General Specifications

Model ALF111 FOUNDATION™ fieldbus Communication Module (for N-IO/FIO)

GS 33J60G20-01EN

CENTUM VP

[Release 6]

■ GENERAL

This document describes about Model ALF111 FOUNDATION fieldbus Communication Module (for N-IO/FIO) which is to establish communication between field control stations (FCS) and fieldbus devices compliant to the FOUNDATION fieldbus (H1) such as transmitters and valve positioners.

This FOUNDATION fieldbus communication module can be mounted on the field control units (AFV30□, AFV40□, and A2FV50□), ESB bus node unit (ANB10□) and optical ESB bus node unit (ANB11□).
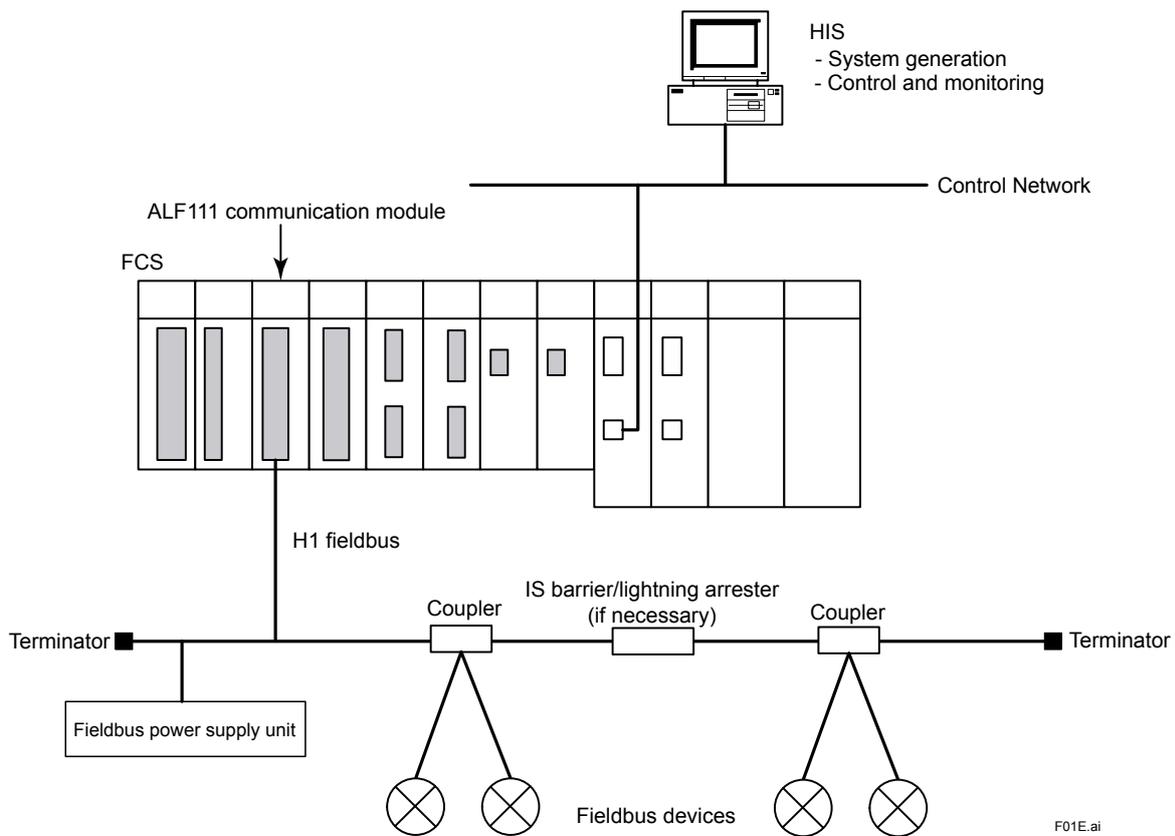

Figure FOUNDATION fieldbus System Configuration

Fieldbus power supply units (*1) and terminators are required depending on the network configuration.

*1: It is suggested that the fieldbus power supply unit is equipped with insulation function for realizing stable communications.

