

2070 Advanced Transportation Controller Units are advanced ruggedized field processors and communication systems configurable for a variety of traffic management applications. The controllers are modular in design and permit compatibility with 170, 170E, 2070ATC, and NEMA specified equipment. The EAGLE-built 2070ATC controllers meet and exceed Caltrans 1999 Transportation Electrical Equipment Specifications (TEES) and the Joint AASHTO/ITE/NEMA Advanced Transportation Controller Standard Specification.



Physical Dimensions:		Temperature	Power Consumption	Weight
<i>2070ATC Unit</i>	<i>NEMA Interface Module</i>	-37°C to +74°C -34.6° F to +165° F	25 Watts (typical) 120 Watts (maximum)	2070ATC <11 kg/<25 lb 2070N <14 kg/<31 lb
177mm H x 260mm D x 483mm L 7" H x 10.25" D x 19" L	101mm H x 260mm D x 432mm L 4" H x 10.25" D x 17" L			

Highlights

- Approved by Caltrans - 1999 TEES
- Open Architecture insures compatibility with off-the-shelf products
- VME Hardware (VME chassis not included on the "lite" version)
 - Standard VME interface modules from multiple vendors
 - Standard OS-9™ Operating System
 - Standard software modules from multiple sources
- Added VME boards and software extensions upgrade system easily
- 2 slots available for choice of dual serial, FSK, and fiber optic, EIA232 or 485 modems
- Multitasking - each 2070ATC unit can control multiple applications
- Multiprocessing - each 2070ATC unit can accommodate multiple CPUs
- High speed serial communications to CPU
- Designed and built for unattended operation in harsh environments
- Built-in 10 Base-T Ethernet with IP address on 2070-1B (2070L models)

Models Available

- | | |
|---|--|
| 2070V
Mates to 170 style cabinets,
5-slot VME Cage Assembly,
4-line display
----- | 2070VN1
Mates to TS-1 or
TS-2 Type 2 cabinets,
5-slot VME Cage, 8-line display
----- |
| 2070L
Mates to 170 style cabinets,
Ethernet, 8-line display
----- | 2070VN2
Mates to TS-2 Type 1 cabinet,
5-slot VME Cage, 8-line display
----- |
| 2070LC
Mates to ITS cabinets,
Ethernet, 8-line display
----- | 2070LN2
Mates to TS-2 Type 1 cabinet,
Ethernet, 8-line display
----- |
| 2070LN1
Mates to TS-1 or
TS-2 Type 2 cabinets,
Ethernet, 8-line display
----- | Numerous other configurations
available — contact your dealer.
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Traffic Application Software

- SE-PAC - Proven traffic control software by EAGLE
- SE-MARC - Proven master closed-loop software by EAGLE
- Other - Diagnostic Acceptance Test Software

A Look at the 2070 Advanced Transportation Controller...

Unit Hardware Features

- Metal housing, serial motherboard, single 96 pin DIN connectors for all plug-in boards (2070ATC)
- Three Front Panel options:
 - 2070-3A** — 4 lines, 40 char/line backlighted Liquid-Crystal Display (LCD) (Each character 5mm wide x 10.44mm high)
Two keypads on panel for programming
 - 2070-3B** — 8 lines, 40 char/line backlighted Liquid-Crystal Display (LCD) (Each character 2.65mm wide x 4.24mm high)
Two keypads on panel for programming
 - 2070-3C** — No display, No keypad, No bell
Programming via PC terminal C60 port

Operating System Features

- Standard Microware OS-9™ Multi-tasking and DOS-like commands
- Embedded real time kernel
- Sequential character file manager (SCFMAN)
- Sequential protocol file manager (SPFMAN)
- Pipe file manager (PIPEMAN)
- Random block file manager (RBFMAN)
- "C" input/output library
- Embedded Software Utilities:
Flash drive, RAM drive, Timer library, Error logger, Validation suite for self-testing, Modem tester

Field I/O Module Features

2070-2A for Type 170 cabinet wiring
2070-2B for NEMA TS-2 Type 2 & ITS cabinets
2070-2N for NEMA TS-2 Type 1 cabinet

