

FL1D series

IDEC SmartRelay

LONWORKS[®] Communication Module User's Manual



Safety Notices



DANGER

Indicates that **death, severe bodily injury or substantial material damage** will occur, if the corresponding safety measures are not taken.



WARNING

Indicates that **death or severe bodily injury may occur**, if the corresponding safety measures are not taken.



CAUTION

With the warning triangle, this indicates that **minor bodily injury may occur**, if the corresponding safety measures are not taken.

CAUTION

Without the warning triangle, this indicates that **material damage may occur**, if the corresponding safety measures are not taken.

WARNING

This indicates that an **undesirable result or condition may occur**, if the corresponding instructions are not observed.

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Disclaimer of liability:

We have checked that the contents of this document correctly describe the associated hardware and software. Nonetheless, it is impossible to exclude the possibility of deviations and therefore we cannot guarantee that there are no errors in this document. The information in this document is checked regularly and any necessary corrections are then made in the next release issued. We are of course thankful for any suggestions for improvements.

Table of Contents

1.	Getting to know LONWORKS® Communication Module	1-1
1.1	What is LONWORKS® Communication Module ?	1-1
1.2	The construction of the LONWORKS® Communication Module	1-2
2.	Mounting and wiring the LONWORKS® Communication Module...2-1	
2.1	General guidelines	2-1
2.2	Wiring the LONWORKS® Communication Module.....	2-3
2.2.1	Connecting the power supply	2-4
2.2.2	Connecting the LON.....	2-5
3.	Putting the LONWORKS® Communication Module into operation3-1	
3.1	Step-by-step	3-1
3.2	The LONWORKS® Communication Module - operational status	3-2
3.3	Behavior in case of a fault	3-3
4.	Supported functions	4-1
4.1	Virtual inputs / outputs	4-1
4.2	Available network variables	4-3
4.3	LON configuration parameters	4-6
4.4	Inputs / Outputs – special considerations.....	4-7
4.5	Alias table entries	4-7
5.	LONWORKS® Communication Module - Specifications.....	5-1

1. Getting to know LONWORKS® Communication Module

1.1 What is LONWORKS® Communication Module ?

The Local Operating Network (LONWORKS® Communication Module) communications module is an interface for connecting IDEC SmartRelay onto a LON network.

The IDEC SmartRelay communications module has been implemented as a Slave module for the IDEC SmartRelay control module.

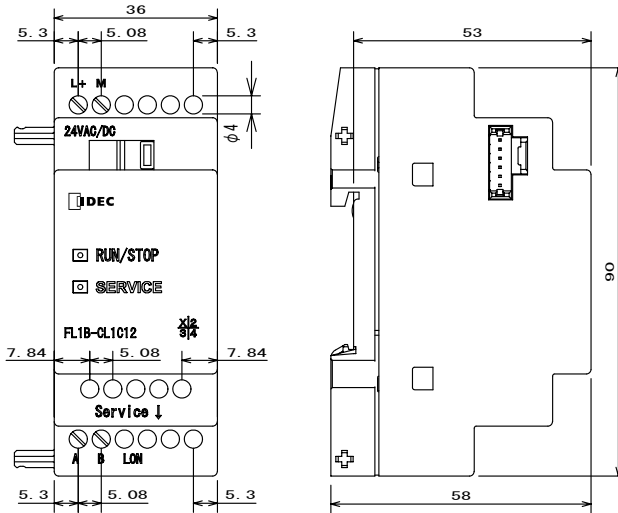
The module supports communication between the IDEC SmartRelay Master and external LON devices via a LON. The LONWORKS® Communication Module is a bus station on the LON and allows the IDEC SmartRelay to communicate with other LON devices.

