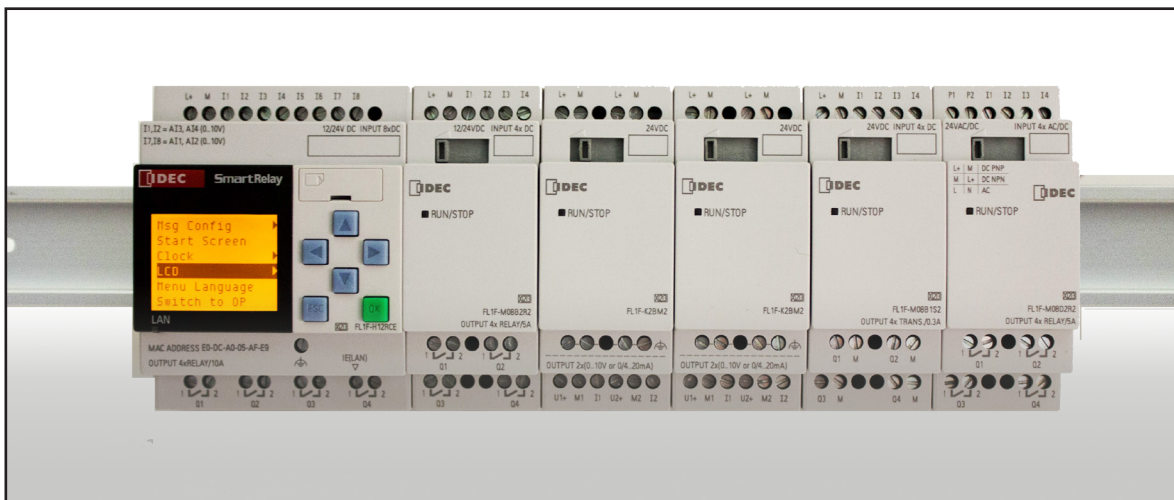


## IDEC SmartRelay – The Intelligent Choice



Look around. IDEC SmartRelays are in everything from lighting controls to ice-making machines and grocery store misters. Proving reliable time after time, these intelligent logic modules are the ideal controller for simple automation tasks. A new sixth-generation of SmartRelays offer functions to give you even more flexibility and convenience.

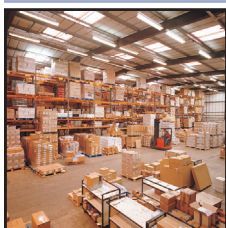
Advances include embedded Ethernet port with web server functions, micro SD port for data logging and program storage, extended memory, a brighter display with higher LCD contrast, improved analog and high-speed inputs, an external text display, and upgraded programming software.

### Industrial Facility Systems



- Conveyor systems
- Elevator controls
- Exhaust and filtering systems
- Automatic food dispensing machines
- Water treatment and irrigation systems
- Motor, pump and valve controls

### Housing and Building Management



- Lighting controls (outside and inside)
- Door and gate controls
- Heating and cooling systems
- Shutter, sun blind and awning controls
- Water and sprinkler systems
- Ventilation systems

### Unique Solutions



- Solar-electric systems
- Marine systems
- Extreme environmental conditions
- Display panels and traffic light controls
- Energy management

### Monitoring Systems



- Access controls
- Alarm systems
- Limit level monitoring
- Parking Lot monitoring
- Baggage control

[www.IDEC.com/smartrelay](http://www.IDEC.com/smartrelay)

