Maple Systems INC.

MAPLE SYSTEMS
PLC BROCHURE

Powerful Industrial Control Solutions

HMI + PLC • PLC • MAPware-7000

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MAPLE SYSTEMS

POWERFUL INDUSTRIAL CONTROL SOLUTIONS

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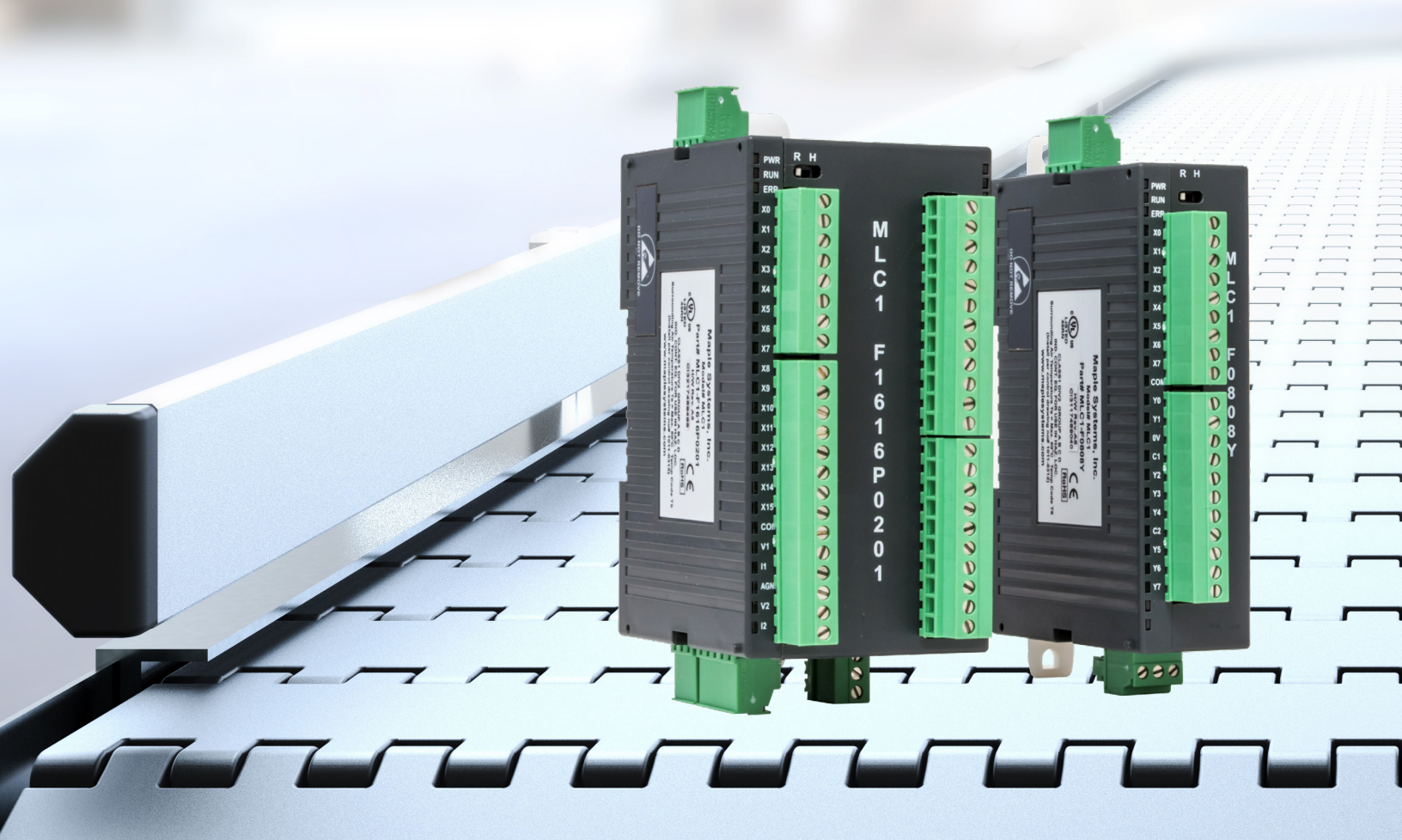


ABOUT US

MAPLE SYSTEMS COMPANY PHILOSOPHY

Maple Systems Specializes in Operator Interface Solutions

We are committed to quality, reliability, and affordability. Our products deliver the quality you deserve, the reliability you demand, with a value that will drive your growth. Whether your customers are residential, commercial, or industrial; whether you create custom automation and integration solutions or manufacture products that require 21st century control, Maple Systems adds value and improves your bottom line.

We Make Machine Control Easy

With modern touchscreens, unrivaled value and functionality, combined with intuitive software, Maple Systems provides a versatile offering of products to complement your machine's design. Our products include:

- Touchscreen HMIs
- Open HMIs
- HMI + PLCs
- PLCs
- Light Industrial Panel PCs
- Heavy Industrial Panel PCs
- Text-Based Alphanumeric OITs

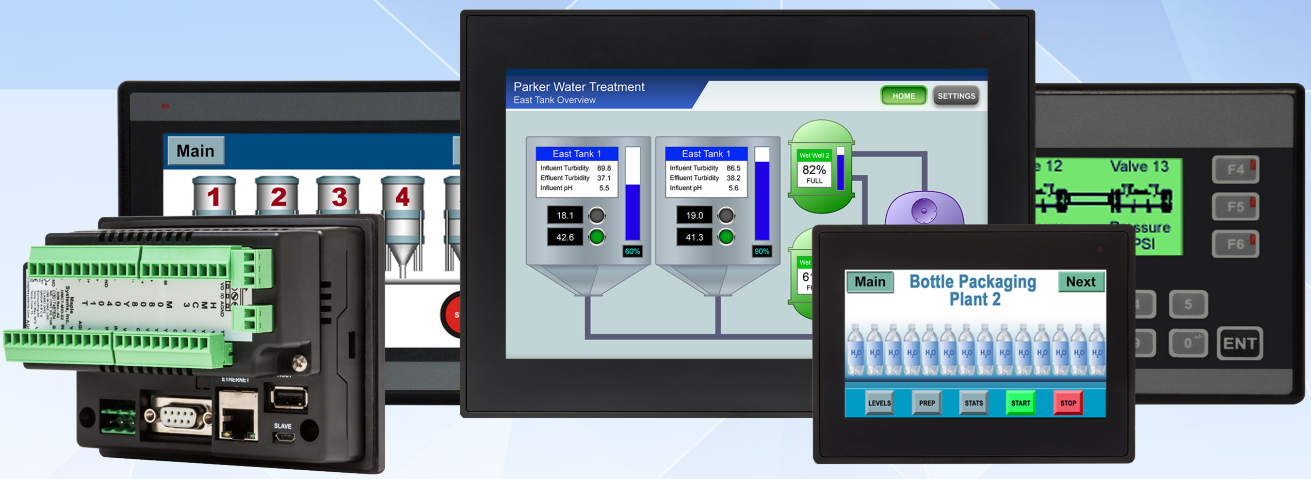
Our goal is to offer high-quality control solutions at affordable prices. We strive for continuous product improvement by being experts in our field, employing the latest technologies, and ensuring that every product is fully tested and inspected before leaving our facility. Paired with an outstanding support team and our comprehensive technical website, you'll see that Maple Systems truly is *your* industrial control solution.