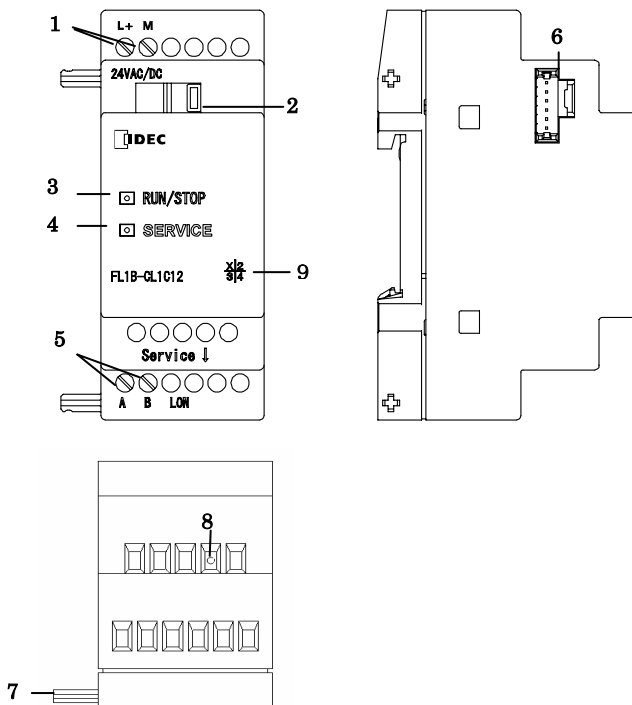
What are the capabilities of the LONWORKS® Communication Module ?

The LONWORKS® Communication Module presents the current states of the LON stations to the IDEC SmartRelay, which is thus able to use its logical functions and timers to join them together. In the process, the LON signals can also be combined with the signals of the local IDEC SmartRelay inputs and outputs. The LONWORKS® Communication Module then transmits every change of the output signal via the LON.

The combination of IDEC SmartRelay and LONWORKS® Communication Module gives the user a decentralized controller functionality for the LON with the capability of setting or changing parameters or operations quickly, simply and without a programming device.

1.2 The construction of the LONWORKS® Communication Module





1. Power supply
2. Bus lock slider, interface to the IDEC SmartRelay
3. The RUN/STOP LED for IDEC SmartRelay communication
4. The SERVICE LED
5. Input - LON connection
6. Expansion interface to the IDEC SmartRelay
7. Mechanical coding - pin
8. Service button
9. Version number

(example: $\frac{X|2}{3|4}$ represents Version 1.)

2. Mounting and wiring the LONWORKS® Communication Module

2.1 General guidelines

The following guidelines should be observed when mounting wiring your LONWORKS® Communication Module:

- When wiring the LONWORKS® Communication Module, make certain that you follow all of the applicable and legally binding standards. Observe all of the relevant national and regional regulations when installing and operating the device. Check with the local authorities regarding the standards and regulations that must be observed in your special case.
- Make certain that the device is de-energized.
- Use only approved bus cables.
- Make certain that the specified cable lengths are used and that the correct terminating resistors are installed properly.
- The LONWORKS® Communication Module must always be installed as the last module on the right of the IDEC SmartRelay, since you may not install other expansion modules onto the LONWORKS® Communication Module.

Please notice:

- The LONWORKS® Communication Module must have its own power supply (24 V AC/DC).
-

NOTE

This module may only be mounted and wired by qualified personnel, who know and observe the generally applicable guidelines and applicable regulations and standards.

Observe the assembly and disassembly instructions in the IDEC SmartRelay manual.



WARNING

The expansion module may only inserted or removed when the power is off.

2.2 Wiring the LONWORKS® Communication Module

To wire the LONWORKS® Communication Module, use a screwdriver with 3 mm wide blade.

- You do not need to use wire end ferrules when clamping the wires.

NOTE

After the installation, the terminals must be covered. To protect personnel against unintentional contact with the portions of the LONWORKS® Communication Module that are conducting electricity, the appropriate national and local standards must be observed.

The LONWORKS® Communication Module is a double-insulated switching device.
A protective grounding conductor is not necessary.

