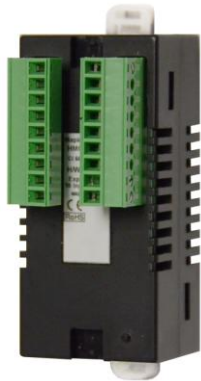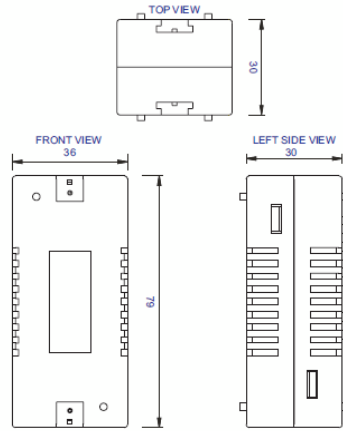# Quick Start Guide
HMC7-MI-1

Description:
HMC7-MI-1 I/O expansion module with 14 digital bidirectional inputs and 2 high-speed inputs.

Contents:
- 1 HMC7-MI-1 (in plastic bag)
- Quick Start Guide

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

Specifications:

Power:	3.9VDC from HMC7000 base
Digital Inputs:	14 bidirectional inputs (2 high speed – 50KHz) 8 points per common

Rated Input Current:	up to 5mA
Input Impedance:	4.9KΩ
Minimum ON voltage:	15 VDC
Maximum OFF voltage:	5 VDC
Turn ON/OFF time:	10 msec
Isolation:	Optically isolated from internal circuit

Special Input Functions:

High Speed Channels:	2 inputs, X0 and X5
Maximum Input Frequency:	25KHz
Maximum Input Count:	4,294,967,295

Connection Method:	Removable terminals (3.81 mm pitch)
Operating Temp:	0 to 55° C
Humidity:	10% to 90% (non-condensing)
Dimensions:	3.11 x 1.18 x 1.42 inches [79x30x36mm]

Dimensional Details:

Mounting Module to HMC7000:
The HMC7 I/O module must be mounted onto the back of a HMC7000 Series unit using one of the HMC expansion ports. When locating equipment behind the HMC7000 ensure that AC power wiring, PLC output modules, contactors, starters, relay and any other source of electrical interference are located away from the HMC7000. Make sure that variable speed drives and switching power supplies are located away from the unit.

Step 1   Step 2   Step 3
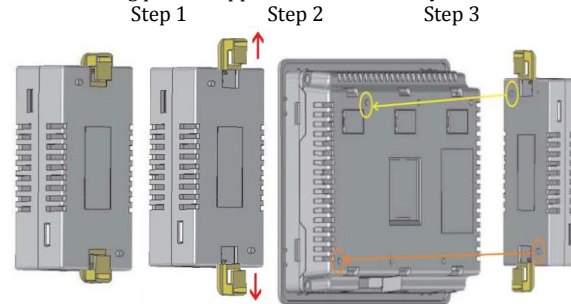
Step 1: Pull the two white lock connectors out from the center of the module.

Step 2: Place the module onto the HMC7000 expansion port so that the I/O module interconnect plug can attach to the HMC7000 socket. *Note: remove the protective tab on the HMC7000 expansion port to expose the socket.*

Step 3: Push down the lock connectors to safely secure the I/O Expansion module.

Wiring I/O Expansion Modules:
The HMC7 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.*
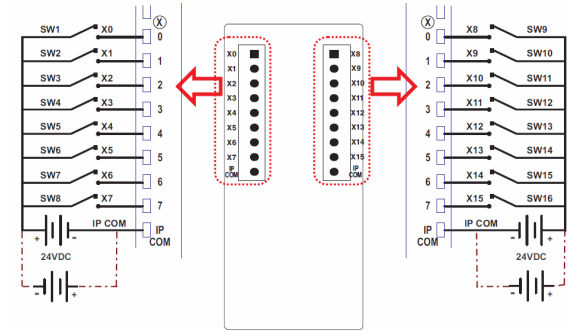
Closing SWx will turn on respective inputs

Configuration:
Use MAPware-7000 to assign input (X and XW) and configuration (M and MW) memory addresses to the module. These addresses are created according to the slot location of the module, where **nn** refers to the slot number:

Register	Description	Access
Xnn000-Xnn015	Input Bits	Read Only
XWnn00	Input Channel 1 Data	Read Only
Mnn080	High Speed Counter (HSC) Channel 1 Enable Bit	Read/Write
Mnn081	HSC Channel 1 Reset Bit	Read/Write
Mnn176	HSC Channel 2 Enable Bit	Read/Write
Mnn177	HSC Channel 2 Reset Bit	Read/Write
MWnn00	HSC Channel 1 Configuration Register	Read/Write
MWnn01	HSC Channel 1 Current Value (4 bytes)	Read/Write
MWnn03	HSC Channel 1 Preset Value (4 bytes)	Read/Write
MWnn06	HSC Channel 2 Configuration Register	Read/Write
MWnn07	HSC Channel 2 Current Value (4 bytes)	Read/Write
MWnn09	HSC Channel 2 Preset Value (4 bytes)	Read/Write

Reference the table below when configuring each HSC Configuration Register (MWnn00 and MWnn06):

Bits	Function
15-8	Not used
7,6	Operation Mode: 00 : 1x mode 01 : 2x mode 10 : 4x mode 11 : Reserved
5, 4	Reserved
3	0 : Falling Edge 1 : Rising Edge
2, 1, 0	HSC type : 000 : Normal Operation 001 : Interrupt Ladder 010 : Up Counter HSC 011 : Quadrature Count 100 : HSC with Rate

To implement High Speed Counter Operation:
1. Connect a device to X1 (Channel 1) or X6 (Channel 2) that will provide the high speed pulses to the expansion module.
2. Configure the HSC using the configuration register MWnn00 (Channel 1) or MWnn06 (Channel 2).
3. Write the HSC preset count value in MWnn03 (Channel 1) or MWnn09 (Channel 2).
4. Enable the HSC by setting the HSC Enable Bit Mnn080 (Channel 1) or Mnn176 (Channel 2).
5. 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 (Channel 1) or Mnn177 (Channel 2). This will cause the HSC current value to reset back to 0 and the output Y1 (Channel 1) or output Y6 (Channel 2) will reset (clear) to 0.
7. 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.

PC Requirements for MAPware-7000:
Processor: 1 GHz Pentium-based processor or equivalent
Operating System: Microsoft Windows XP Professional, 2000, Vista or Windows 7
RAM: 1 GB
Hard Disk: 800 MB (including 200MB for the .NET Framework Redistributable)
Display: 1024x768 high color 16-bit
Mouse/Keyboard: Required
USB port: for project downloads

Installing the Software:
1. Insert MAPware-7000 CD into CD-ROM drive and follow instructions.
2. If software installation does not automatically start, click \SETUP.EXE from CD directory.

Additional Resources:
Detailed instructions on the operation and installation of the HMC7000 Series are available in the HMC7000 Programming Manual that is included with the MAPware-7000 configuration software. MAPware-7000 also includes help files which provide detailed information on using the configuration software.

Other Sources (visit Maple Systems Support Center website):
- Controller Information Sheets - specific information on connecting a particular manufacturer's PLC to the HMC7000
- Cable Drawings- wiring diagrams to particular PLCs
- Technical Notes- Provides additional information and examples not covered in the operations manual
- Software Upgrades- Upgrades to the MAPware-7000 software

⚠ WARNING: DO NOT REMOVE OR REPLACE WHILE CIRCUIT IS LIVE UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITIBLE CONCENTRATIONS OF FLAMMABLE SUBSTANCES. 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 and 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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