Contact Us Today

We invite you to explore our product offerings and contact us to discuss how Maple Systems can help solve and support your automation and control needs:

Phone: 425.745.3229
Email: sales@maplesystems.com
Website: www.maplesystems.com

HMI + PLC OVERVIEW



Lower your costs while saving time and space.

Our HMI + PLC units merge the functionality of a PLC/Controller and an HMI into one unit. HMI + PLCs lower costs, save space, and feature options including touchscreen and function key models, serial and Ethernet, and numerous I/O configurations.

We offer two different HMI + PLC lines featuring over twenty different I/O modules to choose from, making these combination units a favorable option for many customers.

Sizing & I/O Modules

The HMC7000 series features two sizes: 4.3" and 7". Units can support up to five I/O modules with 15 fixed and expandable options to choose from.

Our HMC3000 series offers a slim design, support for a micro SD card and expandable I/O modules that provide both analog and digital I/O within the same module. The HMC3000 line offers three sizes: 4.3", 7", and 10" touchscreen displays.

HMI + PLC Features

- Support for Class I, Division 2
- Numerous I/O Configurations
- Serial & Ethernet Ports
- MAPware-7000 Software
- IEC Programming
- Native Ladder Logic
- Timers & High-Speed Counters
- Graphic Libraries
- ASCII Communications
- Real-Time Monitoring
- Offline Simulation Testing
- Data Monitor Feature

HMI + PLC SERIES

CLASS I, DIVISION 2

		HMC7043A-M	HMC3043A-M	HMC7070A-M	HMC3070A-M	HMC3102A-M
DISPLAY	Display Size	4.3"	4.3"	7.0"	7.0"	10.2"
	Display	Resistive	Resistive	Resistive	Resistive	Resistive
	Touchscreen	Yes	Yes	Yes	Yes	Yes
	Resolution	480 × 272	480 × 272	800 × 480	800 × 480	800 × 480
	Brightness (cd/m2)	400	400	300	300	350
	Max Colors	32K	32K	32K	32K	32K
	Contrast Ratio	500:1	500:1	500:1	500:1	300:1
SYSTEM	Memory	128MB	128MB	128MB	128MB	128MB
	Application Memory	47MB	47MB	47MB	47MB	47MB
	Data Log Memory	20MB	20MB	20MB	20MB	20MB
	Program Capacity	160K Steps	320K Steps	160K Steps	320K Steps	320K Steps
	Processor Speed	400MHz	454MHz	400MHz	454MHz	454MHz
	PLC Ladder Memory	2MB	2MB	2MB	2MB	2MB
I/O PORTS	Ethernet	Yes	Yes	Yes	Yes	Yes
	Micro SD Card	No	Yes	No	Yes	Yes
	USB Host	Yes	Yes	Yes	Yes	Yes
	USB Client (Device)	Type B	Micro	Type B	Micro	Micro
	Serial Ports	2	2	2	2	2
I/O MODULES	I/O	Expandable	Expandable	Expandable	Expandable	Expandable
	I/O Slots	3	1	5	3	5
	Max I/O Points (Digital)	48	32	80	96	160
	Max Digital In	48	16	80	48	80
	Max Digital Out	48	16	80	48	80
	Max I/O Points (Analog)	24	5	40	15	25
	Max Analog In	24	4	40	12	20
	Max Analog Out	6	1	10	3	5
MECHANICAL/ENVIRONMENT	Dimensions (W×H×D)	5.04" × 4.02" × 1.77"	4.72" × 3.50" × 1.26"	7.68" × 5.59" × 1.97"	7.32" × 5.43" × 1.22"	10.55" × 7.48" × 1.3"
	Panel Cutout	4.70" × 3.68"	4.37" × 3.14"	7.24" × 5.16"	6.88" × 5.00"	10.08" × 7.00"
	Enclosure	Plastic	Plastic	Plastic	Plastic	Plastic
	Ratings	IP66	IP66	IP66	IP66	IP66
	Mounting	Panel	Panel	Panel	Panel	Panel
	Certifications	CE, UL (Class I, Div 2), RoHS	CE, UL (Class I, Div 2), RoHS	CE, UL (Class I, Div 2), RoHS	CE, UL (Class I, Div 2), RoHS	CE, UL (Class I, Div 2), RoHS
	Power Requirements	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC
	Operating Temp	32° - 122° F	32° - 122° F	32° - 122° F	32° - 122° F	32° - 122° F
SOFTWARE FEATURES	IEC Programming	Yes	Yes	Yes	Yes	Yes
	Native Ladder	Yes	Yes	Yes	Yes	Yes
	High-Speed Counters	25kHz	200kHz	25kHz	200kHz	200kHz
	PWM	10kHz	200kHz	10kHz	200kHz	200kHz
	Real Time Clock	Yes	Yes	Yes	Yes	Yes
	Data Logging	Yes	Yes	Yes	Yes	Yes
	FTP	No	Yes	No	Yes	Yes

PLC Logic Editing Tools

Our HMI + PLCs offer the ability to choose from two logic editing modes: Native Ladder or IEC 61131-3.

Native Ladder Editing Mode

Native Ladder Editing Mode provides an intuitive ladder logic editor and an extensive set of instructions. Real-time monitoring and debugging tools help you to quickly find logical errors and complete your project in a timely manner.

IEC 61131-3 Editing Mode

Incorporates five logic editors and a familiar development environment for anyone experienced with the IEC 61131-3 standard.

Make logic reusable by creating User-Defined Function Blocks (UDFB). Use multiple instances of UDFBs throughout a project or export to another project. Online monitoring tools allow you to view the logic in action.

HMC3000 I/O MODULES

CLASS I, DIVISION 2

Which HMI + PLC is right for you?

Both Maple HMI + PLC lines are Class I, Division 2 rated, support high-speed counters and timers, provide serial and Ethernet communications, and let you choose either Native Ladder or IEC programming. Both series are programmed using MAPware-7000 software, which allows you to have web server functionality, data logging, recipes, graphs, alarms, trending, objects with multiple tasks, and more.

When deciding on which HMI + PLC series to choose, I/O and display size are the key differentiators and factors. Consider how many inputs (analog/digital) your program requires. Do you need separate analog and digital modules, or would a module with both analog and digital best meet your needs?

Use the I/O tables on pages 4 & 5 to help choose the configuration for your specific project.

