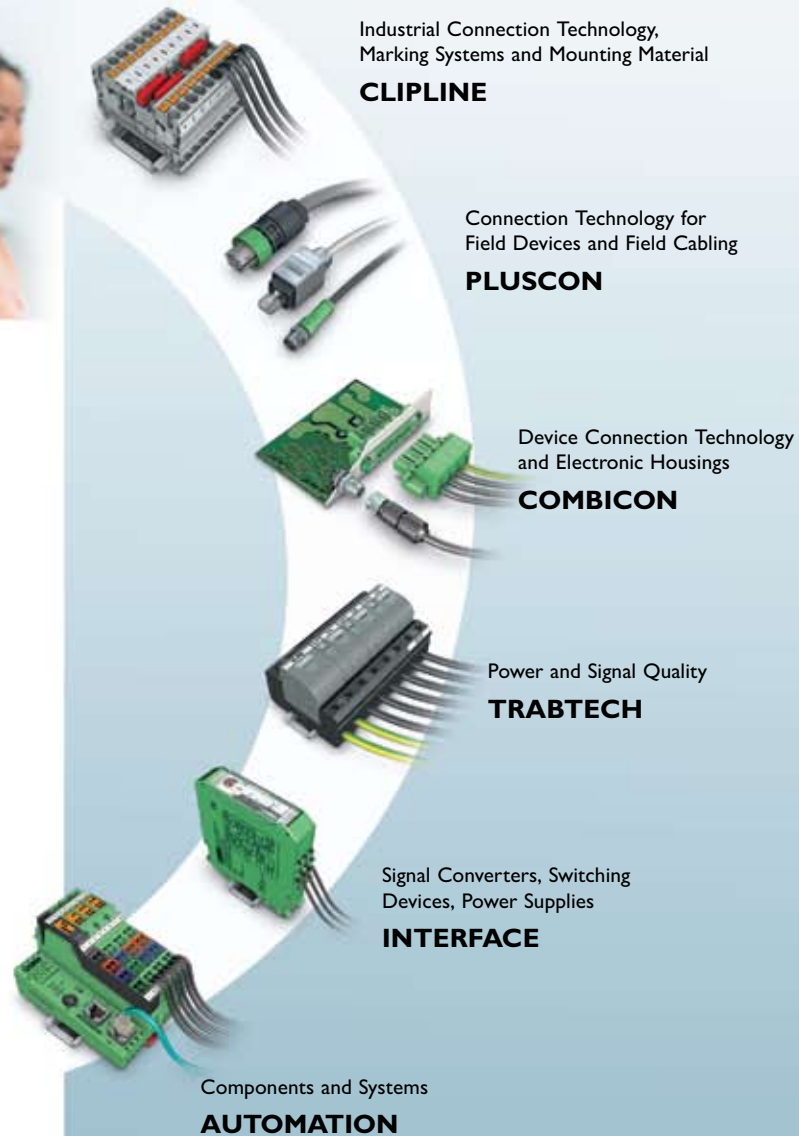


Further information on the products presented here and on the world of solutions from Phoenix Contact can be found at [www.phoenixcontact.net/catalog](http://www.phoenixcontact.net/catalog)



Or contact us directly.



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**Nanoline<sup>®</sup>**  
Simple controls... fast solutions

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# Nanoline® – Simple controls...fast solutions

The Nanoline family is a new control platform with easy application programming and flexible, modular configurations. It requires virtually no support and is designed for basic applications in markets that require increasing connectivity.

## Smart

The Nanoline is a smart, compact control system. It performs many tasks automatically, saving time and preventing errors.

## Simple

The Nanoline logic modules support two simple programming language options – an intuitive flow chart language that requires no programming experience or traditional Relay Ladder Logic (RLL).

## Connected

The Nanoline supports a new level of connectivity in its class. Nanoline systems can be embedded into systems, monitored from a distance, or remotely controlled by a host computer, large PLC or advanced HMI via serial connection, Ethernet or GSM.

## Flexible

The Nanoline is an easy-to-use, tightly integrated, modular system. The user only needs to select the necessary project components.

