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In-Circuit Emulators for the 68HC11 Series

Package Deals

EMUL68, 64 low-cost package	Package includes the following: EMUL68-PC/E-2.1, your choice of pod, EMUL-PC/BOX-HSP, the Getting Started manual, a cable and the Seehau software.	**EMUL68-PC/ 64-LCPKG**
EMUL68, 64 package	Package includes the following: EMUL68-PC/E-2.1, your choice of pod, EMUL68-PC/TR4-2.1, EMUL-PC/BOX-HSP, the Getting Started manual, a cable and the Seehau software.	**EMUL68-PC/ 64-PKG**
EMUL68, 256 package	Package includes the following: EMUL68-PC/EB256-4.0, your choice of pod, EMUL68-PC/ETR64-4.0, EMUL-PC/BOX-HSP, the Getting Started manual, a cable and the Seehau software.	**EMUL68-PC/ ENHANCED- 256-PKG**

These packages are available while supplies last. Please note that the adapters are sold separately. Refer to pages 13-19 in this price list for the adapters.

Examples of How to Order EMUL68 Systems

Listed below are examples of what parts to order for your EMUL68 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 68 derivative, select the same component type for that derivative. The following 68 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.icetech.com/reps, or Nohau technical support: support@icetech.com or sales@icetech.com.

HC11FL0 system

EMUL68-PC/EB1M-4.0	Emulator board
EMUL68-PC/TR16-4.0	Trace board
POD-11-FL0-4.0	Pod board
EMUL-PC/BOX-HSP	Communications Interface
EDI/104NC/100QFS20-TOP-HC11FL0	Target adapter

HC11E system

EMUL68-PC/EB256-3.3	Emulator board
EMUL68-PC/ETR64-3.3	Trace board
POD-11E-PLCC-3.0	Pod board
EMUL-PC/BOX-HSP	Communications Interface

The system will also include the power supply, a BNC trace trigger cable, trace probe set, the User Guide and the Seehau Debugger software. If you need assistance please contact your local rep, www.icetech.com/reps.html, or Nohau technical support: support@icetech.com.

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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. Any US dollar prices shown are valid in the USA only.

What an emulator is and what it does

An emulator is a scientific device used by engineers to design their computers faster and more accurately. 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.

Types of Trace Cards

The EMUL68-PC has two optional trace cards available. The standard trace (EMUL68-PC/TRxxx) records the history of execution, has two levels of triggering or filtering on addresses, data values and cycle type or external inputs, time stamping with prescaler; loop event counter and program performance analysis. The enhanced trace (EMUL68-PC/ETRxxx) adds, up to 8 levels of triggering, state and delay counters, a filter delay, trace search, Shadow Ram, and 1 MB Code Coverage.

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 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 and 2000. For more information about the benefits of Seehau, see www.icetech.com for the latest data sheets or call your Nohau rep.

EMUL68-PC Parts

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Product Support Table

POD-11E/S	POD-11DE/S	POD-11FE	POD-11FL0	POD-11KE/KS
68HC11A0	68HC11D0	68HC11F1	68HC11FL0	68HC11K0
68HC11A1	68HC11ED0			68HC11K1
68HC11A7	68HC11D3			68HC11K3
68HC11A8	68HC711D3			68HC11K4
68HC11E0				68HC711K4
68HC11E1				
68HC811E2				
68HC11E8				
68HC11E9				
68HC711E9				
68HC11E20				
68HC711E20				

* Note: For 3.3 V support please contact Nohau technical support.

General Features

The emulator parts

The basic Nohau 68HC11 emulator consists of an ISA emulator, a pod board and the debugger software (Seehau). You can run this system stand-alone without any target hardware. Add a target adapter and you can run in your target board. Add an optional ISA trace card and you can trigger and record CPU instructions and their bus operations.

Connecting to the PC and the software Seehau

The emulator plugs into an ISA slot in a Windows based PC. This can either be inside the PC or inside our external HSP box. The High Speed Parallel (HSP) box would then plug into the parallel port of your PC or lap top. The 5-foot ribbon cable would then plug into the emulator board and stick out the back of the PC or HSP box. The other end of the ribbon cable would plug into the POD. The Seehau debugger software that is installed on the PC controls the emulator and provides the graphical user interface (GUI). The trace card is optional and can be added later according to your needs and budget.

Target adapter basics

Nohau provides many types of target adapters to connect the emulator to your target board. The two options are solder-down adapters or the PLCC plug adapter. In both cases, the 68HC11 processor must not be mounted on the target board since an 68HC11 cannot be tri-stated. A target 68HC11 and the emulator will conflict with each other preventing operation.

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 68HC11. Nohau supports all the 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 Support Packages section in this document. Nohau also distributes Real Time Operating System (RTOS) packages. Contact your local Nohau rep for other embedded components they offer.

Clock and bus speeds

There are two ways to specify the speed of a Motorola 68HC11 processor. One is clock speed, also referred to as "E-clock", and the other is bus speed. Typically the E-clock speed is one-fourth the crystal speed. A 4-MHz bus speed translates to a 16-MHz clock speed.

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General Features (Continued)

What parts do I need to order?

A 68HC11 emulator system consists of the emulator board, a pod board and a trace board for PC's with ISA slots. For other PCs or notebook computers you will need an HSP box. A target adapter will normally be needed to connect the emulator to the target system. There are various flavors 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.

EMUL68 with HSP Box

Minimum System Requirements

Pentium 200 or higher

2x or better CD ROM

40 MB Free Hard Disk Space

Windows 95, 98, ME, 2000, or NT

RAM for Windows 95/98 /ME: 64MB

RAM for Windows NT/2000: 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.icetech.com/documents and then select either the Technical Publications link, the Technical Applications link or the Nohau Manual link.

Materials listed under the Technical Publications link:

Software Engineers Guide to In-circuit Emulation for Motorola Microcontrollers.

