Quick Start Guide
MLE-A0402T

Description:

MLE-A0402T I/O expansion module with 4 analog inputs and 2 analog outputs.

Contents:

1 MLE-A0402T (in plastic bag)
Removable screw type terminal blocks*
Removable power supply connector*
Quick Start Guide

*Note: Connector manufacturer may vary.

Programming software (MAPware-7000), cables, and power supply purchased separately.

Specifications:

Power:	3.75VDC from MLC PLC base 80mA maximum
Isolation:	I/O optically isolated from internal circuit
Analog Inputs:	4 inputs
Voltage modes:	0 - 10VDC, 1-5VDC, 0-100mV, 0-50mV
Current modes:	0 - 20mA, 4 - 20mA
RTD modes:	PT-100 Alpha1, PT-100 Alpha2
Thermocouple modes:	Types B, E, J, K, N, R, S, T
Resolution:	16 bit
Accuracy:	0.2% of Full Scale, 0.5% Thermocouple
Non-linearity:	0.04% max.
Input Impedance:	1MΩ (voltage, millivolts, RTD, Thermocouple mode) 30Ω (current mode)
Temperature drift:	60 ppm
Analog Outputs:	2 outputs
Voltage modes:	0 - 10VDC (min. load 1000Ω)
Current modes:	4 - 20mA (max. load 500Ω)
Resolution:	16 bit
Accuracy:	0.2% of Full Scale
Non-linearity:	0.04% max.

External DC Power Supply Required:

Input Voltage:	24VDC +/-15%
Current Rating:	Max. 150mA (all outputs ON)

Mounting Module to MLC CPU Base or Expansion:
The MLE I/O modules are connected in series to a MLC1-E, MLC2-E, or MLC3-E CPU base- up to a maximum of sixteen MLE I/O modules. Each IO module is designated a slot number (nn = 1-16) based upon its location in relation to the MLC CPU base (i.e. the IO module connected directly to the MLC base is Slot 1, the IO module to the right is Slot 2, and so on.)

Each MLE I/O module is attached to the MLC CPU base or another I/O module with a 20pin I/O interconnect plug located on the left side of each module. In turn, the MLC CPU base or I/O module has an interconnect jack located on the right side of the module (remove the protective sticker).

To attach a MLE I/O expansion module, perform the following steps:
1. Locate the two small white lock connectors above the interconnect jack on the right side of the MLC CPU base (or I/O expansion module).
2. Slide each lock connector out, along the length of the module.
3. Align the interconnect plug (on the MLE expansion module) and insert into the jack of the MLC CPU base. Carefully compress the two units until the interconnect plug is fully connected to the jack.
4. Slide each lock connector back in (towards the module) until it 'snaps' into place.

Fig 1 Fig 2 Fig 3 Fig 4

Wiring Diagram for Analog Inputs:

Mounting the PLC to a DIN rail:

Fig 1 Fig 2 Fig 3

Fig 1: Pull out the white DIN rail sliders on the back side of each module (along the length of the module).

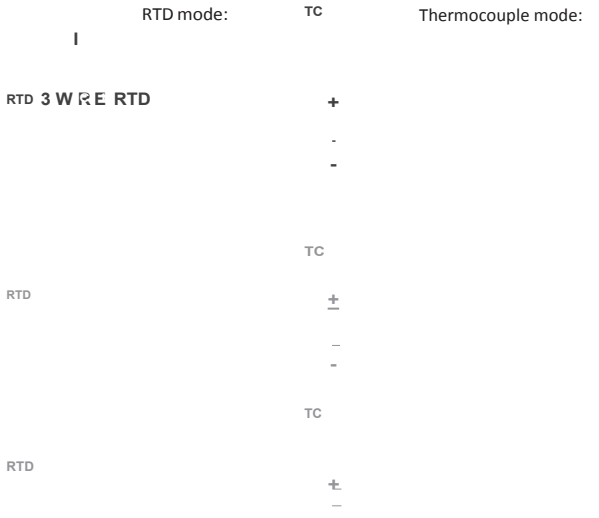
Fig 2: Place the module on the DIN rail plate.

