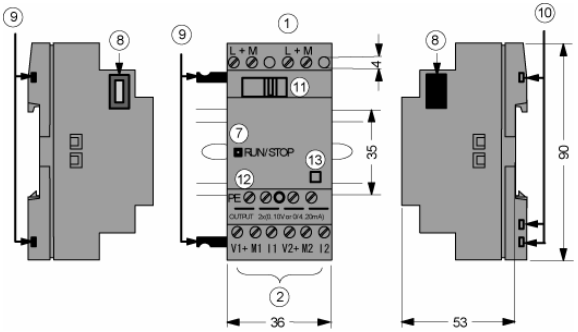
FL1E Series User's Manual Supplement

New analog output module FL1D-K2BM2 is added in FL1E IDEC SmartRelay series. And password protection function is available in the Text Display (version 4 or later). The following contents supplement FL1E series IDEC SmartRelay User's Manual (FL9Y-B1090).

When you use the FL1D-K2BM2, read this supplement and the latest FL1E series IDEC SmartRelay User's Manual and understand enough the feature and the capability.

●You can download the latest user's manual from the website.
http://www.idec.com/usa/index.html

Page 7 The analog output module (FL1D-K2BM2) structure



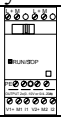
①Power supply
②Outputs
⑦RUN/STOP indicator
⑧Expansion interface
⑨Mechanical coding pins
⑩Mechanical coding sockets
⑪Slide
⑫PE terminal, for connecting earth
⑬Version number

Page 9 How to identify the IDEC SmartRelay

The IDEC SmartRelay identifier informs you of various properties.

Analog output module
FL1D－K①②③④
①Number of Outputs
②Resolution B: 10bit
③blank: 0 ... 10V M: 0 ... 10V, 0/4 ... 20mA
④Terminal type 2: non-removable terminal

Page 12 Expansion modules

Symbol	Name	Power supply	Inputs	Outputs
	FL1D-K2BM2	24V DC	none	2 analog 0 ... 10V DC, 0/4 ... 20mA (4)

(4): 0 ... 10V, 0/4 ... 20mA can be connected optionally.

Page 20 2.1.2 Setup with different voltage classes

Overview: Connecting an expansion module to the base module

In the following tables, "X" means that the connection is possible; "-" means that the connection is not possible.

Base module	Expansion module
	FL1D-K2BM2
FL1E-H12RCE	x
FL1E-H12SND	x
FL1E-H12RCA	x
FL1E-H12RCC	x
FL1E-B12RCE	x
FL1E-B12RCA	x
FL1E-B12RCC	x

Overview: Connecting an additional expansion module to an expansion module

Expansion module	Additional expansion module					
	FL1B-M08B2R2	FL1B-M08B1S2	FL1B-M08D2R2	FL1B-M08C2R2	FL1D-K2BM2	CM
FL1D-K2BM2	x	x	x	-	x	x

When setting up expansion modules of different power voltages, take the following restrictions into consideration.

Note

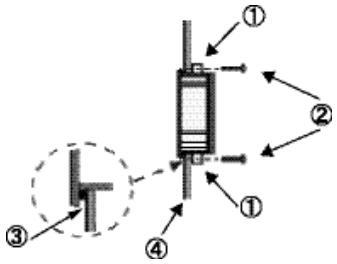
When you use a 24V DC power supply to supply power to 12/24V DC power type base module and 24V DC power type expansion I/O modules, use a 24V DC power supply which starts up within 10 seconds, otherwise the base module does not recognize the expansion I/O modules. When the power supply voltage varies while the base module and the expansion I/O modules are operating, they normally operate within the permissible operating voltage range.

When using different power supplies, supply power to the base module and expansion modules at the same time, or supply power to expansion modules before the base module.When supplying power to expansion modules after the base module, expansion modules may not be recognized by the base module. When using different power supplies, the fast transient/burst immunity (IEC61000-4-4) will be 1 kV (power supply).
A 100 to 240V AC/DC module cannot be connected to the right side of a 12/24V DC, 24V DC, or 24V AC/DC module. For analog input module and AS-Interface communication module, a module of any voltage can be connected to the left side. To the right side, however, a 100 to 240V AC/DC module cannot be connected.

Page 21 2.1.3 Compatibility

You can use FL1D-K2BM2 with equipment series FL1C or FL1D, but you cannot use the module with equipment series FL1B or earlier.