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

Materials listed under the Technical Applications link:

Case Studies - Connecting to Targets.

EMUL68 User Guide

The EMUL68 user guide is located under the Nohau Manuals, select the EMUL68 User Guide.

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Emulator Motherboards

General Features

E-Clock Rating	Maximum XTAL Frequency
2.1 MHz	8.4 MHz
3.0 MHz	12.0 MHz
3.3 MHz	13.2 MHz
4.0 MHz	16.0 MHz

Speed specifications are for E-clock frequencies. The maximum external oscillator frequency is four times the E-clock frequency. Higher-frequency ratings cover all lower frequencies.

General Emulator Description

This is a plug-in board for ISA bus PC compatible computer or the Nohau HSP box that includes the five-foot ribbon cable used to connect the emulator to the POD. To operate, the emulator must be connected to a POD (order separately). The emulator also includes Nohau Seehau68 Windows emulator operating software that runs the emulator, PODs, optional trace boards and box options. The Seehau software has high-level debug capability for supported compilers. See the "Software Support Packages" section for assemblers, compilers, and simulators.

Emulation Memory options

There are three emulation memory sizes available. The 64K Standard emulator has 64K of memory that can be mapped to the emulator or target with 4 kilobyte resolution. The 256K and 1M Bankswitch emulator has 256K or 1M of memory that can be mapped to the emulator or target with 64 byte resolution.

64K Standard Emulators

2.1 MHz with 64K memory

This emulator operates at E-clock speeds up to 2.1 MHz. It has 64K of emulation memory to be used for code or data. **EMUL68-PC/E-2.1**

3.3 MHz with 64K memory

This emulator operates at E-clock speeds up to 3.3 MHz. It has 64K of emulation memory to be used for code or data. **EMUL68-PC/E-3.3**

4.0 MHz with 64K memory

This emulator operates at E-clock speeds up to 4.0 MHz. It has 64K of emulation memory to be used for code or data. **EMUL68-PC/E-4.0**

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Emulator Motherboards (Continued)

256K Bankswitch Emulators

2.1 MHz bank-switching with 256K memory	This bankswitching emulator operates at E-clock speeds up to 2.1 MHz. It has 256K of emulation memory to be used for code or data.	**EMUL68-PC/ EB256-2.1**
3.3 MHz bank-switching with 256K memory	This bankswitching emulator operates at E-clock speeds up to 3.3 MHz. It has 256K of emulation memory to be used for code or data.	**EMUL68-PC/ EB256-3.3**
4.0 MHz bank-switching with 256K memory	This bankswitching emulator operates at E-clock speeds up to 4.0 MHz. It has 256K of emulation memory to be used for code or data.	**EMUL68-PC/ EB256-4.0**

1M Bankswitch Emulators

2.1 MHz bank-switching with 1M memory	This bankswitching emulator operates at E-clock speeds up to 2.1 MHz. It has 1M of emulation memory to be used for code or data.	**EMUL68-PC/ EB1M-2.1**
3.3 MHz bank-switching with 1M memory	This bankswitching emulator operates at E-clock speeds up to 3.3 MHz. It has 1M of emulation memory to be used for code or data.	**EMUL68-PC/ EB1M-3.3**
4.0 MHz bank-switching with 1M memory	This bankswitching emulator operates at E-clock speeds up to 4.0 MHz. It has 1M of emulation memory to be used for code or data.	**EMUL68-PC/ EB1M-4.0**

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Trace Options

Optional second PC plug-in board. The emulator board has no trace buffer.

Standard Trace

The trace buffer shows history of execution. There are two condition registers for triggering or filtering on address or data values, cycle type or external inputs. There is also time stamping with prescaler, loop event counter and program performance analysis.

4K Trace Options

2.1 MHz trace	A 2.1 MHz trace with a 4K frame trace buffer.	**EMUL68-PC/ TR4-2.1**
3.3 MHz trace	A 3.3 MHz trace with a 4K frame trace buffer.	**EMUL68-PC/ TR4-3.3**

16K Trace Options

2.1 MHz trace	A 2.1 MHz trace with a 16K frame trace buffer.	**EMUL68-PC/ TR16-2.1**
3.3 MHz trace	A 3.3 MHz trace with a 16K frame trace buffer.	**EMUL68-PC/ TR16-3.3**
4.0 MHz trace	A 4.0 MHz trace with a 16K frame trace buffer.	**EMUL68-PC/ TR16-4.0**

Enhanced Trace

The enhanced trace has all the features of the standard trace, plus 32-bit time stamping with 16-bit prescaler, state and counter functions, filter delay, search, Shadow RAM, 1MB Code Coverage memory and up to 8 levels of trigger conditions. Each frequency step covers all lower steps and may be run at lower frequencies. The ETR requires 32 contiguous I/O addresses. Enhanced trace boards are for PC plug-in or HSP configurations only. The ETR requires use of EMUL68–PC Windows software version 1.0H or later (EMUL68–PC for DOS does not support the ETR) or Seehau.

64K Trace Options

2.1 MHz trace	A 2.1 MHz trace with a 64K enhanced trace memory board.	**EMUL68-PC/ ETR64-2.1**
3.3 MHz trace	A 3.3 MHz trace with a 64K enhanced trace memory board.	**EMUL68-PC/ ETR64-3.3**
4.0 MHz trace	A 4.0 MHz trace with a 64K enhanced trace memory board.	**EMUL68-PC/ETR64-4.0**

256K Trace Options

2.1 MHz trace	A 2.1 MHz trace with a 256K enhanced trace memory board.	**EMUL68-PC/ ETR256-2.1**
3.3 MHz trace	A 3.3 MHz trace with a 256K enhanced trace memory board.	**EMUL68-PC/ ETR256-3.3**
4.0 MHz trace	A 4.0 MHz trace with a 256K enhanced trace memory board.	**EMUL68-PC/ ETR256-4.0**

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Pod Boards

The pod boards support a series of chips as listed in the header. The speed indicates the maximum E Clock frequency, which is ¼ of the crystal frequency. There are two types of pods available. The Single-Chip mode pods are for applications that do not have external memory and uses all the pins for I/O. The expanded mode pods are for applications that have external memory and other peripheral devices.

