NOHAU
A World Leader in Supplying
8-, 16- and 32-bit In-circuit Emulators

EMUL16/300-PC Table of Contents

PH:(650) 375-0409   Fax:(650) 375-8666 Email:sales@icetech.com Web:www.icetech.com.com

PH:(650) 375-0409   Fax:(650) 375-8666 Email:sales@icetech.com Web:www.icetech.com.com

NOHAU
A World Leader in Supplying
8-, 16- and 32-bit In-circuit Emulators

PH:(650) 375-0409   **Fax:**(650) 375-8666 **Email:**sales@icetech.com **Web:**www.icetech.com.com

In-Circuit Emulators for the 16/300 Architecture

Example of How to Order EMUL16/300-PC Systems

Listed below are examples of what parts to order for your EMUL16/300-PC system. Use the examples as a guide to help you in your ordering of a Nohau emulator system. To order a system for a different 16/300 derivative, select the same component type for that derivative. The following EMUL16/300-PC price list contains all the components you will need to order your complete system. There are photos of systems and adapters to help you in your ordering. If you need assistance, please contact your local rep, www.nohau.com/reps, or Nohau technical support: support@nohau.com or sales@nohau.com.

Low Cost System Examples

EMUL16/EPC-BDM	Parallel Port Background Debugger for 68HC16
EMUL16-PC/LC-ISA/BDM	8-BIT ISA Background Debugger for the 68HC16
EMUL300/LC-ISA/BDM	8-BIT ISA Background Debugger for the 68300

16/300 System with Trace

EMUL300/E256-16	Emulator Board
POD-331/256-16	Pod Board
EMUL16/300-PC/DTR128-16	Data Trace card
EMUL-PC / BOX-HSP	Parallel Port BOX
	Order Total 0.00

68331 System (16 MHz)

EMUL300/E256-16	Emulator Board
POD-331/256-16	Pod Board
EMUL16/300-PC/DTR128-16	Data Trace card
EMUL-PC / BOX-HSP	Parallel Port BOX
ET/EP5-132-QF03T	32/Texttool socket adapter
	Order Total 0.00

The systems will also include the power supply, trace probe set, the User Guide, and the Seehau Debugger software.

PH:(650) 375-0409   **Fax:**(650) 375-8666 **Email:**sales@icetech.com **Web**:www.icetech.com.com

Introduction

| What this document is and about pricing | This price list is designed to be used by engineers, buyers and purchasing agents. It is widely quoted and used as an information source by Nohau representatives. The latest version is available from the Nohau website or from your local Nohau representative. If this document contains no prices then it is called the parts list and is designed for distribution outside of the USA. In this case, contact your local Nohau rep for the price list for your country. Your rep may distribute this document with local prices listed. You can find the name of your rep by contacting Nohau as listed on this document. All prices shown are in US dollars and are valid in the USA only. |

What an emulator is and what it does

An emulator is a tool designed to assist engineers with software debugging and verification during the hardware/software integration phase of their development project. The emulator temporarily replaces the microcontroller in the customer target system. The emulator behaves exactly like the processor with the added benefit of allowing you to view data and code inside the processor and control the operation of the CPU. You can load user code, view it in machine code or C source, set breakpoints on addresses and preset variables and registers. You can view data changes in real-time with the Shadow RAM feature. The emulator can be operated in stand-alone mode so development work can begin before the target system is available or complete.

What the trace does and why people order one

You can set triggers on specified addresses and data which will stop the emulation and/or trace memory when this action occurs. This alerts you that the specified event has occurred and you may now use the information stored by the trace to find any hardware or software errors. The trace memory records the microcontroller cycles including data reads and writes for user specified conditions. You can view the trace memory to find out what your code was actually doing at a particular time. Most people purchase the optional trace card due to its unique ability to save many hours of engineering time looking for elusive bugs.

Seehau - the Nohau debugger for the emulator

The emulator and its software is designed to be relatively intuitive to use. The Nohau debugging software is called "Seehau" and updates are available free on the website or directly from any Nohau office or rep anywhere in the world. Seehau is macro-based enabling automatic operation. Seehau operates under Windows 95, 98, NT, Me, XP and 2000Pro. For more information about the benefits of Seehau, see www.nohau.com for the latest data sheets or call your Nohau rep.

More info is available

For more information on the entire embedded tool chain, get your copy of "The Software Engineer's Guide to In-Circuit Emulation For Motorola Microcontrollers" from your Nohau rep or from www.nohau.com. Nohau has other informative documents available from the same sources. Any questions can be directed to your Nohau rep or sales@nohau.com.

PH:(650) 375-0409   **Fax:**(650) 375-8666   **Email:**sales@icetech.com   **Web:**www.icetech.com.com

General Features

Emulator Boards

The emulator parts
The basic Nohau EMUL16/300-PC emulator consists of an emulator board, an in-circuit pod board, the debugger software (Seehau) and a 5-foot cable. The emulator board along with a pod board can be run stand-alone without any target hardware. Add a target adapter and you can run in your target board. Add an optional trace card and you can trigger and record CPU instructions and their bus operations.

