

Ethernet Base Controller Modules

Ethernet Base Controller Module

H4-EBC <---->
H4-EBC-F <---->

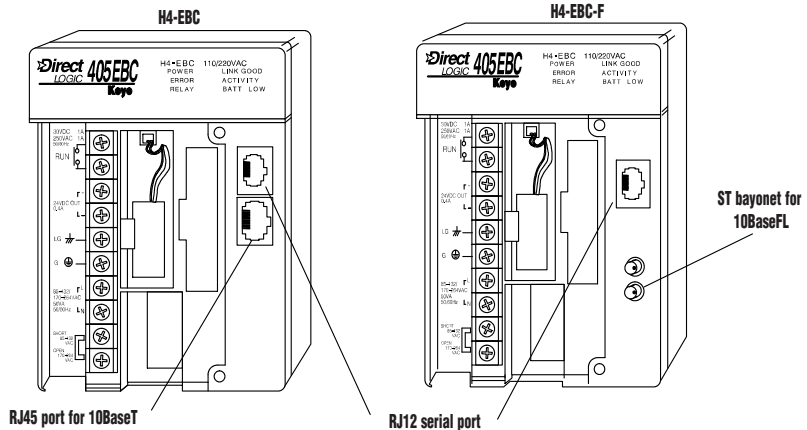


Use EBCs for PC-based control and for H4-ERM remote I/O slaves

The H4-EBC and H4-EBC-F Ethernet Base Controller modules provide a high-performance, low-cost Ethernet link between your PC-based control system or H4-ERM Ethernet remote I/O system and DL405 I/O. The H4-EBC module supports industry standard 10Base-T Ethernet communications, and the H4-EBC-F module supports 10Base-FL (fiber optic) Ethernet standards. Both modules offer 10Mbps transfer rates between your PC application and your DL405 I/O base. The EBC modules are compatible with TCP/IP and IPX protocols for flexible PC communications. Four addressing schemes make it easy to identify the module on the network using the method that works best for you. EBCs also offer:

- Virtually unlimited number of I/O points
- I/O updates on dedicated networks
- Use off-the-shelf networking components to connect to your existing network
- Fast I/O updates (<1ms per base possible based on IO)
- On-board serial port for operator interface, etc. when used with a PC-based program like Think and Do Live. (serial port not supported when used with the Hx-ERM module).

Specifications	H4-EBC	H4-EBC-F
Communications	10Base-T Ethernet	10Base-FL Ethernet
Data Transfer Rate	10Mbps	10Mbps
Link Distance	100 meters (328 ft)	2,000 meters (6,560 ft)
Ethernet Port	RJ45	ST-style fiber optic
Ethernet Protocols	TCP/IP, IPX	TCP/IP, IPX
Serial Port	RJ12, K-sequence, ASCII IN/OUT	RJ12, K-sequence, ASCII IN/OUT
Power Supplied	3470mA @ 5VDC 400mA @ 24VDC	3300mA @ 5VDC 400mA @ 24VDC
Manufacturer	Host Automation Products, L.L.C.	Host Automation Products, L.L.C.



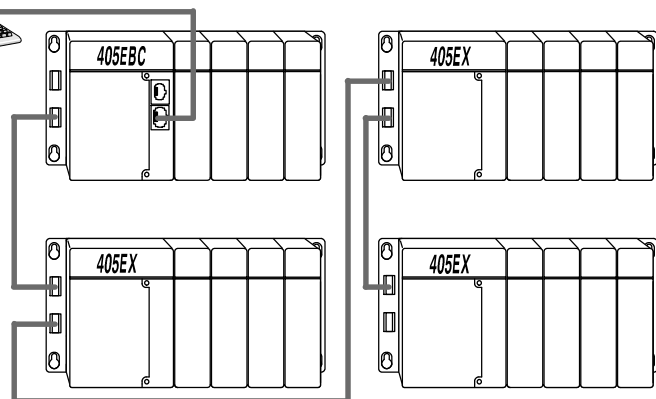
Easy to use, reliable and fast

The H4-EBC(-F) module plugs into the CPU slot of any DL405 I/O base. The 10Base-T or 10Base-FL port can be networked using commercially available cabling, hubs, and repeaters. The H4-EBC(-F) module supports all DL405

discrete and analog I/O modules. The H4-EBC module also supports the H4-CTRIO and D4-HSC, but no other intelligent modules are supported.



The H4-EBC(-F) supports up to three expansion bases.



