

# General Specifications

Model ALF111  
 FOUNDATION™ fieldbus  
 Communication Module (for FIO)



GS 33K50G20-50E

[Release 5]

## ■ GENERAL

This document describes about Model ALF111 FOUNDATION fieldbus Communication Module (for 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□, AFV10□, and AFF50□), ESB bus node unit (ANB10□), optical ESB bus node unit (ANB11□), and ER bus node unit (ANR10□).

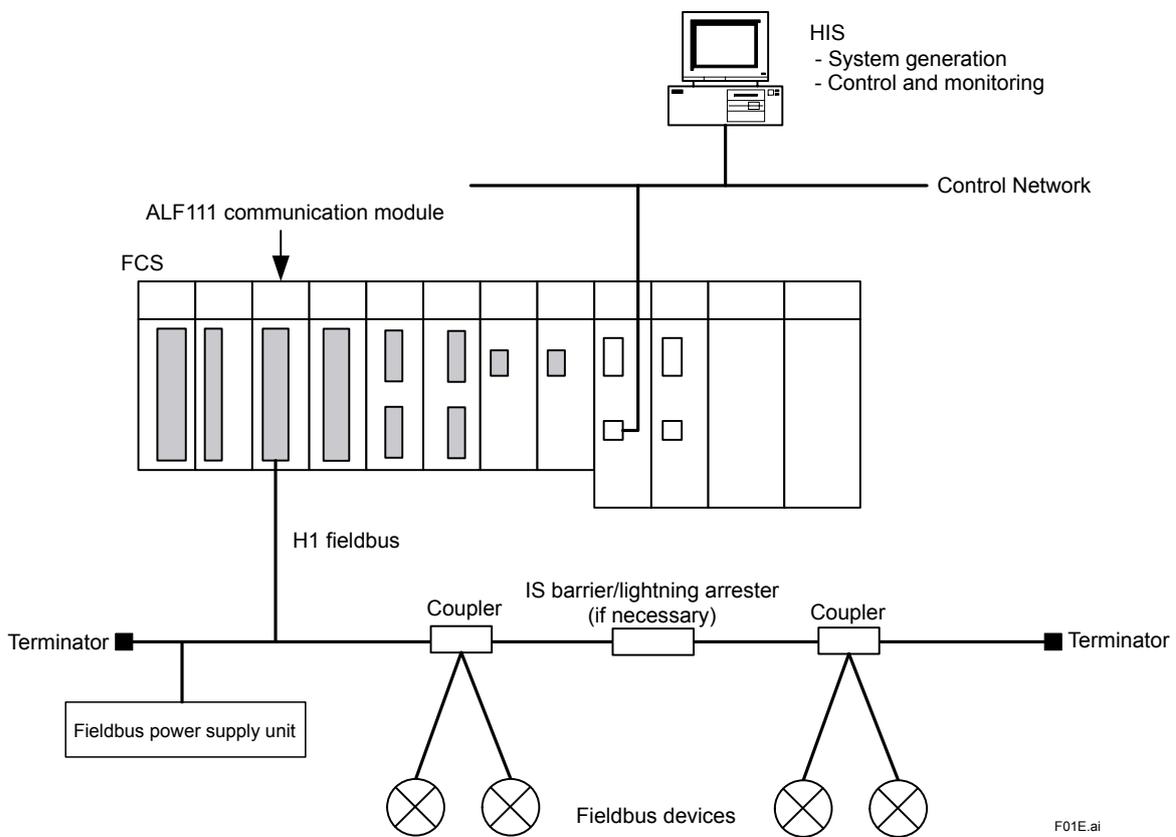


Figure FOUNDATION fieldbus System Configuration

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.