■ STANDARD SPECIFICATIONS

The FOUNDATION fieldbus communication module (ALF111) performs as the Link Active Scheduler (LAS) to exchange data with devices compliant with FOUNDATION fieldbus (H1) protocol. The hardware specifications for this module are as shown in the table below.

Table FOUNDATION fieldbus Communication Module Hardware Specifications

Item	Specifications
Model	ALF111
Interface	FOUNDATION fieldbus (low speed voltage mode) 4 ports (1 segment (*1) per port)
Transmission speed	31.25 kbps
Withstanding voltage	From field to system: 1500 V AC/minute
Bus connection (external connection)	• Pressure clamp terminals (removable terminal block with built-in terminators that can be switched on/off. • Connects with terminal board via a dedicated cable.
Installation method	Mounted on ANB10☐, ANB11☐, AFV30☐, AFV40☐, or A2FV50☐
No. of control I/O channels (*2)	Max. 48 points/segment (Complies with high- and medium-speed scanning cycle by specifying up to 6 points of I/O points as high-speed scanning type on the ER bus.)
No. of fieldbus devices	Max. 32 units per segment (*3) (ALF111 counts as one unit) (*4)
Communication functions	LAS function, Clock master function
Dual-redundancy	Enabled to set up two units of ALF111 installed in the annexed slots in the same node unit.
Current consumption	0.5 A or less
Weight	Approx. 0.40 kg

*1: A segment is the engineering unit that consists of the sum of field devices that can be connected to a single H1 fieldbus and the ALF111 ports.
*2: Number of control I/O channels means the sum of parameters to be connected with each internal block of the fieldbus devices.
*3: Number of fieldbus devices to be connected varies by the conditions such as cable length, power supply capacity, and with or without IS barriers.
*4: In order to configure dual-redundant communication by setting 2 units of ALF111 in one segment, the maximum 30 units/segment of fieldbus devices can be connected.

■ OPERATING ENVIRONMENT

Hardware Requirements
The FOUNDATION fieldbus communication module runs on the following FCS.

AFV30S, AFV30D, AFV40S, AFV40D, A2FV50S, A2FV50D

Software Requirements
The FOUNDATION fieldbus communication module runs on the control functions of the following FCS.

VP6F1700 Control Function for Field Control Station: for AFV30☐/AFV40
VP6F1800 Control Function for Field Control Station: for A2FV50☐

Engineering Requirements
Works on VP6E5100 Standard Builder Function.

■ INSTALLATION ENVIRONMENT

VP6F1700 Control Function for Field Control Station (for AFV30☐/AFV40☐)

No. of ALR111/ALR121/ALE111/ALP111 or ALP121/AGS813/ AGP813 modules	Max. 32 units/FCS (Max. 16 pairs for dual-redundant operation) (*1)
No. of ALF111 modules	Max. 64 units/FCS (Max. 32 pairs for dual-redundant operation)
No. of all the communication modules	Max. 64 modules/FCS (*1) (*2)
No. of FOUNDATION fieldbus face plate blocks	Max. 100 blocks/ALF111
	Max. 1500 blocks/FCS (general-purpose database type)
	Max. 1000 blocks/FCS (batch database type)

*1:   ALP111 and ALP121 cannot be mounted on the same FCS together.
*2:   This is the sum of ALR111, ALR121, ALE111, ALF111, ALP111 or ALP121, AGS813, and AGP813 modules.

**VP6F1800 Control Function for Field Control Station (for A2FV50☐)**

No. of ALR111/ALR121/ALE111/ALP111 or ALP121/AGS813/ AGP813 modules	Max. 32 units/FCS (Max. 16 pairs for dual-redundant operation) (*1)
No. of ALF111 modules	Max. 64 units/FCS (Max. 32 pairs for dual-redundant operation)
No. of all the communication modules	Max. 64 modules/FCS (*1) (*2)
No. of FOUNDATION fieldbus face plate blocks	Max. 100 blocks/ALF111
	Max. 1500 blocks/FCS (general-purpose database type)
	Max. 1000 blocks/FCS (batch database type)

*1:   ALP111 and ALP121 cannot be mounted on the same FCS together.
*2:   This is the sum of ALR111, ALR121, ALE111, ALF111, ALP111 or ALP121, AGS813, and AGP813 modules.