### Logic modules

Choose from nine logic modules in various power and I/O combinations. A wide variety of options, including additional I/O, communications, operator panel and real-time clock, connect to the logic module

### I/O expansion modules

Add up to three I/O expansion modules in any combination of digital and analog. Mixing digital I/O types is also possible. For example, you can combine an AC logic module with a DC I/O expansion module.

### Flexible operator panel

Mount the operator panel on the logic module, through a control cabinet or use it as a simple hand-held device.

### nanoNavigator

Program in two languages, flow chart and Relay Ladder Logic (RLL). Flow chart programming is intuitive and easy to understand. No training is necessary. RLL is an industry standard, simple for many applications.

### Ethernet Modbus TCP or GSM modem

### Connectivity

Install the expansion module or serial option module (RS-232 or RS-485), and the Nanoline functions as a Modbus TCP or RTU server. Using one of these options, the user can read and write all I/O points, registers, timers, counters, program flags and system flags remotely and independently of the program. This is also possible using SMS texting with the GSM expansion module.

### USB Module

### RS232 Module

### RS485 Module



# Nanoline – Class-leading connectivity

The Nanoline supports a new level of connectivity in its class. In addition to Modbus TCP and Modbus RTU server support, it also supports GSM short message service (SMS) messaging.

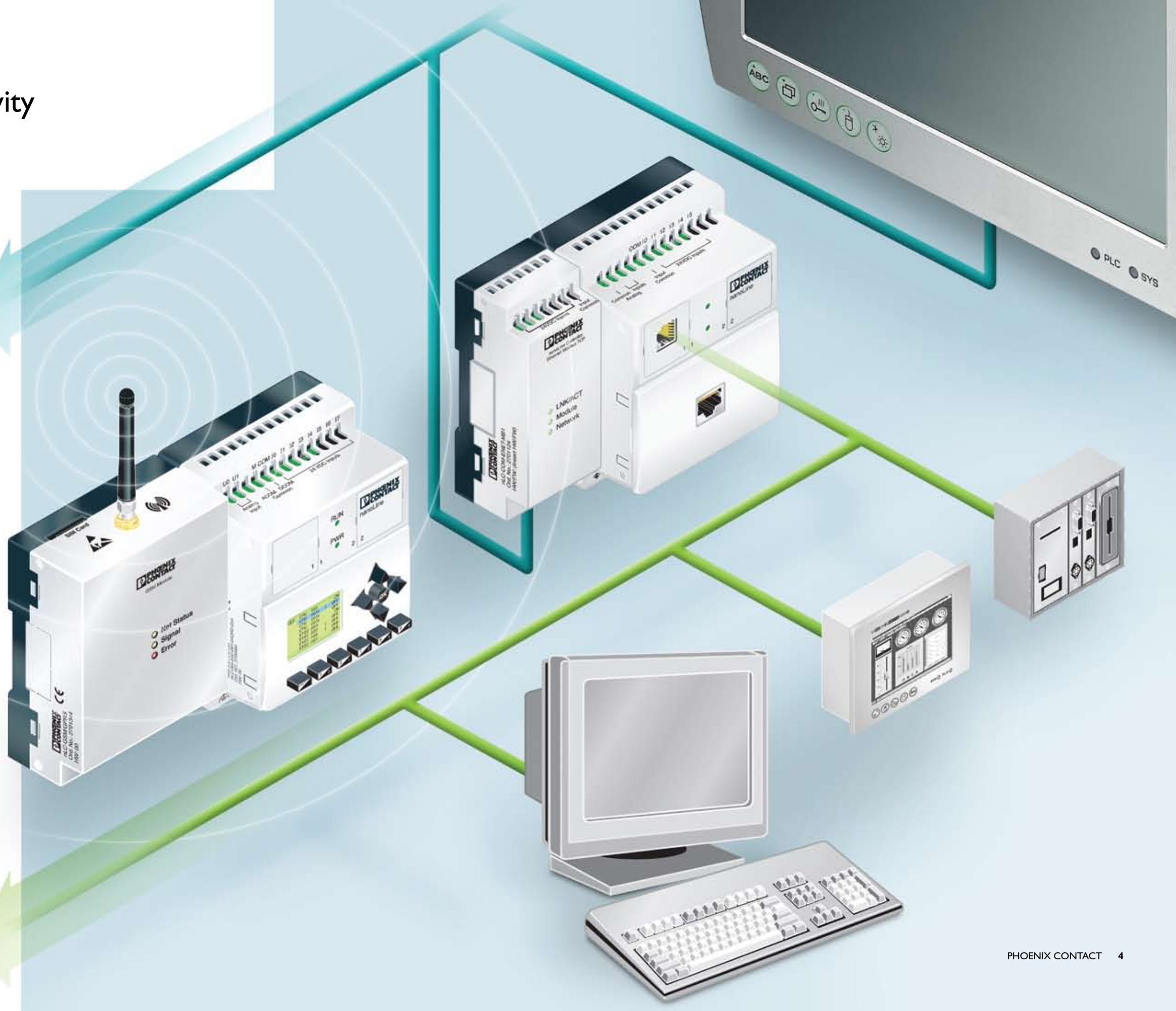
A host computer, larger PLC or advanced HMI can use Modbus TCP to monitor the Nanoline from a distance, or to integrate the Nanoline into larger systems. Modbus RTU provides connectivity for additional local control or an additional HMI.

