

IDEC SmartRelay Series Programming Software WindLGC

WindLGC reduces development and debugging time of simple and complex programming



WindLGC Ver.6.*
Programming Software for IDEC
SmartRelays

Programming

Programs can be configured using the drag-and-drop method quickly and easily.

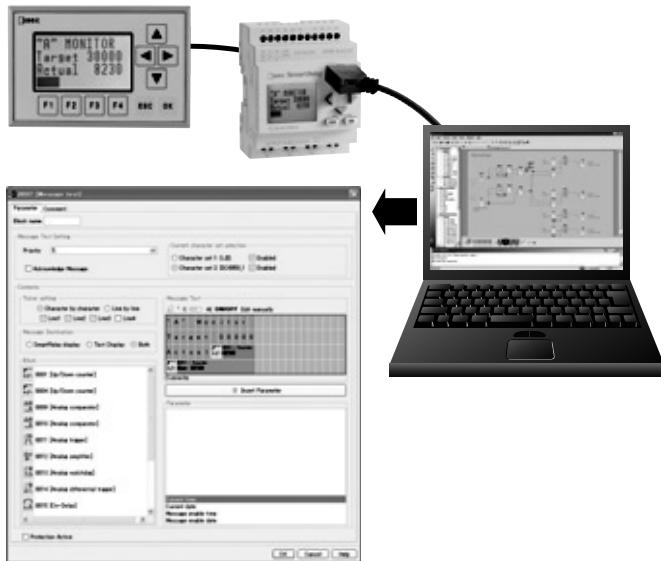


Function Block Programming

Function block parameters are entered and modified in the function block dialog boxes.



WindLGC features user-friendly debugging functions such as simulation and online test functions. Not only writing programs but also configuring, confirming, changing the messages on the base module and text display can be completed.



<http://www.idec.com/support>

Update Center



Free upgrade from WindLGC Ver. 3 can be downloaded from the update center or IDEC website through the Internet.

<http://www.idec.com/download>

WindLGC 6.* System Requirements

[CPU]	Pentium III 500MHz
[OS]	Windows® 98 SE/Me/ NT4.0/2000/XP/ Vista (except for 64 bit)
[Hard disk space]	90 MB
[RAM]	256 MB
[Display]	800x600 pixels, 256 colors (1024 x 768 recommended)

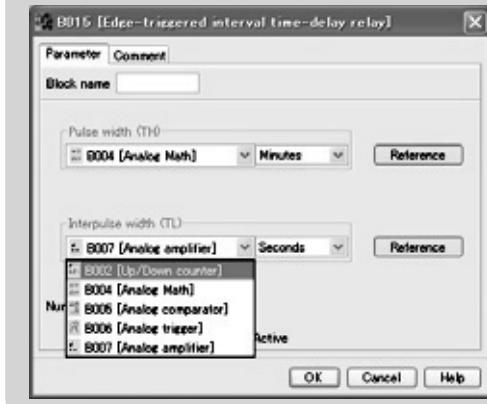
- To upgrade WindLGC Ver. 5.0.20 or Ver. 5.0.22 to Ver. 6.*, upgrade the software to Ver. 5.0.23 beforehand.

WindLGC Ver. 6.*: New Functions

Improvement of function blocks 1 Updated

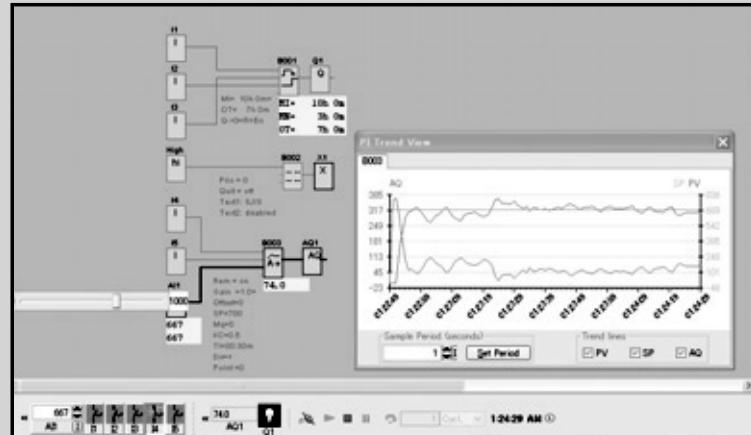
The addition of function blocks that can be set as parameters makes it possible to achieve optimization of the entire program and flexible programming through the coordination of function blocks necessary for programming.

No. of function blocks which can set as parameters	No. of function blocks which can be used as parameter preset values
22	8



Improvement of function blocks 2 Updated

When using simulation or online test on WindLGC, changes of analog output values (AQ), current values (PV), and set-values (SP) can be shown in a trend graph for easy monitoring of the changes. Sampling period can be also chosen in one-second increments, so that the chronological changes can be confirmed accurately and more easily.



- SP (Set Point) obtained by referring to the analog value of the linked function block can also be shown in the trend graph (WindLGC V.6.1.16 and up).

Flush
Silhouette

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Pilot Lights

Display
Lights

LED
Illumination
Units

Display
Units

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Blocks

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Terminals

AS-Interface

Relays &
Timers

Sockets

Circuit
Protectors

Power
Supplies

PLCs &
SmartRelay

Operator
Interfaces

Sensors

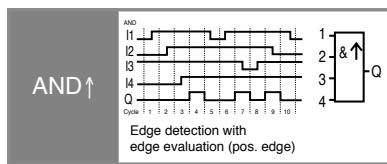
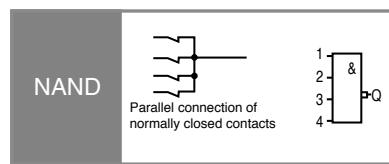
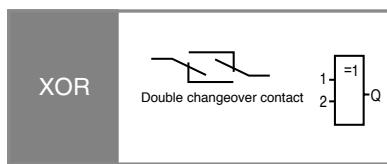
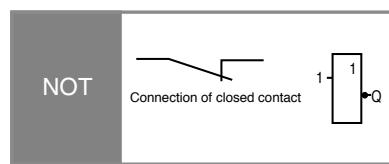
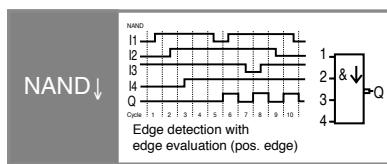
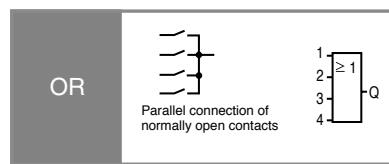
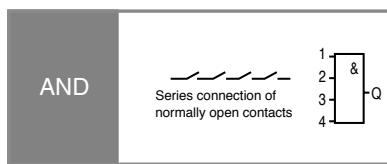
Control
Stations