● Mounting Conditions

When ALF111 is used in a dual-redundant configuration to connect with a terminal board (AEF9D), always mount a terminator (YCB138) in empty ports of the terminal board.
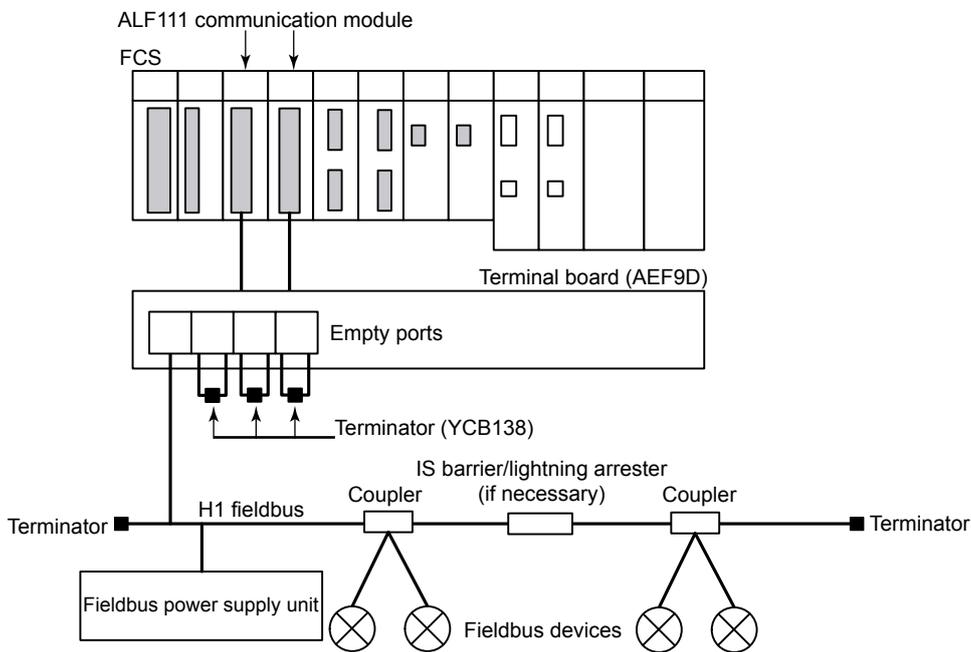
Figure Dual-redundant System Configuration

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■ COMMUNICATING WITH FIELDBUS DEVICES

The Foundation fieldbus communication module communicates with fieldbus devices and stores the data in the Input/Output image area in the communication module. An FCS refers to and sets the Input/Output image by accessing the communication module. The FCS utilizes the fieldbus device data via I/O terminals of the function block in the same way as other analog/digital I/O signals.
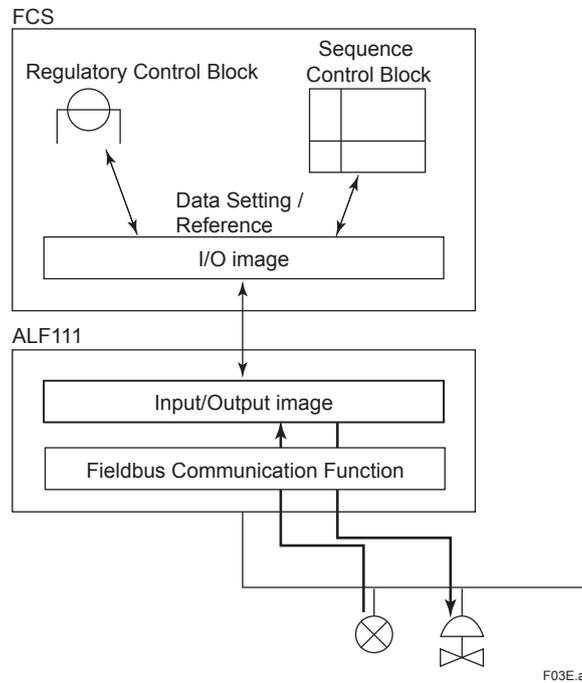

Figure Process Data Flow of Fieldbus Communication

● Foundation fieldbus Face Plate Block

The Foundation fieldbus face plate block is a continuous function block that works as a data buffer to enable access to the internal parameters of the fieldbus function block in the fieldbus devices from control and monitoring function blocks, other fieldbus function blocks, or FCS function blocks.