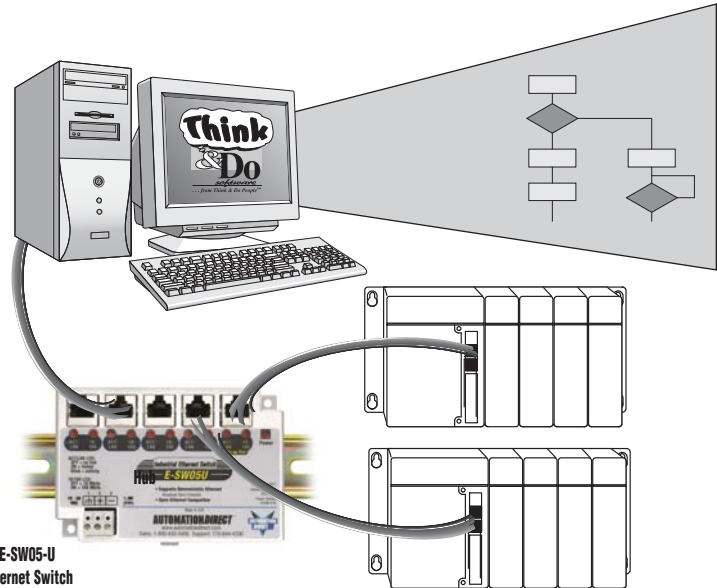
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Off-the-shelf solutions

You can purchase PC-based control software that is ready to use with the H4-EBC(-F) module. PC-based control packages are equipped with compatible I/O device drivers, program development tools, and run-time environments. See the PC-based Control Products section for a integrated PC-based Control solution to make your PC into an industrial controller.

Software developers

For programmers developing custom drivers for our I/O, we offer a free Ethernet Software Development Kit (SDK). The SDK provides a simplified API for interfacing with the H4-EBC(-F). The software interface libraries are provided for WIN32, WIN16, and DOS operating systems. The source code is available to developers under a non-disclosure agreement. Visit the technical support link at our Web site for more information.



The following vendors have PC-based Control products ready to control our I/O, or they have compatible products to be released in the future.

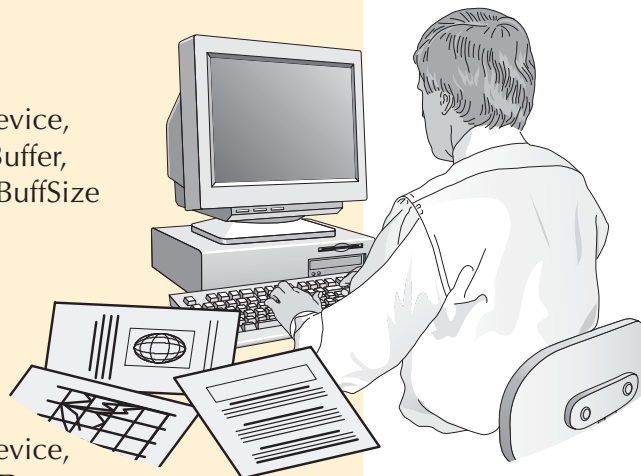
Vendor	Product	Web Address
AUTOMATIONDIRECT	KEPDirect EBC I/O Server	www.automationdirect.com
Phoenix Contact	Think & Do Live!	www.phoenixcon.com/software
KEPware	KEPServerEX	www.kepware.com
Wonderware	InControl	www.wonderware.com

READ I/O

```
int HEIReadIO
(
    HEIDevice *pDevice,
    Byte *pBuffer,
    WORD BuffSize
);
```

WRITING I/O

```
int HEIWriteIO
(
    HEIDevice *pDevice,
    BYTE *pData,
    WORD SizeofData,
    BYTE *pReturnData,
    WORD *pSizeofReturnData
);
```



Ethernet Remote I/O Kits



Overview

The DL405 PLC Ethernet Remote I/O system is available at prices that are better than many Serial (master/slave) Remote I/O combinations. This means you can make the switch from Serial PLC Remote I/O to Ethernet Remote I/O and gain all the ease-of-use, diagnostics, and performance of Ethernet connectivity, for little or no additional installation cost.

Additionally, the Ethernet Remote I/O kits are offered at a considerable savings when compared to purchasing the Ethernet Remote Master (ERM) and Slaves (EBC) separately.

The Ethernet Remote I/O kits are offered to provide an easy way to choose the Ethernet Remote I/O products that best fit your application.

Example of an Ethernet remote I/O system using a T14-ERKIT-2. CPU, bases, I/O modules, Ethernet switch, etc. are sold separately.

