

EPAC 300 Family: M40, 41, 42

The EPAC300 Series Controller Unit is a fully actuated controller unit with a full complement of operational, programming and diagnostics capabilities.

This unit EXCEEDS both NEMA TS 1-1989 and TS 2-2003 Actuated Controller Unit Standards and is equipped with an LCD alphanumeric backlit display (8-line - 40 char/line).

Programming is easy and error free using English Language Menus.

Within a menu, each parameter can be viewed and a cursor moved to that parameter for changes.

Related parameters are visible simultaneously, making verification an easy matter. The screen provides both programming area identification and editing prompts.



Specifications

Power Requirements

Voltage: 89 to 135 VAC
Frequency: 57 to 63 Hz
Consumption: 25 Watts

Physical Dimensions

9"H X 15"W X 8"D
(229mm H x 381mm W
x 203mm D)

Model EPAC 3808M41 Shown

Temperature Range

-30 F to +165 F
(-34 C to +74 C)

Highlights

EPAC300 TS-1 and TS-2

Exceeds NEMA TS-1 and TS-2 standards for traffic controllers. Front Panel multi-line alphanumeric backlit display for all operational parameters and states. Fully prompted, menu driven programmability.

EEPROM technology is used to retain all timing and control parameters even during power outages. No batteries are required for retention of traffic parameters.

Six Modes of Coordination

Permissive Mode
Yield Mode

Permissive Yield Mode
Permissive Omit Mode
Sequential Omit Mode
Full Actuated Mode

Adaptive Traffic Control

16 Vehicle Phases
16 Pedestrian Phases
4 Timing Rings
16 Overlaps
80 Detectors
Adaptive Maximum Routines
Adaptive Protected/Permissive Routines
Coordination Virtual Split Routine

Reports

Local Alarm Log, stores up to 120 events

Comm Fault Log, stores up to 60 events
Detector Fault Log, stores up to 60 events
System Detector Log, stores up to 96 events
MOE Log, stores up to 24 events
Speed Log, stores up to 24 events
Volume Count Log, stores up to 72 events
Cycle MOE Log, stores up to 60 events
MMU Fault Log, stores up to 10 events

Preemption/Priority

6 Preempt Routines
6 Priority Routines

EPAC 300 Family



Model 3808M42 Shown

DIAGNOSTICS & STATUS DISPLAYS

A resident diagnostic program is standard in the EPAC 300 Series Controller Unit. In addition to the extensive displays to aid in intersection setup, monitoring, and operation, the resident diagnostic program enhances the maintenance and troubleshooting of the controller assembly.

- Monitor Compatibility Diagnostics
- Monitor Field Status Diagnostics
- Cycling Diagnostics
- Detector Diagnostics
- Port 1 Message Display
- Port 2 Comm Status Display
- Port 3 Comm Status Display
- Hardware I/O Status Display
- MMU Status Display

PREEMPTION/PRIORITY

Internal Preemption is a highly flexible routine operating within the EPAC 300 Series Controller Unit. Included are:

- 6 Preempt Routines providing complete signal control

- 6 Priority Routines providing complete phase control and in sync return to coordination Preempt activity can be monitored on a Preempt Status display which denotes:
- Preempt In Control, Interval Timing, & Interval Countdown
- Individual Preempt Status & Timing
- Individual Priority Status & Timing

HARDWARE DESIGN

The EPAC 300 Series Controller Unit is designed for efficient operation and ease of maintenance. The metal chassis is designed for easy access to the boards for testing without disassembly.

To insure the accuracy of traffic control parameters, even during power outages, EEPROM technology is used to retain all timing and control parameters. No batteries are required for retention of traffic parameters. Event logging and Time Base clock utilize RAM memory for those functions with battery support.



EPAC 300 Family

SIX MODES OF COORDINATION

Permissive Mode provides non-actuated coord phase, vehicle and pedestrian, with permissive windows opened phase by phase to the non-coord phases.

Yield Mode provides non-actuated coord phase vehicle and pedestrian, with a single permissive window for all non-coord phases.

Permissive Yield Mode provides for actuated coord phase vehicle and pedestrian, with permissive windows opened phase by phase to the non-coord phases. Additionally, the coord phase vehicle may extend its green time at the beginning of the first permissive window.

