

Ethernet Remote I/O Master Modules

Ethernet Remote I/O Master Module

H2-ERM <---->
H2-ERM-F <---->



Overview

The Ethernet Remote Master H2-ERM (-F) connects 240, 250-1 and 260 CPU systems to slave I/O over a high-speed Ethernet link. The H2-ERM can also be used in a WinPLC system, but only one H2-ERM can be used with one slave per system.

Need a lot of I/O?

Each ERM module can support up to 16 additional H2-EBC systems, 16 Terminator I/O EBC systems, or 16 fully expanded H4-EBC systems. Of course, combinations are fine, too. The ERM also supports EDrives. See the Drives section for details.

Note: Applications requiring an extremely large number of T1H-EBC analog I/O or H4-EBC 16-channel analog I/O, could exceed the buffer capacity of a single H2-ERM module. In these cases, an additional H2-ERM may be required.

Specifications	H2-ERM	H2-ERM-F
Communications	10BaseT Ethernet	10BaseFL Ethernet
Data Transfer Rate	10Mbps	
Link Distance	100 meters (328 ft)	2K meters (6560 ft)
Ethernet Port	RJ45	ST-style fiber optic
Ethernet Protocols	TCP/IP, IPX	
Power Consumption	320mA @5VDC	450mA @5VDC
Manufacturer	Host Automation Products, L.L.C.	

Simple connections

The ERM connects to your control network using Category 5 UTP cables for cable runs up to 100 meters. Use repeaters to extend distances and expand the number of nodes. Our fiber optic version uses industry standard 62.5/125 ST-style fiber optic cables and can be run up to 2,000 meters.

The PLC, ERM and EBC slave modules work together to update the remote I/O points. These three scan cycles are occurring at the same time, but asynchronously. Critical I/O points that must be monitored every scan are best placed in the CPU base.

Networking ERMs with other Ethernet devices

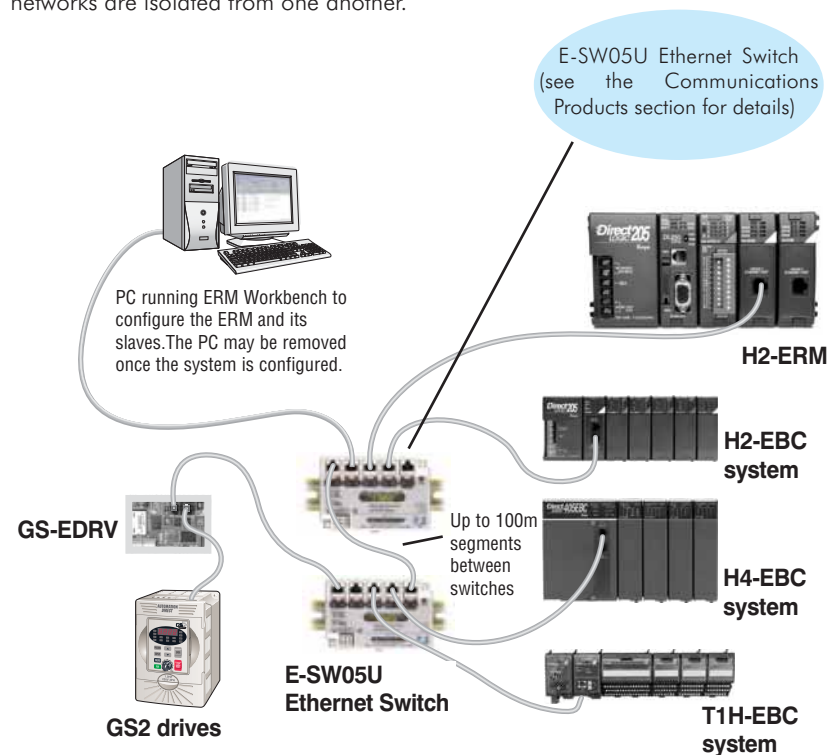
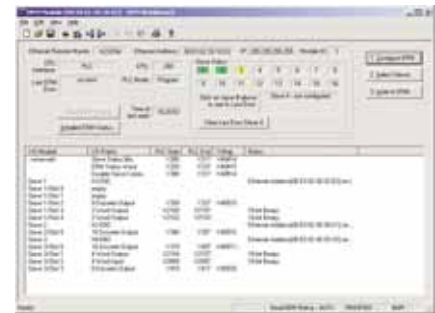
It is highly recommended that a dedicated Ethernet remote I/O network be used for the ERM and its slaves. While Ethernet networks can handle a large number of data transactions, and normally handle them very quickly, heavy Ethernet traffic can adversely affect the reliability of the slave I/O and the speed of the I/O network. Ensure ERM networks, multiple ERM networks and ECOM/office networks are isolated from one another.