	HMC3-M1616P	HMC3-M1614Y	HMC3-M1212P0200	HMC3-M1212Y0200	HMC3-M1210P0201	HMC3-M1210Y0201	HMC3-M0808P0401T	HMC3-M0808Y0401T
Digital Inputs (Bidirectional)								
No. of Digital Inputs (Bidirectional)	16	16	12	12	12	12	8	8
No. of High Speed (200kHZ) Inputs	4	4	4	4	4	4	4	4
Single Phase Up/Down Counter or Quad 4X Encoder Mode*	2	2	2	2	2	2	2	2
Digital Outputs								
No. of Digital Outputs	16 PNP	12 Relay, 2 PNP	12 PNP	10 Relay, 2 PNP	10 PNP	8 Relay, 2 PNP	8 PNP	6 Relay, 2 PNP
PWM Mode (up to 200kHz)**	2	2	2	2	2	2	2	2
Analog Inputs								
No. of Analog Inputs	N/A	N/A	2	2	2	2	4	4
Voltage Modes			0 to 10 V 0 to 5 V	0 to 10 V 0 to 5 V	0 to 10 V 0 to 5 V	0 to 10 V 0 to 5 V	0 to 10 V 0 to 5 V 0 to 100 mV 0 to 50 mV	0 to 10 V 0 to 5 V 0 to 100 mV 0 to 50 mV
Current Modes			0 to 20 mA 4 to 20 mA	0 to 20 mA 4 to 20 mA	0 to 20 mA 4 to 20 mA	0 to 20 mA 4 to 20 mA	0 to 20 mA 4 to 20 mA	0 to 20 mA 4 to 20 mA
RTD Modes							PT100 a1 PT100 a2 PT1000	PT100 a1 PT100 a2 PT1000
Thermocouple Modes							Type J, Type K	Type J, Type K
Analog Outputs								
No. of Analog Outputs	N/A	N/A	N/A	N/A	1	1	1	1
Voltage Modes					0 to 10 V 0 to 5 V	0 to 10 V 0 to 5 V	0 to 10 V 0 to 5 V	0 to 10 V 0 to 5 V
Current Modes					0 to 20 mA 4 to 20 mA	0 to 20 mA 4 to 20 mA	0 to 20 mA 4 to 20 mA	0 to 20 mA 4 to 20 mA

* Each Up Counter requires 2 high-speed (HS) inputs (one is used to determine up/down counting) so maximum of two channels available.
** Four options are available when using PWM mode: Normal, Fixed Pulse, CW-CCW, or Pulse-Dir.
If CW-CCW or Pulse-Dir is selected, only 1 PWM output can be used.

HMC7000 I/O MODULES

Questions to Consider

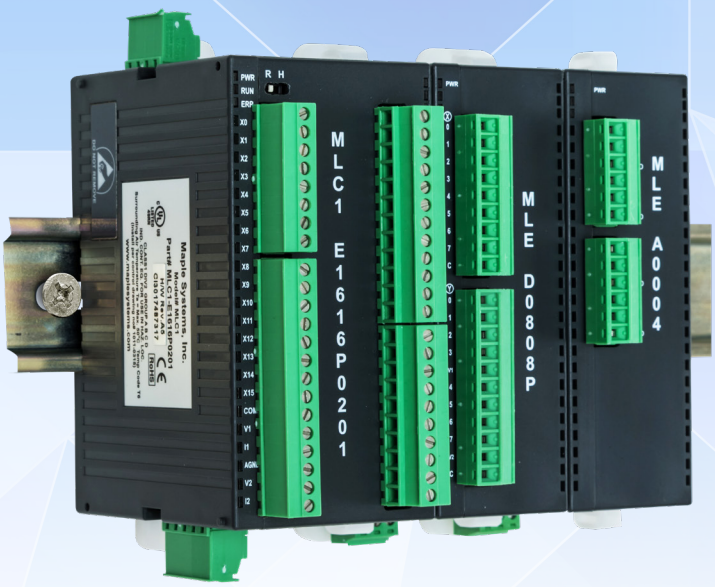
Once you decide on an I/O configuration and the required modules, you can then determine which screen size, or sizes, will support that configuration. How many modules does a particular model support? What about the speed of the high-speed counter? Do you need a micro SD card? These are important questions to consider when making your selection. Refer to the comparison tables for more information.

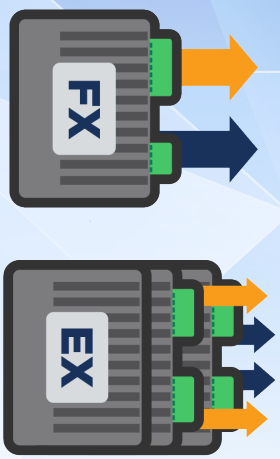
	HMC7-MI-01	HMC7-MI-02	HMC7-MI-03	HMC7-MI-04	HMC7-MIO-01	HMC7-MIO-02	HMC7-MIO-03	HMC7-MIO-04	HMC7-MIO-05	HMC7-MIO-06	HMC7-MIO-07	HMC7-MIO-08	HMC7-MO-01	HMC7-MO-02	HMC7-MO-03
Digital Inputs (Bidirectional)															
No. of Digital Inputs (Bidirectional)	16	N/A	N/A	N/A	8	8	N/A	8	8	8	8	N/A	N/A	N/A	N/A
No. of Single Phase Up High Speed Counter (25kHz) Inputs	2				2	2		4	4	4	4				
No. of Quadrature Encoder (20kHz) Inputs*	1				1	1		2	2	2	2				
Digital Outputs															
No. of Digital Outputs	N/A	N/A	N/A	N/A	8 NPN	8 PNP	N/A	8 NPN	8 PNP	6 Relay, 2 NPN	6 Relay, 2 PNP	N/A	12 Relay	16 NPN	16 PNP
PWM (10kHz) Mode**								2	2	2	2			1	1
Analog Inputs															
No. of Analog Inputs	N/A	4	8	8	N/A	N/A	2	N/A	N/A	N/A	N/A	4	N/A	N/A	N/A
Voltage Modes		0 to 10 V -10 to 10 V	0 to 10 V -10 to 10 V				0 to 10 V -10 to 10 V					0 to 10 V 1 to 5 V -10 to 10 V 0 to 100 mV 0 to 50 mV			
Current Modes		0 to 20 mA, 4 to 20 mA		0 to 20 mA, 4 to 20 mA			0 to 20 mA, 4 to 20 mA					0 to 20 mA, 4 to 20 mA			
RTD Modes												PT100 a1, PT100 a2 PT1000			
Thermocouple Modes												Type J, Type K			
Analog Outputs															
No. of Analog Outputs	N/A	N/A	N/A	N/A	N/A	N/A	2	N/A	N/A	N/A	N/A	2	N/A	N/A	N/A
Voltage Modes							0 to 10 V					0 to 10 V, 0 to 5 V			
Current Modes							0 to 20 mA, 4 to 20 mA					0 to 20 mA, 4 to 20 mA			

* Each Quad Encoder requires 2 HS inputs, so maximum of two available. If both Quad Encoders are used, the maximum input frequency is limited to 5kHz. If one Quad Encoder, the maximum input frequency is 20kHz.

** Four options are available when using PWM mode: Normal, Fixed Pulse, CW-CCW, or Pulse-Dir. If CW-CCW or Pulse-Dir is selected, only 1 PWM output can be used

PLC SERIES





Maple Systems Stand-Alone PLCs

Maple Systems offers a complete line-up of simple, low-cost Programmable Logic Controllers (PLCs) with built-in I/O. These stand-alone PLCs share the same configuration software used with Maple's HMI + PLC product lines – reducing the learning curve and making it easy to share data between the HMI and PLC.

These powerful units are fully functional PLCs with digital and analog I/O that support high-speed counters and PWM (pulse width modulation). Analog I/O options support several voltage and current modes as well as RTD (resistance temperature detection) and thermocouple sensors to measure temperature.

Program your PLC in native ladder logic or any IEC61131-3 programming language. PLCS also support communications with Maple's HMI + PLC and popular HMI lines, native Modbus RTU (serial), and Modbus TCP/IP (Ethernet models only). With support for major PLC manufacturers, easily add a Maple PLC to your existing control system for additional I/O.