Page 27 2.2.3 Mounting the Text Display



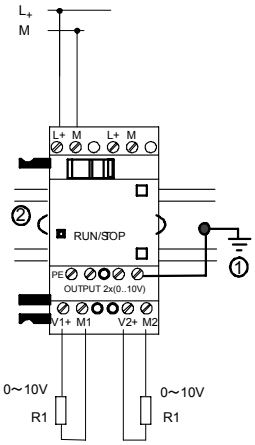
① Mounting brackets
② Mounting screws
③ Gasket
④ Cabinet door or control panel
(Thickness: 1.5 to 4 mm)

Note

The number of supplied mounting screws and brackets on the FL1E-RD1 text display depends on the version. The version number of the FL1E-RD1 is found in the lower-right corner on the back of the module. For identifying the version, see page 5.
For versions 3 and earlier, 2 screws and brackets are provided.
For versions 4 and later, 4 screws and brackets are provided. Listed by UL type 4x / 12 for a tightening torque of 0.2 Nm.

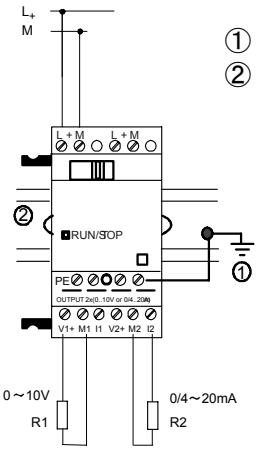
Page 41 Connecting outputs

FL1D-K2B2



V1, V2: 0 ... 10V
R1: >= 5kΩ

FL1D-K2BM2



① Earth
② DIN rail

V1, V2: 0 ... 10V
R1: >= 5kΩ
I1, I2: 0/4 ... 20mA
R2: <= 250Ω

Note

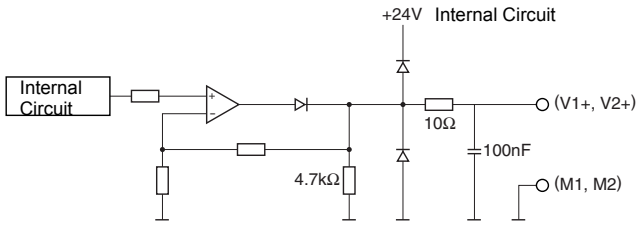
Caution for wiring the analog output terminals:

Check the analog output terminals, and wire each output terminal to the external equipment, according to the type of analog outputs. Incorrect wiring may cause damage to the equipment connected to the analog output terminals. The terminal arrangement on the FL1D-K2BM2 is different from that of the FL1D-K2B2.

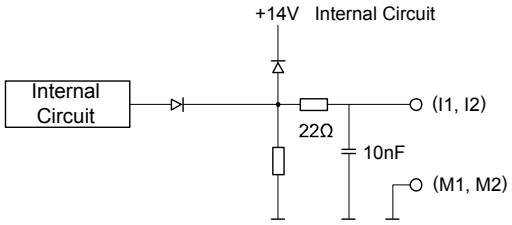
Check the analog output terminals on the FL1D-K2BM2, and replace the FL1D-K2B2 with the FL1D-K2BM2.

Page 42 Output Internal Circuit

FL1D-K2BM2
Analog Output (0-10V)



FL1D-K2BM2
Analog Output (0-20mA)



Page 72 3.6.5 Password

You can protect a circuit program from unauthorized access by assigning it a password. You can only assign or deactivate a password from the IDEC SmartRelay Base module or from WindLGC. You can only change a password from the IDEC SmartRelay Base module. If you have assigned a password, and are using a Text Display (version 4 or later) together with an IDEC SmartRelay Base module (version 4 or later), you must enter this password if you want to change IDEC SmartRelay from RUN mode to STOP mode from the Text Display. You can not stop the execution of the circuit program in IDEC SmartRelay from the Text Display without entering the password.

Note

This additional password protection function is only available in the Text Display with version number 4 or later. This function is only available under the following conditions:

• The version number of both the IDEC SmartRelay Base and the Text Display installed is at least version 4

• IDEC SmartRelay is currently in RUN mode and you want to switch to STOP mode

There is only one password that you can assign for IDEC SmartRelay. You can only assign it from the IDEC SmartRelay base module or from WindLGC. To change IDEC SmartRelay from RUN to STOP from the Text Display, you must enter the password from the Text Display as described below in the section "Changing IDEC SmartRelay from RUN to STOP mode from the Text Display".