## Universal Supply Voltage

- 12-24V DC, 24V DC, 24V AC/DC and 100-240V AC/DC models

## Built-in Analog Inputs

- 4 x 0-10V DC, 10-bit resolution

## High Speed Inputs

- Up to 4 inputs can be configured as 5 KHz high speed inputs

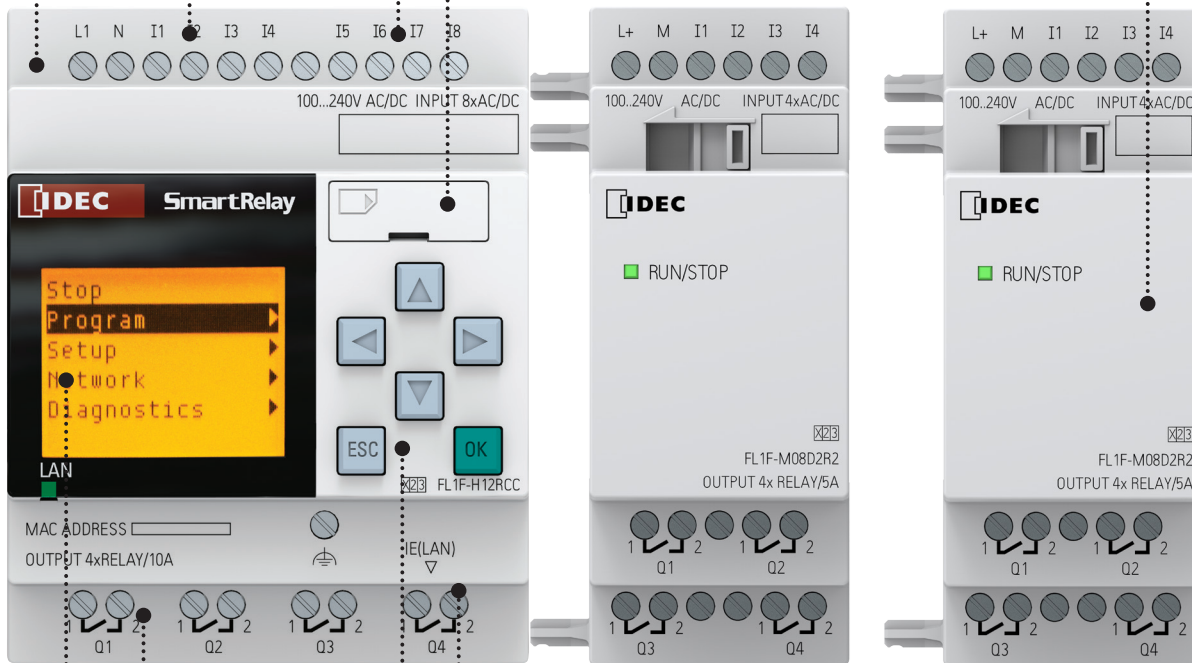
## Micro SD card

- Every IDEC SmartRelay is now equipped with a micro SD slot for program storage, transfer and data logging
- Special memory cartridge is no longer required



## Expansion interface

- Add expansion modules for additional I/O
- Up to 12 expansion modules can be added
- Total maximum I/O: 24 digital inputs, 20 digital outputs, 8 analog inputs, 8 analog outputs



## Digital Outputs

- 10A relay or transistor outputs

## Operational Control Buttons

- Using built-in LCD screen and buttons, simple program can be created without PC and software
- Change preset values such as Timers and Counters



## Embedded RJ45 Ethernet Port

- Remote program download, upload and monitor
- Integrated web server for remote monitoring and control
- Easily create, monitor and control web pages with no HTML programming

## New and improved LCD display

- 6 lines (16/10 characters per line)
- 3 backlight colors (white, amber, red)



Class 1, Div 2



Part Numbers

Base Modules – with and without LCD

| Style                                                                             | Part Number | Rated Power Volt-age | Input Signal                                                | I/O Points | Output     | Display | With Clock | Weight |
|-----------------------------------------------------------------------------------|-------------|----------------------|-------------------------------------------------------------|------------|------------|---------|------------|--------|
|  | FL1F-H12SCD | 24V DC               | DC<br>I1, I2, I7 and I8 are used for digital/ana-log inputs | 8/4 points | Transistor | Yes     | Yes        | 195g   |
|                                                                                   | FL1F-H12RCE | 12/24V DC            |                                                             | 8/4 points | Relay      | Yes     |            | 204g   |
|                                                                                   | FL1F-B12RCE |                      |                                                             |            |            | —       |            | 200g   |
|                                                                                   | FL1F-H12RCA | 24V AC/DC            | AC/DC                                                       | 8/4 points | Relay      | Yes     |            | 240g   |
|                                                                                   | FL1F-B12RCA |                      |                                                             |            |            | —       |            | 200g   |
|                                                                                   | FL1F-H12RCC | 100 to 240V AC/DC    | AC/DC                                                       | 8/4 points | Relay      | Yes     |            | 240g   |
|                                                                                   | FL1F-B12RCC |                      |                                                             |            |            | —       |            | 200g   |

Text Message Display

| Style                                                                               | Part Number | Rated Voltage       | Description             | Weight |
|-------------------------------------------------------------------------------------|-------------|---------------------|-------------------------|--------|
|  | FL1F-RD1    | 12 V DC, 24 V AC/DC | FL1F Text Display Panel | 220g   |

Digital and Analog I/O Expansion Modules

- 8-pt expansion module (4 in/4 out)
- Max. 4 digital expansion modules, 4 analog input modules, and 4 analog output modules

| Style                                                                               | Part Number  | Total I/O  | Input Power            | Input Signal       | Output Signal | Weight |
|-------------------------------------------------------------------------------------|--------------|------------|------------------------|--------------------|---------------|--------|
|  | FL1F-M08B1S2 | 4/4 points | 24V DC                 | DC                 | Transistor    | 95g    |
|                                                                                     | FL1F-M08B2R2 | 4/4 points | 12/24V DC              | DC                 | Relay         | 130g   |
|                                                                                     | FL1F-M08D2R2 | 4/4 points | 24V AC/DC <sup>2</sup> | AC/DC <sup>2</sup> | Relay         | 130g   |
|                                                                                     | FL1F-M08C2R2 | 4/4 points | 100 to 240V AC/DC      | AC/DC              | Relay         | 130g   |
|                                                                                     | FL1F-J2B2    | 2/0 points | 12/24V DC              | Analog             | —             | 95g    |
|                                                                                     | FL1F-K2BM2   | 0/2 points | 24V DC                 | —                  | Analog        | 95g    |