FX-Series

Fixed I/O for Simple Control

Designed for simple control applications in which a small number of digital or analog inputs/outputs are all that are required. Most models include and RTC (real-time clock) and support for high-speed counters and PWM (pulse-width modulation) output. FX-Series models do not support expansion modules.

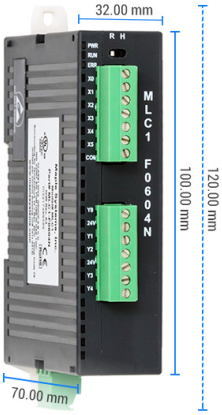
- High-Speed Counters
- Class I, Division 2
- Up to 16 Digital In / 16 Digital Out
- Up to 2 Analog In / Analog Out
- Serial Communications

EX-Series

Expandable I/O for Simple Control

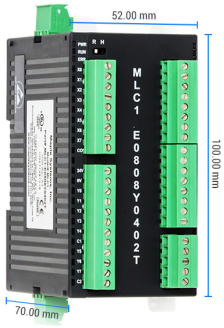
Ex-Series PLCs are expandable from 1 to 16 I/O modules. Several CPU base modules are available with built-in I/O that can be increased at any time by adding I/O expansion modules. Up to sixteen expansion modules can be mounted to the base CPU.

- Ethernet Models
- Expandable up to 16 I/O Modules
- Up to 256 Additional I/O Points
- Class I, Division 2
- Thermocouple, RTD, High-Speed Counters
- SD Card Support
- FTP Server



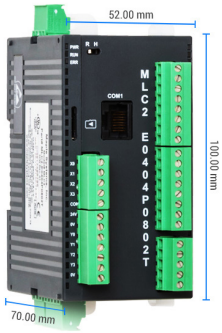
MLC1-F Fixed Overview (FX-Series)

The MLC1-F (Fixed) CPU base modules are all-in-one PLCs. Every module includes 90KB of memory that can be used for creating a tag database, allocating logic blocks, creating tasks, and configuring the built-in I/O. Over 30K steps (198 KB) are separately allocated for your logic program. They have a very small footprint (only 3.94" x 1.26" x 2.76"), are DIN-rail mounted, and use 24VDC power.
The MLC1-F modules have two serial ports: one RS232 port and one RS485 2W port to connect to an external HMI and/or a 3rd Party PLC. The USB programming port connects to any PC running MAPware 7000. Select from nine different modules each with a unique selection of I/O - both digital and analog. LED status indicators report the status of each digital input/output as well as a Power LED, RUN LED, and an Error LED that indicates a program fault. Change the operating mode (Run or Halt) using the programming software or the mini toggle switch located on the unit. The inputs/outputs have detachable screw-type terminal connectors to make wiring easy.



MLC1-E Expandable Overview (EX-Series)

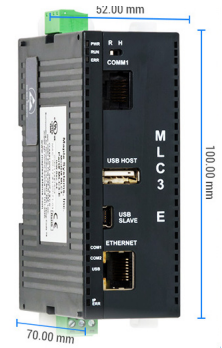
The MLC1-E (Expandable) CPU base modules share the same features as the MLC1-F modules listed above. However, they generally have more I/O built-in to the CPU base module as well as the option of adding up to 16 expansion I/O modules. Since many of our MLE expansion modules have up to 16 inputs/outputs per module, this means you could add up to an additional 256 I/O points to your system. This expandability enables you to use the MLC Series PLCs for small to medium-sized control systems. The flexibility means more I/O can be added to your system in the future - should there be a need. These modules are slightly wider (2.05" vs 1.26"), and still provide a compact fit in your control panel. Select from six different modules each with a unique selection of I/O - both digital and analog.



MLC2 Overview (EX-Series)

The MLC2 module is very similar in function to the MLC1-E modules, but also includes an Ethernet port - for faster communications with an external HMI or PLC. Each module has 4 digital inputs, 4 digital outputs, 8 analog inputs and 2 analog outputs as part of the CPU base module. Notice that this module has twice as many analog inputs than any of the other modules. As with the MLC1-E modules, up to 16 of the MLE I/O expansion modules can be added to the MLC2. Another important feature to run smoothly is the additional memory (192KB for applications, 300 KB for ladder logic) which allows for more complex programs.

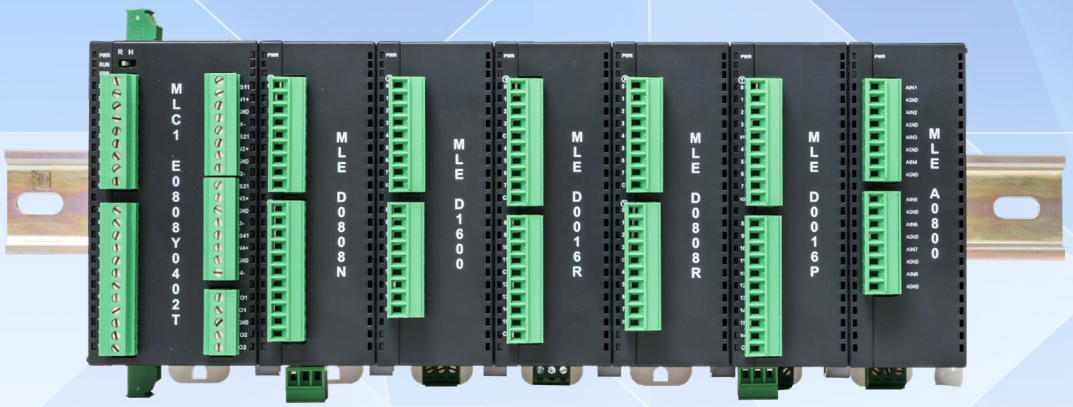
Finally, the MLC2 supports an external SD card - which can then be used to log data from the PLC.



MLC3 Overview (EX-Series)

The MLC3 module is the only MLC Series PLC in our lineup that does not have any I/O built-in to the CPU base module. This unit offers 30MB of memory for ladder logic, and an additional 22MB of memory for internal data logging and web screens for remote access. This module also supports up to 16 I/O expansion modules and the USB Host port allows you to transfer programs and logged data from the PLC to a computer for review and analysis.