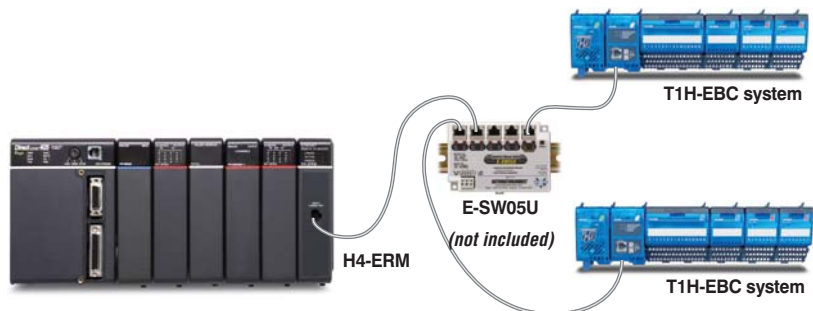
T14-ERKIT-x Ethernet Remote I/O Kits

A T14-ERKIT-x Ethernet Remote I/O Kit includes one H4-ERM Ethernet Remote Master module and up to "x" number of T1H-EBC Ethernet Base Controller modules by adding -1, -2, -3, etc. as the part number suffix. (See the table below.) A T14-ERKIT-2 is shown below, which includes one H4-ERM and two T1H-EBC modules. All other necessary hardware, including the CPU, I/O modules, bases, cables and Ethernet hub (if required), is sold separately.

Example kit: T14-ERKIT-2 includes one H4-ERM and two T1H-EBCs.



T14-ERKIT-x Ethernet Remote I/O Kits		
Kit Number	Kit Contents	Price
T14-ERKIT-1	1 H4-ERM + 1 T1H-EBC	<--->
T14-ERKIT-2	1 H4-ERM + 2 T1H-EBCs	<--->
T14-ERKIT-3	1 H4-ERM + 3 T1H-EBCs	<--->
T14-ERKIT-4	1 H4-ERM + 4 T1H-EBCs	<--->
T14-ERKIT-5	1 H4-ERM + 5 T1H-EBCs	<--->
T14-ERKIT-6	1 H4-ERM + 6 T1H-EBCs	<--->
T14-ERKIT-7	1 H4-ERM + 7 T1H-EBCs	<--->
T14-ERKIT-8	1 H4-ERM + 8 T1H-EBCs	<--->
T14-ERKIT-9	1 H4-ERM + 9 T1H-EBCs	<--->
T14-ERKIT-10	1 H4-ERM + 10 T1H-EBCs	<--->



Check the Power Budget

Verify your power budget requirements

Your I/O configuration choice can be affected by the power requirements of the I/O modules you choose. When determining the types and quantity of I/O modules you will be using, it is important to remember there is a limited amount of power available from the power supply.

The chart on the opposite page indicates the power supplied and used by each DL405 device. The adjacent chart shows an example of how to calculate the power used by your particular system. These two charts should make it easy for you to determine if the devices you have chosen fit within the power budget of your system configuration.

If the I/O you have chosen exceeds the maximum power available from the power supply, you can resolve the problem by shifting some of the modules to an expansion base or remote I/O base (if you are using remote I/O).

Warning: It is extremely important to calculate the power budget correctly. If you exceed the power budget, the system may operate in an unpredictable manner which may result in a risk of personal injury or equipment damage.

Use ZIPLinks to reduce power requirements

If your application requires a lot of relay outputs, consider using the ZipLink AC or DC relay output modules. These modules can switch high current (10A) loads without putting a load on your base power budget. Refer to page 6-57 for more information.

This logo is placed next to I/O modules that are supported by the ZIPLink connection systems. See the I/O module specifications at the end of this section.



Calculating your power usage

The following example shows how to calculate the power budget for the DL405 system. The example is constructed around a single 8-slot base using the devices shown. It is recommended you construct a similar table for each base in your system.

A			
Base Number	Device Type	5 VDC (mA)	External 24 VDC Power (mA)
B CURRENT SUPPLIED			
CPU/Expansion Unit /Remote Slave	D4-440 CPU	3700	400
C CURRENT REQUIRED			
SLOT 0	D4-16ND2	+150	+0
SLOT 1	D4-16ND2	+150	+0
SLOT 2	F4-04DA	+120	+100
SLOT 3	D4-08ND3S	+100	+0
SLOT 4	D4-08ND3S	+100	+0
SLOT 5	D4-16TD2	+100	+0
SLOT 6	D4-16TD2	+100	+0
SLOT 7	D4-16TR	+1000	+0
D OTHER			
BASE	D4-08B	+80	+0
Handheld Programmer	D4-HPP	+320	+0
E Maximum Current Required		2820	100
F Remaining Current Available		3700-2820=880	400-100=300
1. Using a chart similar to the 3 one above, fill in column 2. 2. Using the tables on the opposite page, enter the current supplied and used by each device (columns 3 and 4). Pay special attention to the current supplied by the CPU, Expansion Unit, and Remote Slave since they differ. Devices which fall into the "Other" category (Row D) are devices such as the Base and the Handheld programmer, which also have power requirements, but do not plug directly into the base. 3. Add the current used by the system devices (columns 3 and 4) starting with Slot 0 and put the total in the row labeled "maximum current required" (Row E). 4. Subtract the row labeled "Maximum current required" (Row E), from the row labeled "Current Supplied" (Row B). Place the difference in the row labeled "Remaining Current Available" (Row F). 5. If "Maximum Current Required" is greater than "Current Supplied" in either column 3 or 4, the power budget will be exceeded. It will be unsafe to use this configuration and you will need to restructure your I/O configuration. Note the auxiliary 24 VDC power supply does not need to supply all the external power. If you need more than the 400mA supplied, you can add an external 24VDC power supply. This will help keep you within your power budget for external power.			