Low voltage adapters for the EMUL68–PC expanded mode pods are available for the following CPUs: 68L11A, 68L11D, 68L11E, 68L11F, 68L11K, 68L11KA, 68L11L, 68L11P, and 68L11PH. No low voltage adapters are required for the 68L11C or the 68L11FC. Only expanded mode pods are supported. Single-chip pods are not supported. Pods might require user-supplied CPU. Some pods might require additional adapters for target sockets. Recommended voltage for pods requiring low voltage adapters is 3.3 V. Call Nohau for information and availability.

NOTE: IRQ must be level sensitive.

What the part numbers mean

The pod part numbers contain the following information: POD-yyy-xxx-2.1. When the yyy field contains E it is an expanded mode pod. An S indicates a Single-Chip mode pod. When xxx contains PLCC it indicates that it plugs directly into a PLCC socket, DIP here indicates it plugs directly into a 48 Pin DIP, and PGA indicates a PGA adapter is required. The 2.1 indicates the maximum E clock frequency.

A0, A1, A7, A8, E0, E1, 811E2, E8, E9, 711E9, E20 and 711E20 Emulation

This POD board contains a socketed 68HC11A1 PLCC chip and supports the A and E series of the 68HC11 series. The POD crystal is 8.0 MHz on all PODs. There are switches to select the on-board crystal or external crystal (or oscillator). To support 68HC11E, 68HC711E, or 68HC811E, the QILEXT-1 extractor tool is recommended for changing the POD PLCC chip to a user-supplied 68HC11E, 68HC711E or 68HC811E PLCC part. An optional ZIF programming adapter, EMUL68-PC/PLCC52ZIF-PLCC52, is recommended, for easy removal when frequently programming '711E9 PLCC parts in the POD. (See the "Adapter Reference Chart" on pages 13 and 14.)

Note: Some restrictions apply for '711E20 parts, contact Nohau Technical Support for details.

Expanded Mode Pods for PLCC

2.1 MHz pod with a 52-pin PLCC adapter	A 2.1-MHz pod including a 52-pin PLCC adapter for expanded mode only.	**POD-11E-PLCC-2.1**
3.0 MHz pod with a 52-pin PLCC adapter	A 3.0-MHz pod including a 52-pin PLCC adapter for expanded mode only.	**POD-11E-PLCC-3.0**

Expanded Mode Pods for DIP

2.1 MHz pod with a 48-pin DIP adapter	A 2.1-MHz pod including a 48-pin DIP adapter for expanded mode only.	**POD-11E-DIP-2.1**
3.0 MHz pod with a 48-pin DIP adapter	A 3.0-MHz pod including a 48-pin DIP adapter for expanded mode only.	**POD-11E-DIP-3.0**

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Pod Boards (Continued)

A0, A1, A7, A8, E0, E1, 811E2, E8, E9, 711E9, E20 and 711E20 Emulation (Continued)

Single-Chip Mode Pods for PLCC

2.1 MHz pod with a 52-pin PLCC adapter	A 2.1-MHz pod including a 52-pin PLCC adapter for single-chip mode.	**POD-11S-PLCC-2.1**
3.0 MHz pod with a 52-pin PLCC adapter	A 3.0-MHz pod including a 52-pin PLCC adapter for single-chip mode.	**POD-11S-PLCC-3.0**

Single-Chip Mode Pods for DIP

2.1 MHz pod with a 48-pin DIP adapter	A 2.1-MHz pod including a 48-pin DIP adapter for single-chip mode.	**POD-11S-DIP-2.1**
3.0 MHz pod with a 48-pin DIP adapter	A 3.0-MHz pod including a 48-pin DIP adapter for single-chip mode.	**POD-11S-DIP-3.0**

'D0, 'ED0, 'D3 and '711D3 Emulation

This POD board supports the D series of the 68HC11series. The POD crystal is 8.0 MHz on all PODs. There are jumpers to select the on-board crystal or external crystal (or oscillator). The POD board contains a socketed 68HC11D3 PLCC chip. To support the 68HC11ED0, or to program user supplied 68HC711D3 chips, the QILEXT-1 extractor tool is recommended for removing the PLCC chip from the pod. An optional ZIF programming adapter, EMUL68-PC/PLCC44ZIF-PLCC44, is recommended, for easy removal when frequently programming '711D3 PLCC parts in the POD. (See the "Adapter Reference Chart" on pages 13 and 14.)

Expanded Mode Pods

2.1 MHz expanded mode pod	A 2.1-MHz pod for the 68HC11D in expanded mode (44-pin PGA from pod).	**POD-11DE-PGA-2.1**
3.0 MHz expanded mode pod	A 3.0-MHz pod for the 68HC11D in expanded mode (44-pin PGA from pod). The 3.0 MHz 68HC11D3 parts may not be available from Nohau. In that case the pod is tested with a 3.0-MHz sample, then shipped with 2.1 MHz rated 68HC11D3.	**POD-11DE-PGA-3.0**

Single-Chip Mode Pods

Port lines PD6 and PD7 may only be used as output lines from these pods. PD6 and PD7 will not work as inputs to these pods.