By using the Foundation fieldbus face plate block, it is possible to integrate the configuration of both fieldbus and FCS engineering works.

■ CONDITIONS OF FIELDBUS DEVICES

• Foundation fieldbus communication module supports fieldbus devices that passed the Host Interoperability Support Test (HIST) scheme and registered to the Fieldbus Foundation.
• The Capability Files have to be generated in accordance with the Foundation fieldbus Common File Format FS1.5, which must have passed the interoperability test along with the Device Descriptions.
• Both the Capability Files and the Device Descriptions are mandatory for engineering.

■ EXTERNAL DIMENSIONS

Unit: mm

(127.5)

32.8

2

125.5

CN1

130

F04E.ai
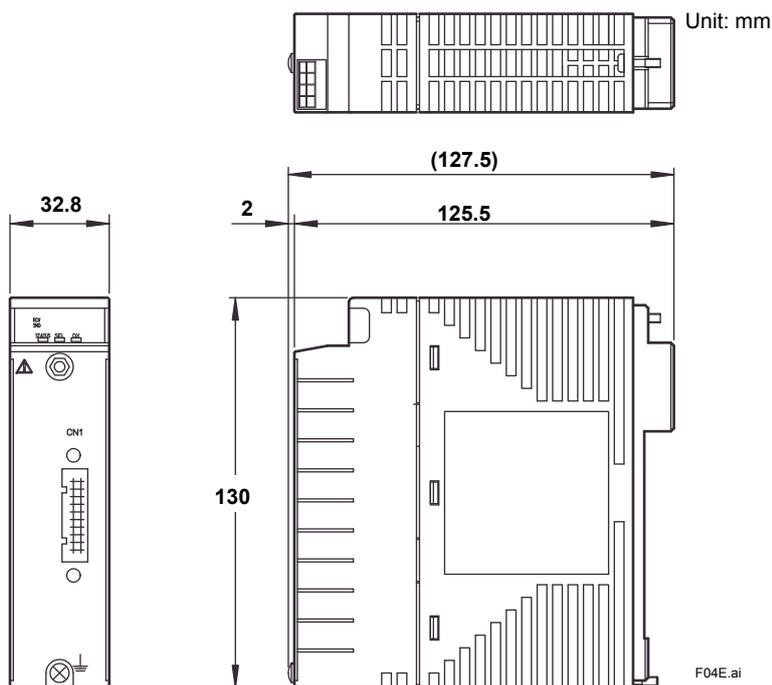
Nominal Tolerances :
    When the reference dimension is over 0.5 mm and equal or less than 120 mm, its nominal tolerance is ± 0.8 mm, while its combination of nominal tolerance is ± 1.5 mm.
    When the reference dimension is over 120 mm, its nominal tolerance is in accordance with JEM 1459.

■ MODEL AND SUFFIX CODE

			Description
Model	ALF111		FOUNDATION fieldbus Communication Module (N-IO/FIO)
Suffix Codes	-S		Standard type
		5	With no explosion protection
		E	With explosion protection
		0	Basic type
		1	With ISA Standard G3 option
Option Code	/F9S00		With pressure clamp terminal block for Fieldbus [Model: ATF9S-00]

■ APPLICABLE STANDARDS

Refer to the GS "Integrated Production Control System CENTUM VP System Overview" (GS 33J01A10-01EN).

■ ORDERING INFORMATION

Specify model, suffix codes, and option codes when ordering.
For selecting the right products for explosion protection, please refer to TI 33Q01J30-01E without fail.

■ TRADEMARKS

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