## Starter Kits

IDEC SmartRelay Starter Kit is an economical and ideal solution for first time IDEC SmartRelay users

- Package includes a base module, WindLGC programming software, simulator switch (DC models only) and a 15W power supply (DC models only).

|                                                                                   | CPU                                     | LCD Screen | Software | Part Number        |
|-----------------------------------------------------------------------------------|-----------------------------------------|------------|----------|--------------------|
|  | 12 I/O, 24V AC/DC, FL1F-B12RCA CPU      | —          | ✓        | KIT-SMARTRELAY-BAF |
|                                                                                   | 12 I/O, 100-240V AC/DC, FL1F-B12RCC CPU | —          | ✓        | KIT-SMARTRELAY-BCF |
|                                                                                   | 12 I/O, 12-24V AC/DC, FL1F-B12RCE CPU   | —          | ✓        | KIT-SMARTRELAY-BEF |
|  | 12 I/O, 24V AC/DC FL1F-H12RCA CPU       | ✓          | ✓        | KIT-SMARTRELAY-HAF |
|                                                                                   | 12 I/O, 100-240V AC/DC, FL1F-H12RCC CPU | ✓          | ✓        | KIT-SMARTRELAY-HCF |
|                                                                                   | 12 I/O, 12/24V DC, FL1F-H12RCE CPU      | ✓          | ✓        | KIT-SMARTRELAY-HEF |
|                                                                                   | 12 I/O, 24V DC, FL1F-H12SCD CPU         | ✓          | ✓        | KIT-SMARTRELAY-HDF |

## Accessories

| Description                                          | Part Number   | Package Quantity | Remarks                                                                                    |
|------------------------------------------------------|---------------|------------------|--------------------------------------------------------------------------------------------|
| Application Software: WindLGC                        | FL9Y-LP1CDW   | 1                | DVD-ROM (incl. online help manual)                                                         |
| Mounting Clip for Base Module                        | FL1F-PSP1PN05 | 5                | Supplied with a module <sup>3</sup>                                                        |
| Mounting Clip and Waterproof Gasket for Text Display | FL1F-KW1      | 1                | Supplied with text display <sup>4</sup>                                                    |
| IDEC SmartRelay User's Manual (English)              |               |                  | Downloadable from: <a href="http://www.idec.com/download">http://www.idec.com/download</a> |

<sup>3</sup> Supplied with a base module and an expansion module.

<sup>4</sup> Supplied with a text display, it includes a gasket, four mounting clips, and a power supply connector.

## WindLGC

## Programming Software

WindLGC is the exclusive programming software for the IDEC SmartRelay using Windows®. Edit, save, and print out your programs.

**Key features:**

- Ladder programming
- Online Monitor
- Program Comparison
- Time Simulation
- Simplified connection of the functions
- Programs can be saved in PDF or JPG format

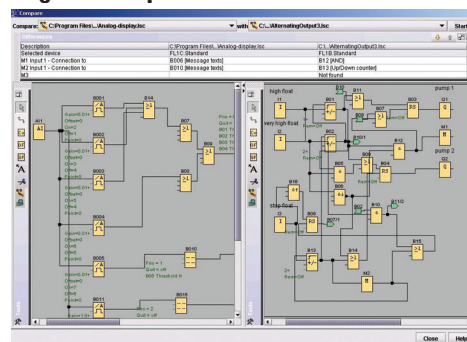
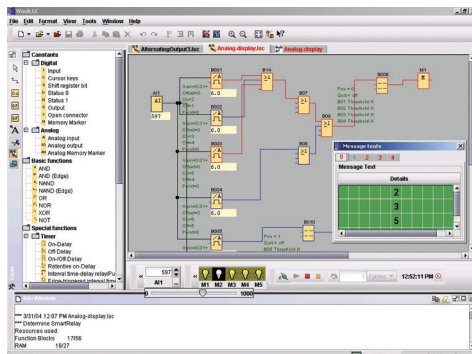
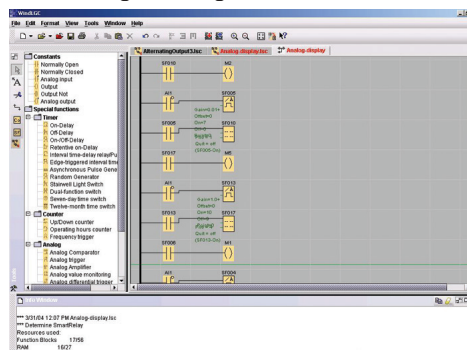
Just click the function blocks you need and link function blocks for easy wiring. Devise complicated circuits using the convenient functions of WindLGC.

**Part Number**

| Part Number | Description                                      |
|-------------|--------------------------------------------------|
| FL9Y-LP1CDW | WindLGC programming software for IDEC SmartRelay |

**WindLGC system requirements:**

- OS: Windows XP, Vista, 7 and 8.
- CPU recommendation: Pentium 266MHz or higher
- Memory: 64MB or more
- RAM recommendation: 128MB
- Hard disk space: 90MB or more for installing WindLGC software.
- Monitor Recommendation: Display more than 800 x 600 dots and 256 colors

**Program Comparison****Simulation Mode/Online Monitor****Ladder Programming**

For more information, see the Automation Software section.