Common Features

- 614 Kbaud data rate to CPU
- SDLC compatible communication with CPU module
- Connector for external EIA-485 port

2070-2A Additional Features

- Motorola 68302 microprocessor, 25 Mhz
- Optically isolated - provides protection from lightning and surges
- Socket EPROM firmware for operational software
- Parallel I/O Ports - 64 bits each input and 64 output

2070-2N Additional Features

- 120 VAC outlet (accommodates 2070-4 line cord)
- Built-in CPU and memory emulates the 2070-8 NEMA Base (less additional inputs and outputs)

CPU Features (2070-1A & 2070-1B)

Common Features

- Motorola 68360 microprocessor, 25 Mhz
- 4 MB of DRAM (minimum)
- 512 KB supercap backed SRAM
- 8 MB of Flash memory
- Data Key
- Real Time Clock

2070-1A CPU

- 2 printed circuit boards:
 - Standard VME 3U size board (MCU) with OS-9™
 - Transition board plugs into serial motherboard bus

2070-1B "single-board" CPU

- 1 MB supercap backed SRAM
- RJ45 Ethernet Communications on Face Plate
- Standard TCP/IP protocols
- DB-25 EIA485 Serial Communications

Power Supply Features (2070-4)

- 10 amp
- Industrial-grade 100 watt quadruple output supply
- Internal safety circuitry senses and measures
- Efficient 50 Khz switching regulator
- Supercap storage system for memory backup without batteries

VME Cage Assembly

(2070-5A for 2070-1A CPU, not available for "lite" version)

- VME standard P1 bus, 3U high cage
- 5 Slots - 1 for CPU, 4 vacant slots for expandability (not included on "lite" version)
- Multiple CPUs can be used and data shared between the CPUs

Miscellaneous 2070ATC Features

- Access to serial ports under application software control
- Power supply module independent, self contained
- Input protection
- +5 VDC standby power using capacitor backup
- Safety circuitry monitors line voltage and output

Communication Modules Options

The two leftmost slots on the motherboard (from the back of the Model 2070ATC unit) are available for dual communications modules.

2070-6 Asynchronous Communications

2070-6A Module Features

- 300 to 1200 baud rate
- 2 channels to voice-grade telephone lines for data transmission
- Frequency Shift Keying (FSK) modulation
- Model 170 "Audio in" and "Audio out" configured connectors
- Face plate C2S and C20S connectors for FSK lines
- Face plate switches to select/enable 2 or 4 wire
- Face plate LED lamp for transmit and receive, and carrier detect for each modem
- Transmission Line: Type 3002, Voice grade, Unconditioned
- Tx output signal level: 0 to -8 dB
- Receiver input sensitivity: 0 to -40 dB
- Converts EIA-485 from the motherboard to telephone lines
- Dual channel
- Half or full duplex selectable

2070-6B Module Features

- Same as above, but with 0 to 9600 baud rate over a limited distance

2070-6D Module Features

- 2 channels to fiber optic lines for data transmission
- 1300 nM fiber optic single mode signal modulation
- Converts EIA-485 from the motherboard to fiber optic cables
- Front panel TxD and RxD fiber connector
- Separate TxD and RxD fiber connector that acts as a repeater for fiber ring
- Face plate LED lamp for transmit and receive on each modem
- Face plate type ST connectors to the fiber data and repeater fibers
- Transmission Line: Plastic or glass fiber cable, type depends on distance required.
- Dual EIA-232 and Dual EIA-485
- 0-614,400 baud

2070-7 Serial Communications Modules

Two Comm

- Two communication ports for connection to local serial devices, i.e. printers, terminals, personal computers, serial modems
- Face plate LED lamp for transmit and receive for each modem

2070-7

- Conforms to EIA-232 specifications for external modem
- 0-38,400 baud
- 9-pin "D" connector

2070-7A

- Conforms to EIA-232 specifications for direct connect
- 0-38,400 baud
- 9 Pin "D" connector
- Optical Isolation