Software configuration

ERM Workbench is a software utility that must be used to configure the ERM and its remote Ethernet slaves. ERM workbench supports two methods of configuring the ERM I/O network:

- ERM Workbench PLC Wizard greatly simplifies the configuration procedure when a PLC is used as the CPU interface.
- ERM Workbench configures the I/O network whether the CPU interface is a PLC or WinPLC, and allows access to all ERM I/O network parameters.

ERM Workbench Software



- PLC Overview
- DL05/06 PLC
- DL105 PLC
- DL205 PLC**
- DL305 PLC
- DL405 PLC
- Field I/O
- Software
- C-more HMIs
- Other HMI
- AC Drives
- Motors
- Steppers/Servos
- Motor Controls
- Proximity Sensors
- Photo Sensors
- Limit Switches
- Encoders
- Current Sensors
- Pushbuttons/Lights
- Process
- Relays/Timers
- Comm.
- TB's & Wiring
- Power
- Circuit Protection
- Enclosures
- Appendix
- Part Index

Ethernet Vs. Serial Remote I/O

I/O throughput

I/O throughput is defined as the time it takes from when an output is set in the ladder logic to when its corresponding input value is equal. This includes the PLC scan time, I/O backplane update time, and I/O module response times.

Testing I/O throughput times

A test was performed by our partner, Host Automation Products, to compare the difference between H2-ERM Ethernet remote I/O and D2-RSM serial remote I/O throughput times. Host Automation Products supplies the H2-ERM, H2-EBC, H2-ECOM, etc. as well as *DirectSOFT* and *DSData Server* software.

I/O groups tested

Discrete I/O - D2-16TD1-2 discrete outputs of slot 2 are tied to the D2-16ND3-2 discrete inputs of slot 0.

Analog I/O - F2-02DAS-2 analog output channel 1 is tied to the F2-04AD-2 analog input channel 1 of slot 3. The analog values were scaled from the full 16-bit range down to 12 bit range.

Each group was run independently through the following cycle 256 times:

- Step 1: Set all outputs to OFF for a random number of scans
- Step 2: Set all outputs to a random value for a random number of scans
- Step 3: Set all outputs to ON for a random number of scans
- Step 4: Set all outputs to a random value for a random number of scans

Since these four steps are repeated 256 times, there are actually 1,024 samples of I/O throughput.

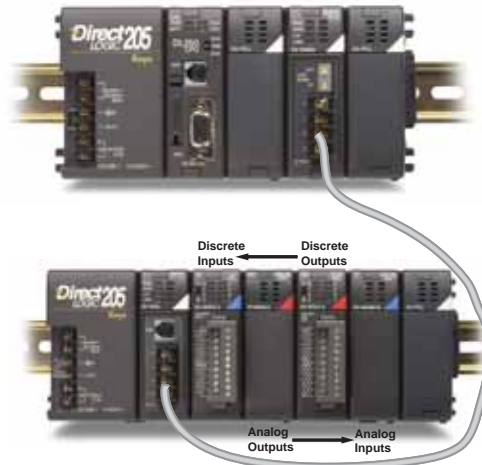
Test results

The results are listed in the tables at the right. As the number of H2-ERM slaves and I/O points increase, the I/O throughput times will remain flat until 64 analog inputs, 64 analog outputs, or 1,024 discrete I/O points are exceeded. As the number of D2-RSM slaves and I/O points increase, the I/O throughput times increase proportionally.

H2-ERM / H2-EBC Ethernet Remote I/O System



D2-RSM / D2-RSSS Serial Remote I/O System



Discrete I/O Test	I/O Throughput Times			
Remote I/O System	Min.	Max.	Avg.	Std. Dev.
H2-ERM / H2-EBC	45ms	71ms	53.32ms	6.14ms
D2-RSM / D2-RSSS	36ms	56ms	42.29ms	5.81ms

Analog I/O Test	I/O Throughput Times			
Remote I/O System	Min.	Max.	Avg.	Std. Dev.
H2-ERM / H2-EBC	46ms	113ms	62.94ms	14.48ms
D2-RSM / D2-RSSS	64ms	321ms	117.38ms	37.44ms