Visit [www.IDEC.com/downloads](http://www.IDEC.com/downloads) for free upgrades or a free demo version.

## Specifications

### Base Modules

| Base Module Type No. |                                                                                | FL1F-H12SCD                                                     | FL1F-H12RCE<br>FL1F-B12RCE                                                                                                                                                                                                      | FL1F-H12RCA<br>FL1F-B12RCA                                           | FL1F-H12RCC<br>FL1F-B12RCC                                                               |
|----------------------|--------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Power Supply         | Rated Power Voltage                                                            | 24V DC                                                          | 12/24V DC                                                                                                                                                                                                                       | 24V AC/DC                                                            | 100 to 240V AC/DC                                                                        |
|                      | Allowable Voltage Range                                                        | 20.4 to 28.8V DC                                                | 10.8 to 28.8V DC                                                                                                                                                                                                                | 20.4 to 26.4V AC<br>20.4 to 28.8V DC                                 | 85 to 265V AC<br>100 to 253V DC                                                          |
|                      | Rated Frequency                                                                | —                                                               | —                                                                                                                                                                                                                               | 47 to 63Hz                                                           | 47 to 63Hz                                                                               |
|                      | Current Draw                                                                   | 15 to 50 mA (24V DC)<br>1.2A (with max. load on digital output) | 30 to 140 mA (12V DC)<br>15 to 90 mA (24V DC)                                                                                                                                                                                   | 15 to 150mA (12V DC)<br>15 to 130mA (24V DC)                         | 15 to 40mA (100V AC) 5 to 10mA (100V DC)<br>15 to 25mA (240V AC) 2 to 8mA (240V DC)      |
|                      | Allowable Momentary Power Interruption                                         | —                                                               | 2ms Typ. (12V DC)<br>5ms Typ. (24V DC)                                                                                                                                                                                          | 5ms Typ. (24V AC/DC)                                                 | 10ms Typ. (100V AC/DC)<br>20ms Typ. (240V AC/DC)                                         |
|                      | Power Consumption                                                              | 1.2 W (24V DC)                                                  | 1.7W (12V DC)<br>2.2W (24V DC)                                                                                                                                                                                                  | 3.6 W (24V AC)<br>3.2 W (24V DC)                                     | 4.6W (100V AC) 1.2W (100V DC)<br>6.0W (240V AC) 2.0W (240V DC)                           |
|                      | Reverse Polarity Protection                                                    | Yes                                                             | Yes                                                                                                                                                                                                                             | —                                                                    | —                                                                                        |
| Clock                | Backup Duration                                                                | 20 days                                                         | 20 days                                                                                                                                                                                                                         | 20 days                                                              | 20 days                                                                                  |
|                      | Clock Accuracy                                                                 | ±2 sec/day (Typ.)                                               | ±2 sec/day (Typ.)                                                                                                                                                                                                               | ±2 sec/day (Typ.)                                                    | ±2 sec/day (Typ.)                                                                        |
| Input                | Input Signal                                                                   | DC                                                              | DC                                                                                                                                                                                                                              | AC/DC                                                                | AC/DC                                                                                    |
|                      | Input Points                                                                   | 8 (I1 to I8)                                                    | 8 (I1 to I8)                                                                                                                                                                                                                    | 8 (I1 to I8)                                                         | 8 (I1 to I8)                                                                             |
|                      | High-speed Input <sup>1</sup>                                                  | 4 (I3, I4, I5, I6), 5kHz maximum                                | 4 (I3, I4, I5, I6), 5kHz maximum                                                                                                                                                                                                | —                                                                    | —                                                                                        |
|                      | Analog Input Points                                                            | 4 (I1, I2, I7, I8)                                              | 4 (I1, I2, I7, I8)                                                                                                                                                                                                              | —                                                                    | —                                                                                        |
|                      | 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)                                                                                                                                                                                                             | —                                                                    | —                                                                                        |
|                      | Cycle time                                                                     | 300ms                                                           | 300ms                                                                                                                                                                                                                           | 300ms                                                                | 300ms                                                                                    |
|                      | Allowable Voltage Range                                                        | 0 to 28.8V DC                                                   | 0 to 28.8V DC                                                                                                                                                                                                                   | 0 to 26.4V AC<br>0 to 28.8V DC                                       | 0 to 265V AC<br>0 to 253V DC                                                             |
|                      | Input Impedance                                                                | Digital Input                                                   | 5.8kΩ                                                                                                                                                                                                                           | 4.8kΩ                                                                | 610kΩ                                                                                    |
|                      |                                                                                | Analog Input                                                    | 72kΩ                                                                                                                                                                                                                            | —                                                                    | —                                                                                        |