2.1 MHz single-chip mode pod	A 2.1-MHz pod for the 68HC11D in single-chip mode (44-pin PGA from pod).	**POD-11DS-PGA-2.1**
3.0 MHz single-chip mode pod	A 3.0-MHz pod for the 68HC11D in single-chip mode (44-pin PGA from pod). The 3.0 MHz 68HC11D3 parts may not be available from Nohau. In that case the pod is tested with a 3.0-MHz sample, then shipped with 2.1 MHz rated 68HC11D3.	**POD-11DS-PGA-3.0**

Pod Boards (Continued)

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'F1 Emulation

This POD board supports the 68HC11F1. The POD crystal is 8.0 MHz on all PODs. There are jumpers to select the on-board crystal or external crystal (or oscillator). The POD board contains a socketed 68HC11F1 PLCC chip. An optional PGA-to-PLCC adapter, EMUL68-PC/PGA68-PLCC68, is required to plug the POD into target PLCC socket. (See the "Adapter Reference Chart" on pages 13 and 14.)

2.1 MHz expanded mode pod	A 2.1-MHz pod for the 68HC11F1 expanded mode (68-pin PGA from pod).	**POD-11FE-PGA-2.1**
3.0 MHz expanded mode pod	A 4.0-MHz pod for the 68HC11F1 expanded mode (68-pin PGA from pod).	**POD-11FE-PGA-4.0**

'FL0 Emulation

This POD board supports the 68HC11FL0. The POD crystal is 8.0 MHz on all PODs. There are jumpers to select the on-board crystal or external crystal (or oscillator). The POD board contains a soldered in 68HC11F1 PLCC chip. The connector on the POD is a 104-pin PGA.

Requires EDI/104NC/100QFS20-TOP-HC11FL0 and EDI100QFS20-SD adapter for the 100-pin QFP target. (See the “Emulator to target adapter” section on page 17.)

4.0 MHz expanded mode pod	A 4.0-MHz pod for the 68HC11FL0 expanded mode. The 4.0 MHz is the most ordered model.	**POD-11FL0-4.0**

K0, 'K1, 'K3, 'K4 and '711K4 Emulation

This POD board supports the K series of the 68HC11series. The POD crystal is 8.0 MHz on all PODs. There are jumpers to select the on-board crystal or external crystal (or oscillator). The POD board contains a socketed 68HC11K4 PLCC chip. The connector on the POD is an 84-pin PGA. An optional PGA-to-PLCC adapter, EMUL68-PC/PGA84-PLCC84, is required to plug the POD into a target PLCC socket, or use the EDI/84PG/80QFS26-HC11K4 for a target with an 80 pin QFP (solder down). (See the "Adapter Reference Chart" on pages 13 and 14.) An optional ZIF programming adapter, EMUL68-PC/PLCC84ZIF-PLCC84, is recommended for frequent programming '711K parts in the POD.

Expanded Mode Pods

*	3.0 MHz K series	A 3.0-MHz pod for the 68HC11K or 68HC711K in expanded mode.	**POD-11KE-PGA-3.0**
	4.0 MHz K series	A 4.0-MHz pod for the 68HC11K or 68HC711K in expanded mode.	**POD-11KE-PGA-4.0**

Single-Chip Mode Pods

Port line PG7 can be used only as an output line from these pods. PG7 does not work as an input to these pods.

3.0 MHz K series	A 3.0-MHz pod for the 68HC11K or 68HC711K in single-chip mode.	**POD-11KS-PGA-3.0**
4.0 MHz K series	A 4.0-MHz pod for the 68HC11K or 68HC711K in single-chip mode.	**POD-11KS-PGA-4.0**

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Pod Boards (Continued)

'KA0, 'KA1, 'KA2, 'KA3, 'KA4, '711KA2 and '711KA4 Emulation

Expanded Mode Pods

3.0 MHz PLCC 68 KA	A 3.0-MHz pod for the 68HC11K or 68HC711K in expanded mode including the adapter EMUL68-PC/PGA84-PLCC68-KA4.	**POD-11KAE-PLCC-68-3.0**
4.0 MHz PLCC 68 KA	A 4.0-MHz pod for the 68HC11K or 68HC711K in expanded mode including the adapter EMUL68-PC/PGA84-PLCC68-KA4.	**POD-11KAE-PLCC-68-4.0**

Single-Chip Mode Pods

Port line PG7 can be used only as an output line from these pods. PG7 does not work as an input to these pods.

3.0 MHz PLCC 68 KA	A 3.0-MHz pod for the 68HC11K or 68HC711K in single-chip mode including the adapter EMUL68-PC/PGA84-PLCC68-KA4.	**POD-11KAS-PLCC-68-3.0**
4.0 MHz PLCC 68 KA	A 4.0-MHz pod for the 68HC11K or 68HC711K in single-chip mode including the adapter EMUL68-PC/PGA84-PLCC68-KA4.	**POD-11KAS-PLCC-68-4.0**

'P1, 'P2, '711P2, 'PH8 and '711PH8 Emulation

This POD board supports the P series of the 68HC11 series. The POD crystal is 8.0 MHz on all PODs. There are jumpers to select the on-board crystal or external crystal (or oscillator). The POD board contains a socketed 68HC11P1 PLCC chip. The connector on the POD is an 84-pin PGA. An optional PGA-to-PLCC adapter, EMUL68-PC/PGA84-PLCC84, is required to plug the POD into a target PLCC socket, or use the EDI/84PG/80QFS26-HC11K4 for a target with an 80 pin QFP (solder down). (See the "Adapter Reference Chart" on pages 13 and 14.) Contact Nohau Technical Support for 32-KHz PLL support.

Expanded Mode Pods

3.0 MHz expanded mode pod	A 3.0-MHz pod for the 68HC11P and 68HC711P in expanded mode.	**POD-11PE-PGA-3.0**
4.0 MHz expanded mode pod	A 4.0-MHz pod for the 68HC11P and 68HC711P in expanded mode.	**POD-11PE-PGA-4.0**

Single-Chip Mode Pods

Port line PG7 can be used only as an output line from these pods. PG7 does not work as an input to these pods.