DL405 CPU power supply specifications and power requirements

Specification	AC Powered Units	24 VDC Powered Units	125 VDC Powered Units
Part Numbers	D4-450, D4-440, D4-430, D4-EX (expansion base unit), D4-RS (remote slave unit)	D4-450DC-1, D4-440DC-1, D4-EXDC (expansion base unit), D4-RSDC (remote slave unit)	D4-450DC-2, D4-440DC-2
Voltage Withstand (dielectric)	1 minute @ 1,500 VAC between primary, secondary, field ground, and run relay		
Insulation Resistance	> 10MΩ at 500VDC		
Input Voltage Range	85-132 VAC (110 range) 170-264 VAC (220 range)	20-28 VDC (24 VDC) with less than 10% ripple	90-146 VDC (125 VDC) with less than 10% ripple
Maximum Inrush Current	20 A	20 A	20 A
Maximum Power	50 VA	38 W	30 W

Power Requirements

Power Supplied					
CPUs/Remote Units/ Expansion Units	5 VDC Current Supplied in mA	24V Aux Power Supplied in mA	CPUs/Remote Units/Expansion Units	5V Current Supplied in mA	24VAux. Power Supplied in mA
D4-430 CPU	3700	400	D4-EX	4000	400
D4-440 CPU	3700	400	D4-EXDC	4000	NONE
D4-440DC-1 CPU	3700	NONE	D4-EXDC-2	3700	NONE
D4-440DC-2 CPU	3700	NONE	D4-RS	3700	400
D4-450 CPU	3100	400	D4-RSDC	3700	NONE
D4-450DC-1 CPU	3100	NONE	H4-EBC	3470	400
D4-450DC-2 CPU	3100	NONE	H4-EBC-F	3300	400
Power Consumed					
Power-consuming Device	5V Current Consumed	External 24VDC Current Required	Power-consuming Device	5V Current Consumed	External 24VDC Current Required
I/O Bases			Analog Modules (continued)		
D4-04B-1	80	NONE	F4-16AD-1	75	100
D4-06B-1	80	NONE	F4-16AD-2	75	100
D4-08B-1	80	NONE	F4-04DA-1	70	75+20per circuit
DC Input Modules			F4-04DA-2	90	90
			F4-04DAS-1	60	60 per circuit
			F4-04DAS-2	60	60 per circuit
			F4-08DA-1	90	100+20 per circuit
			F4-08DA-2	80	150
			F4-16DA-1	90	100+20 per circuit
			F4-16DA-2	80	25 max.
			F4-08RTD	80	NONE
			F4-08THM-n	120	50
			F4-08THM	110	60
AC Input Modules			Remote I/O		
D4-08NA	100	NONE	H4-ERM	320	NONE
D4-16NA	150	NONE	H4-ERM-F	450	NONE
AC/DC Input Modules			D4-RM	300	NONE
D4-16NE3	150	NONE	Communications and Networking		
F4-08NE3S	90	NONE	H4-ECOM100	300	NONE
DC Output Modules			H4-ECOM	530	NONE
D4-08TD1	150	35	H4-ECOM-F	670	NONE
F4-08TD1S	295	NONE	D4-DCM	500	NONE
D4-16TD1	200	125	F4-MAS-MB	235	NONE
D4-16TD2	400	NONE	FA-UNICON	NONE	65
D4-32TD1	250	140	CoProcessors		
D4-32TD1-1	250	140 (15V)	F4-CP128-1	305	NONE
D4-32TD2	350	120 (4A max including loads)	Specialty Modules		
D4-64TD1	800	NONE	H4-CTRIO	400	NONE
AC Output Modules			D4-INT	100	NONE
D4-08TA	250	NONE	D4-HSC	300	NONE
D4-16TA	450	NONE	F4-16PID	160	NONE
Relay Output Modules			F4-8MPI	225	170
D4-08TR	550	NONE	D4-16SIM	150	NONE
F4-08TRS-1	575	NONE	F4-4LTC	280	75
F4-08TRS	575	NONE	Programming		
D4-16TR	1000	NONE	D4-HPP-1 (Handheld Prog.)	320	NONE
Analog Modules			Operator Interface		
F4-04AD	85	100	DV-1000	150	NONE
F4-04ADS	270	120	C-more Micro-Graphic	210	NONE
F4-08AD	75	90			