|                      | Isolation                                                                      | —                                                               | —                                                                                                                                                                                                                               | —                                                                    | —                                                                                        |
|                      | Operating Range                                                                | OFF Voltage                                                     | < 5V DC                                                                                                                                                                                                                         | < 5V AC/DC                                                           | < 40V AC<br>< 30V DC                                                                     |
|                      |                                                                                | ON Voltage                                                      | ≥ 12V DC                                                                                                                                                                                                                        | ≥ 8.5 V DC                                                           | ≥ 79V AC ≥ 79V DC                                                                        |
|                      |                                                                                | OFF Current                                                     | < 0.9mA (I3 to I6) < 0.07mA (I1, I2, I7, I8)                                                                                                                                                                                    | < 0.88mA (I3 to I6) < 0.07mA (I1, I2, I7, I8)                        | < 1.2mA                                                                                  |
|                      |                                                                                | ON Current                                                      | ≥ 2.1mA (I3 to I6) ≥ 0.18mA (I1, I2, I7, I8)                                                                                                                                                                                    | ≥ 1.5mA (I3 to I6) ≥ 0.12mA (I1, I2, I7, I8)                         | ≥ 2.6mA                                                                                  |
|                      | Turn ON Time                                                                   | 1.5ms (Typ.)<br>≤ 1.0ms (I3 to I6)                              | 1.5ms (Typ.)<br>≤ 1.0ms (I3 to I6)                                                                                                                                                                                              | 1.5ms (Typ.)                                                         | 100V AC: 40ms (Typ.), 240V AC: 30ms (Typ.)<br>100V DC: 25ms (Typ.), 240V DC: 20ms (Typ.) |
|                      | Turn OFF Time                                                                  | 1.5ms (Typ.)<br>≤ 1.0ms (I3 to I6)                              | 1.5ms (Typ.)<br>≤ 1.0ms (I3 to I6)                                                                                                                                                                                              | 15ms (Typ.)                                                          | 100V AC: 45ms (Typ.), 240V AC: 70ms (Typ.)<br>100V DC: 60ms (Typ.), 240V DC: 75ms (Typ.) |
|                      | Wire Length <sup>2</sup>                                                       | 100m                                                            | 100m                                                                                                                                                                                                                            | 100m                                                                 | 100m                                                                                     |
| Output               | Output Signal                                                                  | Transistor source output                                        | Relay output                                                                                                                                                                                                                    | Relay output                                                         | Relay output                                                                             |
|                      | Output Points/<br>Contact Configuration                                        | 4 points (separate)                                             | 4NO contacts                                                                                                                                                                                                                    | 4NO contacts                                                         | 4NO contacts                                                                             |
|                      | Isolation                                                                      | —                                                               | Isolated                                                                                                                                                                                                                        | Isolated                                                             | Isolated                                                                                 |
|                      | Dielectric Strength<br>(between power/input terminals<br>and output terminals) | —                                                               | 2500V AC, 1 minute<br>500V DC, 1 minute                                                                                                                                                                                         | 2500V AC, 1 minute<br>500V DC, 1 minute                              | 2500V AC, 1 minute<br>500V DC, 1 minute                                                  |
|                      | Output Voltage                                                                 | External power voltage                                          | —                                                                                                                                                                                                                               | —                                                                    | —                                                                                        |
|                      | Maximum Load Current                                                           | 0.3A maximum                                                    | Resistive load<br>10A at 12/24V AC/DC, 10A at 100/120V AC, 10A at 230/240V AC, 0.2A at 120V DC, 0.1A at 240V DC<br>Inductive load<br>2A at 12/24V AC/DC, 3A at 100/120V AC, 3A at 230/240V AC, 0.2A at 120V DC, 0.1A at 240V DC |                                                                      |                                                                                          |
|                      | Surge Current                                                                  | —                                                               | 30A maximum                                                                                                                                                                                                                     | 30A maximum                                                          | 30A maximum                                                                              |
|                      | Short-circuit Protection                                                       | Built-in current limiting resistor:<br>Approx. 1A               | External fuse required:<br>16A maximum                                                                                                                                                                                          | External fuse required:<br>16A maximum                               | External fuse required:<br>16A maximum                                                   |
|                      | Minimum Switching Load                                                         | —                                                               | 10mA, 12V DC (reference value)                                                                                                                                                                                                  | 10mA, 12V DC<br>(reference value)                                    | 10mA, 12V DC (reference value)                                                           |
|                      | Initial Contact Resistance                                                     | —                                                               | 100mΩ maximum<br>(at 1A, 24V DC)                                                                                                                                                                                                | 100mΩ maximum<br>(at 1A, 24V DC)                                     | 100mΩ maximum<br>(at 1A, 24V DC)                                                         |
|                      | Mechanical Life                                                                | —                                                               | 10 million operations<br>(no load, 10Hz)                                                                                                                                                                                        | 10 million operations<br>(no load, 10Hz)                             | 10 million operations<br>(no load, 10Hz)                                                 |
|                      | Electrical Life                                                                | —                                                               | 100,000 operations<br>(rated resistive load)<br>1800 operations/hour                                                                                                                                                            | 100,000 operations<br>(rated resistive load)<br>1800 operations/hour | 100,000 operations<br>(rated resistive load)<br>1800 operations/hour                     |

<sup>1</sup> When selecting frequency trigger function and up/down counter function.