3.0 MHz single-chip mode pod	A 3.0-MHz pod for the 68HC11P and 68HC711P in single-chip mode.	**POD-11PS-PGA-3.0**
4.0 MHz single-chip mode pod	A 4.0-MHz pod for the 68HC11P and 68HC711P in single-chip mode.	**POD-11PS-PGA-4.0**

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Communication Interfaces

One of these communication interfaces is used for PC's without ISA slots or with notebook PC's. The interface is also used when no ISA slots are present in the PC or in the notebook PC. The communication interface includes a cable that connects the PC to the emulator system.

The High Speed Parallel Box lets you use the in-circuit emulator and optional trace board rather then installing them inside your PC. Connects to the host computer's printer port.

HSP Box	Includes high speed parallel box chassis, box board card (CARD-HSP) and cable for connection to PC's printer port.	**EMUL-PC/BOX-HSP**

HSP card and cable to convert a serial box to an HSP box.	Includes box board card (CARD-HSP) and cable. This product is for converting a serial box to a high speed parallel box.	**EMUL-PC/SET-HSP**

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Emulator to Target Adapters, Programming Adapters and Accessories

Adapter Reference Chart

	A0, A1, A7, A8, E0, E1, 811E2, E8 E9, 711E9, E20, 711E20 Descriptions on page 15	D0, ED0, D3, 711D3 Descriptions on page 16	F1 Descriptions on page 17	FL0 Descriptions on page 17
Solder-down adapters	EDI/52PL/QFS26-SD 52 pin QFP	EDI/44PG/QFS31-SD 44 pin QFP	EDI/68PG/64QFS31-HC11F1 64 pin QFP	EDI/104NC/100QFS20- 100 pin QFP
	EDI/52PL/QFS39-SD-HC11E9 52 pin QFP		EDI/68PG/80QFS26-HC11F1 80 pin QFP	
	EDI/52PL/64QFS31-SD-HC11E9 64 pin QFP			
Socket adapters		EMUL68-PC/PGA44-PLCC44 44 pin PLCC	EMUL68-PC/PGA68-PLCC68 68 pin PLCC	
		EMUL68-PC/PGA44-DIP40-11D3 40 pin DIP	EMUL68-PC/PGA68-SDIP64 64 pin SDIP	
Isolators and Extenders	EMUL68-PC/PLCC52-ISO 52 pin PLCC	EMUL68-PC/PGA44-PLCC44-EL2 44 pin PLCC	EDI/EXT68PG/PL-1/6R 68 pin PLCC extender cable	
	EMUL68-PC/EXT-DIP48 48 pin DIP 6 inch cable	EMUL68-PC/PGA44-ISO 44 pin PGA	EMUL68-PC/PGA68-ISO-PLCC68 68 pin PLCC	
	EMUL68-PC/EXT-PLCC52 52 pin PLCC 9 inch cable	EDI/EXT44PG/PL-1/6R 44 pin PLCC extender cable		
Programming socket adapters	EMUL68-PC/PLCC52ZIF-PLCC52 52 pin PLCC ZIF	EMUL68-PC/PLCC44ZIF-PLCC44 44 pin PLCC ZIF	EMUL68-PC/PLCC68ZIF-PLCC68 68 pin PLCC ZIF	
Replacement adapters	EDI/52QFS26-SD 52 pin QFP	EDI/44QFS31-SD 44 pin QFP	EDI/64QFS31-SD 64 pin QFP	EDI/104NC/100QFS20- 100 pin QFP
	EMUL68-PC/DIP48-ADAP 48 pin DIP		EDI/80QFS26-SD 80 pin QFP	EDI/100QFS20-SD-V 100 pin QFP
	EMUL68-PC/PLCC52-ADAP 52 pin PLCC			

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Adapter Reference Chart (Continued)

	K0, K1, K4, 711K4	KA0, KA1, KA2, KA3, KA4, 711KA2, 711KA4	P1,P2,711P2, PH8 and 711PH8
	Descriptions on page 18	Descriptions on page 19	Descriptions on page 19
Solder-down adapters	ET/AS-PGA3-QF14-S-68HC11K4 80 pin QFP	EDI/84PG/80QFS 26-HC11K4 80 pin PQFP	
	EDI/84PG/80QFS 26-SD-HC11K4/KA 80 pin QFP	EDI/84PG/80QFS 26-SD-HC11K4/KA 80 pin QFP	
	EDI/84PG/80QFS 26-HC11K4 80 pin QFP		
Socket adapters	EMUL68-PC/PGA84-PLCC84 84 pin PLCC	EDI/84PG/64QFS 31-SD-HC11K4/KA 64 pin QFP	EMUL68-PC/PGA84-PLCC84 84 pin PLCC
		EMUL68-PC/PGA84-PLCC68-KA4 68 pin PLCC	
Isolators and Extenders	EMUL68-PC/PGA84-ISO 84 pin PGA	EMUL68-PC/PGA68-ISO-PLCC68 68 pin PLCC	
	EDI/EXT84PG/PL-2/9R-HC11K4 84 pin PGA		
Programming socket adapters	EMUL68-PC/PLCC84ZIF-PLCC84 84 pin PLCC ZIF	EMUL68-PC/PLCC84ZIF-PLCC84 84 pin PLCC ZIF	
		EDI/68PL/84PL-ZL-KA4/K4 68 pin ZIF	
Replacement adapters		EDI/64QFS31/SD 64 pin QFP	

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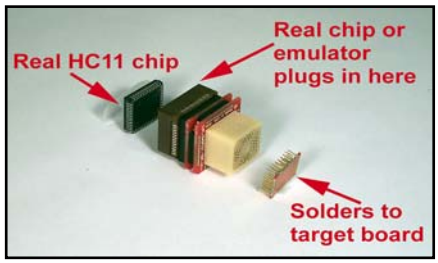
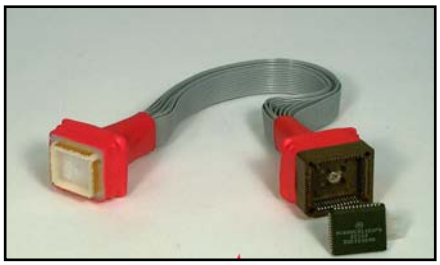
Emulator to Target Adapters, Programming Adapters and Accessories (Continued)