Explosion
Protection

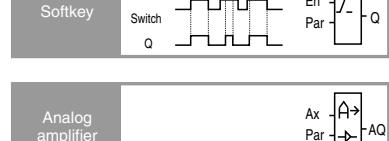
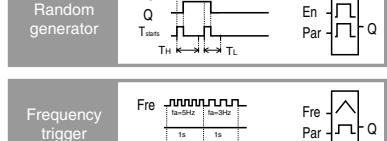
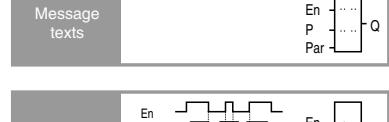
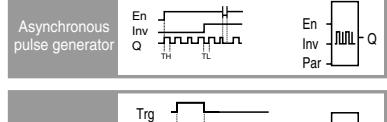
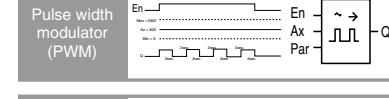
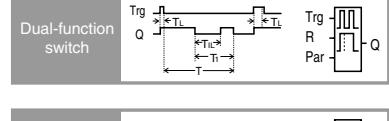
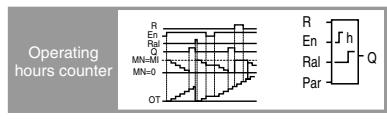
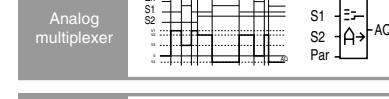
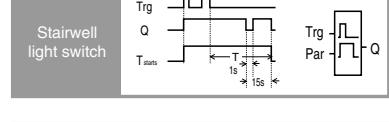
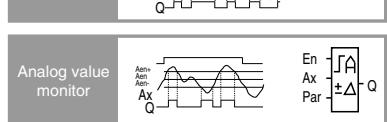
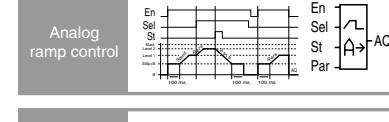
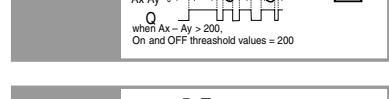
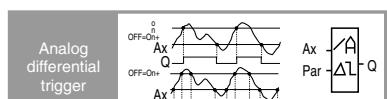
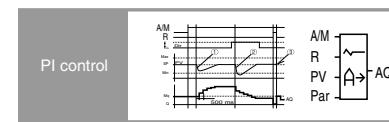
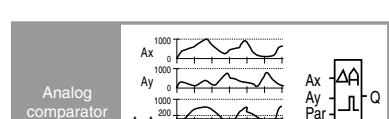
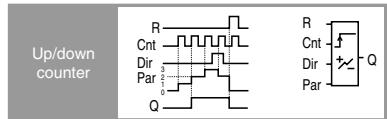
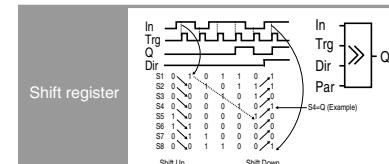
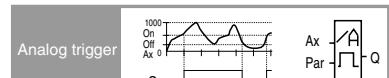
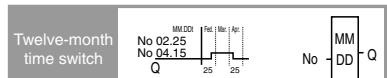
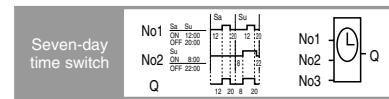
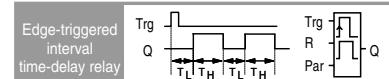
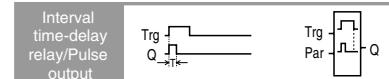
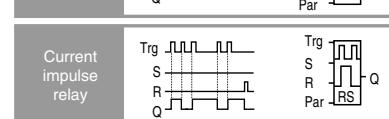
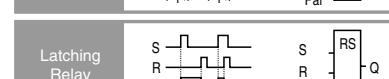
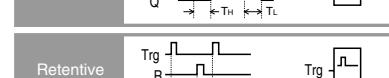
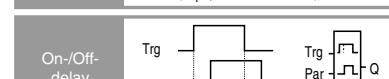
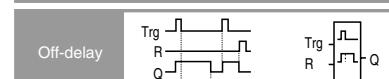
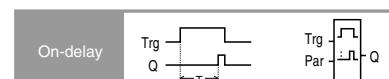
References

IDEC SmartRelay Series Programming Software WindLGC

GF General Function Blocks



SF Special Function Blocks



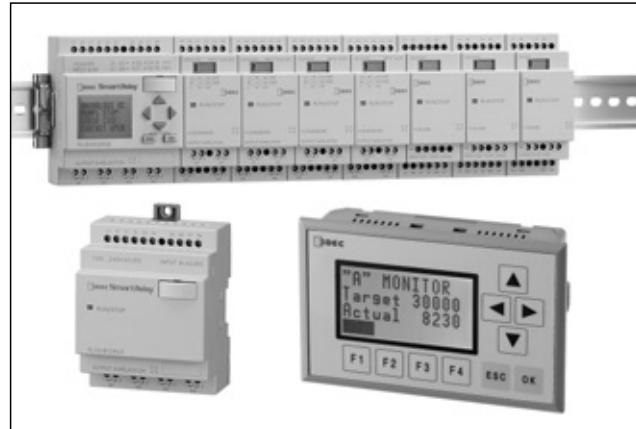
FL1E IDEC SmartRelay

New IDEC SmartRelay with enhanced performance and visibility!