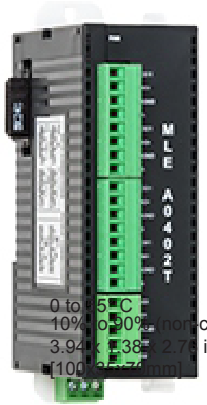
Fig 3: Push in the DIN rail sliders, so that the module is securely connected to the DIN rail plate.

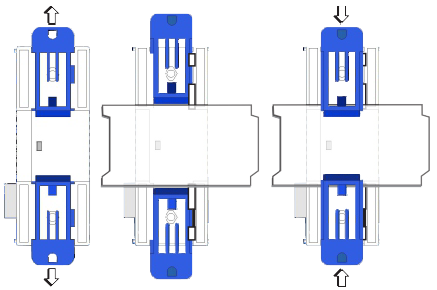
Conversion Time:

Mode	Cycle Time
Voltage	760 msec.
milliVolts	670 msec.
Current	670 msec.
RTD	910 msec.
Thermocouple	1230 msec.

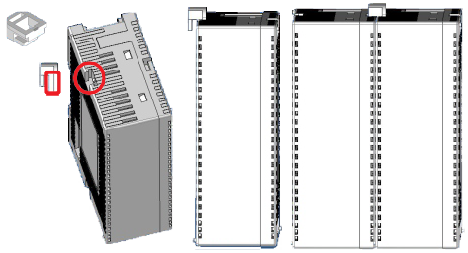
Note: this represents the amount of time required to convert all analog values to digital values when configured as above.

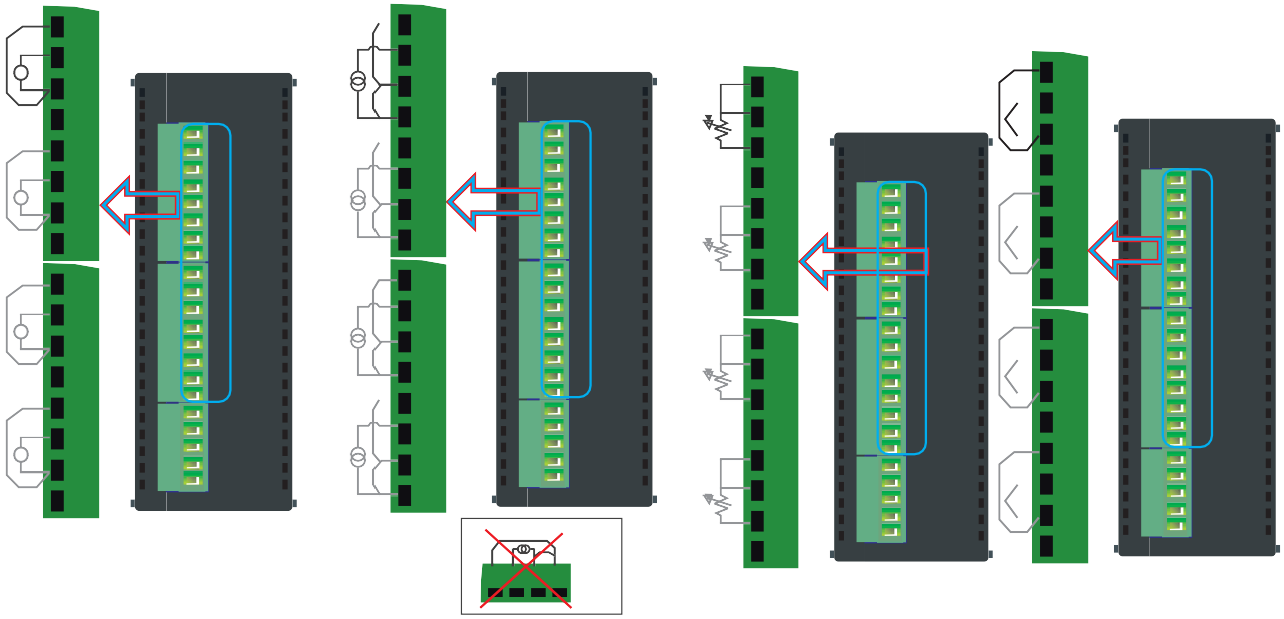






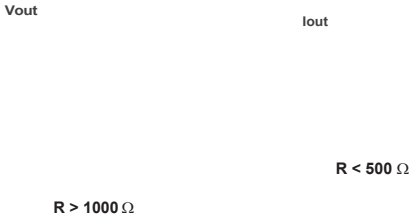
Operating Temp: 0 to 55°C
Humidity: 10% to 90% (non-condensing)
Dimensions (LxWxH): 3.94 x 1.38 x 2.76 inches
[100 x 35 x 70 mm]





Wiring Diagram for Analog Outputs:

Voltage mode: Current mode:



Configuration:

Use MAPware-7000 to configure the expansion port, in which the module is installed, using the module's model number.