The available emulator boards
Both the Standard and Low Cost emulator units are available for the 16/300 family.
Standard Emulator - These units come with either 64K, 256K or 1M of shadow RAM, and are available up to 25.16MHz.
Low Cost Debugger - These units come with your choice of communications interface, the Background Debugger POD board, and will support systems to 25.16MHz.

The emulator board connections
The emulator board will plug into any ISA slot. This can be either inside the PC or inside our external HSP box. The HSP box would then plug into the parallel port of your PC or laptop. The 5-foot cable would then plug into the emulator board and stick out the back of the PC or HSP box. The other end of the cable would plug into the pod board.

Note: The HSP box option will support using the LC-ISA BDM systems. If you wish to use the EPC interfaced Background Debuggers, you will have to obtain a new system.

Pod Boards

The 16/300 Family
Nohau supports a wide range of processors within the 16/300 family. There are many pods available which will allow you to more accurately emulate your designs. Some basic knowledge of your hardware design will be required when selecting a pod. This will include the microprocessor you are using, the frequency, the mode you are using it in, and your memory configuration.   Due to slight differences between the 68HC16Y1 and the 68HC916Y1, you might need to install the corresponding chip in the pod. Refer to the Motorola documentation for details.

Connection
The emulator board connects to the pod board through a cable supplied with the emulator. For direct connection to your target system, the pod board typically requires an adapter (see the "Emulator to Target Adapters and Accessories" section). The pod board has memory that can be used for emulation, an on-board crystal, and, in most cases, a serial interface to the CPU through a 9-pin D connector. The pod resources, including memory, crystal, the serial port, CPU and power supply to your target can all be disabled. The pod board also has a background debug mode (BDM) connector. If you connect to your target through the BDM connector only, the system does not allow the use of pod emulation memory, emulator Shadow RAM nor data collection in the optional trace buffer.

PH:(650) 375-0409   **Fax:**(650) 375-8666 **Email:**sales@icetech.com **Web:**www.icetech.com.com

General Features (Continued)

Trace Boards

General trace information

Trace boards are optional for the 16/300 families and they can be purchased and added at any time. Trace boards add trace memory for execution, data read and write history recording, triggers and Shadow RAM. Each trace frame holds 104 bits of data consisting of the following: address, data, timestamp, cycle type, cycle width and miscellaneous signals. The trace display includes address, data, timestamp, processor status, program flow, source code and labels. Shadow RAM displays data writes in real time without stealing emulation cycles. The trace board can be viewed and triggers can be configured without stealing CPU cycles for these housekeeping functions. Triggers can be set in anywhere within the memory range.

Trace boards available

There are two trace board options which are available for the EMUL16/300-PC systems. The Standard Trace and the Data Trace.
Standard Trace Option: The standard trace board is available with a 32K deep trace buffer. This board is also available up to 25MHz. This trace board includes all the basic trace features including two-level triggers, loop counter, filter, trigger on code or external read and write addresses or values or both.
Data Trace Option: The data trace boards are available with either a 128K or 512K deep trace buffer. This board is also available up to 25MHz. This trace board includes all the features of the standard trace plus the ability to trigger on the DATA value.

Target Adapters

Target adapter basics

Target adapters are used to connect the emulator to your target system. There are many methods used to connect Nohau EMUL16/300-PC emulators to the target boards and each application requires a different solution. Once the pod is selected, note the number of pins and the package to which that specific pod terminates. The adapters section of this price list will then help you select the proper adapter to mate with the package you are using on your target.

Full emulator and BDM differences

The full emulator offers superior debugging power not found on the BDM emulator. The BDM emulator does not offer trace or trigger capabilities and has only two hardware breakpoints. The full emulator has unlimited hardware and software breakpoints. The BDM emulator does not have emulation RAM but does have Shadow RAM like the full emulator. The BDM emulator can program the target processor FLASH and EEPROM and the full emulator can program these memories on the processor mounted on the personality card. For more information regarding emulator features go to www.nohau.com/products.html and select the MCUs by manufacturer, and click on 68HC16/68300.

Compilers, code formats and RTOS's

The emulator will accept user code in various formats from assemblers and compilers. Elf-Dwarf, IEEE695 and S-records are the three most popular formats for the 16/300. Nohau supports a variety of popular compiler vendors. Source code and labels for both C and assembler will appear in the source windows and trace windows because of these formats. The emulator automatically detects which format is being loaded without user intervention. Nohau is a distributor of many compiler packages and are listed under the "Software Packages" section. Nohau also distributes real time operating system (RTOS) packages. Contact your local Nohau rep for other embedded components they offer.

PH:(650) 375-0409   **Fax:**(650) 375-8666 **Email:**sales@icetech.com **Web**:www.icetech.com.com

What parts do I need to order?

What parts do I need to order?

