9-32, Nakacho, Musashino-shi, Tokyo, 180-8750 Japan
Tel.: 81-422-52-5634 Fax.: 81-422-52-9802

GS 33M50F30-40E
©Copyright Feb. 4, 2008 (YK)
5th Edition Aug. 1, 2010 (YK)

● Voltage Output Module (Non-Isolated)

This module outputs -10 to +10 V DC.
It can be used in dual redundant configuration.

Items	Specifications
Model	**AAV542**
Number of output channels	16, non-isolated
Output signal	-10 to 10 V
Withstanding voltage	—
Allowable load resistance	More than 10 kΩ
Accuracy	Larger of ±0.3 %/FS and ±12 mV
Data update period	10 ms
Output step response time	40 ms
Temperature drift	Larger of ±0.1 %/10 °C and ±10 mV/10 °C
Maximum current consumption	450 mA (5 V DC)
Weight	0.2 kg
External connection	Pressure clamp terminal, KS cable, MIL connector cable

● Current Input Modules (Isolated)

This module inputs 4 to 20 mA.
It can be used in dual redundant configuration.

Items		Specifications
Model		**AAI143 (*1)**
Number of input channels		16, isolated
Input signal		4 to 20 mA
Allowable input current		24 mA
Withstanding voltage		Between input and system: 1500 V AC, For 1 minute (*4)
Input resistance	**Power ON**	270 Ω (20 mA) to 350 Ω (4 mA) (*2)
	Power OFF	500 kΩ or more
Accuracy		±16 μA
Data update period		10 ms
Transmitter power supply		19.0 V or more (at 20 mA) 25.5 V or less (at 0 mA) (output current limit: 25 mA) (*5)
Setting of 2-wire or 4-wire transmitter		For each channel by setting pin
Drift due to ambient temperature change		±16 μA/10 ˚C
Maximum current consumption		230 mA (5 V DC), 540 mA (24 V DC)
Weight		0.3 kg
External communication		Pressure clamp terminal, MIL connector cable, Dedicated cable (KS1)
HART communication (*3)		Available

*1: This module does not allow a Zener barrier to be connected. If the module is to be used in intrinsically safe applications, use an isolation barrier.

*2: Viewed from the terminals, module input resistance is, depending on the current flowing:

$$250\ \Omega + \frac{\text{voltage drop (0.4 V maximum) in the input protection circuit}}{\text{current value}}$$

F09E.ai

*3: When installing the module with HART function to a remote node, the firmware of EB401 must be Rev 2 or later.
For HART function specifications, refer to “HART Communication Package (for A□I□□□-H) (GS 33M15F30-40E).”

*4: The withstanding voltage for using the dedicated cable is 500 V AC (between the input signal and the system).
The withstanding voltage for using MIL connector cable depends on the electrical specifications of its cable.

*5: This voltage is developed between connecting terminals for this module’s 2-wire transmitter. When calculating if transmitter minimum operating voltage requirement will be satisfied, remember to allow for voltage drop in external wiring.

All Rights Reserved. Copyright © 2008, Yokogawa Electric Corporation

		Description
Model	AAP135	Pulse Input Module (8-channel, Pulse count, 0 to 10 kHz, Isolated channels)
Suffix Codes	-S	Standard type
	0	Always 0
	0	Basic type
	3	With ISA Standard G3 option and temperature (-20 to 70 °C) option
Option Codes	/13A00	With KS Cable Interface Adapter [Model: ATI3A-00]
	/K4A00	With KS Cable Interface Adapter [Model: ATK4A-00]
	/13S00	With Pressure Clamp Terminal Block for Pulse [Model: ATI3S-00]
	/13S10	With Pressure Clamp Terminal Block for Pulse (surge absorber) [Model: ATI3S-10]
	/13D00	With Dual Pressure Clamp Terminal Block for Pulse [Model: ATI3D-00]
	/13D10	With Dual Pressure Clamp Terminal Block for Pulse (surge absorber) [Model: ATI3D-10]
	/CCC01	With Connector Cover for MIL Cable [Model: ACCC01]

		Description
Model	AAI143	Analog Input Module (4 to 20 mA, 16-channel, Isolated)
Suffix Codes	-S	Standard type
	-H	With digital communication (HART protocol)
	0	Always 0
	0	Basic type
	3	With ISA Standard G3 option and temperature (-20 to 70 °C) option
Option Codes	/K4A00	With KS Cable Interface Adapter (For connecting AEA4D Terminal Board) [Model: ATK4A-00]
	/A4S00	With Pressure Clamp Terminal Block [Model: ATA4S-00]
	/A4S10	With Pressure Clamp Terminal Block (surge absorber) [Model: ATA4S-10]
	/A4D00	With Dual Pressure Clamp Terminal Block [Model: ATA4D-00]
	/A4D10	With Dual Pressure Clamp Terminal Block (surge absorber) [Model: ATA4D-10]
	/CCC01	With Connector Cover for MIL Cable [Model: ACCC01]

