Quick Start Guide HMC3-M1614Y



Description: HMC3-M1614Y I/O expansion module with 16 digital bidirectional inputs and 12 relay outputs, 2 sourcing (PNP-type) outputs.

Contents:

1 HMC3-M1614Y (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: 12VDC from HMC3000 base

Isolation: I/O optically isolated from internal circuit

Digital Inputs: 16 bidirectional inputs

24VDC up to 5mA (per contact) Rated Input Voltage:

ЗКΩ Input Impedance: Minimum ON voltage: 15 VDC Maximum OFF voltage: 5 VDC Turn ON/OFF time: 10 m

Special Input Functions:

2 inputs, X0 and X2 High Speed Channels:

200KHz Maximum Input Freq:

Maximum Input Count: 4,294,967,295 (32-bit)

Digital Outputs: 12 relays, 2 sourcing outputs (PNP-type)

Output Current: 300mA maximum (per contact)

Rated Load: 300mA@24VDC (PNP)

230VAC/2A, 30VDC/2A (relay) 96Ω / 6W (Resistive) @ 24VDC

6VA (Inductive, Unity Power Factor)

Special Output Functions:

High Speed Channels: 2 outputs, Y0 and Y1

Maximum Output Freg: 1KHz PWM duty cycle: 0 to 100%

Input Power Supply:

Nominal Load:

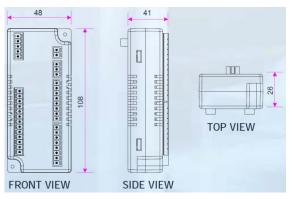
24VDC +/- 15% Removable terminals (3.81 mm pitch) Input Voltage: Connection Method:

Operating Temp:

Humidity: 10% to 90% (non-condensing)

Dimensions (WxHxD): 1.89 x 4.25 x 1.61 inches [48x108x41mm]

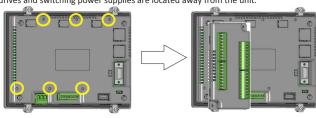
Dimensional Details:



Mounting Module to HMC3000:

The HMC3 I/O module must be mounted onto the back of a HMC3000 Series unit using one of the HMC expansion ports.

When locating equipment behind the HMC3000 ensure that AC power wiring, PLC output modules, contactors, starters, relay and any other source of electrical interference are located away from the HMC3000. Make sure that variable speed drives and switching power supplies are located away from the unit.



Step 1: Remove protective tab on HMC3000 expansion port to expose socket. Step 2: Align I/O module screws with screw holes, then carefully press down to establish contact between I/O interconnect plug on I/O module and the socket. Step 3: Tighten the two screws of the I/O module to the base (approx. 0.1Nm torque).

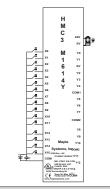
Wiring I/O Expansion Modules:

The HMC3 I/O module has green block terminals that are used to wire the module

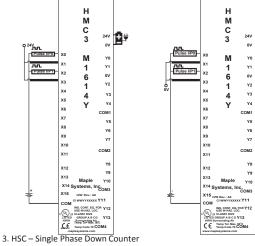
to the digital input devices (i.e. switches, contacts, etc.). The block terminals can be physically removed from the module to facilitate connection (18-gauge wire recommended) Note: A 3/32" flat blade screwdriver should be used to tighten the screws of the terminal block.

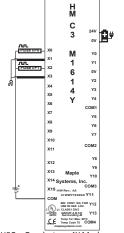
Connecting to bidirectional inputs:

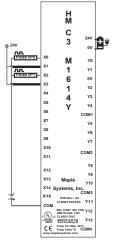
1. Normal



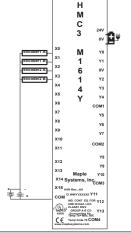
2. HSC- Single Phase Up Counter



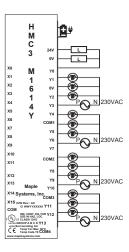




4. HSC - Quadrature 4X Mode



5. Digital outputs:



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...05):

Function	Register	Access
X0-X15 Inputs	Xnn000-015 (XWnn00)	Rd Only
Slot nn- CH1 Rate	XWnn01	Rd Only
Register		
Slot nn- CH2 Rate	XWnn03	Rd Only
Register		
Slot nn- CH1 Pulses	XWnn05	Rd Only
Per Scan Register		
Slot nn- CH2 Pulses	XWnn07	Rd Only
Per Scan Register		
Y0-Y15 Outputs	Ynn000-015 (YWnn00)	Rd/Write