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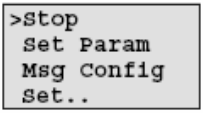
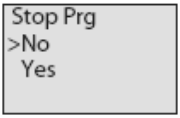
Changing IDEC SmartRelay from RUN to STOP mode from the Text Display

A change from RUN mode to STOP mode from the Text Display requires password entry if one is assigned. You must know the existing password if one is assigned. If there is no password assigned on the IDEC SmartRelay Base module, the Text Display will not prompt you for password entry. To change IDEC SmartRelay from RUN mode to STOP mode from the Text Display when IDEC SmartRelay is password-protected, follow these steps:

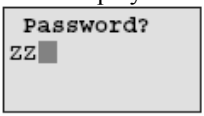
1. On the Text Display, press ESC to switch IDEC SmartRelay from RUN mode to STOP mode. Text Display shows the following menu:



2. Press OK. The Text Display shows you the following display:



3. Press ▼ to move the cursor to "Yes", and press OK. Enter the correct password (in this case: "ZZ"). If you enter an incorrect password, the Text Display returns to the display in Step 1.



4. Press OK to exit the password entry screen form. The Text Display opens the main menu:

Note

Whenever the Text Display is initialized, the password needs to be inputted again. The next time you start it and access this password-protected function (RUN to STOP), you will be prompted for password entry on the Text Display.When IDEC SmartRelay subsequently changes from STOP to RUN mode, you will again be prompted for password entry to change IDEC SmartRelay to STOP mode from the Text Display if more than one minute has elapsed since you pressed any key on the Text Display.The Text Display can also change IDEC SmartRelay from STOP to RUN mode, but no password is required in this case.

Page 88 Note

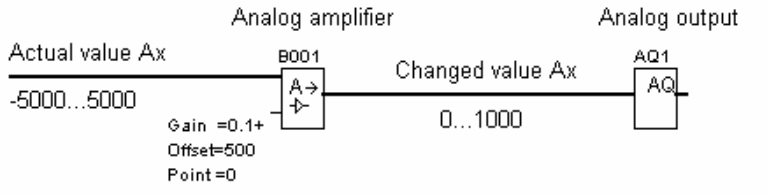
In case that you forget the password, you can delete the circuit program and the password using WindLGC. See the onlinehelp for WindLGC for more details.

For a base module with versions 3 and earlier, you can delete the circuit program and the password by inputting a wrong password on "Clear Prg" menu three times in a row.

For a base module with versions 4 or later, you can delete the circuit program and the password by inputting a wrong password on "Clear Prg" menu a hundred times in a row.

Page 178 Analog output

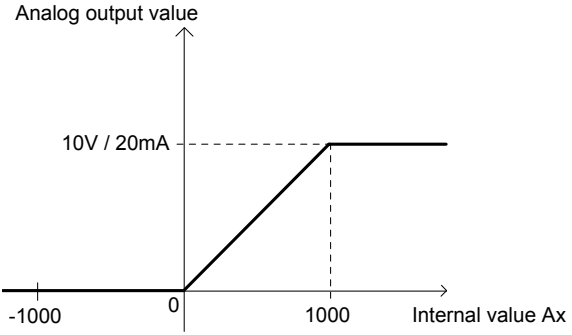
Analog output can only process values between 0 and 1000. Connect an Analog amplifier function block in front of the analog output function block to convert the analog output of the special function block within a range between 0 and 1000. The analog output range -5000 to 5000 of a special function block is converted to a range between 0 and 1000 in the block diagram below.



When an analog signal out of the range between 0 to 1000 is inputted to an analog output function block:
The analog output module operates as below for the analog signal out of the range between 0 to 1000.

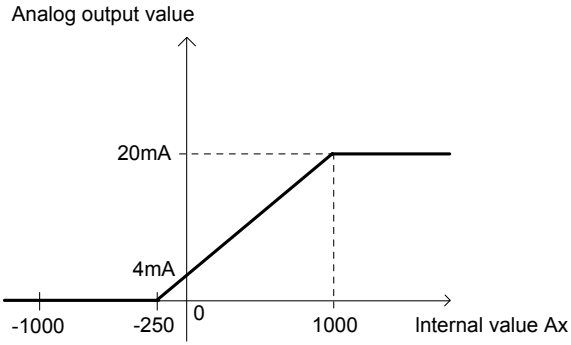
(1) When the type of analog outputs is set to 0-10V/0-20mA:
When internal values less than zero are inputted to the analog output function block, the analog output module outputs 0V and 0mA. When internal values more than 1000 are inputted to the analog output function block, the analog output module outputs 10V and 20mA.

The relationship between the internal value Ax inputted to the analog output function block and the analog output value:



(2) When the type of analog outputs is set to 4-20mA:
When internal values less than zero are inputted to the analog output function block, the analog output module outputs current values less than 4mA. When internal values more than 1000 are inputted to the analog output function block, the analog output module outputs 20mA.