PLC SERIES

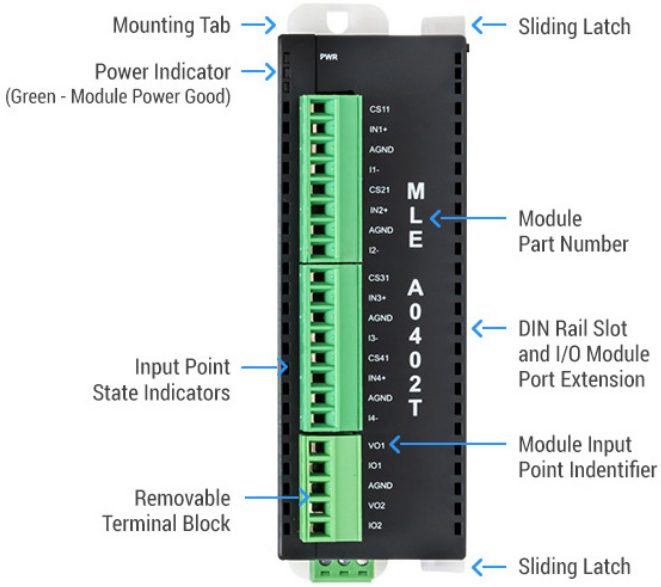


Model Number	System		Comm Ports				Expandable I/O Modules	Built In I/O				Certifications
	CPU	Total Memory	Ethernet Port	USB 2.0	SD Card	Serial Port		Digital In	Digital Out	Analog In	Analog Out	
MLC1-F0604N	32-bit RISC, 120 MHz	292 kB	N/A	1 Client	N/A	1	N/A	6	5 NPN			CE, cULus, Class I, Div 2
MLC1-F0604P	32-bit RISC, 120 MHz	292 kB	N/A	1 Client	N/A	1	N/A	6	5 PNP			CE, cULus, Class I, Div 2
MLC1-F0808N	32-bit RISC, 120 MHz	292 kB	N/A	1 Client	N/A	2	N/A	8	8 NPN			CE, cULus, Class I, Div 2
MLC1-F0808P	32-bit RISC, 120 MHz	292 kB	N/A	1 Client	N/A	2	N/A	8	8 PNP			CE, cULus, Class I, Div 2
MLC1-F0808Y	32-bit RISC, 120 MHz	292 kB	N/A	1 Client	N/A	2	N/A	8	8 (2 PNP, 6 Relay)			CE, cULus, Class I, Div 2
MLC1-F0808N0201	32-bit RISC, 120 MHz	292 kB	N/A	1 Client	N/A	2	N/A	8	8 NPN	2 Voltage/ Current	1 Current	CE, cULus, Class I, Div 2
MLC1-F0808P0201	32-bit RISC, 120 MHz	292 kB	N/A	1 Client	N/A	2	N/A	8	8 PNP	2 Voltage/ Current	1 Current	CE, cULus, Class I, Div 2
MLC1-F0808Y0201	32-bit RISC, 120 MHz	292 kB	N/A	1 Client	N/A	2	N/A	8	8 (2 PNP, 6 Relay)	2 Voltage/ Current	1 Current	CE, cULus, Class I, Div 2
MLC1-F1616P0201	32-bit RISC, 120 MHz	270 kB	N/A	1 Client	N/A	2	N/A	16	16 PNP	2 Voltage/ Current	1 Voltage/ Current	CE, cULus, Class I, Div 2
MLC1-E1616P	32-bit RISC, 120 MHz	270 kB	N/A	1 Client	N/A	2	Up to 16	16	16 PNP			CE, cULus, Class I, Div 2
MLC1-E1616Y	32-bit RISC, 120 MHz	270 kB	N/A	1 Client	N/A	2	Up to 16	16	16 (14 Relay, 2 PNP)			CE, cULus, Class I, Div 2
MLC1-E0808Y0402T	32-bit RISC, 120 MHz	270 kB	N/A	1 Client	N/A	2	Up to 16	8	8 (6 Relay, 2 PNP)	4 Voltage/ Current/ RTD/ Thermo	2 Voltage/ Current	CE, cULus, Class I, Div 2
MLC1-E1616N0201	32-bit RISC, 120 MHz	270 kB	N/A	1 Client	N/A	2	Up to 16	16	16 NPN	2 Voltage/ Current	1 Voltage/ Current	CE, cULus, Class I, Div 2
MLC1-E1616P0201	32-bit RISC, 120 MHz	270 kB	N/A	1 Client	N/A	2	Up to 16	16	16 PNP	2 Voltage/ Current	1 Voltage/ Current	CE, cULus, Class I, Div 2
MLC1-E1616Y0201	32-bit RISC, 120 MHz	270 kB	N/A	1 Client	N/A	2	Up to 16	16	16 (14 Relay, 2 PNP)	2 Voltage/ Current	1 Voltage/ Current	CE, cULus, Class I, Div 2
MLC2-E0404P0802T	32-bit RISC, 120 MHz	440 kB	1	1 Client	Yes	2	Up to 16	4	4 PNP	8 (4 Voltage/ Current/ RTD/Thermo 4 Current)	2 Voltage/ Current	CE, cULus, Class I, Div 2
MLC3-E	32-bit RISC, 400 MHz	52 MB	1	2 (1 Client, 1 Host)	N/A	2	Up to 16	N/A	N/A	N/A	N/A	CE, cULus, Class I, Div 2

MLE ANALOG & DIGITAL MODULES

EX-Series Expansion I/O Modules

Compatible with all EX-Series PLCs, Maple Systems offers twelve MLE I/O expansion modules (nine digital and three analog). Customize your PLC to maximize functionality while minimizing unnecessary costs. Up to 16 expansion modules can be connected to an EX-Series PLC for a maximum of 256 additional I/O points.

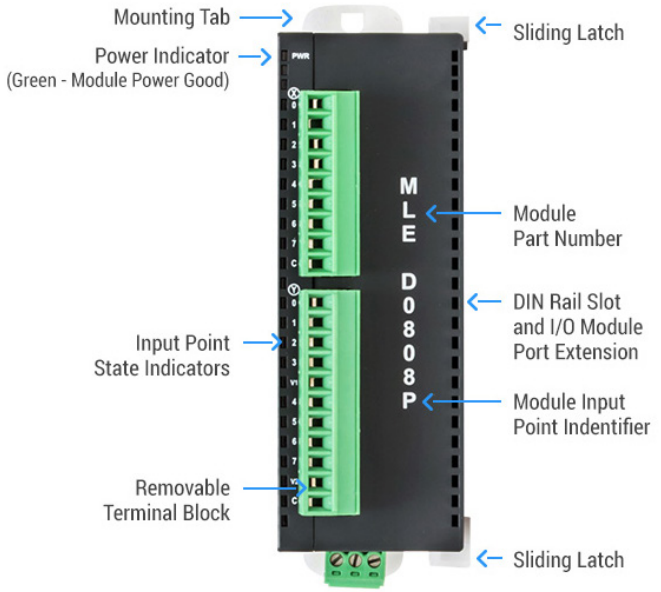


MLE Analog Modules

The analog I/O modules support as many as eight analog inputs, four analog outputs, or a combination of analog I/O.

These modules support:

- 0-10 V or 4-20 mA inputs or outputs
- 0-10 V, 0-5 V, 0-100 mV, or 0-50 mV inputs
- 4-20ma or 0-20mA outputs
- Support for RTD PT100 (Alpha 1 & Alpha 2) temperature inputs
- Support for Thermocouple (Types B, R, S, E, J, K,N, and T) temperature inputs In 16-bit resolution



MLE Digital Modules

The digital I/O modules support as many as sixteen inputs or outputs per module, or a combination of eight inputs/outputs.

These modules support:

- Bidirectional (sink or source) inputs
- PNP (source), NPN (sink), or relay outputs
- High speed counter input option
- Pulse Width Modulation output option

EXPANDABLE DIGITAL MODULES

CLASS I, DIVISION 2

Digital Plug-In I/O Modules

The MLE I/O expansion modules greatly extend the capabilities of the MLC1-E, MLC2, and MLC3 CPU base models. We offer twelve options (nine digital and three analog) to ensure that you can customize your PLC to maximize functionality while minimizing unnecessary costs.

Our digital expansion modules allow your Maple PLC to meet the needs of your application. The wide variety of options listed in the chart below should help you reduce excess or unused I/O, thus minimizing unnecessary expense.