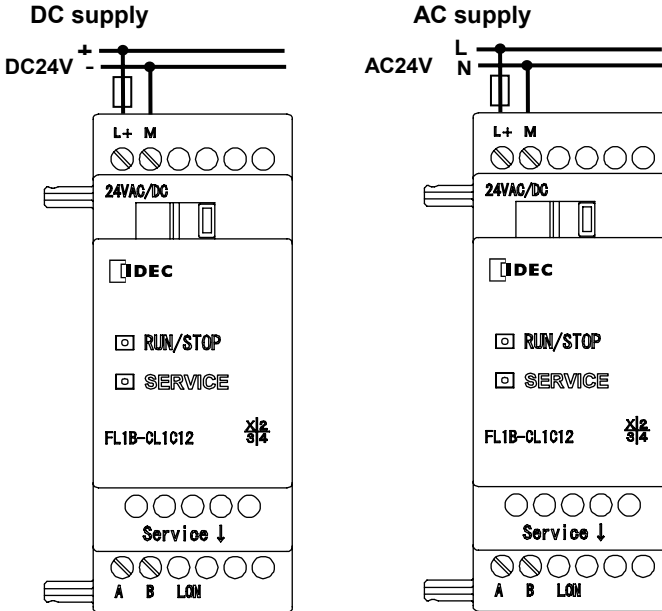
2.2.1 Connecting the power supply

The LONWORKS® Communication Module has been designed to serve as a Slave module for the IDEC SmartRelay controller. It must be connected to a 24 V AC/DC supply voltage.

Please observe the relevant instructions that are found in the product information that was included with your equipment as well as the technical data regarding the permissible voltage tolerances, main frequency and current consumption.

Connecting

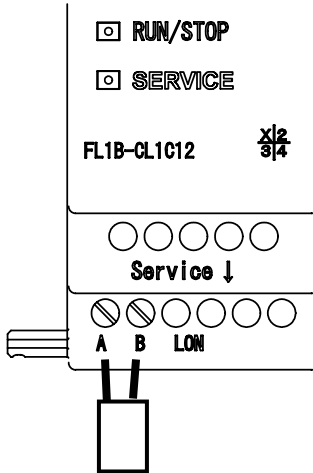
How to connect the LONWORKS® Communication Module to the power:



Protect the LONWORKS® Communication Module with a 80 mA/slow action fuse, if desired (recommended).

2.2.2 Connecting the LON

This connection is made using the two screw terminals A-B.



You can start the programming by pressing the “Service ↓” button.

NOTE

Don't apply force when pressing the “Service ↓” button. When contact has been made, the LED will light up in orange.

3. Putting the LONWORKS® Communication Module into operation

A LONMARK certified application was loaded into the LON module at the factory.

3.1 Step-by-step

1. Interrupt the voltage to the IDEC SmartRelay.
(The IDEC SmartRelay and its modules do not have power switches.)
2. Mount the LONWORKS® Communication Module
3. Connect the power supply to the LONWORKS® Communication Module.
4. Connect the LON bus lines to the LONWORKS® Communication Module.
5. Remove the label with the Neuron-ID from the LONWORKS® Communication Module and stick it on the network plan at the LONWORKS® Communication Module's installed location. (The Neuron-ID is also given as a bar code on the label.)
6. Apply power to the IDEC SmartRelay and LONWORKS® Communication Module.
7. If multiple LONWORKS® Communication Modules have been installed, repeat Steps 1 to 6 for each LONWORKS® Communication Module.
8. To log a LONWORKS® Communication Module in on a LON network, you can either press the "Service" button or enter the Neuron-ID directly in the LON using the Installation Tool or by reading the label with a bar code scanner.
9. The LONWORKS® Communication Module is then registered in the LON database and ready for operation.
10. For further details regarding the LON installation, please read the corresponding documentation.

3.2 The LONWORKS® Communication Module - operational status

The LONWORKS® Communication Module is a IDEC SmartRelay expansion module. This module has two LED displays:

“RUN/STOP” LED Communication with the IDEC SmartRelay
 “SERVICE” LED Service LED

LED “RUN/STOP” Lights In		
Green (RUN)	Red (STOP)	Orange
The LONWORKS® Communication Module is communicating with the device on the left.	The LONWORKS® Communication Module is not communicating with the device on the left.	The LONWORKS® Communication Module 's initialization phase

LED “SERVICE” Lights In			
Green	Red	Orange	Green /Orange Flashing
Configure	“Service” button pressed	The LONWORKS® Communication Module 's initialization phase	Unconfigure

3.3 Behavior in case of a fault

IDEC SmartRelay - Power failure

If the power to the IDEC SmartRelay fails or the communications with the IDEC SmartRelay Master or the communications partner to the left is interrupted, the outputs will be set to 0. The “RUN/STOP” LED will light in RED after one second.