## ■ HARDWARE 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)	<ul style="list-style-type: none"> <li>• Pressure clamp terminals (removable terminal block with built-in terminators that can be switched on/off.</li> <li>• Connects with terminal board via a dedicated cable.</li> </ul>
Installation method	Mounted on ANB10□, ANB11□, ANR10□, AFF50□, AFV30□, AFV40□, or AFV10□
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	0.4 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, AFV10S, AFV10D,  
AFS30S, AFS30D, AFS40S, AFS40D,  
AFG30S, AFG30D, AFG40S, AFG40D,  
AFG81S, AFG81D, AFG82S, AFG82D, AFG83S, AFG83D, AFG84S, AFG84D,  
AFF50S, and AFF50D

### Software Requirements

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

LFS1700 Control Function for Field Control Station (for AFV30□/AFV40□, Vnet/IP and FIO):  
for AFV30□/AFV40□

LFS1500 Control Function for Field Control Station (for AFV10□, Vnet/IP and FIO): for AFV10□

LFS1300 Control Function for Standard Field Control Station (for V net and FIO): for AFS30□/AFS40□

LFS1330 Control Function for Enhanced Field Control Station (for V net and FIO):  
for AFG30□/AFG40□ /AFG8□□

LFS1350 Control Function for Compact Field Control Station (for V net and FIO): for AFF50□

### Engineering Requirements

Works on LHS5100/LHMS5100 Standard Builder Function.

## ■ INSTALLATION ENVIRONMENT

### LFS1700 Control Function for Field Control Station (for AFV30□/AFV40□)

No. of ALR111/ALR121/ALE111/ALP111 or ALP121/AGS813/AGP813 modules	Max. 8 units/FCS (Max. 4 pairs for dual-redundant operation) (*1)
No. of ALF111 modules	Max. 30 units/FCS (Max. 15 pairs for dual-redundant operation)
No. of all the communication modules	Max. 30 modules/FCS (*1) (*2)
No. of FOUNDATION fieldbus face plate blocks	Max. 100 blocks/ALF111
	Max. 500 blocks/FCS (general-purpose database type)
	Max. 400 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.

### LFS1700 Control Function for Field Control Station (for AFV30□/AFV40□) + LFS1750 Node Expansion Package (for 10 nodes)

No. of ALR111/ALR121/ALE111/ALP111 or ALP121/AGS813/AGP813 modules	Max. 16 units/FCS (Max. 8 pairs for dual-redundant operation) (*1)
No. of ALF111 modules	Max. 32 units/FCS (Max. 16 pairs for dual-redundant operation)
No. of all the communication modules	Max. 48 modules/FCS (*1) (*2)
No. of FOUNDATION fieldbus face plate blocks	Max. 100 blocks/ALF111
	Max. 1200 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.

### LFS1700 Control Function for Field Control Station (for AFV30□/AFV40□) + LFS1750 Node Expansion Package (for 14 nodes)

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.

### LFS1500 Control Function for Field Control Station (for AFV10□)

No. of ALR111/ALR121/ALE111/ALP111/AGS813/AGP813 modules	Max. 8 units/FCS (Max. 4 pairs for dual-redundant operation)
No. of ALF111 modules	Max. 30 units/FCS (Max. 15 pairs for dual-redundant operation)
No. of all the communication modules	Max. 30 modules/FCS (*1)
No. of FOUNDATION fieldbus face plate blocks	Max. 100 blocks/ALF111
	Max. 500 blocks/FCS

\*1: This is the sum of ALR111, ALR121, ALE111, ALF111, ALP111, AGS813, and AGP813 modules.

### LFS1500 Control Function for Field Control Station (for AFV10□) + LFS1550 Node Expansion Package

No. of ALR111/ALR121/ALE111/ALP111/AGS813/AGP813 modules	Max. 16 units/FCS (Max. 8 pairs for dual-redundant operation)
No. of ALF111 modules	Max. 32 units/FCS (Max. 16 pairs for dual-redundant operation)
No. of all the communication modules	Max. 48 modules/FCS (*1)
No. of FOUNDATION fieldbus face plate blocks	Max. 100 blocks/ALF111
	Max. 600 blocks/FCS

\*1: This is the sum of ALR111, ALR121, ALE111, ALF111, ALP111, AGS813, and AGP813 modules.