Advanced features enable pulse width modulation (PWM) and analog maths functions.

- A maximum of 200 function blocks can be programmed, including 27 internal relays, 50 message displays, and an unlimited number of timers and counters to achieve powerful control operations (program capacity 3,800 bytes).
- 10A relay outputs eliminate the need for external relays.
- Expandable up to 24 digital inputs, 16 digital outputs, 8 analog inputs, and 2 analog outputs.
- AS-Interface communication modules enable decentralized control.
- An optional text display available. Easy operation from the control panel.
- All base and expansion modules are UL/c-UL listed, FM approved, IEC61131/VDE0631 compliant, Australian EMC compliant, and marine certified (ABS, BV, DNV, GL, Lloyd's Register, and Class NK).*

* Surge protection device (DEHN + SÖHNE GmbH + Co, BVT AD 24 Part No. 918 402) is required for marine certification when using 12/24V and 24V DC SmartRelay modules.



Base Modules

Rated Power Voltage	Input Signal	Output Signal	Display	Clock	I/O Points	Weight (approx.)	Part No.
24V DC	DC	Transistor	Yes (Note 1)	—	8/4 points	150g	FL1E-H12SND
12/24V DC	I1, I2, I7 and I8 are used for digital/analog inputs	Relay	Yes	Yes	8/4 points	190g	FL1E-H12RCE
			—			180g	FL1E-B12RCE
			Yes			190g	FL1E-H12RCA
24V AC/DC	AC/DC (Note 2)	Relay	—	Yes	8/4 points	180g	FL1E-B12RCA
			Yes			195g	FL1E-H12RCC
100 to 240V AC/DC	AC/DC	Relay	—	Yes	8/4 points	185g	FL1E-B12RCC

Note 1: FL1E-H12SND of Ver. 5 has clock function. Ver. 2, 3, and 4 do not have clock function.

Note 2: With NPN/PNP sensor input. For details, see "Input Internal Circuits" on page 1457.

Expansion I/O Modules

Input/Output	Rated Power Voltage	Input Signal	Output Signal	I/O Points	Weight (approx.)	Part No.
Input/Output	24V DC	DC	Transistor	4/4 points	90g	FL1B-M08B1S2
	12/24VDC	DC	Relay	4/4 points	125g	FL1B-M08B2R2
	24V AC/DC	AC/DC *	Relay	4/4 points	125g	FL1B-M08D2R2
	100 to 240V AC/DC	AC/DC	Relay	4/4 points	130g	FL1B-M08C2R2
Analog Input	12/24V DC	Analog	—	2/0 points	80g	FL1B-J2B2
Analog Output	24V DC	—	Analog	0/2 points	90g	FL1D-K2BM2

* With NPN/PNP sensor input. For details, see "Input Internal Circuits" on page 1457.

• I/O points within the maximum number of expandable I/O points can be used.

• Use of a base module and expansion I/O modules of the same power voltage rating is recommended, with power supplied to all modules using one power supply. When power is supplied to the modules from different power supplies, the fast transient noise is 1 kV (IEC61000-4-4).

Communication Modules

Name	Rated Power Voltage	I/O Points	Weight (approx.)	Part No.
AS-Interface Communication Module	30V DC (AS-Interface rated voltage)	Input: 4 points Output: 4 points	75g	FL1B-CAS2

Text Display for FL1E

Rated Power Voltage	Weight (approx.)	Part No.	Remarks
24V AC/DC 12V DC	220g	FL1E-RD1	Supplied with text display cable, mounting clip and waterproof gasket

Option

Name	Part No.	Ordering No.	Package Quantity	Remarks
Application Software Program WindLGC	FL9Y-LP1CDW	FL9Y-LP1CDW	1	CD-ROM (incl. online help manual)
USB Communication Cable	FL1E-PC2	FL1E-PC2	1	
Memory Cartridge	FL1E-PM4	FL1E-PM4	1	With read/write protect function
Battery Cartridge	FL1E-PB1	FL1E-PB1	1	Backup duration 2 years (typ.)
Memory/Battery Cartridge	FL1E-PG1	FL1E-PG1	1	
Mounting Clip for Base Module	FL1B-PSP1	FL1B-PSP1PN05	5	Supplied with a module
Mounting Clip and Waterproof Gasket for Text Display	FL1E-KW1	FL1E-KW1	1	Supplied with text display
Text Display Cable	FL1E-RDC1	FL1E-RDC1	1	Length: 2.5m
Lens Removal Tool	MT-101	MT-101	1	For removing memory and cartridges
IDECA SmartRelay User's Manual (English)	FL9Y-B1090	FL9Y-B1090	1	Downloadable from: http://www.idec.com/download/

