

CONTROLLER INFORMATION SHEET

Maple Model(s)

Graphic HMCs

PLC or Controller

Modbus/TCP Server (Slave)



P/N: 1036-0195

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Summary

Maple Systems **HMC7000 Series** Human/Machine Controllers (Maple HMCs) communicate with any device that uses the Modbus TCP/IP protocol. The HMC uses the Modbus/TCP Server (Slave) protocol driver to allow the Maple HMC to act as the slave in a single master, single slave format.

Communications Cable

The Maple HMCs Ethernet port connects directly to the Modbus TCP/IP Ethernet port on the Modbus master. A list of communications cables offered by Maple Systems as well as cable assembly instructions to assist you in assembling your own communications cable are available on our website at www.maplesystems.com.

WARNING *If your communications cable is not wired exactly as shown in our cable assembly instructions, damage to the HMI or loss of communications can result.*

PLC Settings

The Modbus port on the controller must be set to TCP master mode in order to properly communicate with the HMC slave.

The Modbus master device must be configured with an IP address that is addressable by the HMC.
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The HMC will respond on TCP port 502

Accessible PLC Memory

PLC Addressing

The following tables list the PLC memory ranges that are accessible on the Maple HMC7000 Series. Please note that your PLC memory range may be *smaller* or *larger* than that supported by the HMC/PLC. The following addresses can be displayed in 8, 16 or 32 bit formatting and/or single bit format as designated.

HMC Modbus Slave Mapping (Native Ladder)

PLC Address Types	Address Range	Modbus Address	Write access
Timer Register (T)	0-00255	400001-400256	Read/write
Counter Register (C)	0-00255	410001-410256	Read/write
System Register (SW)	0-0255	420001-420256	Read/write
Retentive Register (R)	0-01399	430001-431400	Read/write
Input Register (XW)	0-3100	440001-440400	Read only
Output Register (YW)	0-3100	441004-441400	Read/write
Internal Register (BW)	0-0255	442001-442256	Read/write
Index Registers (I,J,K)	0-2	443001-443003	Read/write
Configuration Register (MW)	0-1599	460001-461600	Read/write
Data Register (D)	0-04095	450001-454096	Read/write
System Coil (S)	0-00099	020001-020100	Read/write
Internal Coil (B)	0-04095	030001-034096	Read/write
Timer Coil (T)	0-0255	021001-021256	Read/write
Counter Coil (C)	0-0255	022001-022256	Read/write
Configuration Coil (M)	0-25599	035001-060600	Read/write

HMC Modbus Slave Mapping (IEC 61131-3)

In IEC 61131-3 projects, a Modbus address is assigned to each tag in the Tag Database. To access the Tag Database go to *Define > Tag Database*, or click on the *Tags* folder in the project tree. Assign the Modbus address in the Ethernet column of the Tag Database.

HMC Data Types ¹	Length	Modbus Address Range
DINT, DWORD, REAL, TIME, UDINT ²	2 Words (32-bits)	400001 – 465534
INT, Retentive Registers, WORD, UINT	1 Word (16-bits)	400001 – 465535
BYTE, SINT, USINT ³	1 byte (8-bits)	400001 – 465535
BOOL	1-bit	000001 – 065535

¹ Read Write access will be specified in the tag database. Most tags are Read/Write, tags defined for input modules and some system tags will be Read Only.

² 32-bit types require two Modbus registers. The tag occupies the specified address and the next consecutive address. Tag addresses cannot overlap.

³ 8-bit types require one Modbus address per tag. The data will be in the low word of the register