An EMUL16/300-PC emulator system consists of the emulator board, the pod board, an optional HSP box and the optional trace card. A target adapter will normally be needed to connect the emulator to the target system. There are various types of these components that you will select to configure your desired system. Your local Nohau representative or the Nohau technical support team are able to assist you with selecting the appropriate components. The Seehau debugging software, technical support, warranty, accessories and manuals are automatically included and need not be specified in your order.
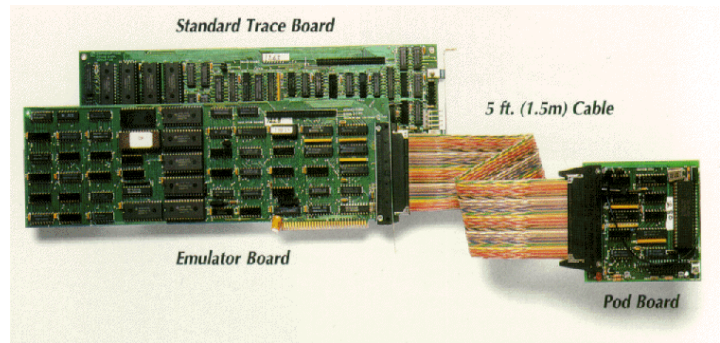
Minimum System Requirements

- Pentium 200 or higher for optimum performance
- 2x or better CD ROM
- 40 MB Free Hard Disk Space
- Windows 95, 98, 2000Pro, Me, XP or NT
- RAM for Windows 95/98/Me: 64MB
- RAM for Windows NT/2000Pro/XP: 128MB

It is possible to run Seehau on slower and smaller machines such as laptops. Nohau technical support reports that Seehau, as any large Windows based program, runs more reliably on larger and faster machines.

Application Notes on our Website

The following is a list of information that can be found on Nohau's website. Go to www.nohau.com/documents and then select either the Technical Publications link, the Technical Application Notes link or the Nohau Manual link. There are also data sheets available on our website for the emulator and the Seehau software.

Materials listed under the Technical Application Notes Link:

Case Studies -connecting to Targets.

Getting Started with your EPC interfaced Emulator system.

Materials listed under the Technical Publications Link:

List of MCUs Supported by Nohau Corporation

The Software Engineer's Guide to In-Circuit Emulation For Motorola Microcontrollers

Product Focus: Nohau Gives RTOS Users Easy Access to the Seehau Interface

Materials listed under Nohau Manuals/EMUL16/300-PC:

User Guide 16/300

PH:(650) 375-0409   **Fax:**(650) 375-8666 **Email:**sales@icetech.com **Web**:www.icetech.com.com

Emulator Boards

Standard emulator boards are for use in the High Speed Parallel Box or as ISA plug-in boards. The emulator must be connected to a Nohau pod board to operate. The emulator includes the 5-foot cable that connects to the pod board and the debugging software, which operates on Microsoft* Windows* 98/ME/NT/2000/XP. The software operates the emulator, pod and optional trace. Shadow RAM can see processor writes so that data can be displayed during emulation or exported to other Windows applications through Dynamic Data Exchange (DDE). The emulator includes either SEEHAU 16 or SEEHAU 300 software. Available assemblers and C-compilers are described in the "Software Packages" section.

16.78 MHz, 64K S. RAM	A 68HC16 emulator board that runs up to 16.78 MHz with 64K of Shadow RAM.	**EMUL16/ E64–16**
16.78 MHz, 64K S. RAM	A 68300 (CPU32 and CPU32+) emulator board that runs up to 16.78 MHz with 64K of Shadow RAM.	**EMUL300/ E64–16**
25.16 MHz, 64K S. RAM	A 68HC16 emulator board that runs up to 25.16 MHz with 64K of Shadow RAM.	**EMUL16/ E64–25**
25.16 MHz, 64K S. RAM	A 68300 (CPU32 and CPU32+) emulator board that runs up to 25.16 MHz with 64K of Shadow RAM.	**EMUL300/ E64–25**
16.78 MHz, 256K S. RAM	A 68HC16 emulator boards that runs up to 16.78 MHz with 256K of Shadow RAM.	**EMUL16/ E256–16**
16.78 MHz, 256K S. RAM	A 68300 (CPU32 and CPU32+) emulator board that runs up to 16.78 MHz with 256K of Shadow RAM.	**EMUL300/ E256–16**
25.16 MHz, 256K S. RAM	A 68HC16 emulator board that runs up to 25.16 MHz with 256K of Shadow RAM.	**EMUL16/ E256–25**
25.16 MHz, 256K S. RAM	A 68300 (CPU32 and CPU32+) emulator board that runs up to 25.16 MHz with 256K of Shadow RAM.	**EMUL300/ E256–25**
16.78 MHz, 1MB S. RAM	A 68HC16 emulator board that runs up to 16.78 MHz with 1MB of Shadow RAM.	**EMUL16/ E1M–16**
16.78 MHz, 1MB S. RAM	A 68300 (CPU32 and CPU32+) emulator board that runs up to 16.78 MHz with 1MB of Shadow RAM.	**EMUL300/ E1M–16**
25.16 MHz, 1MB S. RAM	A 68HC16 emulator board that runs up to 25.16 MHz with 1MB of Shadow RAM.	**EMUL16/ E1M–25**
25.16 MHz, 1MB S. RAM	A 68300 (CPU32 and CPU32+) emulator board that runs up to 25.16 MHz with 1MB of Shadow RAM.	**EMUL300/ E1M–25**

Each bank of pod memory requires a chip select. For example, a 1M4B pod can use four chip selects to address four 256K banks.