**LFS1300 Control Function for Standard Field Control Station (for AFS30□/AFS40□)**

No. of ALF111 modules	Max. 16 units/FCS (Max. 8 pairs for dual-redundant operation) (*1)
No. of FOUNDATION fieldbus face plate blocks	Max. 100 blocks/ALF111
	Max. 250 blocks/FCS

\*1: Depending on the FCS's database type, the maximum number of ALF111 is 2 units and the maximum number of FOUNDATION fieldbus face plate blocks is 30 blocks. For details, refer to "Model LFS1300 Control Function for Standard Field Control Station (for V net and FIO) (GS 33K15C30-50E)."

**LFS1330 Control Function for Enhanced Field Control Station (for AFG30□/AFG40□/AFG8□□)**

No. of ALF111 modules	Max. 32 units/FCS (Max. 16 pairs for dual-redundant operation)
No. of FOUNDATION fieldbus face plate blocks	Max. 100 blocks/ALF111
	Max. 600 blocks/FCS

\*1: Depending on the FCS's database type, the maximum number of ALF111 is 16 units. For details, refer to "Model LFS1330 Control Function for Enhanced Field Control Station (for V net and FIO) (GS 33K15C40-50E)."

**LFS1350 Control Function for Compact Field Control Station (for AFF50□)**

No. of ALF111 modules	Max. 30 units/FCS (Max. 15 pairs for dual-redundant operation)
No. of FOUNDATION fieldbus face plate blocks	Max. 100 blocks/ALF111
	Max. 500 blocks/FCS

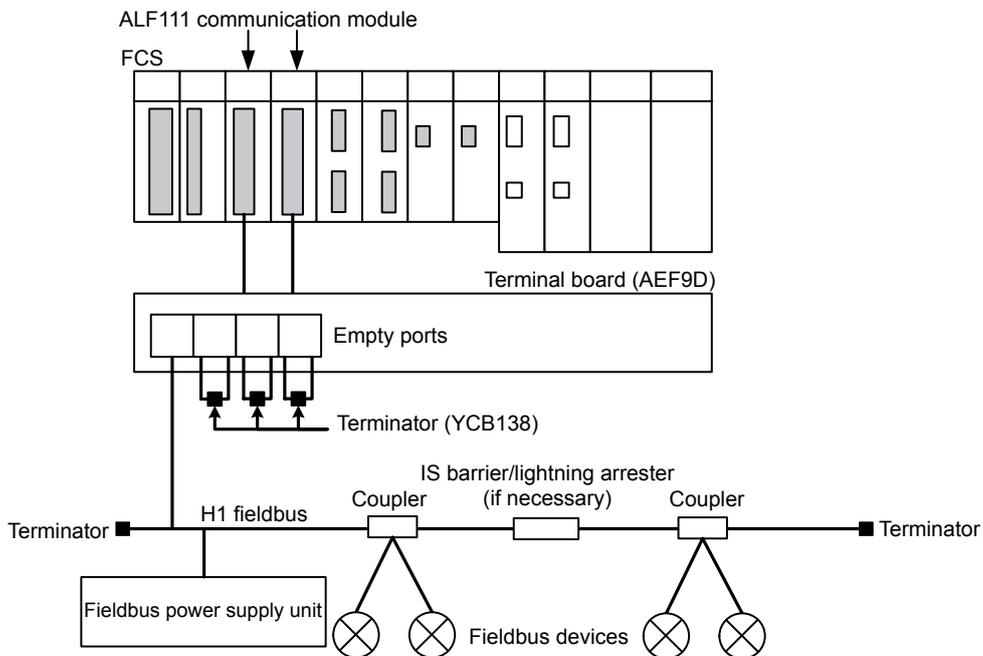
**● Installations to the ER Bus Node Unit (\*1) (\*2)**

No. of ALR111/ALR121/ALE111/ALF111/ALP111 modules: Max. 8 units

- \*1: Mounting on the ER bus node unit is applicable when the FCS's main memory is 32 Mbyte or more and EB401 firmware revision is R3 or later.
- \*2: Field control units (AFV30□ and AFV40□) do not support ER bus node unit (ANR10□).

