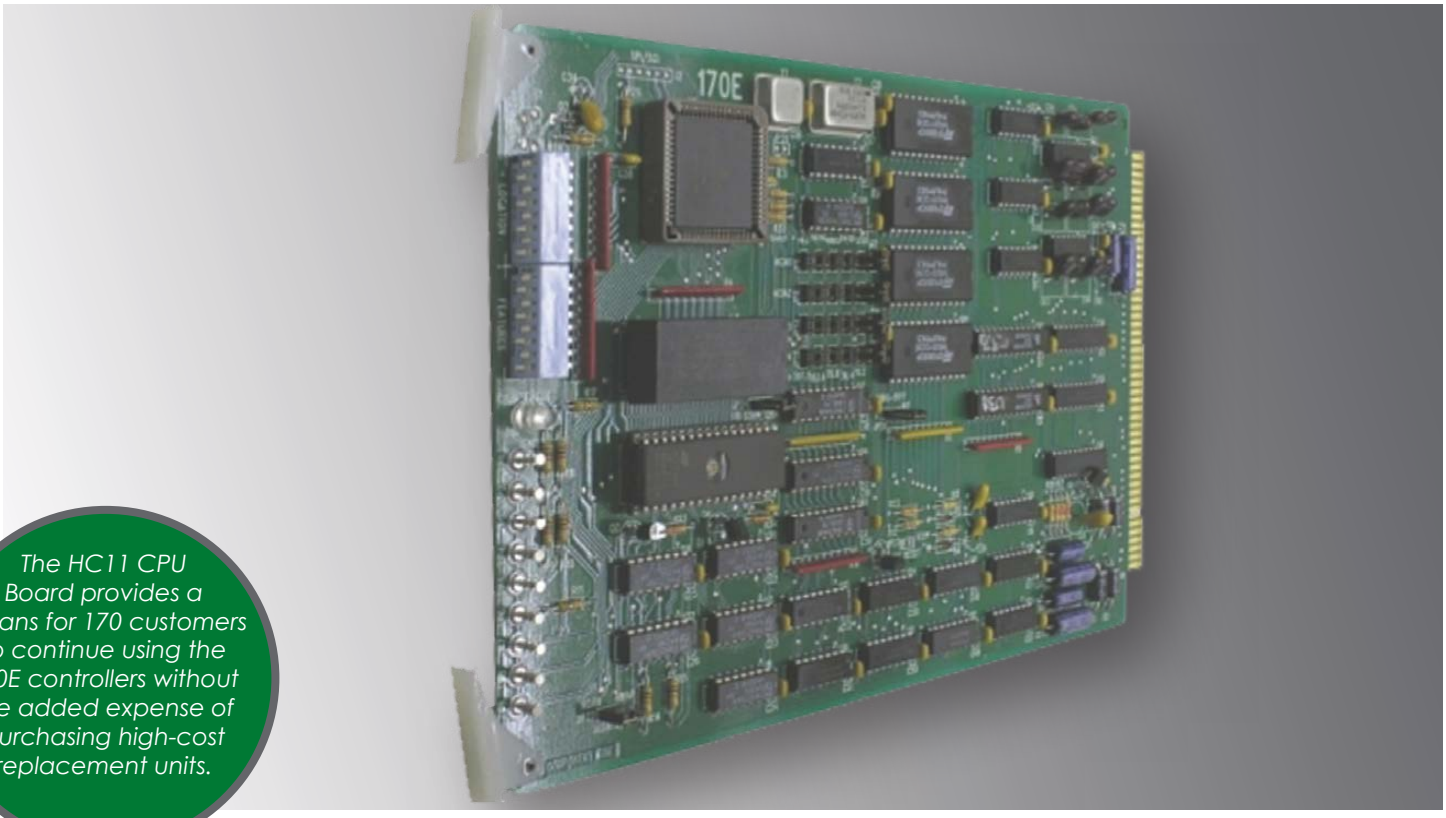
Model HC11 Central Processing Unit (CPU) Board



The HC11 CPU Board provides a means for 170 customers to continue using the 170E controllers without the added expense of purchasing high-cost replacement units.