PH:(650) 375-0409　**Fax:**(650) 375-8666　**Email:**sales@icetech.com　**Web:**www.icetech.com.com

Pod Board Configurations

Part numbers = POD-AAA/BBB-CC where "AAA" = Pod; "BBB"= memory size; "CC" = speed.
(For example: POD-16Y/256-16)

MCU	Pod	Memory Size				Please call for availability of pods whose prices are shown in bold.
		256	1M4B	1MB	4M	
68HC16X1/ 68HC916X1	16X1/BBB-16					
68HC16Y1/ 68HC916Y1	16Y1/BBB-16					[1] The Y3 pod uses the same adapters as the Y1 pod (call for availability).
68HC16Y3/ 68HC916Y3	16Y3/BBB-16[1]					
68HC16Z1	16Z1/BBB-16					
68HC16Z2[2]	16Z1/BBB-20					[2] To support the 68HC16Z2, use the 68HC16Z1 with the EMUL16/300-PC/QFP132 CLIP clip-over adapter.
	16Z1/BBB-25					
68CM16Z1/ 68CK16Z1	CM16Z1/BBB-25					
68331	331/BBB-16					
	331/BBB-20					
	331/BBB-25				Call for avail.	
68332	332/BBB-16					
	332/BBB-20					
	332/BBB-25				Call for avail.	
68F333	333/BBB-16					
68334	334/BBB-16					
	334/BBB-20	Call for availability				
68335	335/BBB-20	Call for availability				
68336	336/BBB-16					
	336/BBB-20				Call for avail.	
	336/BBB-25	Call for availability				
68338	338/BBB-14					
68340	340/BBB-16					
	340/BBB-20				Call for avail.	
	340/BBB-25					
68341	341/BBB-16					
	341/BBB-20	Call for availability				
	341/BBB-25					
68376	376/BBB-20				Call for avail.	
	376/BBB-25	Call for availability				
16S2	16S2/BBB-20	Call for availability				
	16S2/BBB-25	Call for availability				
16V1	16Z1(=ADP-EVO)-20	Call for availability				

PH:(650) 375-0409   **Fax:**(650) 375-8666 **Email:**sales@icetech.com **Web**:www.icetech.com.com

Trace Boards

Data Trace Boards

This is an optional ISA board that adds trace (execution history) capabilities to the standard emulator and pod. The 104-bit trace records include address, data, timestamp, processor status and user-defined external data. Includes external probe assembly and cable.

16.78 MHz trace, 128K records	Data Trace Board for 68HC16 and 683XX families. Holds 128K records. 16.78 MHz. This trace board can trigger on or filter combinations of fetch, read and write addresses and data values.	**EMUL16/300–PC/ DTR128–16**
25.16 MHz trace, 128K records	Data Trace Board for 68HC16 and 683XX families. Holds 128K records. 25.16 MHz. This trace board can trigger on or filter combinations of fetch, read and write addresses and data values.	**EMUL16/300–PC/ DTR128–25**
16.78 MHz trace, 512K records	Special order. Contact Nohau. Data Trace Board for 68HC16 and 683XX families. Holds 512K records. 16.78 MHz. Subject to memory component availability. This trace board can trigger on or filter combinations of fetch, read and write addresses and data values.	**EMUL16/300–PC/ DTR512–16**
25.16 MHz trace, 512K records	Special order. Contact Nohau. Data Trace Board for 68HC16 and 683XX families. Holds 512K records. 25.16 MHz. Subject to memory component availability. This trace board can trigger on or filter combinations of fetch, read and write addresses and data values.	**EMUL16/300–PC/ DTR512–25**

Standard Trace Boards

This optional ISA board adds trace (execution history) capabilities to the standard emulator and pod. The 104-bit trace records include address, data, timestamp, processor status and user-defined external data. Includes external probe assembly and cable.