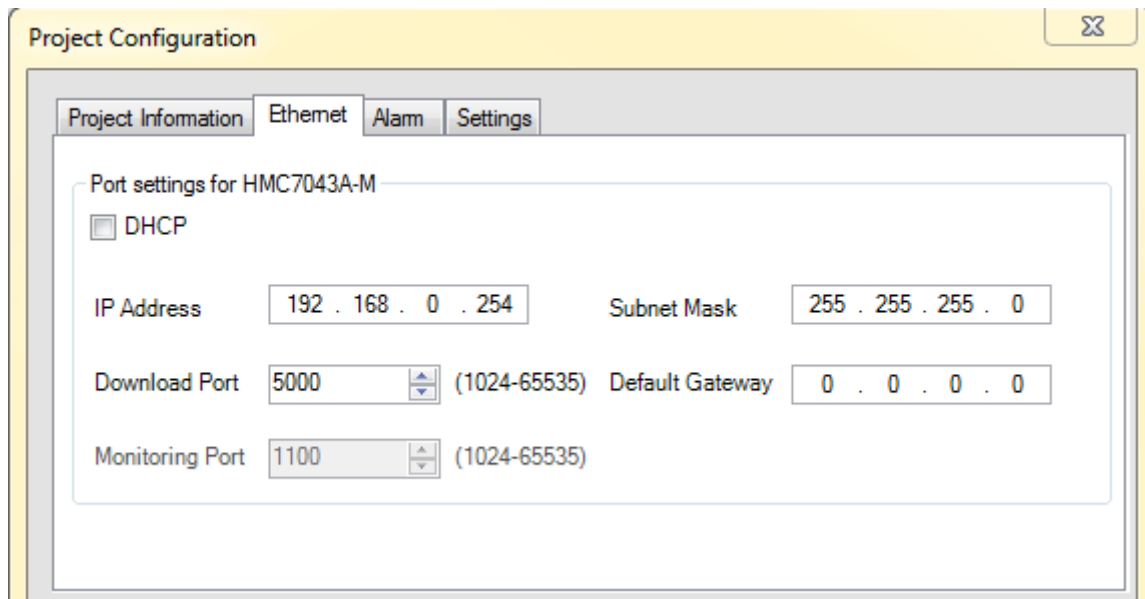
Important Memory Considerations

If your PLC memory range is smaller than the range supported by the Maple HMC, it is possible to configure the unit to monitor PLC memory addresses that are not available. Because this can cause unpredictable results, when you configure the HMC ensure that all selected PLC memory addresses are valid for your PLC model.

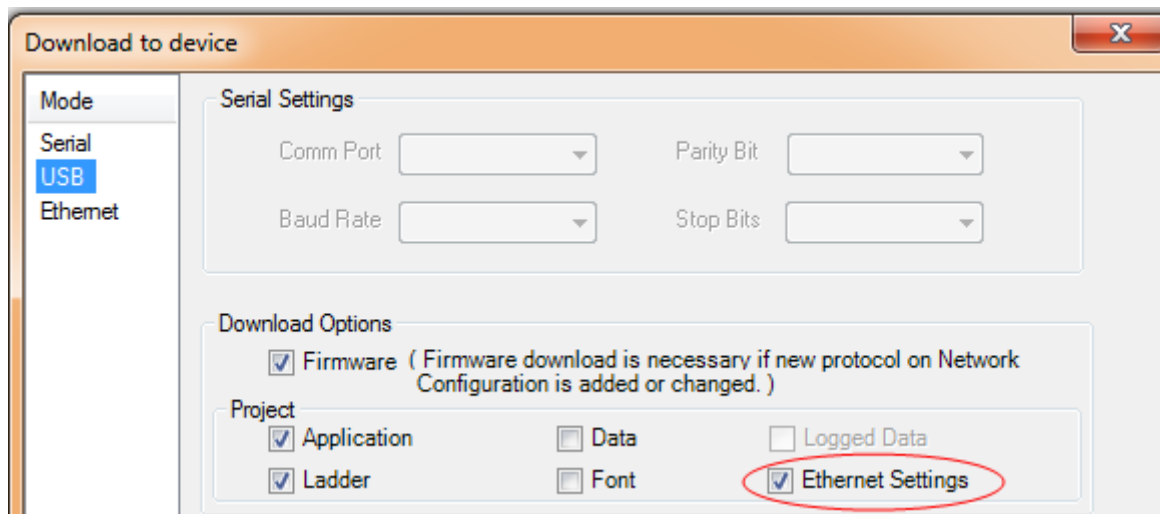
Do not configure the HMC7000 to write to any PLC memory address which should only be written to by the PLC.

MAPware-7000 Settings

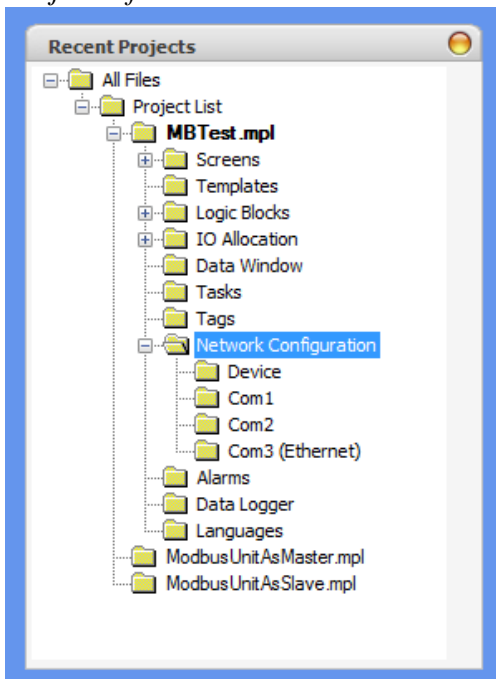
The HMC must be configured with an IP address that is accessible from the Modbus TCP/IP Master. The HMC's IP address is configured on the Ethernet tab of the Project Configuration window (*Project > Properties...*)