The input (X and XW), outputs (Y and YW), and configuration (M and MW) memory addresses are used to interact with the module. These addresses are created according to the slot location of the module, where **nn** refers to the slot number (ex. 01...16):

Function	Register	Access
Input Channels 1-4	XWnn00-03	Rd Only
Output Channels 1-2	YWnn00-01	Read/Write
Input Ch 1 Configuration	MWnn06	Read/Write
Input Ch 2 Configuration	MWnn10	Read/Write
Input Ch 3 Configuration	MWnn14	Read/Write
Input Ch 4 Configuration	MWnn18	Read/Write
Output Ch 1 Configuration	MWnn22	Read/Write
Output Ch 2 Configuration	MWnn26	Read/Write
Input/Output Conversion Enable	MWnn30	Read/Write

The Input/Output Conversion Enable is used to notify the MLC of any changes to the configuration of the I/O channels. After using a MW register to configure the operating mode, write a value of '1' to this register.

Input Channel Mode	Value
Not Defined	0
Voltage (0-100mV)	1
Voltage (0-50mV)	3
Current (0-20mA)	5
Current (4-20mA)	7
Voltage (0-10V)	19
Voltage (1-5V)	20
RTD PT100 (alpha1)	9
RTD PT100 (alpha2)	10

Input Channel Mode	Value
Thermocouple- Type B	11
Thermocouple- Type R	12
Thermocouple- Type S	13
Thermocouple- Type E	14
Thermocouple- Type J	15
Thermocouple- Type K	16
Thermocouple- Type N	17
Thermocouple- Type T	18

Note: Reference these tables, when configuring each Configuration Register (MWnn06-MWnn26).

Output Channel Mode	Value
Not Defined	0
Current (4-20mA)	1
Voltage (0-10VDC)	2

To configure the expansion module in your MAPware-7000 project:
1. Start a new project.
2. In the Select Product dialog box, select your MLC base CPU model.
3. In the Project Information Window, expand the IO Allocation folder, then click on the Expansion folder to display the current IO Slot configuration table. Double-click one of the slots to display the IO Allocation window:

Select the MLE model.
1. Check the "Add tags for XW, YW, and MW used for expansion modules" option. The tags for the selected IO module are added to the Tags database when you press the OK button.
2. Some MLE modules (ex. MLE-0808NH) have additional settings (i.e. HSC or PWM) that can be configured by pressing the Configure button.
   Note: if the selected MLE module has no additional options, the Configure button will not be present.
3. Check the "Download Configuration Settings" option. Any changes that were made using the Configure button will be sent to the MLC the next time you download your project.

In the Project Information Window, click on the Tags folder to view the assigned tags for the selected MLE module, according to slot number:

Additional Resources:

Detailed instructions on the operation and installation of the MLC Series are available in the MLC Series PLC Programming Manual (P/N 1010-1054) and the I/O Module Guide for the PLC Series (P/N 1010-1055) that is included with the MAPware-7000 configuration software.

MAPware-7000 also includes help files that provide detailed information on using the configuration software.

This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D or non-hazardous locations only.

WARNING – EXPLOSION HAZARD – Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.

WARNING – EXPLOSION HAZARD - Substitution of components may impair suitability for Class I, Division 2.

It is recommended that the user periodically inspect the sealed devices used, check for any degradation of properties, and replace as necessary.

For Technical Support:

Please contact Maple Systems if you have any questions regarding this product. We ask that you provide us with the unit serial number and firmware revision number written on the product label of the unit.