A0, A1, A7, A8, E0, E1, 811E2, E8, E9, 711E9, E20 and 711E20 Adapters





52-pin PLCC to 52-pin QFP adapter	A 52-pin PLCC to 52-pin QFP adapter for the 68HC11E9.	**EDI / 52PL/QFS26-SD**
Replacement QFP square subassembly	A replacement QFP square adapter subassembly, 0.026-inch pitch, solder-down, 52-lead. This adapter solders to an additional target board.	**EDI / 52QFS26-SD**
52-pin PLCC to QFP adapter	A 52-pin PLCC to QFP adapter for the 68HC11E9.	**EDI / 52PL/QFS39-SD-HC11E9**
52-pin PLCC to 64-pin QFP adapter	A 52-pin PLCC to 64-pin QFP adapter for the 68HC11E9.	**EDI / 52PL/64QFS31-SD-HC11E9**
Extender cable for 48-pin DIP	A six-inch extender cable for a 48-pin DIP.	**EMUL68-PC/ EXT-DIP48**
Replacement DIP adapter	A replacement DIP adapter for the POD-11E or POD-11S.	**EMUL68-PC/ DIP48-ADAP**
Extender cable for 52-pin PLCC	A nine-inch extender cable for the 52-pin PLCC.	**EMUL68-PC/ EXT-PLCC52**
52-pin PLCC to 52-pin PLCC isolator	A 52-pin PLCC to 52-pin PLCC isolator adapter.	**EMUL68-PC/ PLCC52-ISO**
Replacement PLCC adapter	A replacement PLCC adapter for the POD-11E or POD-11S.	**EMUL68-PC/ PLCC52-ADAP**
Programming adapter	A programming adapter, Zero Insertion Force, for programming EPROM of 52-pin PLCC parts in POD-11E/-11S-DIP/-PLCC. User supplies external Vpp.	**EMUL68-PC/ PLCC52ZIF-PLCC52**

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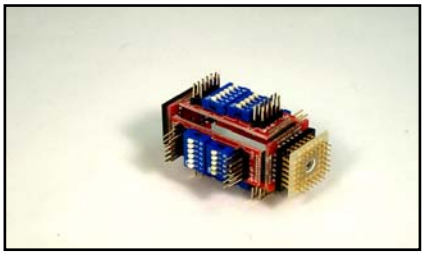
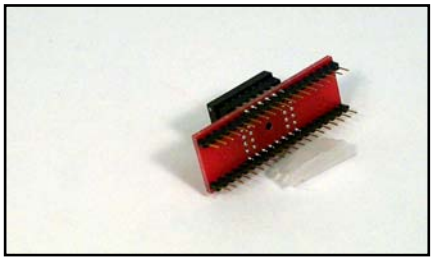
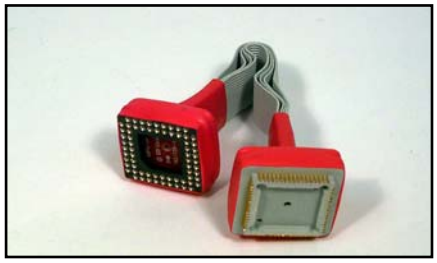
Emulator to Target Adapters, Programming Adapters and Accessories (Continued)

'D0, 'ED0, 'D3 and '711D3 Adapters







44-pin PGA to 44-pin PLCC	A 44-pin PGA socket to 44-pin PLCC plug adapter.	**EMUL68-PC/ PGA44-PLCC44**
44-pin PGA to 40-pin DIP	A 44-pin PGA socket to 40-pin DIP plug adapter.	**EMUL68-PC/ PGA44-DIP40-11D3**
44-pin PGA to 44-pin QFP	A 44-pin PGA socket to 44-pin QFP adapter for the 68HC11D3.	**EDI / 44PG/QFS31-SD**
A replacement QFP square subassembly	A replacement QFP square adapter subassembly, 0.031-inch pitch, solder-down, 44-lead. This adapter solders to an additional target board.	**EDI / 44QFS31-SD**
44-pin PGA t to 44-pin PLCC plug extender	A 44-pin PGA socket to 44-pin PLCC plug extender-adapter with a rigid -2-inch "elevator" or "tower".	**EMUL68-PC/ PGA44-PLCC44-EL2**
44-pin PGA to 44-pin PGA plug isolator	A 44-pin PGA socket to 44-pin PGA plug isolator adapter.	**EMUL68-PC/ PGA44-ISO**
44-pin PGA to 44-pin PLCC plug extender	A 44-pin PGA socket to 44-pin PLCC plug extender cable.	**EDI/ EXT44PG/PL-1/6R**
Programming adapter	A programming adapter, Zero Insertion Force, for programming EPROM of 44-pin PLCC parts in a pod. User supplies external Vpp.	**EMUL68-PC/ PLCC44ZIF-PLCC44**

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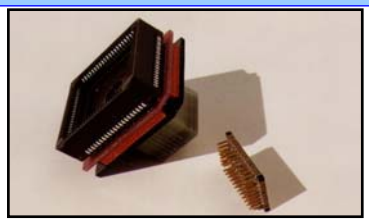
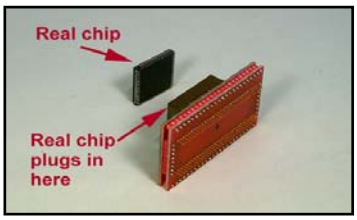
Emulator to Target Adapters, Programming Adapters and Accessories (Continued)