With Modbus TCP and RTU and SMS messaging, all I/O points, registers, timers, counters, program flags and system flags can be read and written remotely and independently of the program. The Nanoline also has multilevel password access control and watchdog timer support.

The Ethernet communication expansion module supports Modbus TCP (slave mode). This module attaches to the left side of the Nanoline. Serial communications options modules are inserted into the logic module to provide Modbus RTU connectivity via RS-232 or RS-485.

With the GSM communication expansion module, the user can send text messages under program control. The Nanoline can provide direct read/write access to all the data and I/O points. Password access, call ID blocking, message aging and watchdog timer security features are provided.

A USB serial communications option module is also available for configuration, programming and simulation. This module can also provide Modbus RTU connectivity during development and testing.





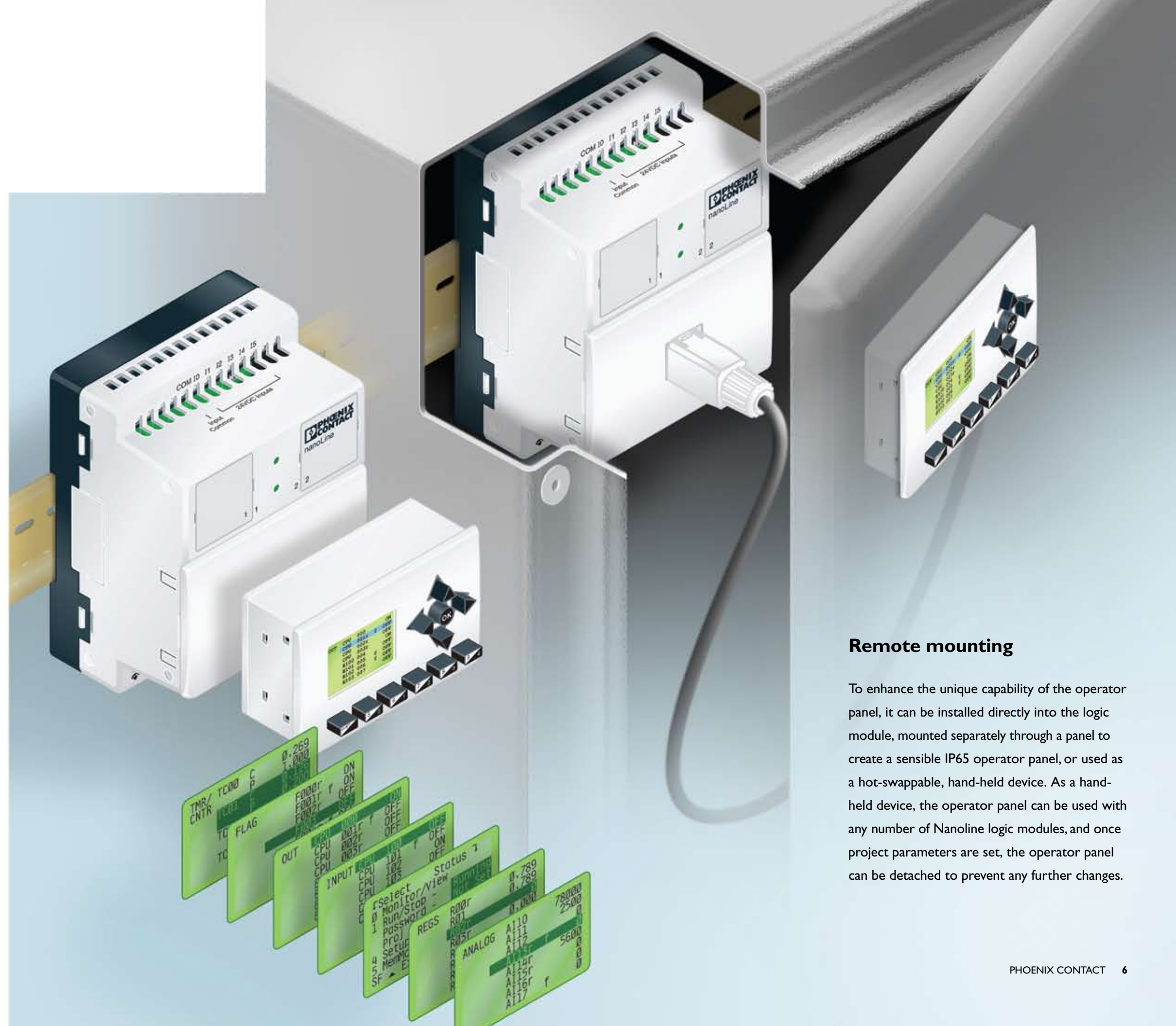
# Nanoline – Flexible operator panel

The Nanoline operator panel is a machine interface that allows the operator to interact with the logic module.

The user can view the status of all I/O points, registers, timers, counters, program flags and system flags via the operator panel. The program also sends messages to the display to provide directions or ask for information.