IDEC SmartRelay - Power returns

The IDEC SmartRelay will startup and the LONWORKS® Communication Module will send the parameterized status.

LONWORKS® Communication Module - Power failure

All of the inputs of the LONWORKS® Communication Module will be set by the IDEC SmartRelay Master to 0.

LONWORKS® Communication Module - Power returns

All of the IDEC SmartRelay Master outputs will be updated.

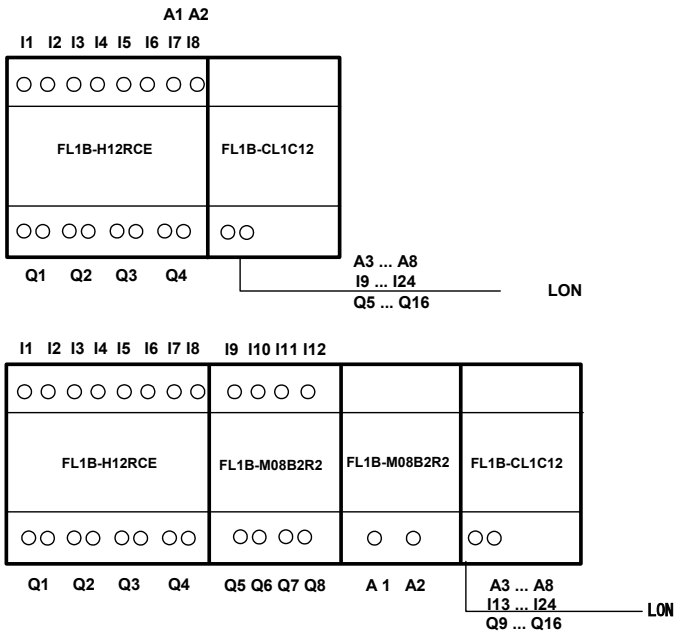
4. Supported functions

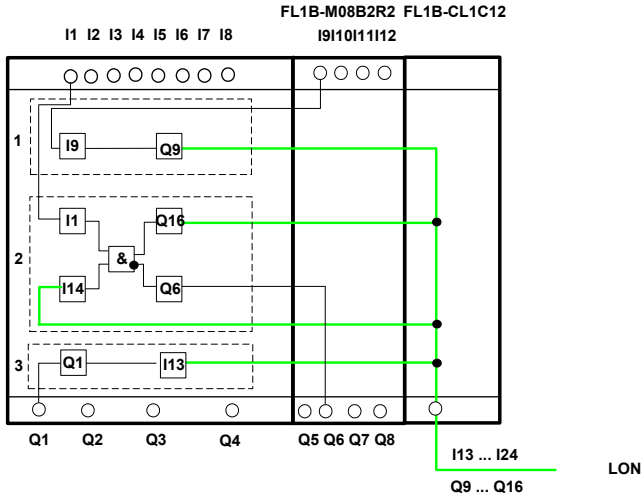
The LONWORKS® Communication Module handles the communications between:

- The IDEC SmartRelay and LON
- Supports virtual inputs and outputs for the communication via the LON.

4.1 Virtual inputs / outputs

The standard LONWORKS® Communication Module application fills the complete IDEC SmartRelay process image.





1. To map the IEC SmartRelay inputs (I1 to I8/I12) as outputs on the BUS, these must be joined with free virtual BUS outputs (Q5/Q9 to Q12) in the IEC SmartRelay application.
2. Operations (basic functions BF / special functions SF) useable within the IEC SmartRelay application (feedback value).
3. To access the IEC SmartRelay application (Q1 to Q4/Q8) directly via the bus communications, these must be joined with free virtual BUS inputs (I13 to I24) in the IEC SmartRelay application.

4.2 Available network variables

The LONWORKS® Communication Module's standard LON application contains the network variables described below.