	MLE-D1600	MLE-D0016N	MLE-D0016P	MLE-D0016R	MLE-D0808N	MLE-D0808P	MLE-D0808R	MLE-D0808NH	MLE-D0808PH
Certifications	UL, CE, Class I Div. 2, RoHS	UL, CE, Class I Div. 2, RoHS	UL, CE, Class I Div. 2, RoHS	UL, CE, Class I Div. 2, RoHS	UL, CE, Class I Div. 2, RoHS	UL, CE, Class I Div. 2, RoHS	UL, CE, Class I Div. 2, RoHS	UL, CE, Class I Div. 2, RoHS	UL, CE, Class I Div. 2, RoHS
Digital Inputs									
Digital Inputs	16	N/A	N/A	N/A	8	8	8	8	8
Bidiretional	Yes	N/A	N/A	N/A	Yes	Yes	Yes	Yes	Yes
Optically Isolated	Yes	N/A	N/A	N/A	Yes	Yes	Yes	Yes	Yes
Input Impedance	5.4kΩ	N/A	N/A	N/A	5.4kΩ	5.4kΩ	5.4kΩ	4.7kΩ	4.7kΩ
Turn On/Off Time	10	N/A	N/A	N/A	10	10	10	10	10
On Voltage Min.	9.6 VDC	N/A	N/A	N/A	9.6 VDC	9.6 VDC	9.6 VDC	15 VDC	15 VDC
Off Voltage Max.	3.6 VDC	N/A	N/A	N/A	3.6 VDC	3.6 VDC	3.6 VDC	5 VDC	5 VDC
High Speed Counter Inputs*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4	4
Quadrature Encoder Inputs**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	2
High Speed Input Max Frequency	N/A	N/A	N/A	N/A	N/A	N/A	N/A	25 kHz (20 kHz Quad)	25 kHz (20 kHz Quad)
Digital Outputs									
Digital Outputs	N/A	16	16	16	8	8	8	8	8
Sinking (NPN) Outputs	N/A	16	N/A	N/A	8	N/A	N/A	8	N/A
Sourcing (PNP) Outputs	N/A	N/A	16	N/A	N/A	8	N/A	N/A	8
Current Capacity per Output Channel (NPN/ PNP Outputs)	N/A	500 mA	500 mA	N/A	500 mA	500 mA	N/A	500 mA	500 mA
High-Speed Outputs**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	2
Max Frequency for High Speed Outputs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10 kHz	10 kHz
High Speed Output (PWM) Functions	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Normal, CW-CCW, Fixed-Pulse, Pulse-DIR	Normal, CW-CCW, Fixed-Pulse, Pulse-DIR
Current Capacity for High Speed Outputs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	300 mA	250 mA
Relay Outputs	N/A	N/A	N/A	16 (Form A)	N/A	N/A	8 (Form A)	N/A	N/A
Relay Voltage Rating	N/A	N/A	N/A	230 VAC/ 30 VDC	N/A	N/A	230 VAC/ 30 VDC	N/A	N/A
Relay Current Rating	N/A	N/A	N/A	2 A	N/A	N/A	2 A	N/A	N/A
Number of Common Pins	N/A	4 (4 outputs/ common)	4 (4 outputs/ common)	4 (4 outputs/ common)	N/A	N/A	4 (4 outputs/ common)	N/A	N/A

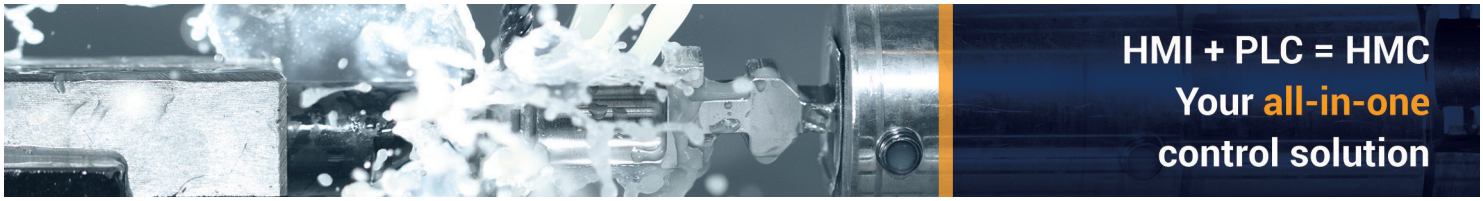
EXPANDABLE ANALOG MODULES

Analog Plug-In I/O Modules

The analog expansion modules allow your Maple PLC to meet the needs of your application. The wide variety of options listed below should help you reduce excess or unused I/O, thus minimizing unnecessary expense.

Our analog I/O options support several voltage and current modes as well as RTD (resistance temperature detection) and thermocouple sensors to measure temperature. With both input and output options available, these analog I/O modules make controlling your machine easier.

	MLE-A0800	MLE-A0004	MLE-A0402
Certifications	UL; CE; Class I, Division 2; RoHS	UL; CE; Class I, Division 2; RoHS	UL; CE; Class I, Division 2; RoHS
Analog Inputs			
Analog Inputs	8	N/A	4
Input Resolution (Bit)	16	N/A	16
Accuracy at 25°C (% at Full Scale)	0.2	N/A	0.2
Nonlinearity	0.04% max.	N/A	0.04% max.
Voltage Input Ranges	0 to 10V	N/A	0 to 10V, 1 to 5V, 0 to 100mV, 0 to 50 mV
Impedance (Voltage Mode)	470 kΩ	N/A	1 MΩ
Current Input Ranges	4 to 20 mA	N/A	4 to 20 mA, 0 to 20 mA
Impedance (Current Mode)	100 Ω	N/A	30 Ω
Temperature Input Ranges	N/A	N/A	RTD: PT100 α1 = -200 to 850°C RTD: PT100 α2 = -200 to 457°C TC: B type = -210 to 1200°C TC: R type = -50 to 1769°C TC: S type = -50 to 1769°C TC: E type = -200 to 1000°C TC: J type = -210 to 1200°C TC: K type = -200 to 1373°C TC: N type = -200 to 1300°C TC: T type = -200 to 400°C
Temperature Mode Overall Accuracy (-25° to 55°C, % of Full Scale)	N/A	N/A	0.5%
Analog Outputs			
Analog Outputs	N/A	4	2
Output Resolution (Bit)	N/A	16	16
Accuracy (at 25°C, % of Full Scale)	N/A	0.2	0.2
Linearity	N/A	0.04% max.	0.04% max.
Voltage Output Range	N/A	0 to 10V	0 to 10V
Minimum Output Load (Voltage Mode)	N/A	1 kΩ	1 kΩ
Current Output Range	N/A	4 to 20 mA	4 to 20 mA
Maximum Output Load (Current Mode)	N/A	500 Ω	500 Ω



HMI + PLC & PLC CONFIGURATION SOFTWARE

Screen Types

In MAPware-7000, you can configure or define a screen to be one of the following:

Base Screen
Create as many base screens as you require. Use buttons or tasks to change from one screen to another. A base screen fills the entire area of the display.

Pop-up Screen
A pop-up screen is displayed on top of a base screen and can be used to display additional information related to the base screen. A pop-up screen must be smaller than the underlying base screen.