The panel's numeric keypad allows easy parameter entry. Create custom menus within a flow chart or ladder logic program using the 14 keys on the operator panel.

Messages on the operator panel can consist of up to four lines of 20 characters each. Alternatively, if you need to view from a greater distance, then configure the operator panel for two lines of 10 characters. The 32-mm backlit screen displays these messages sharply. In addition to text, messages can contain references to I/O points, registers, timers, counters, program flags and system flags for display or data entry.



## Remote mounting

To enhance the unique capability of the operator panel, it can be installed directly into the logic module, mounted separately through a panel to create a sensible IP65 operator panel, or used as a hot-swappable, hand-held device. As a hand-held device, the operator panel can be used with any number of Nanoline logic modules, and once project parameters are set, the operator panel can be detached to prevent any further changes.










# nanoNavigator – Fast, easy programming

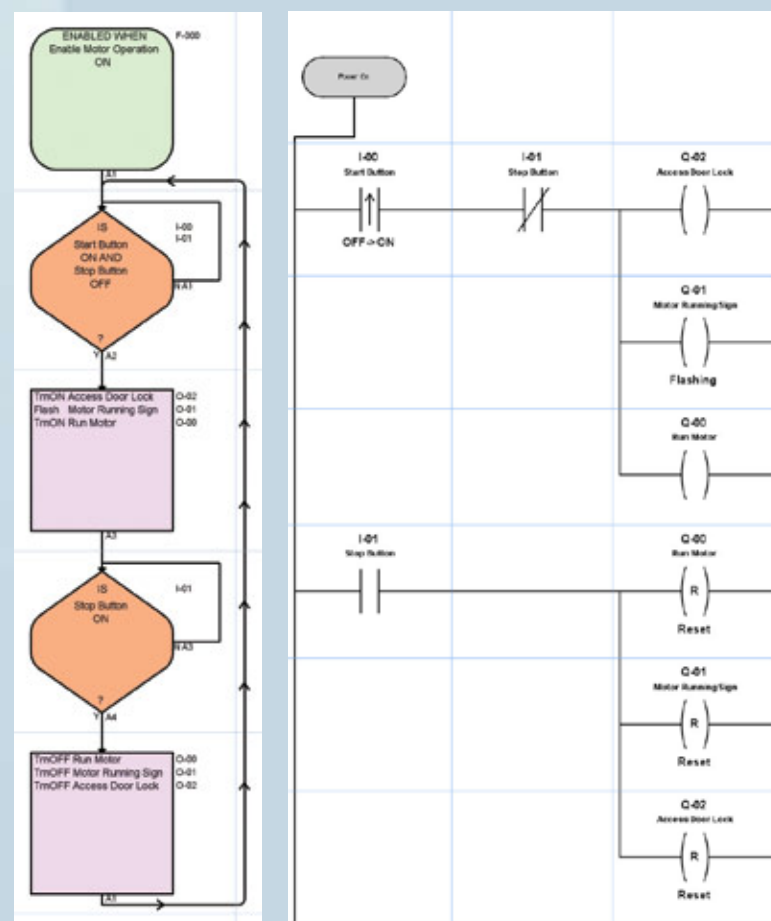
No training is necessary to learn nanoNavigator's intuitive flow chart language. Just follow the seven easy instructions. Those familiar with Relay Ladder Logic (RLL) can use ladder charts exclusively or in combination with flow chart. Each project can consist of up to 32 charts.