16.78 MHz trace 32K deep trace buffer	Trace Board for 68HC16 and 683XX families. 32 k deep trace buffer. 16.78 MHz. Only this frequency is available. This trace board can trigger on or filter fetch, read or write addresses (not data values).	**EMUL16/300–PC/ TR32–16**

PH:(650) 375-0409   **Fax:**(650) 375-8666 **Email:**sales@icetech.com **Web:**www.icetech.com.com

Background Mode Debugging Tools

Background mode debugging tools for:

68HC16	68HC16S2	68HC16V1	68HC16X1	68HC16Y1	68HC16Z1	68HC16Z2
68331	68332	68F333	68334	68335	68336	68338
68340	68341	68349	68360	68376	68HC16S2	and other CPU16, CPU32, and CPU32+ Microcontrollers

Background Mode Debuggers

The Background Debug Mode (BDM) debugger is a low-cost development tool for all CPU16, CPU32, and CPU32+ microcontrollers. If your controller is not listed here, please contact Nohau. The hardware consists of a plug-in board for ISA-bus PC-AT or compatible, a 5-foot flat cable, a connector with STATUS LIGHTS connector cable with a "Berg" connector and a CLKOUT wire. A working target system with a BDM connector is required. To load your program, set breakpoints, or step through source, you must use writable RAM as program memory. Emulates in real time at maximum chip speed.

The Seehau debugger is included with the hardware and is available for either 68HC16 (CPU16) parts or for 68300 (CPU32 or CPU32+) parts. This software runs on Microsoft* Windows* 98/ME/NT/2000/XP.

The High-Level Debugger supports local (stack) variables, C structures, arrays and C expressions. Compilers supported include: Altium, Archimedes Software, COSMIC, IAR, Intermetrics, Introl, Microtec Research (MRI C and C++), Sierra Systems and Software Development Systems (SDS) C compilers.

The hardware debugger board is always sold as a hardware-software combination. The debugger hardware is the same for all controllers. Additional software modules are available separately.

Each background debugger consists of the debugger hardware plus one software variation.

BDM with CPU16	CPU16 debugger with hardware and EMUL16–PC/ HLD software. Includes the EMUL/LC–ISA, a cable, the EMUL–PC/LC–POD (BDM pod) and the EMUL16/300–PC/BDM User Guide. Note: will not work in the HSP box.	**EMUL16/300–PC/ BDM–HLD16**
BDM with CPU32 and CPU32+	CPU32 or CPU32+ debugger with hardware and EMUL300–PC/HLD software. Includes the EMUL/LC–ISA, a cable, the EMUL–PC/LC–POD (BDM pod) and the EMUL16/300–PC/BDM User Guide. Note: will not work in the HSP box.	**EMUL16/300–PC/ BDM–HLD300**
16 EPC	Includes the Emulator Parallel Cable (EMUL–PC/EPC), which allows the PC to communicate with the pod through the standard PC parallel port, the EMUL–PC/EPC–POD, and the power supply (SA052A412051P). Also includes Seehau-16 high-level debugger software for CPU16, a 2.4 amp power supply and the EMUL16/300–PC/BDM User Guide.	**EMUL16/ EPC-BDM**
300 EPC	Includes the Emulator Parallel Cable (EMUL–PC/EPC), which allows the PC to communicate with the pod through the standard PC parallel port, the EMUL–PC/EPC–POD, and the power supply (SA052A412051P). Also includes Seehau-300 high-level debugger software for CPU16, a 2.4 amp power supply and the EMUL16/300–PC/BDM User Guide.	**EMUL300/ EPC-BDM**

PH:(650) 375-0409   **Fax:**(650) 375-8666 **Email:**sales@icetech.com **Web**:www.icetech.com.com

Background Mode Debuggers (cont.)

The BDM does not support a trace buffer (execution history), data write shadow RAM, emulation memory or Dynamic Data Exchange. For those features, consider the Nohau EMUL16/300–PC in-circuit emulator.

Upgrade path: Upon return of a Nohau EMUL16/300–PC/BDM system, 90% of its **current listed price** can be used toward the purchase price of an EMUL16/300–PC in-circuit emulator board and pod, with a one-year warranty from the date of the upgrade included. This offer is only valid for units in good working condition as judged by Nohau Corporation.

BDM Pod Boards

25-pin BDM interface to 10-pin Berg connector. Includes BDM status indicator LEDs.	**EMUL-PC/EPC-Pod**

Target Systems

The EMUL16/300-PC/BDM system requires a working target board. It can either be the user's working target board or one of the following Nohau target boards. Unless otherwise noted, the target board has a processor, an oscillator, 32KBytes of RAM and a Background Debug Mode (BDM) connector. The RAM is connected to CSBOOT and works only in 8-bit mode. The board has an open array of holes for prototyping and wire-wrap experimenting. Power to the target board can be supplied from the EMUL16/300–PC/BDM.