'F1 Adapters





	A 68-pin PGA to 64-pin QFP adapter	A 68-pin PGA socket to 64-pin QFP, square adapter for the POD-11FE-PGA, 0.031-inch pitch. Includes one top and one 64QFS31-SD base to solder to the target.	**EDI/68PG/ 64QFS31-HC11F1**
*	64-pin base replacement	A replacement base for the 64-pin QFP Square 0.031-inch pitch solder down base for the 68PG/64QFS31-HC11F1. This adapter solders to an additional target board.	**EDI/64QFS31-SD**
	A 68-pin PGA to 68-pin PLCC plug	A 68-pin PGA socket to 68-pin PLCC plug EDI/68PG/PL adapter.	**EMUL68-PC/ PGA68-PLCC68**
	A 68-pin PGA to 80-pin QFP	A 68-pin PGA socket to 80-pin QFP, square adapter subassembly for the POD-11FE-PGA, 0.026-inch pitch. Includes one top and one 80QFS26-SD base to solder to target.	**EDI/68PG/ 80QFS26-HC11F1**
	80-pin base replacement	A replacement base for the 80-pin QFP Square 0.026-inch pitch solder down base for the 68PG/80QFS26-HC11F1. This adapter solders to an additional target board.	**EDI/80QFS26-SD**
*	A 68-pin cable	A 68-pin PGA PLCC 6-inch extender cable.	**EDI/EXT68PG/ PL-1/6R**
	68-pin PGA to 68-pin PLCC isolator	A 68-pin PGA socket to 68-pin PLCC plug adapter-isolator.	**EMUL68-PC/ PGA68-ISO-PLCC68**
	64 pin shrink DIP adapter	A 68-pin PGA socket to 64-pin shrink DIP plug adapter.	**EMUL68-PC/ PGA68-SDIP64**
	Programming adapter	A programming adapter, Zero Insertion Force, for programming EPROM of 68-pin PLCC parts in a pod. User supplies external Vpp.	**EMUL68-PC/ PLCC68ZIF-PLCC68**

'FL0 Adapters

*	FL0 100-pin adapter	A 100-pin QFP adapter required for the POD-11FL0-4.0. This adapter is made up of the following parts: EDI/104NC/100QFS20-TOP-HC11FL0 and EDI100QFS20-SD-V.	**EDI/104NC/100QFS20-HC11FL0-V**
	Replacement top half of the adapter	A replacement top of the adapter required for the POD-11FL0-4.0 requires EDI100QFS20-SD.	**EDI/104NC/100QFS20-TOP-HC11FL0**
*	Replacement bottom half of the adapter	A replacement bottom half of the adapter for the FL0 100 pin QFP, solders to the target.	**EDI100QFS20- SD-V**

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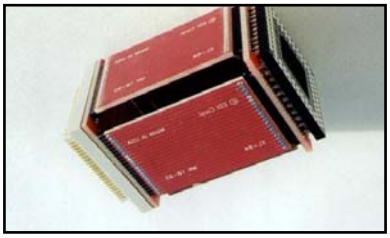
Emulator to Target Adapters, Programming Adapters and Accessories (Continued)

K0, 'K1, 'K3, 'K4 and '711K4 Adapters



84-pin PGA to 80-pin QFP adapter	An 84-pin PGA socket to 80-pin QFP adapter. It solders to the user target board. For use with POD-11KE/11KS-PGA-3.0/4.0.	**ET/ AS-PGA3-QF14S-68HC11K4**
84-pin PGA to 80-pin QFP adapter	An 84-pin PGA socket to 80-pin QFP adapter for the 68HC11K4/KA.	**EDI/ 84PG/80QFS26-SD-HC11K4 / KA**
84-pin PGA to 80-pin QFP adapter	An 84-pin PGA socket to 80-pin QFP adapter subassembly for the 68HC11K4. Includes one top and one 80QFS26-SD base to solder to the target.	**EDI/ 84PG/80QFS26-HC11K4**
84-pin PGA to 84-pin PLCC adapter	An 84-pin PGA socket to 84-pin PLCC plug adapter.	**EMUL68-PC/ PGA84-PLCC84**
84-pin PGA to 84-pin PGA isolator	An 84-pin PGA socket to 84-pin PGA plug isolator adapter.	**EMUL68-PC/ PGA84-ISO**
84-pin PGA to 84-pin PLCC adapter	An 84-pin PGA socket to 84-pin PLCC extender/adapter for the POD-11KE/S.	**EDI/ EXT84PG/PL-2/9R-HC11K4**
Programming adapter	A programming adapter, Zero Insertion Force, for programming EPROM of 84-pin PLCC parts in a pod. User supplies external Vpp.	**EMUL68-PC/ PLCC84ZIF-PLCC84**

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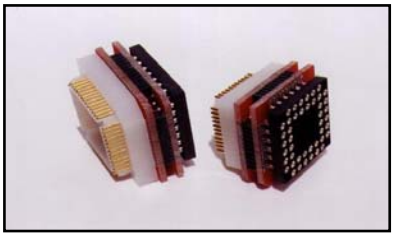
Emulator to Target Adapters, Programming Adapters and Accessories (Continued)

'KA0, 'KA1, 'KA2, 'KA3, 'KA4, '711KA2 and '711KA4 Adapters



84-pin PGA to 64-pin QFP	An 84-pin PGA socket to 64-pin QFP adapter for the 68HC11K4/KA.	**EDI/ 84PG/64QFS31-SD-HC11K4 / KA**
Replacement QFP square subassembly	A replacement QFP square adapter subassembly, 0.031-inch pitch, solder-down, 64-lead. This adapter solders to the additional target board.	**EDI / 64QFS31-SD**
84-pin PGA to 68-pin PLCC	An 84-pin PGA socket to 68-pin PLCC plug adapter, to plug the K pod into the KA target.	**EMUL68-PC/ PGA84-PLCC68-KA4**
68-pin PGA to 68-pin PLCC	A 68-pin PGA socket to 68-pin PLCC plug adapter-isolator.	**EMUL68-PC/ PGA68-ISO-PLCC68**
84-pin PGA to 80-pin QFP adapter	An 84-pin PGA socket to 80-pin QFP adapter for the 68HC11K4/KA.	**EDI/ 84PG/80QFS26-SD-HC11K4 / KA**
84-pin PGA to 80-pin QFP	An 84-pin PGA socket to 80-pin QFP adapter subassembly for the HC11K4. Includes one top and one 80QFS26-SD base to solder to target.	**EDI/ 84PG/80QFS26-HC11K4**

Note: Use either the 68-pin or 84-pin programming adapter listed below with the user-supplied 68HC(7)11KA PLCC chip for complete emulation of all 'KA features.