Flush Silhouette

Switches & Pilot Lights

Display Lights

LED Illumination Units

Display Units

Safety Products

Terminal Blocks

Comm. Terminals

AS-Interface

Relays & Timers

Sockets

Circuit Protectors

Power Supplies

PLCs & SmartRelay

Operator Interfaces

Sensors

Control Stations

Explosion Protection

References

FL1E IDEC SmartRelay

Base Module Specifications

Base Module Part No.	FL1E-H12SND	FL1E-H12RCE FL1E-B12RCE	FL1E-H12RCA FL1E-B12RCA	FL1E-H12RCC FL1E-B12RCC		
Power Supply	Rated Power Voltage	24V DC	12/24V DC	24V AC/DC		
	Allowable Voltage Range	20.4 to 28.8V DC	10.8 to 28.8V DC	20.4 to 26.4V AC 20.4 to 28.8V DC		
	Rated Frequency	—	—	47 to 63 Hz		
	Current Draw	40 to 75 mA (24V DC)	60 to 175 mA (12V DC) 40 to 100 mA (24V DC)	76 to 182 mA (12V DC) 40 to 100 mA (24V DC)		
	Allowable Momentary Power Interruption	—	2 ms Typ. (12V DC) 5 ms Typ. (24V DC)	5 ms Typ. (24V AC/DC)		
	Power Consumption	1.0 to 1.8W (24V DC)	0.7 to 2.1W (12V DC) 1.0 to 2.4W (24V DC)	1.8 to 4.4 VA (24V AC) 1.0 to 2.4W (24V DC)		
Clock	Reverse Polarity Protection	Yes	Yes	—		
	Backup Duration	80 hours (Note 1, 5)	80 hours (Note 1)	80 hours (Note 1)		
	Clock Accuracy	±5 sec/day maximum	±5 sec/day maximum	±5 sec/day maximum		
Input	Input Signal	DC	DC	AC/DC		
	Input Points	8 (I1 to I8)	8 (I1 to I8)	8 (I1 to I8)		
	Analog Input Points	4 (I1, I2, I7, I8)	4 (I1, I2, I7, I8)	—		
	High-speed Input (Note 2)	4 (I3, I4, I5, I6), 5 kHz maximum	4 (I3, I4, I5, I6), 5 kHz maximum	—		
	Analog Input Range	0 to 10V DC (max. rated input: 28.8V DC)	0 to 10V DC (max. rated input: 28.8V DC)	—		
	Analog Input Error	±1.5 (of full scale)	±1.5 (of full scale)	—		
	Analog Input Resolution	10 bits (0 to 1000)	10 bits (0 to 1000)	—		
	Allowable Voltage Range	0 to 28.8V DC	0 to 28.8V DC	0 to 26.4V AC 0 to 28.8V DC		
	Input Impedance	3.5 kΩ	3.5 kΩ	4.8 kΩ		
	Digital Input	72 kΩ	72 kΩ	—		
	Isolation	—	—	—		
	Operating Range	OFF Voltage ON Voltage OFF Current ON Current	< 5V DC ≥ 12V DC < 0.85 mA (I3 to I6) < 0.05 mA (I1, I2, I7, I8)	< 5V DC ≥ 8.5 V DC < 0.85 mA (I3 to I6) < 0.05 mA (I1, I2, I7, I8)	< 5V AC/DC ≥ 12V AC/DC < 1.0 mA ≥ 2.5 mA	< 40V AC < 30V DC ≥ 79V AC ≥ 79V DC < 0.03 mA ≥ 0.08 mA (AC) < 0.12 mA (DC)
	Turn ON Time	1.5 ms (Typ.) ≤ 1.0 ms (I3 to I6)	1.5 ms (Typ.) ≤ 1.0 ms (I3 to I6)	1.5 ms (Typ.)	100V AC: 50 ms (Typ.) 240V AC: 30 ms (Typ.) 100V DC: 25 ms (Typ.) 240V DC: 15 ms (Typ.)	
	Turn OFF Time	1.5 ms (Typ.) ≤ 1.0 ms (I3 to I6)	1.5 ms (Typ.) ≤ 1.0 ms (I3 to I6)	15 ms (Typ.)	100V AC: 65 ms (Typ.) 240V AC: 105 ms (Typ.) 100V DC: 95 ms (Typ.) 240V DC: 125 ms (Typ.)	
	Wire Length	100m (Note 3)	100m (Note 3)	100m	100m	
Output	Output Signal	Transistor source output	Relay output	Relay output		
	Output Points/Contact Configuration	4 points (separate)	4NO contacts	4NO contacts		
	Isolation	—	Isolated	Isolated		
	Dielectric Strength (between power/ input terminals and output terminals)	—	2500V AC, 1 minute 500V DC, 1 minute	2500V AC, 1 minute 500V DC, 1 minute		
	Output Voltage	External power voltage	—	—		
	Maximum Load Current	0.3A maximum	Resistive load 10A at 12/24V AC/DC 10A at 100/120V AC 10A at 230/240V AC Inductive load 2A at 12/24V AC/DC 3A at 100/120V AC 3A at 230/240V AC	Resistive load 10A at 12/24V AC/DC 10A at 100/120V AC 10A at 230/240V AC Inductive load 2A at 12/24V AC/DC 3A at 100/120V AC 3A at 230/240V AC	Resistive load 10A at 12/24V AC/DC 10A at 100/120V AC 10A at 230/240V AC Inductive load 2A at 12/24V AC/DC 3A at 100/120V AC 3A at 230/240V AC	
	Surge Current	—	30A maximum	30A maximum	30A maximum	
	Short-circuit Protection	Built-in current limiting resistor: Approx. 1A	External fuse required: 16A maximum	External fuse required: 16A maximum	External fuse required: 16A maximum	
	Minimum Switching Load	—	10 mA, 2V DC	10 mA, 12V DC	10 mA, 12V DC	
	Initial Contact Resistance	—	100 mΩ maximum (at 1A, 24V DC)	100 mΩ maximum (at 1A, 24V DC)	100 mΩ maximum (at 1A, 24V DC)	
Switching Rate	Mechanical Life	—	10 million operations (no load, 10 Hz)	10 million operations (no load, 10 Hz)	10 million operations (no load, 10 Hz)	
	Electrical Life	—	100,000 operations (rated resistive load) 1800 operations/hour	100,000 operations (rated resistive load) 1800 operations/hour	100,000 operations (rated resistive load) 1800 operations/hour	
	Mechanical Load (Note 4)	—	10 Hz	10 Hz	10 Hz	
	Electrical Load	10 Hz	—	—	—	
	Resistive Load/Lamp Load	10 Hz	2 Hz	2 Hz	2 Hz	
	Inductive Load	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	

Note 1: 2 year backup duration (typ.) when battery cartridge or memory/battery cartridge is used.

Note 2: When selecting frequency trigger function and up/down counter function.

Note 3: 10m when connected to analog input (twisted pair cable)

Note 4: For fluorescent lamps, if the inrush current exceeds the allowable value, use an appropriate relay.

Note 5: FL1E-H12SND of Ver. 4 and before does not have clock function.

Initialization Time: After power-up, the FL1E takes a maximum of 10 seconds (when using a memory cartridge or memory/battery cartridge) or 9 seconds (without using any cartridges or when using a battery cartridge) for initialization. When initialization is complete, the FL1E is automatically set to RUN mode.