Template Screen
A template screen also fills the entire area of the display but is not called directly by a button or function key on the HMI + PLC. A template screen is displayed by attaching it to a base screen. When displayed, all objects on the template screen are under-layed below the base screen.

Keypad Screen
A keypad screen is a specialized pop-up screen used to enter numbers or ASCII characters in a data entry display. There are four pre-defined pop-up keypad screens: numeric keypad, hex keypad, bit keypad, and ASCII keypad. These can be edited and custom keypads can be created.

Web Screen
Web screens are viewed by connecting to the HMI + PLC's built-in web server with an Internet browser. The HMI + PLC's web screens display in the browser as if it were a website, providing remote access to the unit for viewing system status information.

Meters

Analog meters display data on a circular scale. Use the meter's color range to demonstrate safe to cautionary levels of operation. Display data such as temperature, voltage, current, and speed in familiar easy-to-read formats. Other features include:

- 0 to 360 degrees of start-stop range
- Enable/disable the display range around the perimeter of the meter
- Supports signed and unsigned integers, BCD, hexadecimal, and floating point

Bar Graphs

Bar graphs are used to display data on a vertical or horizontal scale, with up to four bar graphs on a single scale. Other features include:

- Customizable colors
- Display divisions and range
- Supports signed and unsigned integers, BCD, hexadecimal, and floating point

An HMC combines an HMI (display) and a programmable logic controller (PLC) into one functional unit

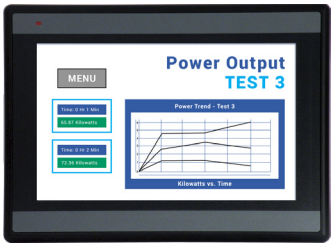
HMI + PLC & PLC CONFIGURATION SOFTWARE

Real Time XY Plots

Display a graphical representation of an X value tag against a Y value tag in real time. Two XY Plot options are available: Single vs Multi-point. A Single-point XY plot displays a single point that moves as the values in the registers change. The Multi-point XY plot displays multiple points. When a new data point is read, the older data points are kept on the graph as the new point is plotted. Multi-point is only available when using IEC61131-3. Other features include:

- Customizable colors, labels, and grid lines
- Display up to three reference lines to delineate the acceptable range of values (single-point only)
- Display multiple points with or without an interconnecting line (multi-point only)
- Supports signed and unsigned integers, BCD, hexadecimal, and floating point

Web Screens



Ethernet HMI + PLC models have a built-in web server, accessible from any Internet web browser, allowing remote access to HMC data from a remote computer on the Ethernet network or, if exposed to the Internet, from anywhere in the world. A username and password are required, ensuring security. The screen is displayed in the web browser as if it were a website. Web screens allow the remote user to both view and modify data in the HMC. Up to 10 simultaneous connections are allowed. The objects used on web screens are restricted to text based data display/input objects, static images and navigation buttons. The following objects are available for use on web screens:

- Bit Display
- Numeric Display
- Bit Entry
- Set Bit
- Reset Bit
- Momentary Bit
- Toggle Bit
- Write or Add Value to Tag
- Subtract Value from Tag
- Add Tag B to Tag A
- Subtract Tag B from Tag A
- Numeric Entry
- Multilingual Text
- Picture Object
- Screen Navigation Buttons

Data Logging

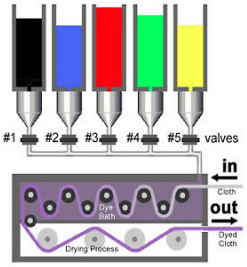
Record values of tags over time. Data is collected and stored in the HMI + PLC's non-volatile memory or attached SD card and can be displayed on the HMI + PLC screen using the Historical Trend or Real Time Trend objects. The Data Logging feature is most often used for data acquisition where the HMI + PLC gathers and saves important process information for analysis.

Additional Data Logging features/facts include:

- Data logging is configured in groups
- Up to four groups can be created, and each group can have a maximum of 30 registers
- Up to 20MB of internal memory or 32GB of external SD card memory can be configured for data logging
- Data logging can start immediately on power up or the start times can be pre-configured in the Data Logger Start Time/Stop Time fields
- Data logging start and stop times can be controlled by a push-button or a system bit
- Data logged to the external SD card can be sent to an external FTP server at a user specified periodic interval

HMI + PLC & PLC CONFIGURATION SOFTWARE

Using Recipes



Register values can be stored, modified by the operator, and the selected batch moved from the Recipe memory into the PLC/HMI memory. Multiple Recipes can be created to achieve desired application requirements. A Recipe is an arrangement of internal registers in the HMI + PLC's non-volatile memory.

Recipes are selected and modified using touchscreen controls and/or user-defined function keys. The operator can use the pre-defined values or alter them to adjust the color. When a color recipe is executed, ladder logic sends control commands to each of the HMI + PLC outputs that control the color valves for the dye bath.

Real-Time Alarms

Real-time alarms are programmed to trigger when certain events in your process occur. Alarms display in real-time to show the current status of a process. When real-time alarms are triggered, they remain on the display window until they are acknowledged. The alarm condition then returns to its normal state. Display real-time alarms with different text colors to delineate the state of the alarm (active unacknowledged, active acknowledged, or inactive unacknowledged), severity, date and time, etc.

Historical Alarms

Historical alarms are a sequential history of your application's alarm activity. Stored in non-volatile memory, they remain even when the machine is turned off. Historical alarms can be displayed with the severity level, date and time the alarm occurred, when it was acknowledged, and when it returned to normal. A historical alarm list can also be uploaded to the PC and saved as a CSV file using MAPware-7000.

Access Levels

The Access Level feature available on the HMC3000 series allows you to create users and passwords assigned to different access levels. These levels can then be assigned to screens and used to restrict access. When accessing a protected screen, a "Screen access denied" error will show for users that have not logged in or do not have the required level of access. Additional features:

- Auto log out feature
- Alphanumeric usernames and passwords
- Ability to change passwords during runtime
- Up to 255 Access Levels
- Predefined user login screen
- Display specific screen once a user has logged on

Protecting Project Screens

Screens can also be individually protected by creating a password in the Screen Properties dialog box. Once entered, any future operator must enter the correct screen password using an on-screen numeric pop-up keypad in order to get to that screen.

Intellectual Property – Project Password

MAPware-7000 offers the ability to password-protect the entire development project to protect your intellectual property. If a password is created in the project configuration window, the correct password must be entered to open the project file for review or editing.

CONFIGURATION SOFTWARE | LOGIC EDITING

Built-In Logic Editors

The HMC configuration software has two comprehensive logic editing modes to choose from: Native Ladder and IEC 61131-3.

IEC Programming Environment

Accelerate your development cycle with an IEC 61131-3 compliant editor suite. Select from five easy-to-use, standardized logic editors to build flexible and maintainable control applications:

- Ladder Diagram (LD) - A graphic editor in which instructions are placed and activated within a pseudo electro mechanical circuit.
- Function Block Diagram (FBD) - A graphical logic editor based upon logic diagrams.
- Structured Text (ST) - A text-based editor similar to text-based programming languages such as C/C++ or Visual Basic.
- Instruction List (IL) - A text-based editor, similar to assembly languages, using simple mnemonic instructions to express logical statements.
- Sequential Function Chart (SFC) - A graphical logic editor in which machine operation is expressed in a flow chart format.