68HC16Z1	Target board for 16-MHz 68HC16Z1.	**EMUL16/300-PC/ BDM-TRG16Z1**
68HC16Z2	Target board for 16-MHz 68HC16Z2. Contact Nohau for availability.	**EMUL16/300-PC/ BDM-TRG16Z2**
68331	Target board for 16-MHz 68331.	**EMUL16/300-PC/ BDM-TRG331**
68332	Target board for 16-MHz 68332.	**EMUL16/300-PC/ BDM-TRG332**
68F333	Target board for 16-MHz 68F333. Contact Nohau for availability.	**EMUL16/300-PC/ BDM-TRG333**
68340	Target board for 16-MHz 68340.	**EMUL16/300-PC/ BDM-TRG340**

PH:(650) 375-0409   **Fax:**(650) 375-8666 **Email:**sales@icetech.com **Web**:www.icetech.com.com

Communication Interfaces

The High Speed Parallel Box lets you use the in-circuit emulator and optional trace board where no ISA slots are available. This option runs through a standard PC parallel port while keeping the port available for regular printing use.

EPC Cable   Additional Emulator Parallel Cable (EPC). This high speed interface device communicates   **EMUL–PC / EPC**
with the pod through the standard PC parallel port (LPTx).

HSP Box   The high speed parallel box (HSP) chassis, the communications interface which consists of: **EMUL-PC/BOX-**
the HSP ISA card (CARD-HSP) and the cable (CBL-HSP), connect to the PC LPT port.   **HSP**
Note: Will not work with old ISA-BDM Debuggers.

HSP ISA card   The communications interface [HSP ISA card (CARD-HSP) and cable (CBL-HSP)] for an   **EMUL-PC/SET-**
and cable   existing ISA chassis.   **HSP**

NOHAU
A World Leader in Supplying
8-, 16- and 32-bit In-circuit Emulators

PH:(650) 375-0409   Fax:(650) 375-8666 Email:sales@icetech.com Web:www.icetech.com.com

Emulator to Target Adapters and Accessories

100-Pin Adapters

Part Number	Microcontroller used with				
ET/EPP-100-QF49W	16S2				
EMUL16/300-PC/ADP-EVO	167V1				

100-pin adapter	An adapter to solder to 100-pin QFP surface mount device pads with 0.5mm pitch. Used with the 16S2 CPU.	**ET/EPP-100-QF49W**
100-pin adapter	An active adapter to be used for 68HC16V1 with POD-16Z1. Requires a 44-pin PLCC socket in the target. Used with the 167V1 CPU.	**EMUL16/300-PC/ADP-EVO**

120-Pin Adapters

Part Number	Microcontroller used with				
EMUL16/300-PC/AX5120QF05W	16X1/916 X1				
EMUL16/300-PC/EPP120-F70-C/DSM	16X1/916 X1				

120-pin adapter top	The top portion of an adapter to plug into a 120-pin QFP socket. To complete the adapter, the bottom half (EMUL16/300-PC/EPP120-F70-C/DSM) is needed and it is listed below. Used with the 16X1/916X1 CPU.	**EMUL16/300-PC/AX5120QF05W**
120-pin adapter bottom	The bottom portion of the adapter listed above (EMUL16/300-PC/AX5120QF05W). Used with the 16X1/916X1 CPU.	**EMUL16/300-PC/EPP120-F70-C/DSM**

* Denotes new item since last price list. Prices valid in the U.S.A. only.

NOHAU

A World Leader in Supplying
8-, 16- and 32-bit In-circuit Emulators

PH:(650) 375-0409   **Fax:**(650) 375-8666   **Email:**sales@icetech.com **Web**:www.icetech.com.com

Emulator to Target Adapters and Accessories (Continued)

132-Pin and 133-Pin Adapters

Part Number	Microcontroller used with						
ET/EP5-132-QF03T	16Z/16Z2	331	332	334	336		
ET/EPP-132-QF03-LG	16Z/16Z2	331	332	334	336		
EMUL16/300-PC/QFP132CLIP	16Z/16Z2	331	332	334	336		
EMUL16/300-PC/ADP-332PGA	331	332			336		
SAMTEC/SSQ-117-03-GD	16X1/ 916X1	16Z1/16Z2	CM16Z1/ CK16Z1	331	332	334	336

132-pin adapter	An adapter to plug into a 132-pin TEXTOOL socket. (3M/TEXTOOL P/N 2-0132-07244-075-018-007)	**ET/EP5-132-QF03T**
132-pin QFP adapter	An adapter to solder to 132-pin Quad flat pack (QFP) surface-mount device (SMT) pads with 0.025 inch pitch.	**ET/EPP-132-QF03-LG**
132-pin QFP adapter	A clip-over adapter for a 132-pin Quad flat pack (QFP) surface-mount device (SMT) with 0.025 inch pitch.	**EMUL16/300-PC/QFP132CLIP**
132-pin adapter	An adapter to plug into a 132-pin PGA socket.	**EMUL16/300-PC/ADP-332PGA**
34-pin extender	A 34-pin (2 x 17) extender strip to raise the height of the pod. Sold individually; use four strips per layer. Each layer of four strips elevates the pod approximately 0.5 inches (12mm).	**SAMTEC/SSQ-117-03-GD**

PH:(650) 375-0409   Fax:(650) 375-8666   Email:sales@icetech.com   Web:www.icetech.com.com

Emulator to Target Adapters and Accessories (Continued)