Users can download free nanoNavigator, even before purchasing the Nanoline system. By downloading in advance, users can save time by writing and simulating programs before the hardware arrives.

## Only 7 instructions:

-  **Compare** inputs, outputs, program and flags (RLL contact)
-  **Decide** based on registers, timer, counters or analog inputs (RLL contact)
-  **Control** outputs, flags, timers and counters (RLL coil)
-  **Move** values between registers, timers, counters and analog inputs (RLL coil)
-  **Message** sends text and data to the Operator Panel (RLL coil)
-  **Wait** for a time from milliseconds to hours
-  **Math** performs four-function arithmetic on registers, analog I/O, timers and counters – requires nLC-055 (RLL coil)

	nLC-050	nLC-055
<b>Flow chart capacity</b>		
Blocks/system	384	1000
Blocks/flow chart	100	100
Flow charts/system	16	32
Memory	3k	12k
<b>Data capacity</b>		
Internal flags	64	128
Registers	32	128
Timers/counters	32	32
Operator messages	32	64



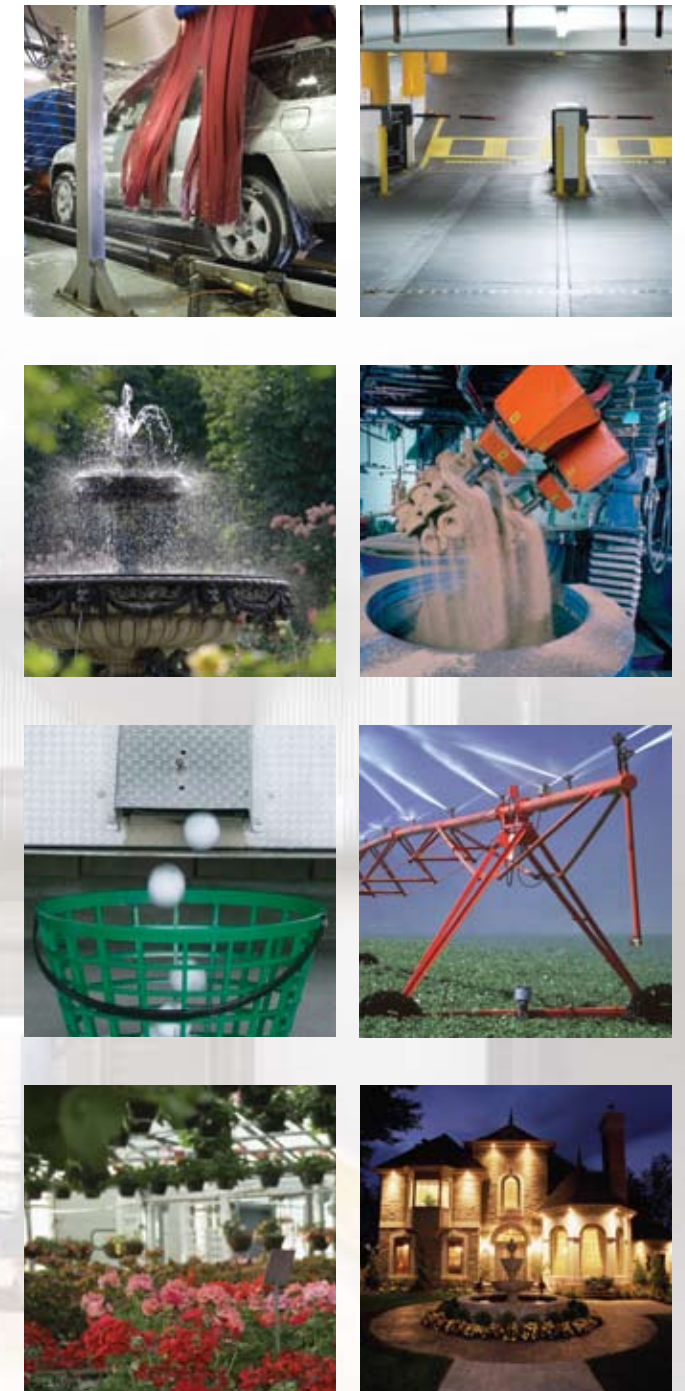
Flow chart example

Relay Ladder Logic example

# Nanoline – Applications

Finding the right solution for small-scale projects is challenging, but the Nanoline product family is a cost-effective solution for a wide range of applications.

