nanoLine

The smart,
simple control system

nanoLine –
Smart, simple, connected, flexible

The nanoLine is a new control platform with easy application programming and flexible, modular configurations. It requires virtually no support and is targeted for basic applications in competitive markets where connectivity is increasingly required.

Smart

The nanoLine is a smart, compact control system designed to perform many tasks automatically, saving time and preventing errors.

Simple

The nanoLine controllers are programmed using an intuitive flow chart programming language that requires no programming background to produce a working program.

Connected

The nanoLine supports a new level of connectivity in its product class. nanoLine controls can be embedded into systems, monitored from a distance, or remotely controlled by a host computer, large PLC or advanced HMI.

Flexible

Select only the necessary project components with this easy-to-use, tightly-integrated, modular system.

Base units
The nanoLine has five base units 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 base unit.

Ethernet Modbus TCP

USB Module

RS232 Module

RS485 Module

Connectivity
When the Ethernet expansion module or serial option module (RS-232 or RS-485) is installed, the nanoLine control functions as a Modbus TCP or RTU server. Using one of these options, all I/O points, registers, timers, counters, and system flags can be read and written remotely, independently of the program.

I/O expansion modules

Up to three I/O expansion modules can be added in any combination of digital and analog. Mixing digital I/O types is also possible, for example combining an AC control with a DC I/O expansion module.

Flexible operator panel

The same operator panel can be mounted on the base unit, through a control cabinet or used as a simple hand-held device.

**nanoNavigator –
Fast and easy programming**

Flow chart programming is intuitive and easy to understand. No training is necessary.

nanoLine –
Class leading connectivity

The nanoLine supports a new level of connectivity in its product class with the inclusion of Modbus TCP and Modbus RTU server support. Modbus TCP is used to monitor the nanoLC at a distance by a host computer, larger PLC or advanced HMI, or to integrate the nanoLC into larger systems. Modbus RTU provides connectivity for additional local control or an additional HMI.

With Modbus TCP and RTU, all I/O points, registers, timers, counters, program flags and system flags can be read and written remotely and independently of the program. Multilevel password access control and watchdog timer support are also provided.

The Ethernet communication expansion module supports Modbus TCP. This module is attached to the left side of the nanoLC. Serial communications options modules are inserted into the base unit to provide Modbus RTU connectivity via RS-232 or RS-485.