144-Pin and 145-Pin Adapters

Part Number	Microcontroller used with:						
EMUL16/300-PC/ADP-144-065-SM	340						
EMUL16/300-PC/ADP-144-050-SM	338						
EMUL16/300-PC/ADP-16Z1-SQFP	16Z1/16Z2	CM16Z1/ CK16Z2					
EMUL16/300-PC/ADP-332-SQFP	331	332					
EMUL16/300-PC/ADP-340PGA	340						
EMUL16/300-PC/ADP-340-050-SM	340						
ET/CLIP-144-QF10-BC	340						
ES/110-1240-00	332						

144-Pin PQFP adapter	An adapter to solder to 144-pin PQFP surface mount device (SMD) pads with 0.65mm pitch.	**EMUL16/300-PC/ ADP-144-065-SM**
144-Pin TQFP adapter	An adapter to solder to 144-pin TQFP surface mount device (SMD) pads with 0.50mm pitch. This adapter is not for use with POD-340.	**EMUL16/300-PC/ ADP-144-050-SM**
144-Pin TQFP adapter	An adapter to solder to the pads in place of the 144-pin TQFP (thin QFP) SMD with 0.50mm pitch.	**EMUL16/300-PC/ ADP-16Z1-SQFP**
144-Pin QFP adapter	An adapter to solder to the pads in place of the 144-pin Small QFP SMD with 0.50mm pitch.	**EMUL16/300-PC/ ADP-332-SQFP**
144-Pin adapter	An adapter to plug into a 144-pin PGA socket.	**EMUL16/300-PC/ ADP-340PGA**
144-Pin TQFP adapter	An adapter to solder to a 44-pin TQFP (thin QFP), with 0.50mm pitch.	**EMUL16/300-PC/ ADP-340-050-SM**
Clip-over QFP adapter	A clip-over adapter for a 144-pin QFP SMD with 0.65mm pitch.	**ET/CLIP-144-QF10-BC**
Clip-over adapter	A clip-over adapter for the 68332. 144-pin PQFP with 0.50mm pitch.	**ES/110-1240-00**

PH:(650) 375-0409   **Fax:**(650) 375-8666 **Email:**sales@icetech.com **Web:**www.icetech.com.com

Emulator to Target Adapters and Accessories (Continued)

160-Pin adapters

Part Number	Microcontroller used with						
ET/EPP-160-QF07-W	16Y1/916 Y1	333	336	341	376		
ET/EPP-160-QF07-SM	16Y1/916 Y1	333	336	341	376		
ET/CLIP-160-QF07-B	16Y1/916 Y1	333	336	341	376		
SAMTEC/SSQ-120-036D	16Y1/916 Y1	333	336	341	376		

160-pin QFP adapter	An adapter that solders to 160-pin QFP surface mount device (SMD) pads. It includes one solder down base, part # ET/EPP-160-QF07-SM. Additional bases are available separately.	**ET/EPP-160-QF07-W**
160-pin adapter base	An additional solder down base for part # ET/EPP-160-QF07-W.	**ET/EPP-160-QF07-SM**
Clip-over QFP adapter	A clip-over adapter for 160-pin plastic QFP SMD. Not recommended for ceramic packages.	**ET/CLIP-160-QF07-B**
Extenders	A 40-pin (2 X 20) extender strip to raise the height of the pod. Sold individually; use four strips per layer. Each layer of four strips elevates the pod approximately 0.5 inches (12mm).	**SAMTEC/SSQ-120-036D**

Accessories

Set of isolator strips	A set of four isolator strips that can be inserted between the pod and the adapter, with individual DIP switches for each pin. This is useful for diagnosing signal conflicts between the pod and the target.	**EMUL–PC/ ISO–160**
5-foot replacement cable	Replacement 5-foot pod cable.	**EMUL–PC/ CBL5–A**
6-amp power supply	6-amp power supply. Required with EMUL16/EPC and EMUL300/EPC if 200mA is not available from target supply.	**CUP4510SHORT**

* Denotes new item since last price list. Prices valid in the U.S.A. only.

PH:(650) 375-0409 **Fax:**(650) 375-8666 **Email:**sales@icetech.com **Web**:www.icetech.com.com

Software Support Packages

Compiler Packages

In addition to the specific products listed, Nohau sells all of the regular software packages listed on each vendor's respective price list, excluding updates and upgrades.

Altium (formerly Tasking, Inc.)

C-Compilers/ Assembler

InterTools 68XXX Family C Compiler package. Includes C compiler, assembler, linker and EDE.	**TASKING/C682XIDE**

<div align="center">Altium and Tasking are trademarks of Altium</div>

Archimedes Software, Inc.