Permissive Omit Mode provides operation similar to Permissive Yield except that the coord phase, once terminated, is prevented from occurring prior to the end of the last permissive.

Sequential Omit Mode provides operation similar to Permissive Yield except the permissive is a phase by phase sliding window (only one phase in a ring will be allowed service at any time).

Full Actuated Mode provides operation similar to Permissive Yield except that any phase may be serviced and reserviced in the standard sequence following the first permissive and through the last permissive.

Adaptive Traffic Control

Simple or highly complex control including:

- 16 Vehicle Phases
- 16 Pedestrian Phases
- 4 Timing Rings
- 16 Overlaps
- 80 Detectors
- Adaptive Maximum Routines which are enabled via Time Base offer three separate Step values to cause the running maximum to increase or decrease smoothly based on current traffic conditions. Separate Dynamic Maximum parameters are available for each Step value.

- Adaptive Protected / Permissive Routines measure the volume of left turn vehicle traffic and available gap windows in the conflicting through-vehicle traffic to determine whether the Left Turn should operate protected or permissive.
- Coordination Virtual Split Routine provides for actuated coord phase vehicle and pedestrian modes. This control provides for a period of time of each cycle which is distributed to the Coord Phase(s) or non-coord phases, based on Coord Phase vehicle traffic activity.
- Coordination Adaptive Split Routines which are enabled via Time Base to adjust split times smoothly based on current traffic conditions.

Controller assemblies with TS 2 Detector Racks provide increased capability, consume less power and provide additional diagnostic data to the Controller Unit via the SDLC port. The Controller Unit can take corrective action much earlier than it could based on internal diagnostics.

Controller assemblies with TS2 Monitors provide additional diagnostic data to the Controller Unit via the SDLC port.

Time Base Control

Internal Time Base Control is a highly flexible routine operating within the EPAC 300 Series Controller Unit. Included are:

- 250 Events for the control of Pattern Selection, Free, Flash, Dimming, Detector Diagnostic Parameters, System Detector Logging, 3 Auxiliary Functions, 8 Special Functions, 16 Traffic Functions
- 99 Day Programs
- 10 Week Programs

Security

The EPAC 300 Series Controller Unit provides for a user specified security code entry before data may be altered. This security code entry is not required to view any parameter. The EPAC300 Series Controller Unit also can disable security code requirements for perpetual access.



Models

EPAC 300 Family

EPAC3 1 0 8

M40

Actuated Controller

Add: "C" = Capacitor Backup
"S" = IC Sockets

M40
TS 1 (16 MHz Unit)

Includes: Port 2 RS 232 (25 Pin) +
Port 3 RS 232 (25 Pin) +
Port 3 "D" Conn (37 Pin)

TS 2 Type 1 Actuated Controller Unit is a performance oriented controller unit using a high speed data channel between all major components within the Terminal and Facilities.

M41

TS 2 Type 1 (16 MHz)

Includes: Port 1 (SDLC 15 Pin) +
Port 2 RS 232 (25 Pin) +
Port 3 RS 232 (9 Pin) +
Port 3 RS 232 (25 Pin) +
Port 3 (FSK 9 Pin)

TS-2 Type 2 Features

TS 2 Type 2 Actuated Controller Unit includes all the features of the Type 1 and adds the following:

1. MSA, MSB, and MSC connectors for data exchange with the Terminals & Facilities. This provides a degree of downward compatibility with NEMA TS 1 counterparts.
2. 37 pin "D" connector for backward compatibility with TS 1 counterpart.

TS-2 Advantages

Controller assemblies with TS 2 Detector Racks provide increased capability, consume less power and provide additional diagnostic data to the Controller Unit via the SDLC port. The Controller Unit can take corrective action much earlier than it could based on internal diagnostics. Controller assemblies with TS2 Monitors provide additional diagnostic data to the Controller Unit via the SDLC port.

M42

TS 2 Type 2 (16 MHz)

Includes: Same as TS 2 Tpe 1+
MSA, MSB, & MSC Connectors
Port 3 "D" Conn (37 Pin)

Number of Phases
8 = 8/16 Phases

Option B
0 = None

Option A (Port 3 Options)
1 = Standard
6 = Port 3 FSK 2 Wire
7 = Port 3 Fiber Modem (single mode)
8 = Port 3 Fiber Modem (multi mode)

Intelligent Transportation Management

TAPCO's system products reflect the latest in computer and software technologies. A leader in the traffic management and control industry, we are capable of supplying an entire system from software to signal heads.