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 control to interact with the operator. Using the operator panel, the operator can view the status of all I/O points, registers, timers, counters, program flags and system flags. The program also sends messages to the display to provide directions or ask for information. For easy parameter entry, the nanoLine operator panel has a numeric keypad. Each of the 14 keys on the operator panel can also be used within a flow chart to create custom menus. Operator panel message can be up to four lines of 20 characters each. These messages are sharply displayed on the 32 mm backlit graphics display. 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.
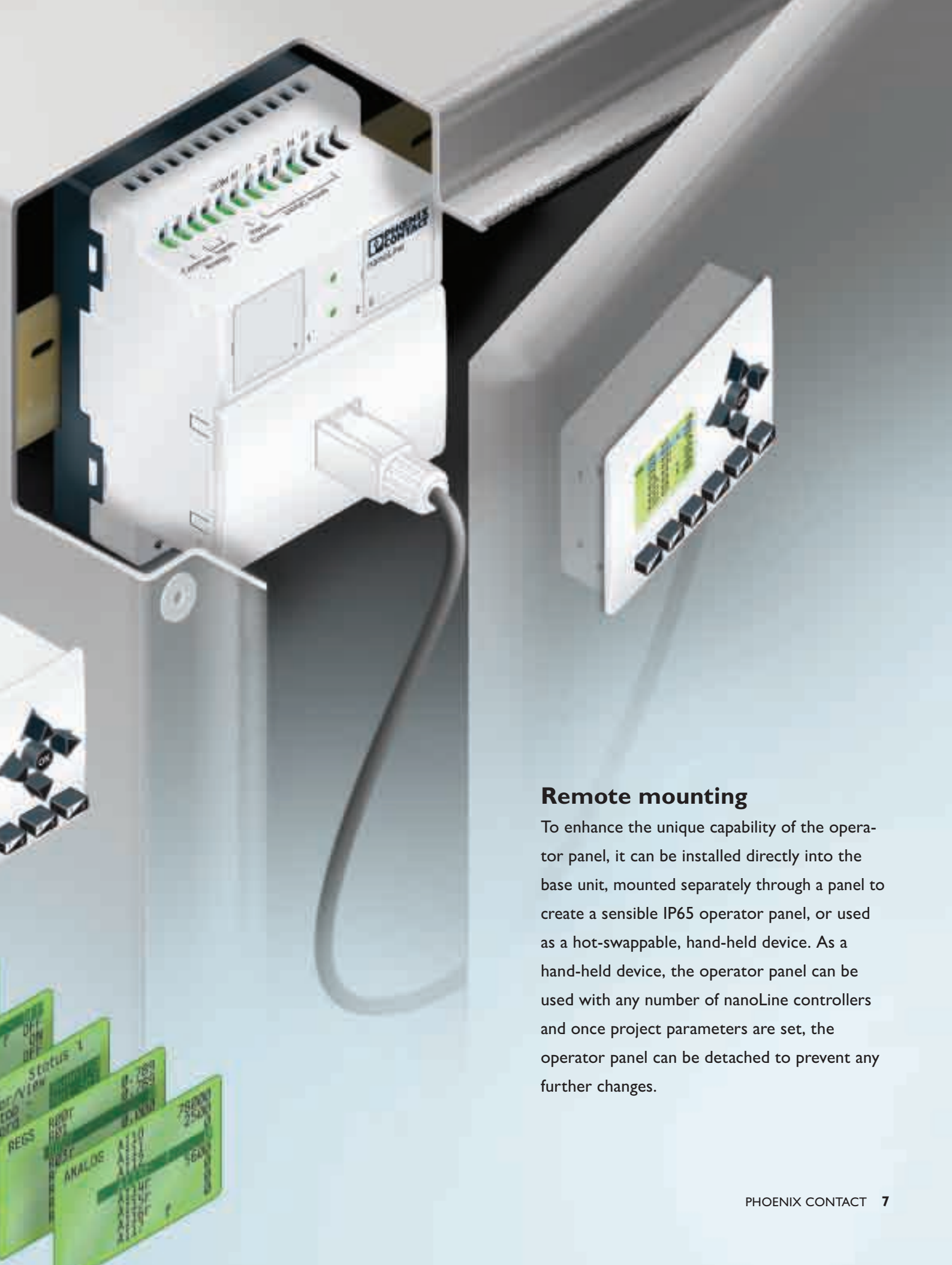
Remote mounting

To enhance the unique capability of the operator panel, it can be installed directly into the base unit, 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 controllers 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. There are only six instructions to follow. Even before the nanoLine system is purchased, users can download nanoNavigator for free on the web. With this free download, users will save time by writing and simulating programs before the hardware arrives.
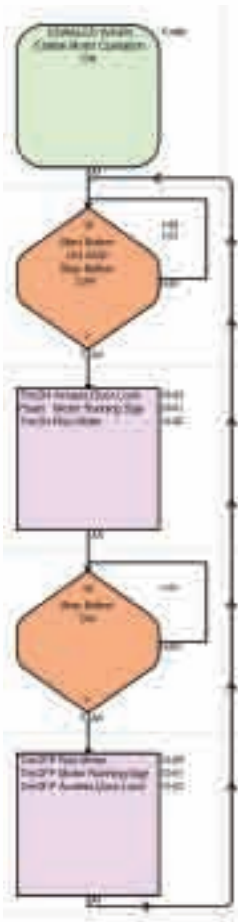
Only 6 instructions:

Compare inputs, outputs, program and flags

Decide based on registers, timer, counters or analog inputs

Control outputs, flags, timers, and counters

Move values between registers, timers, counters and analog inputs

Message sends text and data to the Operator Panel

Wait for a time from milliseconds to hours

1 Select your configuration

Begin by selecting which hardware options are required for the application.