<sup>2</sup> 10m when connected to analog input (twisted pair cable)

Initialization Time: After power-up, the FL1F takes a maximum of 9 seconds (when using a micro SD card) for initialization. When initialization is complete, the FL1F is automatically set to RUN mode.

OT Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

## Expansion I/O Module

| Expansion I/O Module Type No. |                                                                          | FL1F-M08B1S2                                   | FL1F-M08B2R2                                                                                                                                                                                                                 | FL1F-M08D2R2                                                      | FL1F-M08C2R2                                                                                     | FL1F-J2B2                                                                | FL1F-K2BM2                                   |
|-------------------------------|--------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------------------|
| Power Supply                  | Rated Power Voltage                                                      | 24V DC                                         | 12/24V DC                                                                                                                                                                                                                    | 24V AC/DC                                                         | 100 to 240V AC/DC                                                                                | 12/24V DC                                                                | 24V DC                                       |
|                               | Allowable Voltage Range                                                  | 20.4 to 28.8V DC                               | 10.8 to 28.8V DC                                                                                                                                                                                                             | 20.4 to 26.4V AC<br>20.4 to 28.8V DC                              | 85 to 265V AC<br>100 to 253V DC                                                                  | 10.8 to 28.8V DC                                                         | 20.4 to 28.8V DC                             |
|                               | Rated Frequency                                                          | —                                              | —                                                                                                                                                                                                                            | 50/60Hz (47 to 63Hz)                                              | 50/60Hz (47 to 63Hz)                                                                             | —                                                                        | —                                            |
|                               | Current Draw                                                             | 15 to 40mA                                     | 10 to 80mA (12V DC)<br>10 to 40mA (24V DC)                                                                                                                                                                                   | 20 to 100mA (24V AC)<br>8 to 50mA (24V DC)                        | 10 to 30mA (100V AC)<br>10 to 20mA (240V AC)<br>5 to 15mA (100V DC)<br>5 to 10mA (240V DC)       | 15 to 30mA                                                               | 15 to 82mA                                   |
|                               | Allowable Momentary Power Interruption                                   | —                                              | 2 ms (typ.) (12V DC)<br>5 ms (typ.) (24V DC)                                                                                                                                                                                 | 5 ms (typ.) (24V AC/DC)                                           | 10ms (typ.) (100V AC/DC)<br>20ms (typ.) (240V AC/DC)                                             | 10ms (typ.) (12/24V DC)                                                  | 10ms (typ.)                                  |
|                               | Power Consumption                                                        | 1.0W                                           | 1.0W (12V DC)<br>1.0W (24V DC)                                                                                                                                                                                               | 2.4W (24V AC)<br>1.2W (24V DC)                                    | 3.5W (100V AC) 1.8W (100V DC)<br>4.8W (240V AC) 2.4W (240V DC)                                   | 0.4W (12V DC)<br>0.8W (24V DC)                                           | 2.0W                                         |
|                               | Reverse Polarity Protection                                              | Yes                                            | 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                                                  | 20.4 to 28.8V DC                               | 10.8 to 28.8V DC                                                                                                                                                                                                             | 20.4 to 26.4V AC<br>20.4 to 28.8V DC                              | 85 to 265V AC<br>100 to 253V DC                                                                  | —                                                                        | —                                            |
|                               | Operating Range                                                          | OFF Voltage                                    | < 5V DC                                                                                                                                                                                                                      | < 5V AC/DC                                                        | < 40V AC < 30V DC                                                                                | —                                                                        | —                                            |
|                               |                                                                          | ON Voltage                                     | ≥ 12V DC                                                                                                                                                                                                                     | ≥ 12V AC/DC                                                       | ≥ 79V AC ≥ 79V DC                                                                                | —                                                                        | —                                            |
|                               |                                                                          | OFF Current                                    | < 0.88mA                                                                                                                                                                                                                     | < 1.1mA                                                           | < 0.05mA (AC)<br>< 0.06mA (DC)                                                                   | —                                                                        | —                                            |
|                               |                                                                          | ON Current                                     | ≥ 2.1mA                                                                                                                                                                                                                      | ≥ 1.5mA                                                           | ≥ 0.08mA (AC)<br>≥ 0.13mA (DC)                                                                   | —                                                                        | —                                            |
|                               | Turn ON Time                                                             | 1.5ms (Typ.)                                   | 1.5ms (typ.)                                                                                                                                                                                                                 | 1.5ms (typ.)                                                      | 100V AC: 40 ms (typ.)<br>240V AC: 30 ms (typ.)<br>100V DC: 25 ms (typ.)<br>240V DC: 20 ms (typ.) | —                                                                        | —                                            |
|                               | Turn OFF Time                                                            | 1.5ms (Typ.)                                   | 1.5ms (typ.)                                                                                                                                                                                                                 | 15ms (typ.)                                                       | 100V AC: 45 ms (typ.)<br>240V AC: 70 ms (typ.)<br>100V DC: 60 ms (typ.)<br>240V DC: 75 ms (typ.) | —                                                                        | —                                            |
|                               | Analog Input Points                                                      | —                                              | —                                                                                                                                                                                                                            | —                                                                 | —                                                                                                | 2                                                                        | —                                            |
|                               | Analog Input Range                                                       | —                                              | —                                                                                                                                                                                                                            | —                                                                 | —                                                                                                | 0 to 10V (max. rated input: 28.8V)<br>0 to 20mA (max. rated input: 40mA) | —                                            |