C-Compilers

Archimedes IDE-6816 C Cross Compiler, Debugger, Simulator for 68HC16, Version 5. This software requires Microsoft* Windows* 95/98/NT. Includes assembler, linker, libraries, make and other utilities.	**ARCHM/ 6816-IDE-V5NT**
Archimedes IDE-683XX C Cross Compiler, Debugger, Simulator for CPU32 microcontrollers. This software requires Microsoft* Windows* 95/98/NT. Includes assembler, linker, libraries, make and other utilities. Version 5.	**ARCHM/ 683X-IDE-V5NT**

<div align="center">Archimedes is a trademark of Archimedes Software, Inc.</div>

COSMIC Software, Inc.

C-Compilers

|	
COSMIC CDSH16 C Cross Compiler for 68HC16. Includes assembler, linker, libraries and debugger utilities.	**COSMIC/ 68HC16–C**
COSMIC CDS3XX C Cross Compiler for 683XX. Includes assembler, linker, libraries and debugger utilities.	**COSMIC/ 68300–C**

<div align="center">COSMIC is a trademark of COSMIC Software, Inc.</div>

RTOS Packages

Micrium, Inc.

MicroC/OS-II RTOS 600 page book by Jean Labrosse. This includes a CD-ROM with source code. ISBN 1-57820-103-9.	**MicroC/OS-II**
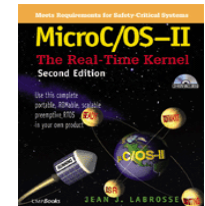
<div align="center">Micrium is a trademark of Micrium, Inc.</div>

Extended Warranties

Purchase of each major EMUL16/300–PC item is covered by a one-year warranty as described elsewhere in this list. At the end of the first year, an additional year of hardware service coverage is available. Coverage must be continuous and is not available if coverage has been allowed to lapse. An additional year of coverage may also be purchased each year at the time an additional paid year's coverage ends. It is the customer's responsibility to renew hardware warranties.

No warranty expiration reminder notices will be sent to customers by Nohau.

Communication interface extended warranty coverage, 1 year

Emulator motherboard extended warranty coverage, 1 year

Pod extended warranty coverage, 1 year

Trace extended warranty coverage, 1 year

Non-Warranty Repairs

Repair service for units beyond an applicable initial one-year warranty period, repairs not covered by that warranty, or for customers who have elected to not carry an extended hardware warranty. The hourly rate includes any parts, if needed (excluding bondouts and some adapters).

Hourly rate

Minimum charge

Maximum charge   One half the purchase price.

PH:(650) 375-0409   **Fax:**(650) 375-8666 **Email:**sales@icetech.com **Web**:www.icetech.com.com

Dell Computer Option

Fully Configured Dell Computer for Your Emulator

In cooperation with Dell Computer Corporation, Nohau offers a complete emulator system. This system will be shipped with the software and hardware (as applicable) installed and tested. Two-week lead time. Available in USA only. No trials or rentals. Subject to Dell Computer Corporation return policy and warranty terms.

See www.dell.com for pricing according to configuration specifications.   **EMUL-PC / DELL**

Setup of Nohau emulator system in Dell computer, including installation and testing.   **EMUL-PC / DELL-SETUP**

How to Order

1. Call Nohau Corporation Technical Support (1-888-886-6428 or 1-408-866-1820) to confirm proper PC configuration needed.

2. Go to: http:/www.dell.com. a. Click on "Small Business".   b. Click on "My Account Login" and enter: Email: sales@nohau.com Password: nohau.   c. Click on the "Systems" tab and choose "Desktops" or "Notebooks".   d. Pick a style of system desired. e. Click on "Customize it" or "View Popular Systems".   f. When satisfied with your selections, click on the "Printable Summary" tab and print a copy for your records. g. Click on "add to cart". h. Click on "Save cart".   i. Exit the Dell website.

3. Choose your Nohau emulator, pod and trace (optional) boards, together with any other hardware or software needed. Issue a purchase order for all pertinent part numbers, including one line item for each Dell system (Part Number: EMUL-PC / DELL) ordered with the corresponding purchase price as shown on your Dell cart sheet.

4. Call Nohau Corporation (1-888-886-6428 or 1-408-866-1820) and ask for the Order Desk.

5. Give the Order Desk attendant your Purchase Order information, together with the Dell cart number for your chosen configuration. Please also fax the printed cart sheet to our Order Department at 1-408-378-8492.

Nohau will place the order with Dell Computer Corporation per your specifications. The system will be shipped to Nohau Corporation for installation and testing of Nohau's hardware and software. When testing is complete, the entire system with emulator installed will be shipped to you. A "Transfer of Ownership" certificate will be mailed to you upon receipt of full payment of your order. Technical support for your Dell system will be provided by Dell Computer Corporation. Technical support for your emulator system will be provided by Nohau Corporation.

Where to get help

For help in configuring your system, choosing an emulator, a pod board, adapters, a trace card or any other items, please contact Nohau or your local representative.

Telephone: (888) 886-6428 or (408) 866-1820	**Sales:** sales@nohau.com
Main Fax: (408) 378-7869	**Support:** support@nohau.com
~Order Department Fax: (408) 378-8492	**Website:** www.nohau.com

~ Please use this fax number to fax purchase orders