High Speed Counter Configuration:

Function	HSC Channel 1	HSC Channel 2	Access
Pulse Input Pin	X0	X2	Rd Only
Direction Pin*	X1	X3	Rd Only
Reset HW Pin	X4	X5	Rd Only
Preset Reached Pin	Y2	Y3	Rd Only
Enable Counting	Mnn080	Mnn176	Rd/Write
Reset SW Bit	Mnn081	Mnn177	Rd/Write
Preset Reached	Mnn083	Mnn179	Rd Only
Configuration Register	MWnn00	MWnn06	Rd/Write
Current Value	MWnn01	MWnn07	Rd Only
Preset Value	MWnn03	MWnn09	Rd/Write

 $^{^*\}text{-}\,\text{X1}$ and X3 are used as Encoder pins 1B and 2B respectively when using Quadrature 4X mode.

Pulse Width Modulation (PWM) Configuration:

Pulse Width Modulation	PWM Channel 1	PWM Channel 2	
Option		Channel 2	
PWM Output	Y0 (terminal)	Y1 (terminal)	Rd/Write
PWM	MWnn24	MWnn30	
	IVIWnn24	MWnn30	Rd/Write
Configuration			
Register			0.1/11/2
PWM Frequency	MWnn25	MWnn31	Rd/Write
or Minimum	MWnn26	MWnn32	
Freq. Setting			
Register			
PWM ON Duty	MWnn27	MWnn33	Rd/Write
or Maximum	MWnn28	MWnn34	
Freq. Setting			
Register			
PWM	MWnn37	MWnn38	Rd/Write
Acceleration			
Time			
PWM	MWnn39	MWnn40	Rd/Write
Deceleration			
Time			
PWM Total	MWnn41	MWnn43	Rd/Write
Pulse	MWnn42	MWnn44	
PWM Elapsed	MWnn45	MWnn47	Rd/Write
Pulse	MWnn46	MWnn48	
PWM	MWnn50	MWnn52	Rd/Write
Trapezoidal	MWnn51	MWnn53	
Minimum Pulse			
Count			
PWM ON Duty	Mnn466	Mnn471	Rd/Write
Setting Error			
Flag			
PWM Frequency	Mnn467	Mnn472	Rd/Write
Setting Error			
Flag			
PWM	Mnn468	Mnn473	Rd/Write
Acceleration			
Time Setting			
Error Flag			
PWM	Mnn469	Mnn474	Rd/Write
Deceleration			
Time Setting			
Error Flag			
PWM No of	Mnn470	Mnn475	Rd/Write
Total Pulses			,
Setting Error			
Flag			
PWM Pulse	Mnn576	Mnn577	Rd/Write
Enable Flag		""""	110, 20116
PWM End of	Mnn784	Mnn785	Rd/Write
F VVIVI EIIU OI	WITH 104	IVIIIIIVO	Ra/ write

To implement High Speed Counter Operation:

- Connect a device to X0 (Channel 1) or X5 (Channel 2) that will provide the high speed pulses to the expansion module.
- Configure for HSC mode using the configuration register MWnn00 (Channel 1) or MWnn06 (Channel 2).
- Write the HSC preset count value in MWnn03 (Channel 1) or MWnn09 (Channel 2).
- Enable the HSC by setting the HSC Enable bit Mnn080 (Channel 1) or MWnn09 (Channel 2).

- HSC increments (starting from 0) the current value register in MWnn01 (Channel 1) or MWnn07 (Channel 2) until the preset value is reached. Then HSC sets Y1 (Channel 1) or Y6 (Channel 2).
- 6. Enable the HSC Reset Bit by setting Mnn081 (Channel1) ...
- To start the process again, simply reset (clear) the HSC Reset Bit and set the HSC Enable Bit. Note: if the HSC Enable Bit is still ON, you must reset (clear) this bit, and then set it again.

Additional Resources:

Detailed instructions on the operation and installation of the HMC3000 Series are available in the HMC3000 Programming Manual 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.

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▲ 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.

▲ WARNING - CAUTION, battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

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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