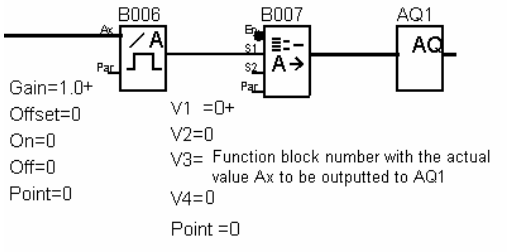
The relationship between the internal value Ax inputted to the analog output function block and the analog output value:



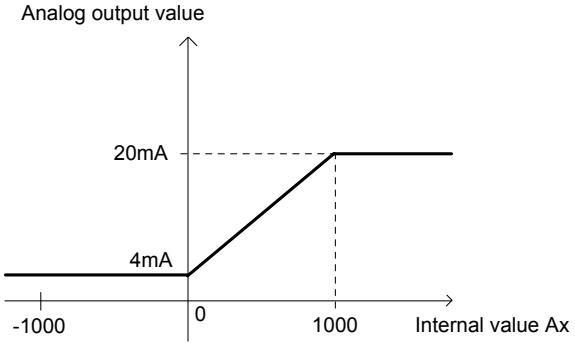
Note
Using an Analog trigger function block, you can determine that the internal values less than zero or more than 1000 are inputted to the analog output function block.

When the type of analog outputs is set to 4-20mA, and internal values less than zero are inputted to the analog output function block, it outputs current values less than 4mA. You may need to prevent the analog output module from outputting current values less than 4mA. To do this, connect the Analog Multiplexer function block (B007) in front of the analog output function block (AQ1) and connect the Analog trigger function block (B006) in front of the Analog Multiplexer function block to convert the internal values less than zero to internal values equal to or more than zero.

In the block diagram below, the analog output module operates as the lower part of the timing chart.



The relationship between the internal value Ax inputted to the analog output function block and the analog output value:



Set each parameter of the function blocks referring to the table below.

	Parameters
Analog trigger function block (B006 in the above table)	A : Gain = + 1.00 B : Offset = 0 On : On threshold = 0 Off : Off threshold = 0 p : Number of decimals: arbitrary
Analog Multiplexer function block (B007 in the above table)	V1 = 0 V2 : arbitrary V3 = Function block number with the actual value Ax to be outputted from AQ1 V4 : arbitrary p : Number of decimals: arbitrary

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Compatibility (Old memory cartridges in newer IDEC SmartRelay modules)

... to earlier versions (FL1C and FL1D devices):
Data written to the memory cartridge in the FL1D can be read in all FL1E. But data written to the memory cartridge in the FL1C cannot be read by the FL1E. When the memory cartridge is read by the FL1E, the original data in the FL1E is deleted. Data cannot be written from the FL1E to the memory cartridge.

Compatibility (New memory, battery, or combined memory/battery cartridges in older IDEC SmartRelay modules)

The FL1E memory cartridge can be used in FL1C or FL1D devices but cannot be used in FL1A..FL1B devices. Data written to the FL1E memory cartridge in the FL1C cannot be read by the FL1E. When the memory cartridge is read by the FL1E, the original data in the FL1E is deleted.

Note
For detail about the compatibility of SmartRelay and memory cartridges, refer to FAQ available on IDEC website
(URL: http://www.idec.com/faq/en/controller/).

Page 309 A.11 Technical data: FL1D-K2BM2

	FL1D-K2BM2
Power supply	
Input voltage	24V DC
Permissible range	20.4 ... 28.8V DC
Power consumption	35 ... 90mA
Voltage failure buffering	typ. 5ms
Power loss at 24 V	0.9 ... 2.2W
Electrical isolation	No
Reverse polarity protection	Yes
Ground terminal	For connecting ground and shielding of the analog output line.
Analog outputs	
Number	2
Voltage range	0 ... 10V DC
Voltage load	>= 5kΩ
Current output	0/4 ... 20mA
Current load	<= 250Ω
Resolution	10 bit, normalized to 0 ... 1000
Cycle time for analog output	depending on installation (typ. 50ms)
Electrical isolation	No
Line length (shielded and twisted)	10m
Error limit	Voltage output: +/- 2.5% at full scale Current output: +/- 3% at full scale
Short circuit protection	Yes
Response at short-circuit	(1)
Overload protection	Yes
Response at overload	(1)

(1) Voltage output: If short-circuit protection or overcurrent protection is activated for a voltage output, the error limit of the other voltage is not ensured.