- **Simple SMS messaging**
- **Scalable connectivity with both Ethernet and serial options**
- **True operator panel capabilities with flexible mounting options, including IP65 sealing**
- **Click-and-drop, flow chart or RLL programming and simulation**



# Nanoline – Technical details

## Real-time-clock

- Three date and time formats
- Summer and winter time

## LED indicators

- Power
- Program running

## Serial communications

- Programming interface
- Modbus RTU server
- USB
- RS-232
- RS-485

## Flexible operator panel

- Remote mountable
- Hot swappable
- Interactive numeric data entry
- IP65 rating when panel mounted

## LCD display

- Up to 24 user messages
- 4 lines x 20 characters
- 32 mm diagonal, high contrast backlit display

## Key pad

- 14 programmable keys
- Numeric keypad
- Navigation keys



### Power options

- 24 V DC
- 24 V AC/DC
- 100...240 V AC
- 12 V DC

### Input options

- 24 V DC
- 24 V AC/DC
- 100...240 V AC
- 12 V DC
- 0-10 V

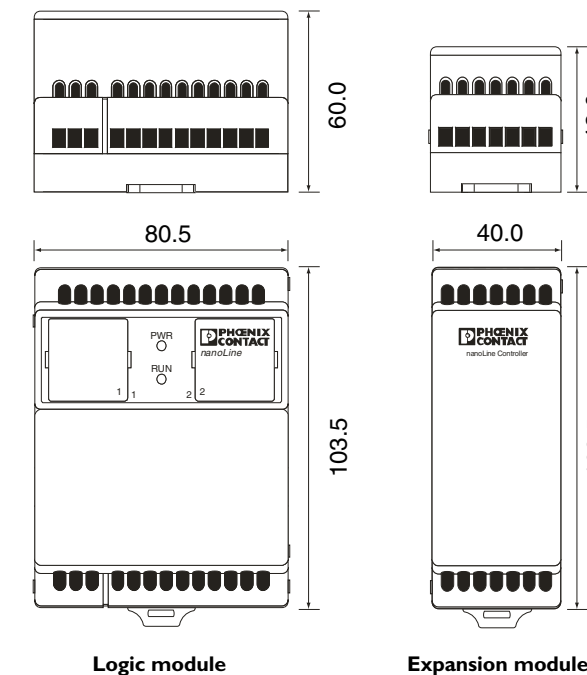
### Output options

- 24 V DC PNP (current sourcing)
- 24 V DC NPN (current sinking)
- 24 V AC/DC 5 A relay
- 100...240 V AC 5 A relay
- 12 V DC 5 A relay