Programming adapter	A programming adapter, Zero Insertion Force, for programming EPROM of 84-pin PLCC parts in a Pod. User supplies external Vpp.	**EMUL68-PC/PLCC84ZIF-PLCC84**
Programming adapter	A programming adapter, Zero Insertion Force, for programming EPROM of 68-pin 711KA PLCC parts in a POD-11KE/KS. User supplies external Vpp.	**EDI/ 68PL/84PL-ZL-KA4/K4**

'P1, 'P2, '711P2, 'PH8 and '711PH8 Adapters

84-pin PGA to 84-pin PLCC adapter	An 84-pin PGA socket to 84-pin PLCC plug adapter.	**EMUL68-PC/ PGA84-PLCC84**

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Emulator to Target Adapters, Programming Adapters and Accessories (Continued)

Pod Cables

10- foot substitute cable	A substitute 10-foot pod cable for the 5-foot pod cable.		**EMUL68-PC/ CBL-10-S**
Additional 10-foot cable	An additional 10-foot pod cable.		**EMUL68-PC/ CBL-10-A**
5 -foot replacement cable	A replacement 5-foot pod cable.		**EMUL68-PC/ CBL-5-A**

External Trace Leads

E-Z hook wires	E-Z Hook wires for trace.	Each	**EMUL68-PC/ EZ**

PLCC Extractor Tool

Extractor tool	An extractor tool for the PLCC parts.	**QILEXT-1**

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Software Support Packages

Compiler Packages

COSMIC Software, Inc.

Assemblers, Compilers and Linking

C compiler, WIN host HC11 including assembler, linker and librarian. **COSMIC / CDSH11**

C compiler, assembler, linker, librarian and utilities package, PC (32-bit) host (Windows 95/NT). **COSMIC / CWSH11**

Zap Windows HC11 debugger, simulator. DOS, Windows 3.1/95/NT. **COSMIC / ZWNH11SIM**

Hi-Tech

C compiler **Hi-Tech/6801/6301**

HiWare

Assemblers, Compilers and Linking

Code Warrior for the 68HC11 including HiWare Technology tools. Speed your time to market by creating, compiling, linking, assembling, and debugging within a single, integrated development environment. 90 days of support is included. A year of support for this product can be purchased for an additional $785.00. **CodeWarrior/68HC11**

IAR Systems Software, Inc.

Assembler; C Compiler, Linker

C compiler, simulator, assembler, linker and librarian for Win 95/98/NT. **IAR / EW6811**

Introl Corporation

C Compilers, Assemblers

68HC11 C compiler and assembler. Each additional user is $1,000 each. **INTROL / CODE**

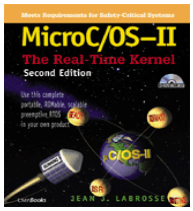
RTOS

CMX Systems

CMX-RTX is a truly preemptive, multi-tasking, RTOS supporting the entire 68HC11 microcontroller series. This RTOS offers the smallest footprint, the fastest context switching times, and the shortest interrupt latency times available on the market today. **68HC11-CMX-RTX**

* Microcross, 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**



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Extended Hardware Warranties

At the end of the initial one year warranty period or an extended warranty period, Nohau will notify purchasers of the opportunity to extend warranty coverage for an additional year. Coverage must be continuous and can not be started after the lapse of coverage.

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

Emulator extended warranty coverage, 1 year	Emulator
Trace extended warranty coverage, 1 year	Trace
Pod extended warranty coverage, 1 year	Pod

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 the part (excluding bondouts and expensive adapters).

* **Hourly rate**	
* **Minimum charge**	
Maximum charge	One half the purchase price.

Discontinued Parts

Some parts are still available for order even though they are discontinued. Please contact Nohau in California for part availability at 800.686.6428 or sales@icetech.com.

POD-11CE-3.0
POD-11FCE-PGA-4.0
POD-11FCE-PGA-6.0
POD-11GE-PGA-2.1
POD-11GS-PGA-2.1
POD-11JE-PGA-2.1
POD-11JE-PGA-3.15
POD-11JS-PGA-2.1
POD-11JS-PGA-3.15
POD-11LE-PGA-2.1
POD-11LE-PGA-3.0
POD-11LS-PGA-2.1
POD-11LS-PGA-3.0

EMUL68-PC/ SDIP64ZIF-PLCC68
ET/ EP5-064-QF29-YAM
ET/ MX-064-QF29-SUB
EDI / 68PG/64QFS31-SD-HC11L6
EDI / 68PG/64QFS31-HC11L6
ET/ EP-064-QF29-SM
EMUL68-PC/ EB512-2.1
EMUL68-PC/ EB512-3.3
EMUL68-PC/ EB512-4.0
EMUL68-PC/ EB256-MODC0-3.3
EMUL68-PC/ E-6.0
INTROL / C11-MSDOS-3HD-2
INTROL / AS11-MSDOS-3HD-1

IAR / ICC6811-DOS
IAR / ICC6811-WIN
EMUL68-PC/ TR16-
EMUL68-PC/ DIP48-ISO
* **MCK/ADP-68PGA/PLCC**

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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.

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Fax: 650.375.8666 **Website:** www.icetech.com