		Description
Model	AAI543	Analog Output Module (4 to 20 mA, 16-channel, Isolated)
Suffix Codes	-S	Standard type
	-H	With digital communication (HART protocol)
	0	Standard switch-over response in redundant configuration (*1)
	1	Fast switch-over response in redundant configuration (*2)
	0	Basic type
	1	With ISA Standard G3 option
	3	With ISA Standard G3 option and temperature (-20 to 70 °C) option
Option Codes	/K4A00	With KS Cable Interface Adapter (For connecting AEA4D Terminal Board) [Model: ATK4A-00]
	/A4S00	With Pressure Clamp Terminal Block [Model: ATA4S-00]
	/A4S10	With Pressure Clamp Terminal Block (surge absorber) [Model: ATA4S-10]
	/A4D00	With Dual Pressure Clamp Terminal Block [Model: ATA4D-00]
	/A4D10	With Dual Pressure Clamp Terminal Block (surge absorber) [Model: ATA4D-10]
	/CCC01	With Connector Cover for MIL Cable [Model: ACCC01]

*1: If “standard switch-over response in redundant configuration” is selected, “basic type” or “with ISA Standard G3 option and temperature (-20 to 70 °C) option” may be specified.
*2: If “fast switch-over response in redundant configuration” is selected, “basic type” or “with ISA Standard G3 option” may be specified.

All Rights Reserved. Copyright © 2008, Yokogawa Electric Corporation

		Description
Model	AAI141	Analog Input Module (4 to 20 mA, 16-channel, Non-Isolated)
Suffix Codes	-S	Standard type
	-H	With digital communication (HART protocol)
	0	Always 0
	0	Basic type
	3	With ISA Standard G3 option and temperature (-20 to 70 °C) option
Option Codes	/K4A00	With KS Cable Interface Adapter [Model: ATK4A-00]
	/A4S00	With Pressure Clamp Terminal Block for Analog [Model: ATA4S-00]
	/A4S10	With Pressure Clamp Terminal Block for Analog (surge absorber) [Model: ATA4S-10]
	/A4D00	With Dual Pressure Clamp Terminal Block for Analog [Model: ATA4D-00]
	/A4D10	With Dual Pressure Clamp Terminal Block for Analog (surge absorber) [Model: ATA4D-10]
	/CCC01	With Connector Cover for MIL Cable [Model: ACCC01]

		Description
Model	AAV141	Analog Input Module (1 to 5 V, 16-channel, Non-Isolated)
Suffix Codes	-S	Standard type
	0	Always 0
	0	Basic type
	3	With ISA Standard G3 option and temperature (-20 to 70 °C) option
Option Codes	/K4A00	With KS Cable Interface Adapter [Model: ATK4A-00]
	/A4S00	With Pressure Clamp Terminal Block for Analog [Model: ATA4S-00]
	/A4S10	With Pressure Clamp Terminal Block for Analog (surge absorber) [Model: ATA4S-10]
	/A4D00	With Dual Pressure Clamp Terminal Block for Analog [Model: ATA4D-00]
	/A4D10	With Dual Pressure Clamp Terminal Block for Analog (surge absorber) [Model: ATA4D-10]
	/CCC01	With Connector Cover for MIL Cable [Model: ACCC01]

		Description
Model	AAV142	Analog Input Module (-10 to +10 V, 16-channel, Non-Isolated)
Suffix Codes	-S	Standard type
	0	Always 0
	0	Basic type
	3	With ISA Standard G3 option and temperature (-20 to 70 °C) option
Option Codes	/K4A00	With KS Cable Interface Adapter [Model: ATK4A-00]
	/A4S00	With Pressure Clamp Terminal Block for Analog [Model: ATA4S-00]
	/A4S10	With Pressure Clamp Terminal Block for Analog (surge absorber) [Model: ATA4S-10]
	/A4D00	With Dual Pressure Clamp Terminal Block for Analog [Model: ATA4D-00]
	/A4D10	With Dual Pressure Clamp Terminal Block for Analog (surge absorber) [Model: ATA4D-10]
	/CCC01	With Connector Cover for MIL Cable [Model: ACCC01]

		Description
Model	AAV542	Analog Output Module (-10 to +10 V, 16-channel, Non-Isolated)
Suffix Codes	-S	Standard Type
	0	Always 0
	0	Basic type
	3	With ISA Standard G3 option and temperature (-20 to 70 °C) option
Option Codes	/K4A00	With KS Cable Interface Adapter [Model : ATK4A-00]
	/A4S00	With Pressure Clamp Terminal Block for Analog [Model : ATA4S-00]
	/A4S10	With Pressure Clamp Terminal Block for Analog (surge absorber) [Model : ATA4S-10]
	/A4D00	With Dual Pressure Clamp Terminal Block for Analog [Model : ATA4D-00]
	/A4D10	With Dual Pressure Clamp Terminal Block for Analog (surge absorber) [Model : ATA4D-10]
	/CCC01	With Connector Cover for MIL Cable [Model : ACCC01]

All Rights Reserved. Copyright © 2008, Yokogawa Electric Corporation