IEC 61131-3 offers several features that make building and maintaining control applications easier. Create customized, modular, and re-usable logic with User-Defined Function Blocks.

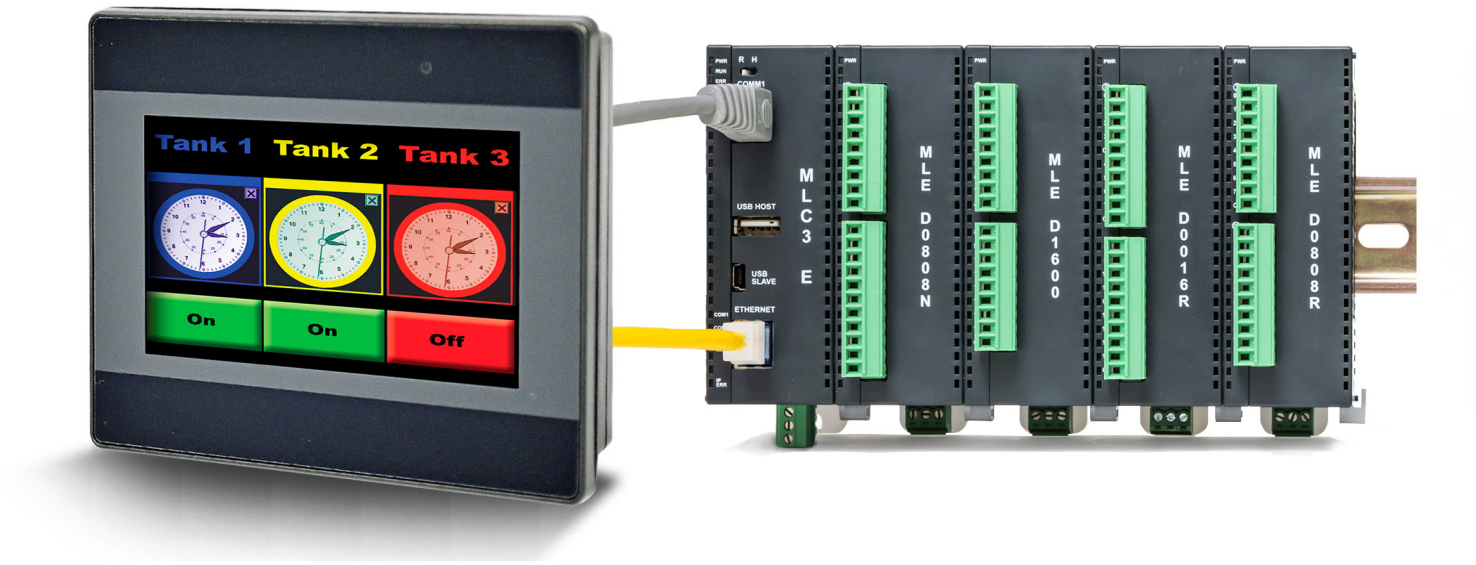
Native Ladder

Ladder Logic programming language offers more than one hundred Logic Block instructions (commands used to create complex routines) for a variety of tasks, such as:

- Inputs and Outputs
- Data Transfers
- Mathematical Operations
- Comparisons
- Logic Instructions
- Complex Functions

View the state of contacts and outputs in a logic diagram and watch the logic work as the data states change. Test how a change in one value impacts the network. View data in real time in a tabular format or track a larger block of data as it changes over time. Slow the execution of a ladder logic sequence down to a human time-scale to reveal what the HMI + PLC is doing one ladder instruction at a time.

HMI + PLC INTEGRATION



Integrating the Maple PLC Line with Maple HMI or HMI + PLC Products

If you need an HMI for local monitoring and control of your automation system, Maple Systems provides several HMIs that are compatible with our PLCs. Maple PLCs integrate seamlessly with our HMI and HMC (HMI + PLC) lines. Maple PLC and HMC product lines are both programmed with MAPware-7000, which offers a built in communications driver for the two.

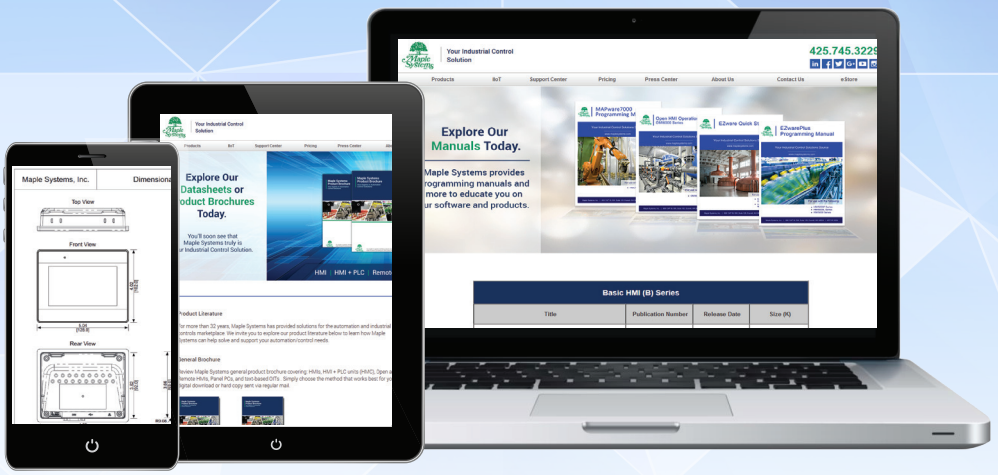
HMI and CMT

Maple Systems HMI products are programmed with EZwarePlus/EBPro, and Modbus RTU/TCP can be used for communications. For applications requiring IIoT connectivity, a cMT device can be added to the system, allowing for data distribution to the cloud with MQTT or OPC UA.
For more information about cMT devices see our website at: www.maplesystems.com/products/cmt/models

Maple PLCs can communicate with an HMC (HMI + PLC) with or without I/O modules attached to it. A potential application would have the PLC existing in a remote cabinet, while the HMC is installed in a convenient location for the operator.

With the HMC optional I/O modules, local control switches could be monitored and controlled by the HMC to reduce wiring complexity. Additionally, only one configuration software is required to program both pieces. When using the Native Ladder logic editor, a native PLC to HMC driver is available, and tags can be imported from one project to another. In IEC mode, Modbus is used to communicate between the PLC and HMI. In models that support Ethernet, a crossover Ethernet cable, our part number 7431-0104, can be used. For all other models, serial cable, our part number 7448-0215, is required.

SUPPORT



The Maple Standard

Maple Systems is honored to be recognized as a leader in the industrial controls marketplace. The Maple Standard represents our dedication to delivering high-quality control products and unmatched support to our valued customers. It is our promise to deliver quality, reliability, and value to help you achieve your business and process goals.

Comprehensive Website and Support Center

Our online Support Center allows our registered customers 24-hour access to all of our technical documentation. Explore tech notes, product specifications, sample projects, drivers, and software upgrades. We also offer complimentary technical support to customers via email and phone, as well as training videos, whitepapers, and controller information sheets.

Visit us at **maplesystems.com/support** or email us at **support@maplesystems.com** for assistance.

Contact Us

How can Maple Systems help meet your control needs?
Contact our industrial automation experts today.

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