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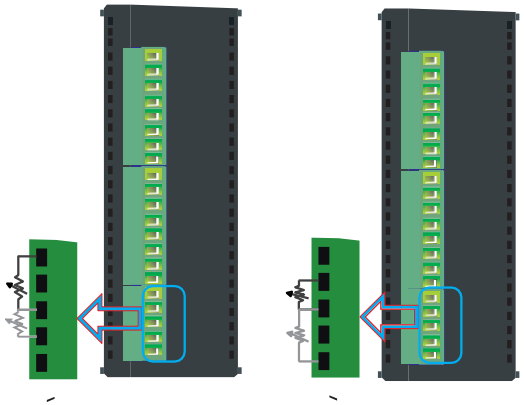
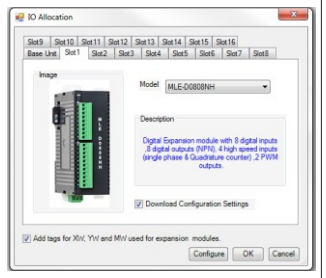
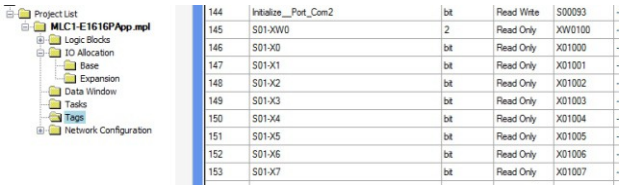
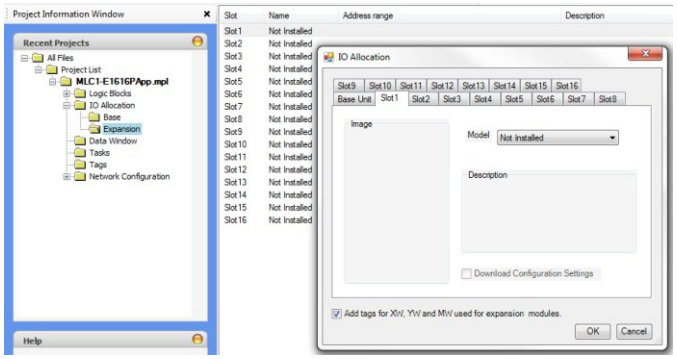



IO Allocation
Slot9 Slot10 Slot11 Slot12 Slot13 Slot14 Slot15 Slot16
Base Unit Slot1 Slot2 Slot3 Slot4 Slot5 Slot6 Slot7 Slot8
Image
Model MLE-D0808NH
Description
Digital Expansion module with 8 digital inputs ,8 digital outputs (NPN), 4 high speed inputs (single phase & Quadrature counter) ,2 PWM outputs.
Download Configuration Settings
Add tags for XnY, YnY and MnY used for expansion modules.
Configure OK Cancel


Project List
MLC1-E1616PApp.mpl
Logic Blocks
IO Allocation
Base
Expansion
Data Window
Tasks
Tags
Network Configuration
144 Initialize__Port_Com2 bit Read Write S00093
145 S01-XW0 2 Read Only XW0100
146 S01-X0 bit Read Only X01000
147 S01-X1 bit Read Only X01001
148 S01-X2 bit Read Only X01002
149 S01-X3 bit Read Only X01003
150 S01-X4 bit Read Only X01004
151 S01-X5 bit Read Only X01005
152 S01-X6 bit Read Only X01006
153 S01-X7 bit Read Only X01007


Project Information Window
Recent Projects
All Files
Project List
MLC1-E1616PApp.mpl
Logic Blocks
IO Allocation
Base
Expansion
Data Window
Tasks
Tags
Network Configuration
Help
Slot Name Address range Description
Slot1 Not Installed
Slot2 Not Installed
Slot3 Not Installed
Slot4 Not Installed
Slot5 Not Installed
Slot6 Not Installed
Slot7 Not Installed
Slot8 Not Installed
Slot9 Not Installed
Slot10 Not Installed
Slot11 Not Installed
Slot12 Not Installed
Slot13 Not Installed
Slot14 Not Installed
Slot15 Not Installed
Slot16 Not Installed
IO Allocation
Slot9 Slot10 Slot11 Slot12 Slot13 Slot14 Slot15 Slot16
Base Unit Slot1 Slot2 Slot3 Slot4 Slot5 Slot6 Slot7 Slot8
Image
Model Not Installed
Description
Download Configuration Settings
Add tags for XnY, YnY and MnY used for expansion modules.
OK Cancel