FL1E IDEC SmartRelay
Expansion I/O Module Specifications

Expansion I/O Module Part No.	FL1B-M08B1S2	FL1B-M08B2R2	FL1B-M08D2R2	FL1B-M08C2R2	FL1B-J2B2	FL1D-K2BM2
Power Supply	Rated Power Voltage	24V DC	12/24V DC	24V AC/DC	100 to 240V AC/DC	12/24V DC
	Allowable Voltage Range	20.4 to 28.8V DC	10.8 to 28.8V DC	20.4 to 26.4V AC 20.4 to 28.8V DC	85 to 265V AC 100 to 253V DC	10.8 to 28.8V DC
	Rated Frequency	—	—	50/60Hz (47 to 63Hz)	50/60Hz (47 to 63Hz)	—
	Current Draw	30 to 45 mA	30 to 140 mA (12V DC) 20 to 75 mA (24V DC)	120 to 146 mA (24V AC) 20 to 75 mA (24V DC)	34 to 45 mA (100V AC) 30 to 32 mA (240V AC) 5 to 15 mA (100V DC) 5 to 10 mA (240V DC)	25 to 50 mA
	Allowable Momentary Power Interruption	—	2 ms (typ.) (12V DC) 5 ms (typ.) (24V DC)	5 ms (typ.) (24V AC/DC)	10 ms (typ.) (100V AC/DC) 20 ms (typ.) (240V AC/DC)	5 ms (typ.) (12/24V DC)
	Power Consumption	0.8 to 1.1W	0.3 to 1.7W (12V DC) 0.4 to 1.8W (24V DC)	2.4 to 4.3VA (24V AC) 0.4 to 1.8W (24V DC)	3.9 to 4.1VA (100V AC) 7.4 to 7.6VA (240V AC) 0.5 to 1.8W (100V DC) 1.2 to 2.4W (240V DC)	0.3 to 0.6W (12V DC) 0.6 to 1.2W (24V DC)
	Reverse Polarity Protection	Yes	Yes	—	—	Yes
Input	Input Signal	DC input	DC input	AC/DC input	AC/DC input	Analog input
	Input Points	4	4	4	4	—
	Isolation	—	—	—	—	—
	Allowable Voltage Range	0 to 28.8V DC	0 to 28.8V DC	0 to 26.4V AC 0 to 28.8V DC	0 to 265V AC 0 to 253V DC	—
	Operating Range	OFF Voltage	< 5V DC	< 5V DC	< 5V AC/DC	< 40V AC < 30V DC
		ON Voltage	≥ 12V DC	≥ 8.5V DC	≥ 12V AC/DC	≥ 79V AC ≥ 79V DC
		OFF Current	< 0.85 mA	< 0.85 mA	< 1.0 mA	< 0.03 mA
		ON Current	≥ 2 mA	≥ 1.5 mA	≥ 2.5 mA	≥ 0.08 mA
	Turn ON Time	1.5 ms (Typ.)	1.5 ms (typ.)	1.5 ms (typ.)	100V AC: 50 ms (typ.) 240V AC: 30 ms (typ.) 100V DC: 25 ms (typ.) 240V DC: 15 ms (typ.)	—
	Turn OFF Time	1.5 ms (Typ.)	1.5 ms (typ.)	15 ms (typ.)	100V AC: 65 ms (typ.) 240V AC: 105 ms (typ.) 100V DC: 95 ms (typ.) 240V DC: 125 ms (typ.)	—
	Analog Input Points	—	—	—	—	2
	Analog Input Range	—	—	—	—	0 to 10V (max. rated input: 28.8V) 0 to 20 mA (max. rated input: 40 mA)
	Digital Resolution	—	—	—	—	10 bits (0 to 1000)
	Input Error	—	—	—	—	±1.5% (of full scale)
	Input Impedance	—	—	—	—	76 kΩ (0 to 10V) 250Ω (0 to 20mA)
	Sampling Cycle	—	—	—	—	50ms
Output	Wire Length	100m	100m	100m	100m	10m (twisted-pair shielded cable)
	Output Signal	Transistor source output	Relay output	Relay output	Relay output	Analog output
	Output Points/Contact Configuration	4 points (separate)	4NO contacts	4NO contacts	4NO contacts	—
	Isolation	—	Isolated	Isolated	Isolated	—
	Dielectric Strength (between power/input terminals and output terminals)	—	2500V AC, 1 minute 500V DC, 1 minute	2500V AC, 1 minute 500V DC, 1 minute	2500V AC, 1 minute 500V DC, 1 minute	—
	Output Voltage	External power voltage (20.4 to 28.8V DC)	—	—	—	—
	Maximum Load Current	0.3A maximum	Resistive load 5A at 12/24V AC/DC 5A at 100/120V AC 5A at 230/240V AC	Resistive load 5A at 12/24V AC/DC 5A at 100/120V AC 5A at 230/240V AC	Resistive load 5A at 12/24V AC/DC 5A at 100/120V AC 5A at 230/240V AC	—
			Inductive load 2A at 12/24V AC/DC 3A at 100/120V AC 3A at 230/240V AC	Inductive load 2A at 12/24V AC/DC 3A at 100/120V AC 3A at 230/240V AC	Inductive load 2A at 12/24V AC/DC 3A at 100/120V AC 3A at 230/240V AC	—
	Short-circuit Protection	Built-in current limiting resistor: Approx. 1A	External fuse required: 16A maximum	External fuse required: 16A maximum	External fuse required: 16A maximum	—
	Minimum Switching Load	—	10 mA, 12V DC	10 mA, 12V DC	10 mA, 12V DC	—
	Initial Contact Resistance	—	100 mΩ maximum (at 1A, 24V DC)	100 mΩ maximum (at 1A, 24V DC)	100 mΩ maximum (at 1A, 24V DC)	—
	Mechanical Life	—	10 million operations (no load, 10 Hz)	10 million operations (no load, 10 Hz)	10 million operations (no load, 10 Hz)	—
	Electrical Life	—	100,000 operations (rated resistive load) 1800 operations/hour	100,000 operations (rated resistive load) 1800 operations/hour	100,000 operations (rated resistive load) 1800 operations/hour	—
	Analog Output Points	—	—	—	—	2
	Analog Output Range	—	—	—	—	Voltage: 0-10V DC Current: 0-20, 4-20 mA
	Digital Resolution	—	—	—	—	10 bits (0 to 1000)
	Output Error (of full scale)	—	—	—	—	Voltage output: ±2.5% Current output: ±3%
	Output Impedance	—	—	—	—	Voltage: 5 kΩ minimum Current: 250Ω maximum
	Analog Value Conversion Interval	—	—	—	—	50 ms (typ.)
	Wire Length	—	—	—	—	10m (twisted-pair shielded cable)
Switching Rate	Mechanical Load (Note)	—	10 Hz	10 Hz	10 Hz	—
	Electrical Load	10 Hz	—	—	—	—
	Resistive Load/Lamp Load	10 Hz	2 Hz	2 Hz	2 Hz	—
	Inductive Load	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	—