|                               | Digital Resolution                                                       | —                                              | —                                                                                                                                                                                                                            | —                                                                 | —                                                                                                | 10 bits (0 to 1000)                                                      | —                                            |
|                               | Input Error                                                              | —                                              | —                                                                                                                                                                                                                            | —                                                                 | —                                                                                                | ±1.5% (of full scale)                                                    | —                                            |
|                               | Input Impedance                                                          | —                                              | —                                                                                                                                                                                                                            | —                                                                 | —                                                                                                | 76kΩ (0 to 10V)<br>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                                                                                     | —                                                                        | —                                            |
|                               | 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<br>500V DC, 1 minute                                                                                                                                                                                      | 2500V AC, 1 minute<br>500V DC, 1 minute                           | 2500V AC, 1 minute<br>500V DC, 1 minute                                                          | —                                                                        | —                                            |
|                               | Output Voltage                                                           | External power voltage (20.4 to 28.8V DC)      | —                                                                                                                                                                                                                            | —                                                                 | —                                                                                                | —                                                                        | —                                            |
|                               | Maximum Load Current                                                     | 0.3A maximum                                   | Resistive load<br>5A at 12/24V AC/DC, 5A at 100/120V AC, 5A at 230/240V AC, 0.2A at 120V DC, 0.1A at 240V DC<br>Inductive load<br>2A at 12/24V AC/DC, 3A at 100/120V AC, 3A at 230/240V AC, 0.2A at 120V DC, 0.1A at 240V DC |                                                                   |                                                                                                  |                                                                          | —                                            |
|                               | 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                                                              | —                                                                        | Yes                                          |
|                               | Minimum Switching Load                                                   | —                                              | 10mA, 12V DC (reference value)                                                                                                                                                                                               | 10mA, 12V DC (reference value)                                    | 10mA, 12V DC (reference value)                                                                   | —                                                                        | —                                            |
|                               | Initial Contact Resistance                                               | —                                              | 100mΩ maximum (at 1A, 24V DC)                                                                                                                                                                                                | 100mΩ maximum (at 1A, 24V DC)                                     | 100 mΩ maximum (at 1A, 24V DC)                                                                   | —                                                                        | —                                            |
|                               | Mechanical Life                                                          | —                                              | 10 million operations (no load, 10Hz)                                                                                                                                                                                        | 10 million operations (no load, 10Hz)                             | 10 million operations (no load, 10Hz)                                                            | —                                                                        | —                                            |
|                               | Electrical Life                                                          | —                                              | 100,000 operations (rated resistive load)<br>1800 operations/hour                                                                                                                                                            | 100,000 operations (rated resistive load)<br>1800 operations/hour | 100,000 operations (rated resistive load)<br>1800 operations/hour                                | —                                                                        | —                                            |
|                               | Analog Output Points                                                     | —                                              | —                                                                                                                                                                                                                            | —                                                                 | —                                                                                                | —                                                                        | 2                                            |
|                               | Analog Output Range                                                      | —                                              | —                                                                                                                                                                                                                            | —                                                                 | —                                                                                                | —                                                                        | Voltage: 0-10V DC<br>Current: 0-20, 4-20 mA  |
|                               | Digital Resolution                                                       | —                                              | —                                                                                                                                                                                                                            | —                                                                 | —                                                                                                | —                                                                        | 10 bits (0 to 1000)                          |
| Barriers                      | Output Error (of full scale)                                             | —                                              | —                                                                                                                                                                                                                            | —                                                                 | —                                                                                                | —                                                                        | Voltage output: ±2.5%<br>Current output: ±3% |
|                               | Output Impedance                                                         | —                                              | —                                                                                                                                                                                                                            | —                                                                 | —                                                                                                | —                                                                        | Voltage: 5kΩ min<br>Current: 250Ω max        |
|                               | Analog Value Conversion Interval                                         | —                                              | —                                                                                                                                                                                                                            | —                                                                 | —                                                                                                | —                                                                        | 50ms (typ.)                                  |
|                               | Wire Length                                                              | —                                              | —                                                                                                                                                                                                                            | —                                                                 | —                                                                                                | —                                                                        | 10m (twisted-pair shielded cable)            |