Relationships between version number and XIF file

Version number*	XIF file
3	F0233100
5	F0233102

*See page 1-3 for more details.

LonMark Node Object

Quantity	Name	Type	Description
1	nviRequest0	SNVT_obj_request	Request object mode
1	nvoStatus0	SNVT_obj_status	Output object status

LonMark Controller Object

SNVT	Description
SNVT_switch	Switch light, alarm, window contact, free inputs / outputs value=0, state=0 ⇒ inactive value>0, state=1 ⇒ active
SNVT_occupancy	Occupancy:0=occupied⇒ 0 1=not occupied ⇒ 1 2=bypass ⇒ 0 3=standby ⇒ 1
SNVT_tod_event	Scheduler program Just current state: 0=occupied 3=standby
SNVT_temp_p	Room temperature
SNVT_lux	Brightness – lighting level
SNVT_lev_percent	Position

Assignment of the SNVT to the inputs and outputs

	SNVT	Name	Assignment	
Digital outputs	SNVT_switch	nvoSwitchDO051	Q5	
		nvoSwitchDO061	Q6	
		nvoSwitchDO071	Q7	
		nvoSwitchDO081	Q8	
		nvoSwitchDO091	Q9	
		nvoSwitchDO101	Q10	
		nvoSwitchDO111	Q11	
		nvoSwitchDO121	Q12	
	SNVT_occupancy	nvoOccDO131	Q13	
		nvoOccDO141	Q14	
	SNVT_tod_event	nvoTodDO151	Q15	
		nvoTodDO161	Q16	
	Digital inputs	SNVT_switch	nviSwitchDI091	I9
			nviSwitchDI101	I10
			nviSwitchDI111	I11
nviSwitchDI121			I12	
nviSwitchDI131			I13	
nviSwitchDI141			I14	
nviSwitchDI151			I15	
nviSwitchDI161			I16	
nviSwitchDI171			I17	
nviSwitchDI181			I18	
nviSwitchDI191			I19	
nviSwitchDI201			I20	
nviSwitchDI211			I21	
nviSwitchDI221		I22		
SNVT_occupancy		nviOccDI231	I23	
	nviOccDI241	I24		
Analog inputs	SNVT_temp_p	nviTempAI081	AI8	
	SNVT_lux	nviLuxAI071	AI7	
	SNVT_switch	nviSwitchAI011	AI1	
		nviSwitchAI021	AI2	
		nviSwitchAI031	AI3	
		nviSwitchAI041	AI4	
		nviSwitchAI051	AI5	
		nviSwitchAI061	AI6	
	SNVT_lev_percent	nviLev_perAI011	AI1	
		nviLev_perAI021	AI2	
		nviLev_perAI031	AI3	
		nviLev_perAI041	AI4	
nviLev_perAI051		AI5		
nviLev_perAI061		AI6		

Immediately after powered up, LONWORKS® communication modules send digital output network variable "0" to destinations.

Relationships between analog input values and SmartRelay internal values are listed in the table below.

【SNVT : SNVT_lev_percent】

Analog input value of FL1B-CL1C12 from network	Internal value
0%	0
10%	100
50%	500
100%	1000

【SNVT : SNVT_switch】

Analog input value of FL1B-CL1C12 from network	Internal value
(Value, state)=(0.0 0)	0
(Value, state)=(0.0 1)	256
(Value, state)=(100.0 0)	200
(Value, state)=(100.0 1)	456

【SNVT : SNVT_temp_p】

Analog input value of FL1B-CL1C12 from network	Internal value
-273.1°C	-2731
0°C	0
100.0°C	1000
327.6°C	3276

【SNVT : SNVT_lux】

Analog input value of FL1B-CL1C12 from network	Internal value
0lux	0
10000lux	200
50000lux	1000
65500lux	1310

4.3 LON configuration parameters

All of the digital outputs are configured with a “Send Heartbeat”. The LON application is configured using the Config Network Variables. The following SCPT are available.