About the HC-11 Board

The HC11 is code-compatible with the 6800 CPU, uses the same communications chips (6850), and uses the same reset, NMI, and start-up circuitry. It is necessary for the software vendor to modify the start-up vector routines. The HC11 CPU Board provides 32K by 8-bit of contiguous ZRAM, 32K by 8-bit of EPROM, plus an additional 32K by 8-bit of bank-switched EPROM all on the HC11 board. A real-time clock option is available. There is a user-defined memory map for software developers to follow as well as a 4K by 8-bit jumper option to allow transfer of data to a remote dual-port location. Feature and Location switches, normally found on the 412C PROM module, are located on the HC11 CPU Board. There is a software-controlled LED indicator located on the front of the HC11 to monitor operations in addition to a jumper that allows either a 32K or 128K by 8-bit EPROM in a Zero-Insertion Force (ZIF) socket. All power supplies are protected by transorbs on the HC11 CPU Board.

At A Glance

- Replaces 6800 CPU Board in 170E controller
- Uses 68HC11F1 Micro-Processor Unit (MPU) clock frequency of 8MHz
- Provides 64K EPROM and 32K ZRAM
- Uses four Asynchronous Communication Interface Adapters (ACIA) currently supported by Caltrans
- 412C Feature and Location switches are provided

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Description

The Model HC11 CPU Board is designed to replace the 6800 CPU board used in the current 170E controllers. The HC11 easily replaces the 6800 CPU by simply removing the 6800 CPU board and sliding the new Model HC11 CPU Board in the same slot.

Feature & Location Switches

Feature and Location switches are provided on the front portion of the HC11 CPU Board. These switches are in the same position as found on the 412C PROM module. Each switch is an eight-position front reading dip switch. The Feature switch is addressed at $700A and the Location switch is addressed at $7000. Each switch is directly connected to Port E and Port A of the HC11 MPU.

MPU

The MPU is a Motorola 68HC11 F1 or equivalent. The MPU operates at a crystal frequency of 8MHz with a 2.0MHz bus speed.

EPROM

The HC11 CPU Board has a ZIF socket that is jumper-selectable to house either a 32K or a 128K by 8-bit EPROM. When the 128K part is installed, the program has access to an extra 32K by 8-bit via bank switching. The bank is activated by a write-to location $7002 which causes memory to go to the upper 64K of the 128K EPROM. The status of the bank switch is read on the Interrupt Request (IRQ) status register (bit six). The EPROM is mounted in a ZIF socket.

Communications

Four ACIA chips are installed on the HC11 CPU Board. These are the 6850 devices required by the Caltrans specification. These ACIAs operate at a clock frequency of 6.144 MHz. An IRQ status register is provided as specified by Caltrans.

ZRAM

The HC11 CPU Board has a 32K ZRAM with continuous locations from $0000-6FFF and 7600-7FFF which provides the software developer with 32K by 8-bit of zero power RAM. When an optional clock chip is desired, a Dallas 1644 may be installed in the ZRAM position. Clock addresses are in the I/O map locations at $7FF8-7FFF. In addition, a jumper selection allows the switching of location $6000-6FFF (4K) to remote dual-port RAM. The status of the jumper position is read on the IRQ status register (bit five).

LED Indicator

There is one LED indicator located on the front portion of the HC11 CPU Board. This LED is controlled via a software output from Port G (bit 3) of the HC11 MPU.

Features

The HC11 is code-compatible with the 6800 CPU, uses the same communications chips (6850), and uses the same reset, NMI, and start-up circuitry. It is necessary for the software vendor to modify the start-up vector routines. The HC11 CPU Board provides 32K by 8-bit of contiguous ZRAM, 32K by 8-bit of EPROM, plus an additional 32K by 8-bit of bank-switched EPROM all on the HC11 board. A real-time clock option is available. There is a user-defined memory map for software developers to follow as well as a 4K by 8-bit jumper option to allow transfer of data to a remote dual-port location. Feature and Location switches, normally found on the 412C PROM module, are located on the HC11 CPU Board. There is a software-controlled LED indicator located on the front of the HC11 to monitor operations in addition to a jumper that allows either a 32K or 128K by 8-bit EPROM in a Zero-Insertion Force (ZIF) socket. All power supplies are protected by transorbs on the HC11 CPU Board.

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1485 Garden of the Gods Road, Colorado Springs, CO 80907 · 719-599-5600 · sales@safetran-traffic.com · www.safetran-traffic.com