2 Drop the flow chart blocks

Develop the program by dropping standard flow chart blocks onto the pallet.

3 Configure the blocks

Double click on the blocks and fill in the drop down boxes.

4 Connect the flow

Finish the program by connecting the flow chart blocks together.

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. Development is fast and easy using the following features:

- **Scalable connectivity with both Ethernet and serial options**

- **True operator panel capabilities with flexible mounting options, including IP65 sealing**

- **Click-and-drop, flow chart 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 enter
- 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	Input Options	Output Options
• 24 V DC	• 24 V DC	• 24 V DC PNP (current sourcing)
• 24 V AC/DC	• 24 V AC/DC	• 24 V DC NPN (current sinking)
• 100…240 V AC	• 100…240 V AC	• 24 V AC/DC 5 A relay
		• 100…240 V AC 5 A relay

nanoLine –
Selection guide

Name	Power Supply Voltage	Inputs		Outputs			Type	Order No.
		Number	Voltage	Number	Type	Voltage		
Base	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	24 V DC	nLC-050-024D-06I-04QRD-05A	2701043
	24 V AC/DC	8	24 V AC/DC	4	Relay	24 V AC/DC	nLC-050-024X-08I-04QRX-05A	2701056
	100...240 V AC	8	100...240 V AC	4	Relay	100...240 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
		4	0-10 V, ±10 V, 4-20 mA				nLC-IO-4AI	2701098
Software	nanoNavigator, configuration and programming software						nLC-NAV-01	2701221
Communications	10/100 Mbaud Ethernet, Modbus TCP Server						nLC-COM-ENET-MB1	2701124
	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						nLC-MOD-RTC	2701153
	Memory Module						nLC-MOD-MEM 032K	2701166
Starter Kits	Starter kit with nLC-050-024D-06I-04QTN-00A base (NPN Transistor Ouputs)						nLC-START-01	2701399
	Starter kit with nLC-050-024D-06I-04QTP-00A base (PNP Transistor Outputs)						nLC-START-02	2701425
	Starter kit with nLC-050-024D-06I-04QRD-00A base (Relay Outputs)						nLC-START-03	2701467

Base Unit

Expansion Module
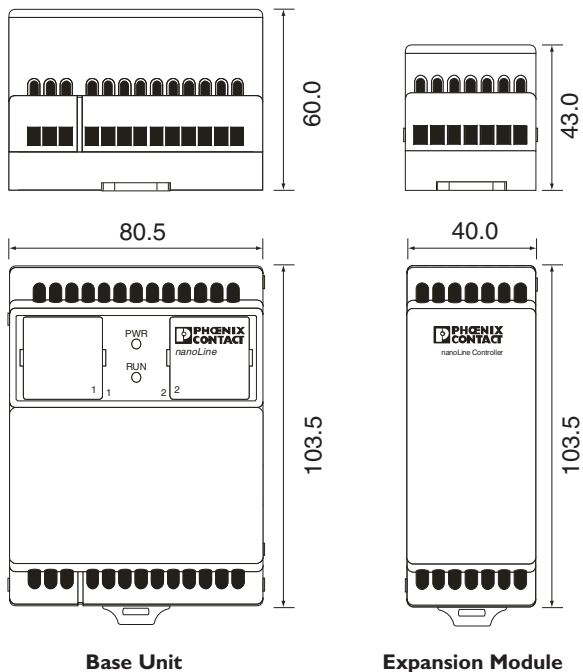
Starter kits

Make your development startup fast and easy with a nanoLine starter kit. The kit includes everything you need to begin your project.

• nanoNavigator CD

• nanoLine Base Unit

• Operator Panel

• USB Option Module

• Input and Output Simulators

• USB Cable

• Quick Start Guide

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