# Nanoline – Selection guide

Name	Power Supply Voltage	Inputs		Outputs			Type	Part number
		Number	Range	Number	Type	Range		
Logic module nLC-055	24 V DC	8 (3)	24 V DC	4	Relay	30 V DC, 250 V AC	nLC-055-024D-08I-04QRD-05A	2700464
	24 V DC	2	0-10 V DC	4	Transistor (PNP)	24 V DC	nLC-055-024D-08I-04QTP-00A	2700453
		8 (3)	24 V DC					
	12 V DC	8 (3)	12 V DC	4	Relay	30 V DC, 250 V AC	nLC-055-100A-08I-04QRA-05A	2700486
100...240 V AC	8	100...240 V AC	4	Relay	30 V DC, 250 V AC	nLC-055-012D-08I-04QRD-05A	2700487	
Logic module nLC-050	24 V DC	6	24 V DC	4	Transistor (PNP)	24 V DC	nLC-050-024D-06I-04QTP-00A	2701027
	24 V DC	6	24 V DC	4	Transistor (NPN)	24 V DC	nLC-050-024D-06I-04QTN-00A	2701030
	24 V DC	6	24 V DC	4	Relay	30 V DC, 250 V AC	nLC-050-024D-06I-04QRD-05A	2701043
	24 V AC/DC	8	24 V AC/DC	4	Relay	30 V DC, 250 V AC	nLC-050-024X-08I-04QRX-05A	2701056
	100...240 V AC	8	100...240 V AC	4	Relay	30 V DC, 250 V AC	nLC-050-100A-08I-04QRA-05A	2701069
		8	100...240 V AC	4	Relay	30 V DC, 250 V AC	nLC-050-100A-08I-04QRA-05A	2701069
I/O Expansion	24 V DC	6	24 V DC	4	Transistor (PNP)	24 V DC	nLC-IO-024D-06I-04QTP-01A	2701072
	24 V DC	6	24 V DC	4	Transistor (NPN)	24 V DC	nLC-IO-024D-06I-04QTN-01A	2701085
	24 V DC	3	24 V DC	4	Relay	30 V DC, 250 V AC	nLC-IO-03I-04QRD-05A	2701328
	-	4	0-10, +/-10, 4-20 mA, 0-20 mA	-	-	-	nLC-IO-4AI	2701098
	24 V DC	2	0-10, +/-10, 4-20 mA, 0-20 mA	2	Analog	0-10, 4-20 mA, 0-20 mA	nLC-IO-2AI-2AO-01	2701040
	24 V DC	2	0-10, +/-10, 4-20 mA, 0-20 mA	2	Analog	0-10, 4-20 mA, 0-20 mA	nLC-IO-2AI-2AO-01	2701040
Software	nanoNavigator, configuration and programming software						nLC-NAV-01	2701221
Communications	10/100 Mbaud Ethernet, Modbus TCP Server						nLC-COM-ENET-MB1	2701124
	GSM modem						nLC-COM-GSM/GPRS	2701344
	USB Communication, Programming port						nLC-MOD-USB	2701195
	RS-232 Communication, Modbus RTU Server, Programming port						nLC-MOD-RS232	2701179
	RS-485 Communication, Modbus RTU Server, Programming port						nLC-MOD-RS485	2701182
Accessories	LCD Display, 4 lines x 20 char, 32 mm diagonal, high contrast backlit display						nLC-OP1-LCD-032-4X20	2701137
	Panel mounting kit for LCD display						nLC-OP1-MKT	2701140
	Real time clock module for nLC-050 logic modules						nLC-MOD-RTC	2701153
	Memory Module						nLC-MOD-MEM 032K	2701166
Starter Kits	Starter kit (1) with nLC-050-024D-06I-04QTP-00A logic module (PNP Transistor Outputs)						nLC-START-01	2701399
	Starter kit (1) with nLC-050-024D-06I-04QTN-00A logic module (NPN Transistor Outputs)						nLC-START-02	2701425
	Starter kit (1) with nLC-055-024D-08I-04QRD-05A logic module (Relay Outputs)						nLC-START-03	2701467
	Starter kit (2) with nLC-050-024D-08I-04QTP-00A logic module (PNP Transistor Outputs)						nLC-START-04	2701483

1. Starter kits contain a logic module, operator panel, USB module, USB cable, input simulator, output simulator, and English/German language quick start guide.
2. Starter kit contains a logic module, operator panel, Ethernet, IO expansion USB module, real-time-clock USB cable, input simulator, output simulator, and power supply. Assembled and wired on a panel with English/German language quick start guide.
3. Two digital inputs may be configured as high speed counters (6kHz).



## Starter kits

Make your development startup fast and easy with a Nanoline starter kit. Download nanoNavigator and you'll have everything you need to begin your project.

- Nanoline logic module
- Operator panel
- USB option module
- Input and output simulators
- USB cable
- Quick start guide