Note: For fluorescent lamps, if the inrush current exceeds the allowable value, use an appropriate relay.

- Flush Silhouette
- Switches & Pilot Lights
- Display Lights
- LED Illumination Units
- Display Units
- Safety Products
- Terminal Blocks
- Comm. Terminals
- AS-Interface
- Relays & Timers
- Sockets
- Circuit Protectors
- Power Supplies
- PLCs & SmartRelay
- Operator Interfaces
- Sensors
- Control Stations
- Explosion Protection
- References

General Specifications

Item	Specifications	Standard
Operating Temperature	Horizontal Mounting 0 to 55°C	Cold: IEC60068-2-1 Hot: IEC60068-2-2
	Vertical Mounting 0 to 55°C	
Storage/Transportation Temperature	-40 to +70°C (no freezing)	—
Relative Humidity	10 to 95% (no condensation)	IEC60068-2-30
Atmospheric Pressure	795 to 1080 hPa	—
Operating Condition	No corrosive gas	—
Degree of Protection	IP20	—
Vibration Resistance	5 to 8.4 Hz, amplitude 3.5 mm 8.4 to 150 Hz, acceleration 9.8 m/s ²	IEC60068-2-6
Shock Resistance	147 m/s ²	IEC60068-2-27
Drop Test (packaged)	0.3m	IEC60068-2-32
Emissions	Limit class B Group 1 (Note 1)	EN55011/A EN55022/B EN50081-1
Electrostatic Discharge Immunity	8 kV air discharge 6 kV contact discharge (Note 2)	IEC61000-4-2
Radiation Field Immunity	Field Strength: 1 V/m and 10 V/m	IEC61000-4-3
Fast Transient Burst	2 kV (power line) 1 kV (I/O signal line) (Note 3)	IEC61000-4-4
Surge Immunity (Note 4) (FL1E-H12RCC, FL1E-B12RCC only)	1 kV (power line) normal 2 kV (power line) common	IEC61000-4-5
Communication Cable	0.5 to 2.5 mm ² (one wire) 0.5 to 1.5 mm ² (two wires)	—
Terminal Style	Finger-safe (Note 5)	—

Note 1: Class A for AS-Interface communication module

Note 2: 8 kV (air discharge), 4 kV (contact discharge) for AS-Interface communication module

Note 3: 1 kV (criteria A), 2 kV (criteria B) for AS-Interface communication module

Note 4: For protection against surge noise on DC power supply types (FL1E-H12RCE/
B12RCE, FL1E-H12SND, FL1E-H12RCA/B12RCA), use surge absorbers, noise cut transformers, or noise filters. Use of a surge protection device (DEHN +
SÖHNE GmbH + Co, BVT AD 24 Part No. 918 402) is recommended.

Note 5: Tightening torque 0.4 to 0.5 N·m

Text Display Specifications

Specifications

Dimensions (W × H × D)	128.2 × 86 × 38.7 mm
Weight (approx.)	220g
Installation	Panel cut-out using mounting clips
Keyboard	Membrane keypad with 10 keys
Display	FSTN graphic display (W × H: 128 × 64 dots) LED backlight
Power Voltage	24V AC/DC 12V DC
Allowable Voltage Range	20.4 to 26.4V AC 10.2 to 28.8V DC
Allowable Voltage Frequency	47 to 63Hz
Power Consumption	12V DC: 65 mA (Typ.) 24V DC: 40 mA (Typ.) 24V AC: 90 mA (Typ.)

Data Transmission Rate/LCD Display Durability

Data Transmission Rate	19200 baud
LCD Display Durability (Note 1)	50,000 hours
Backlight Durability (Note 2)	20,000 hours

* Connect the text display and the base module using the text display cable (2.5m). The text display cable can be extended up to 10m using an extension cable (D-sub 9-pin).

Note 1: Display durability is calculated under ordinary operating and storage conditions: room temperature, normal humidity below 65% RH, and not subjected to direct sunlight.

Note 2: Backlight durability is the number of hours taken for the light to become 50% of the original brightness.

AS-Interface Communication Module:

FL1B-CAS2

Specifications

Module	AS-Interface slave module
Slave Type	Standard
Profile	I/O code: 7 ID code: F ID2 code: F
Input/Output	Virtual input: 4 Virtual output: 4
Rated AS-Interface Voltage	30V DC (26.5 to 31.6V DC)
Current Draw	70 mA max. (AS-Interface)

I/O Allocation

Input		Output	
AS-Interface	SmartRelay	SmartRelay	AS-Interface
Output Data Bit D0	Input In	Output Qm	Input Data Bit D0
Output Data Bit D1	Input In+1	Output Qm+1	Input Data Bit D1
Output Data Bit D2	Input In+2	Output Qm+2	Input Data Bit D2
Output Data Bit D3	Input In+3	Output Qm+3	Input Data Bit D3

• I/O point numbers "n" and "m" of the SmartRelay are automatically allocated by the base module according to the mounted position of the AS-Interface communication module.

• AS-Interface communication module is IP20 terminal type.