## General

| Style                                              | Specification                                                                 | Standard                |
|----------------------------------------------------|-------------------------------------------------------------------------------|-------------------------|
| Operating Temperature                              | Horizontal Mounting                                                           | 0 to 55°C (no freezing) |
|                                                    | Vertical Mounting                                                             | 0 to 55°C (no freezing) |
| Storage/Transportation Temperature                 | –40 to +70°C (no freezing)                                                    | —                       |
| Relative Humidity                                  | 10 to 95% RH (no condensation)                                                | IEC60068-2-30           |
| Atmospheric Pressure                               | 795 to 1080 hPa                                                               | —                       |
| Operating Condition                                | No corrosive gas                                                              | —                       |
| Degree of Protection                               | IP20                                                                          | —                       |
| Vibration Resistance                               | 5 to 8.4Hz, amplitude 3.5mm<br>8.4 to 150Hz, acceleration 9.8m/s <sup>2</sup> | IEC60068-2-6            |
| Shock Resistance                                   | 147m/s <sup>2</sup>                                                           | IEC60068-2-27           |
| Drop Test                                          | 0.3m                                                                          | IEC60068-2-31           |
| Drop Test (packaged)                               | 1m                                                                            | IEC60068-2-32           |
| Emission                                           | Class B Group 1 <sup>1</sup>                                                  | EN55011                 |
| Electrostatic Discharge                            | 8kV air discharge, 6kV contact discharge <sup>2</sup>                         | IEC61000-4-2            |
| Radiation Field Immunity                           | Field Strength: 1V/m and 10V/m                                                | IEC61000-4-3            |
| Burst Pulses                                       | 2kV (power line), 1kV (I/O signal line) <sup>3</sup>                          | IEC61000-4-4            |
| Surge Immunity1<br>(FL1F-H12RCC, FL1F-B12RCC only) | 1kV (power line) normal<br>2kV (power line) common                            | IEC61000-4-5            |
| Communication Cable                                | 0.5 to 2.5mm <sup>2</sup> (one wire), 0.5 to 1.5mm <sup>2</sup> (two wires)   | —                       |
| Terminal Style                                     | Finger-safe type <sup>5</sup>                                                 | —                       |

1: For protection against surge noise on DC power supply types (FL1F-H12RCE/B12RCE, FL1F-H12SCD, FL1F-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.

2: Tightening torque 0.5 to 0.6N·m

## Text Display

| Part Number            |                                 |                                                 | FL1F-RD1                                                                               |
|------------------------|---------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------|
| Keyboard Display       |                                 |                                                 | FSTN graphic display<br>(W × H: 160 × 96 dots)<br>LED backlight<br>(White, Amber, Red) |
| Dimensions (W × H × D) |                                 |                                                 | 128.2 × 86 × 38.7 mm                                                                   |
| Installation           |                                 |                                                 | Panel cut-out using mounting clips                                                     |
| Font Type              |                                 |                                                 | English, Spanish, Russian, Chinese, Italian, Turkish, German, Dutch, French, Japanese  |
| Keyboard               |                                 |                                                 | Membrane keypad with 10 keys                                                           |
| Power Supply           | Input Voltage                   |                                                 | 24V AC/DC, 12V DC                                                                      |
|                        | Allowable Voltage Range         |                                                 | 20.4 to 26.4V AC<br>10.2 to 28.8V DC                                                   |
|                        | Rated Frequency                 |                                                 | 47 to 63Hz                                                                             |
|                        | Current Draw                    |                                                 | 30 to 55mA (24V DC)                                                                    |
|                        | Power Consumption               | 12V DC                                          | 145mA (Typ.)                                                                           |
|                        |                                 | 24V DC                                          | 70mA (Typ.)                                                                            |
|                        |                                 | 24V AC                                          | 75mA (Typ.)                                                                            |
| Data Transmission Rate |                                 | 10/100M full/half duplex data transmission rate |                                                                                        |
| LCD Display            | Backlight lifetime <sup>1</sup> | 20,000 hours                                    |                                                                                        |
|                        | Display lifetime <sup>2</sup>   | 50,000 hours                                    |                                                                                        |
| Weight                 |                                 |                                                 | 220g                                                                                   |

1 For protection against surge noise on DC power supply types (FL1F-H12RCE/B12RCE, FL1F-H12SCD, FL1F-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.

2 Tightening torque 0.5 to 0.6N·m

OT Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

### Base Module (without Display)

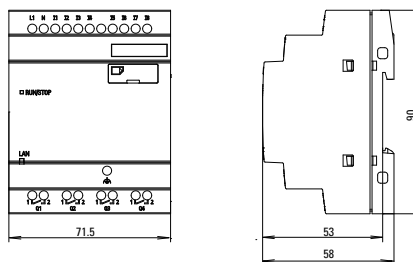


Diagram illustrating the mounting clip assembly. The assembly includes a panel (thickness: 1.5 to 4mm), mounting clips, mounting screws (tightening torque: 0.15 to 0.2N·m), and a gasket. A detailed inset shows the gasket being placed between the panel and the mounting clip.

Technical drawing of a rectangular plate. The horizontal dimension is labeled as  $119.0 \pm 0.5 \text{ mm}$  and the vertical dimension is labeled as  $78.5 \pm 0.5 \text{ mm}$ . The drawing shows a rectangle with a small square at the top-left corner, indicating a right angle.