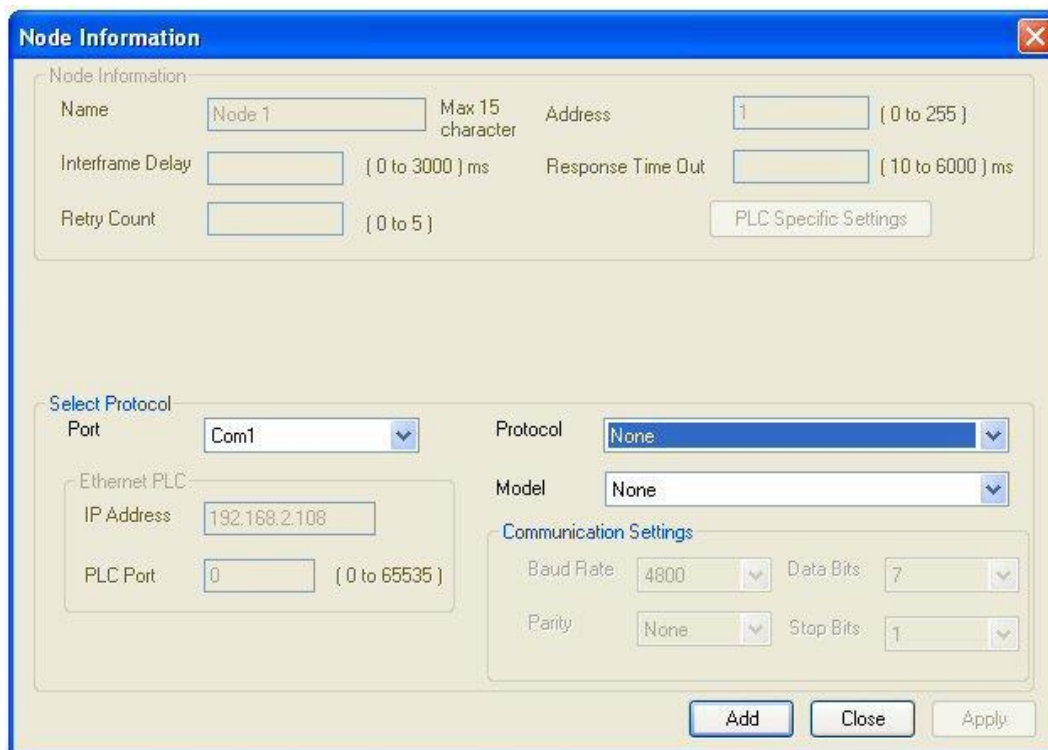
The Ethernet settings are downloaded to the HMC by checking the *Ethernet Settings* checkbox in the download window.



The following table lists the communications settings that must be configured in MAPware-7000. These settings can be found in the Network Configuration folder for the selected project in the *Project Information* window:



Right-click on the Com port that you wish to use to connect to the PLC, and then click *Add...* to display the Node Information dialog box:



Please note:

- The **Options** column lists MAPware-7000 options; your PLC may not support every option.

Name	Recommended Settings	Options	Important Notes
Port	Ethernet	---	
Protocol	Modbus/TCP Server (Slave)	---	Select the appropriate protocol for your PLC
Model	Modbus	---	
Ethernet PLC: IP Address	---	---	The IP address is the address assigned to the HMC in the project configuration window (see above)
Ethernet PLC: PLC Port	---	---	The HMC will respond to Modbus TCP/IP requests on port 502
Node Information: Name	---	Maximum of 15 characters	Provide a meaningful description to the port
Node Information: Address	1	0 to 255	Assigns a network address to each PLC. Use when networking several PLCs on one COM port.
Node Information: Interframe Delay	---	0 to 3000 msec	Minimum time delay between commands sent to the PLC
Node Information: Retry Count	---	0 to 5	The maximum attempts by the HMC to resend an unanswered command
Node Information: Response Time Out	---	10 to 6000 msec	The time that must pass before the HMC reattempts to send an unanswered command to the PLC
PLC Specific Settings	---	NA	Not Available for this protocol communications driver

---indicates no recommended option.

N/A indicates not available for this driver.