SCPT	Description	Name	Assignment	Default
SCPTmaxSendTime	Send Heartbeat	cpMaxSendTDO05	Q5	0 min
SCPTmaxSendTime	Send Heartbeat	cpMaxSendTDO06	Q6	0 min
SCPTmaxSendTime	Send Heartbeat	cpMaxSendTDO07	Q7	0 min
SCPTmaxSendTime	Send Heartbeat	cpMaxSendTDO08	Q8	0 min
SCPTmaxSendTime	Send Heartbeat	cpMaxSendTDO09	Q9	0 min
SCPTmaxSendTime	Send Heartbeat	cpMaxSendTDO10	Q10	0 min
SCPTmaxSendTime	Send Heartbeat	cpMaxSendTDO11	Q11	0 min
SCPTmaxSendTime	Send Heartbeat	cpMaxSendTDO12	Q12	0 min
SCPTmaxSendTime	Send Heartbeat	cpMaxSendTDO13	Q13	0 min
SCPTmaxSendTime	Send Heartbeat	cpMaxSendTDO14	Q14	0 min
SCPTmaxSendTime	Send Heartbeat	cpMaxSendTDO15	Q15	0 min
SCPTmaxSendTime	Send Heartbeat	cpMaxSendTDO16	Q16	0 min

After changing configuration parameters, shut down and power up again. When power is restored, the new configuration parameters take effect.

4.4 Inputs / Outputs – special considerations

Allocating the IDEC SmartRelay inputs/outputs

All of the inputs/outputs, which are physically allocated on the IDEC SmartRelay or an expansion module, are not available for allocation as virtual inputs/outputs.

Only the outputs on additional I/O modules can be issued in parallel to the LON.

Using the IDEC SmartRelay inputs / outputs on the LONWORKS® Communication Module

To access the IDEC SmartRelay outputs (Q1 to Q4) directly via the bus communications, these must be joined in the IDEC SmartRelay application with free virtual BUS inputs.

To map the IDEC SmartRelay inputs (I1 - I8) as outputs on the BUS, these must be joined with free virtual BUS outputs in the IDEC SmartRelay application.

Feedback value

Feedback variables are required for status displays for a variety of applications (primarily lighting applications).

These are not directly supported by the LONWORKS® Communication Module.

However, an internal operation using IDEC SmartRelay inputs/outputs is enough to display the status information on the IDEC SmartRelay.

4.5 Alias table entries

The LONWORKS® Communication Module supports 8 alias table entries.

5. LONWORKS® Communication Module - Specifications

Electrical Data

Supply voltage	24 V AC	24 V DC
Permissible range	-15% +10%	-15% +20%
Current consumption	max. 33 mA	
Data transmission rate - LON	78 kBaud	

Physical Construction

Dimensions (W x H x D)	36 x 90 x 55 mm
Weight	approx. 85g
Mounting options	35 mm rail wall mounting

Connections

IDEC SmartRelay connection	Standard expansion interface For IDEC SmartRelay 12/24 V and 100/240 V
LON connection (TP/FT-10)	2 screw terminals (0.5 – 2.5 mm ²)
Max. torque	0.5 Nm
Power supply	2 screw terminals (0.5 – 2.5 mm ²)
Max. torque	0.5 Nm
Standard bus lines to use	2 x 2 x 0.8 mm ²

Environmental Conditions

Permissible operating temperature	0°C to +55°C free convection
Storage and transport temperatures	-40°C to +70°C
Humidity	95% at +25°C

Safety

Protection standard	IP 20
Radio interference suppression Certification	EN 55011 (Limit Value Class B) CE UL 508 VDE 0631 IEC 61131-2
Overvoltage protection Fuse	80 mA slow action fuse

Order Data

IDEC SmartRelay Expansion Module	FL1B-CL1C12
LONWORKS® Communication Module	

6. Index

Mechanical coding - pin ..	1-3	SNVT_lux.....	4-3
Power supply	1-3	SNVT_obj_request.....	4-3
RUN/STOP LED	1-3	SNVT_obj_status.....	4-3
Service button	1-3	SNVT_occupancy.....	4-3, 4-4
SERVICE LED	1-3	SNVT_switch	4-3, 4-4
slider	1-3	SNVT_temp_p	4-3, 4-4
SNVT_lev_percent	4-3, 4-4	SNVT_tod_event	4-3, 4-4