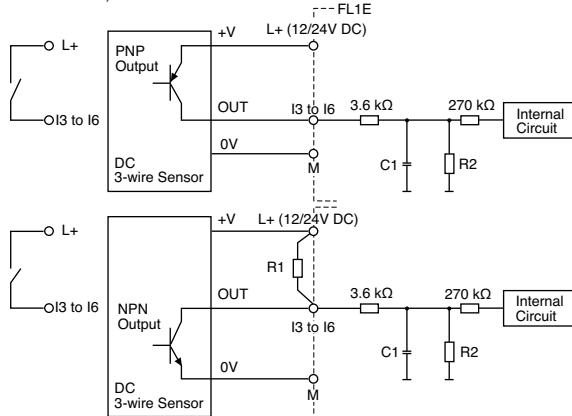
• AS-Interface cable is connected to the terminal block.

FL1E IDEC SmartRelay

Input Internal Circuits

DC Input

FL1E-H12SND, -H12RCE, -B12RCE
FL1B-M08B1S2, -M08B2R2



Note 1: When using an NPN output sensor, connect an external resistor (I3 to I6):
FL1E-H12SND:

For power voltage 24V DC: $R_1 \leq 4\text{ k}\Omega$, 1/4W

FL1E-H12RCE, -B12RCE:

For power voltage 24V DC: $R_1 \leq 8.1\text{ k}\Omega$, 1/4W

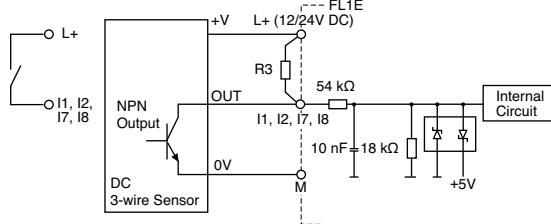
For power voltage 12V DC: $R_1 \leq 1.5\text{ k}\Omega$, 1/4W

FL1E-H12SND, -H12RCE, -B12RCE:

$R_2 = 2.21\text{ k}\Omega$, $C_1 = 47\text{ nF}$

FL1B-M08B1S2, -M08B2R2 (I1 to I4):

$R_2 = 2.2\text{ k}\Omega$, $C_1 = 100\text{ nF}$



Note 2: I1, I2, I7 and I8 accept both digital and analog inputs. The diagram above is for using I1, I2, I7, and I8 as digital inputs.

When using an NPN output sensor, connect an external resistor (I1, I2, I7, I8):
FL1E-H12SND

For power voltage 24V DC: $R_3 \leq 50\text{ k}\Omega$, 1/8W

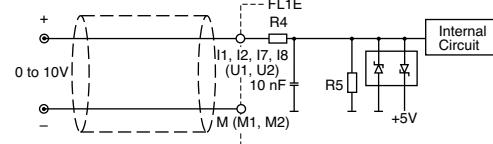
FL1E-H12RCE-B12RCE

For power voltage 24V DC: $R_3 \leq 100\text{ k}\Omega$, 1/8W

For power voltage 12V DC: $R_3 \leq 19\text{ k}\Omega$, 1/8W

Analog Voltage Input

FL1E-H12SND, -H12RCE, -B12RCE
FL1B-J2B2



FL1E-H12SND, -H12RCE, -B12RCE:

$R_4 = 54\text{ k}\Omega$, $R_5 = 18\text{ k}\Omega$

FL1B-J2B2 :

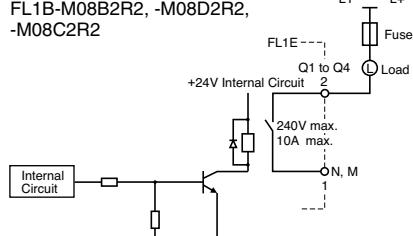
$R_4 = R_5 = 38\text{ k}\Omega$

Note 3: I1, I2, I7, and I8 accept both digital and analog inputs. When connecting an analog input, use a twisted pair cable, and keep the cable as short as possible.

Output Internal Circuits

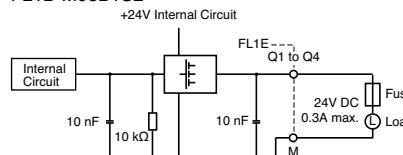
Relay Output

FL1E-H12RCE, -B12RCE, -H12RCA, -B12RCA, -H12RCC, -B12RCC
FL1B-M08B2R2, -M08D2R2, -M08C2R2



DC Output (Transistor Source Output)

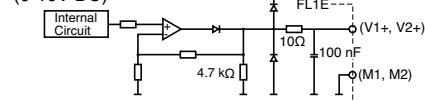
FL1E-H12SND
FL1B-M08B1S2



Note 6: When connecting to a DC input type PLC, use a negative common sink input type.

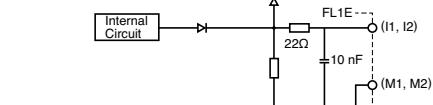
Analog Voltage Output

FL1D-K2BM2
(0-10V DC)



Analog Current Output

FL1D-K2BM2
(0-20, 4-20 mA DC)

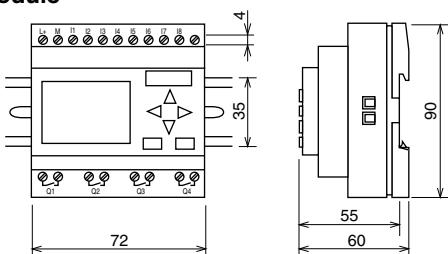


Flush Silhouettes
Switches & Pilot Lights
Display Lights
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Display Units
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References

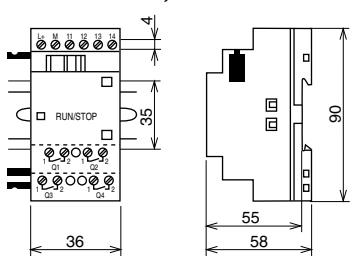
FL1E IDEC SmartRelay

Dimensions

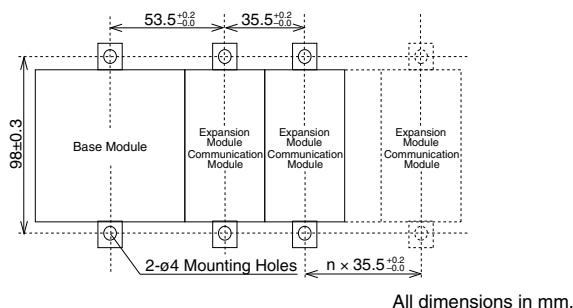
Base Module



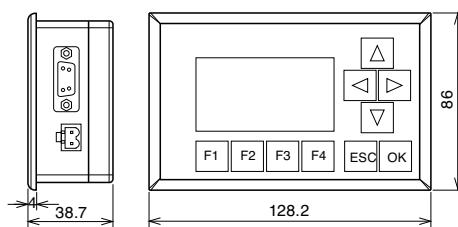
Expansion I/O Module, Communication Module