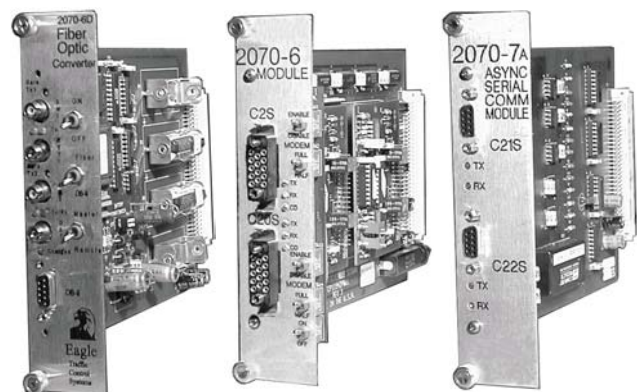
2070-7B

- Conforms to EIA-485 specifications for twisted pair
- 0-614,400 baud
- 15 pin "D" connector
- Optical Isolation

Other Communications Modules

- VME Ethernet adapter, OS-9™ drivers (requires 2070-1A)
- VME EIA-232 adapter, 8 channels (requires 2070-1A)

A few of the available communications modules



Fiber Connect

FSK Connect

EIA Connect

2070N NEMA (2070-8)

Compatibility Module Option - TS1 & TS2 Type 2

Compatibility with NEMA TS-1 and TS-2 Type 2 standard equipment is via the installation of the NEMA module (2070-8) and the SDLC compatible communication module (2070-2B). The 2070-8 module is mounted to the bottom of the 2070ATC unit, and is connected to the 2070-2B module via cable.

2070-8 Module Features

- NEMA specified "A," "B," and "C" connectors with 80 bits of input and 96 bits of output
- 63 pin "D" Connector
- C12 Cable to connect to 2070-2B
- Fault/Voltage Monitor Circuitry
- Internal Motorola 68302 microprocessor 25 Mhz
- Watchdog Circuit
- Parallel I/O Ports — 118 NEMA inputs, 102 NEMA outputs for NEMA TS1 and TS2 Type 2
- EIA-485 differential transmission for noise immunity
- 614 Kbaud data rate to CPU
- Secure SDLC Protocol
- Separate Power Supply
 - +24 VDC for External Logic
 - Input Protection
 - DC Voltage tolerance +/- 3%
 - LED DC Power Indicator
 - Incoming VAC Fuse Protection
- Two DB-25S Connectors
 - EIA-232 serial channel to 68302 processor (Ext 1)
 - 2 modem and 2- EIA-232 (Ext 2)
- Circuitry optically isolated
- 2070N Back Cover (optional, not required)

2070N NEMA (2070-2N)

Compatibility Module Option - TS2 Type 1

Compatibility with NEMA TS2 Type 1 standard equipment is via the installation of the NEMA module (2070-2N) that communicates to the standard NEMA BIU.

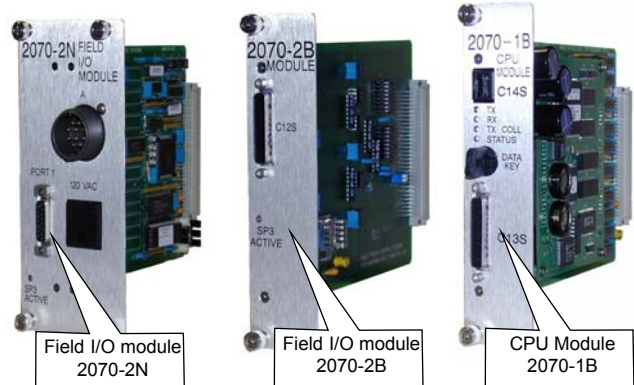
2070-2N Module Features

- NEMA Port 1 "D" connector (15 pin)
- NEMA TS-2 Type 1 "A" connector
- 153.6 SDLC Communications to BIU
- 120 VAC outlet for 2070 line cord

2070ATC Lite Option

- No VME chassis (Upgrade to a standard 2070V by adding the VME chassis)
- Requires a mounting bracket (2070-5B) for the 2070-1A MCU card

Optional Modules



2070 ATC Back View