**● 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.



F02E.a

**Figure Dual-redundant System Configuration**

## ■ 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.

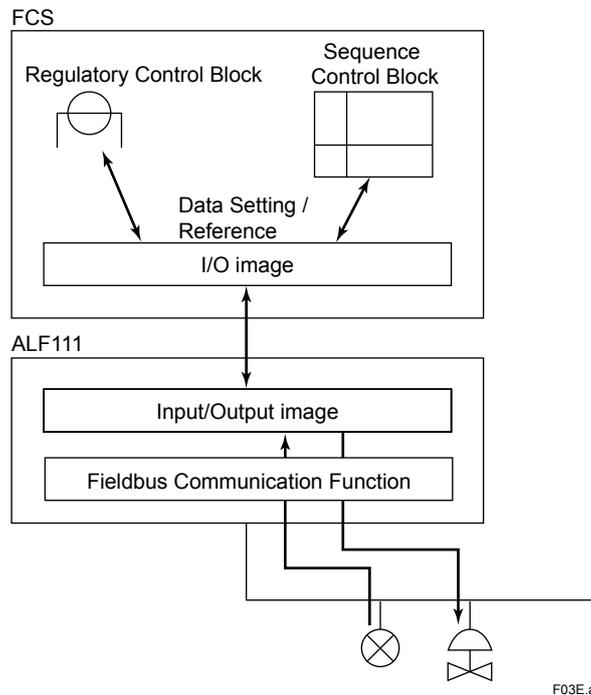


Figure Process Data Flow of Fieldbus Communication

### ● FOUNDATION fieldbus Face Plate Block

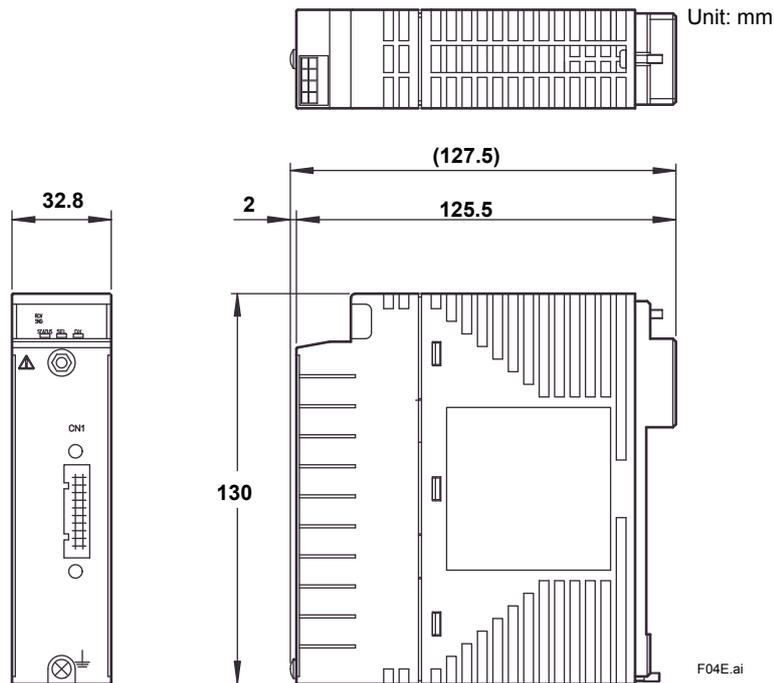
The FOUNDATION fieldbus face plate block is a continuous function block that works as a data buffer to enable access to the internal parameters of the fieldbus function block in the fieldbus devices from control and monitoring function blocks, other fieldbus function blocks, or FCS function blocks.

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



## MODEL AND SUFFIX CODE

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

## ORDERING INFORMATION

Specify model and suffix codes.

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

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