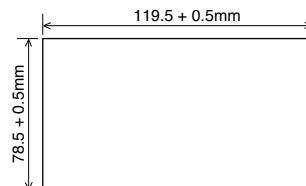
Mounting Hole Layout (Using Mounting Slides)



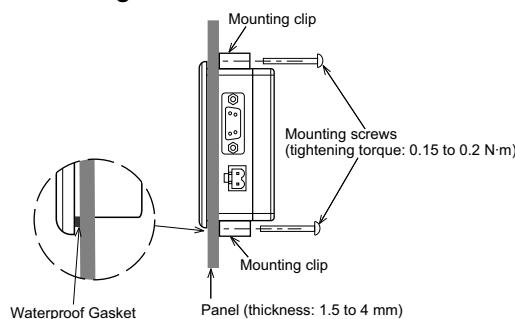
Text Display



(Panel Cutout)



Panel Mounting



Instructions

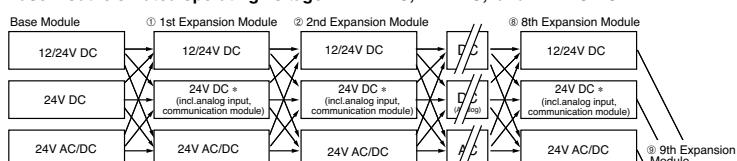
Module Expansion

Use the base module, expansion I/O modules, and communication modules according to the combinations shown on the right.

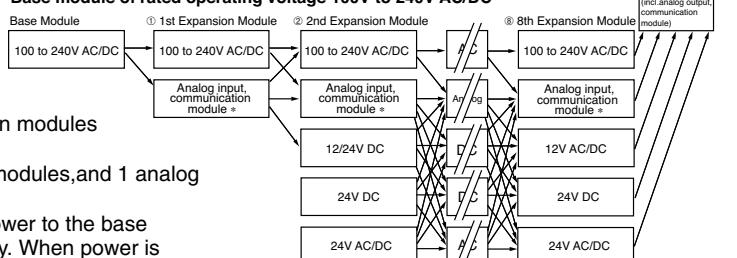


1. A maximum of 9 expansion I/O modules and communication modules can be connected to a base module.
2. A maximum of 4 combination I/O modules, 4 analog input modules, and 1 analog output module can be connected to a base module.
3. When using modules of the same power voltage, supply power to the base module and expansion I/O modules using one power supply. When power is supplied to the modules from different power supplies, the fast transient burst is 1 kV (IEC61000-4-4).
4. 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.
5. 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.
6. Before connecting and disconnecting modules, turn power off.

Base module of rated operating voltage 12/24V DC, 24V DC, and 24V AC/DC



Base module of rated operating voltage 100V to 240V AC/DC



AS-Interface Communication Module

- A maximum of 4 AS-Interface communication modules can be connected to a base module.
- AS-Interface communication module can be connected to any base module and expansion I/O modules.
- A 100 to 240V AC/DC module cannot be connected to the right side of AS-Interface communication module.

Instructions

Wiring

Base Module and Expansion I/O Module

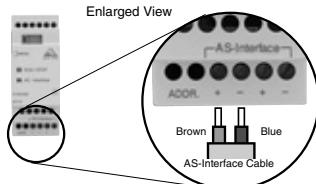
- Connect an IEC60127 approved fuse to the power supply for protection against overload and short circuit.
- Do not connect input wire and communication cable in parallel or near the power line, output line, or motor line. Also make sure that any noise source is not present nearby.
- Use 0.5 to 2.5 mm² wires (for one-wire) or 0.5 to 1.5 mm² wires (for two-wire) for power line, input line, and output line (tightening torque: 0.4 to 0.5 N·m).

AS-Interface Communication Module

Purpose	Specification	Part No.
Signal / Power	EPDM (rubber) yellow	F-LINK-ASYE
Signal / Power	TPE (heat-resistant PVC) yellow	F-LINK-ASYT
Auxiliary Power	EPDM (rubber) black	F-LINK-ASBE
Auxiliary Power	TPE (heat-resistant PVC) black	F-LINK-ASBT

*Available from IDEC

- When connecting AS-Interface cable to an AS-Interface communication module, make sure that the brown cable is connected to terminal +, and the blue cable to terminal -. The two + terminals and two - terminals are both connected internally.



Safety Precautions

- All IDEC SmartRelay devices are manufactured under IDEC's rigorous quality control system, but users must add a backup or failsafe provision to the control system using the device in applications where heavy damage or personal injury may be caused in case the device should fail.
- Turn off the power to the device before installation, removal, wiring, maintenance, and inspection of the device. Failure to turn power off may cause electric shocks or fire hazard.

Initialization after Power-up

- Initialization starts when the FL1E base module is powered up. When initialization is complete, the FL1E is automatically set to RUN mode. When using the FL1E base module with display, an hourglass appears on the display during the initialization. When using the FL1E without display, the red LED flashes during the initialization.
- Initialization time
 - When a memory cartridge or memory/battery cartridge is used: 10 seconds maximum
 - When a cartridge is not used, or battery cartridge is used: 9 seconds maximum
 - * Initialization time varies according the program size.

Flush Silhouette

Switches & Pilot Lights

Display Lights

LED Illumination Units

Display Units

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Comm. Terminals

AS-Interface

Relays & Timers

Sockets

Circuit Protectors

Power Supplies

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Operator Interfaces

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Control Stations

Explosion Protection

References