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or Order by Fax 1-262-814-7017 Toll-free 1-800-444-0331



EPAC 300 Family - EPAC M50



Model 3608M50 Shown

The EPAC M50 Series Controller Unit is a fully actuated controller unit with a full complement of operational, programming, and diagnostics capabilities.

The M50 Series Controller Unit EXCEEDS both NEMA TS-1 1989, NEMA TS-2 -2003 and NEMA /AASHTO/ITE. Actuated Controller Unit Standards. Exceeds NEMA TS 2-2003 Standard for Traffic Controller Assemblies with NTCIP Requirements.

Exceeds NEMA/AASHTO/ITE Rev 5.2 Standard for Advanced Transportation Controller (with next generation engine board).

The M50 Series Controller Unit has a removable LCD alphanumeric backlit display unit (8-line x 40 char/line). Programming is easy and error free using English Language Menus. Within a menu, each parameter can be viewed and a cursor moved to that parameter for changes. Related parameters are visible simultaneously, making verification an easy matter. The screen provides both programming area identification and editing prompts. The M50 can also be utilized as a master control unit using SE-MARC Master software.

SPECIFICATIONS

Physical Dimensions	Temperature	Power Consumption	Weight
177mm H x 394mm W x 241mm D 7" H x 15.5" W x 9.5" D	-34°C to +74°C -30° F to +165° F	25Watts (typical) • 120 Watts (max) 89 to 135 VAC • 57 to 63 Hz	4 kg (typical) 8 lbs. (typ.)

Hardware Features

- Exceeds NEMA TS-1 and TS-2 standards for traffic controllers
- Removable Hand-Held Front Panel multi-line alphanumeric backlit display for all operational parameters and states
- 8MB of flash memory is used to retain all timing and control parameters even during power outages. No replacement of EPROMs necessary
- Built-in 10-Base T Ethernet and Infrared ports
- Datakey option -- carries timing data easily from controller to controller

Six Modes of Coordination

- Permissive Mode
- Yield Mode

- Permissive Yield Mode
- Permissive Omit Mode
- Sequential Omit Mode
- Full Actuated Mode

Adaptive Traffic Control

- 16 Vehicle Phases
- 16 Pedestrian Phases
- 4 Timing Rings
- 16 Overlaps
- 80 Detectors
- Adaptive Maximum Routines
- Adaptive Protected/Permissive Routines
- Coordination Virtual Split Routine



EPAC 300 Family

Reports

The M50 Series Controller Unit provides extensive reporting capability. Each report entry includes the Date and Time of occurrence.

- Local Alarm Log, stores up to 120 events
- Comm Fault Log, stores up to 60 events
- Detector Fault Log, stores up to 60 events
- System Detector Log, stores up to 96 events
- MOE Log, stores up to 24 events
- Speed Log, stores up to 24 events
- Volume Count Log, stores up to 72 events
- Cycle MOE Log, stores up to 60 events
- MMU Fault Log, stores up to 10 events

Preemption/Priority

- 6 Preempt Routines
- 6 Priority Routines

Diagnostics & Status Displays

- Monitor Compatibility Diagnostics
- Monitor Field Status Diagnostics
- Cycling Diagnostics
- Detector Diagnostics
- Port 1 Message Display
- Port 2 Comm Status Display
- Port 3 Comm Status Display
- Hardware I/O Status Display
- MMU Status Display

Time Base Control

- 250 Events
- 99 Day Programs
- 10 Week Programs

Preemption Priority

Internal Preemption is a highly flexible routine operating within the M50 Series Controller Unit. Included are:

- 6 Preempt Routines providing complete signal control
- 6 Priority Routines providing complete phase control and in-sync return to coordination

Preempt activity can be monitored on a Preempt Status display which denotes:

- Preempt In Control, Interval Timing, & Interval Countdown
- Individual Preempt Status & Timing
- Individual Priority Status & Timing

Diagnostics and Status Displays

A resident diagnostic program is standard in the M50 Series Controller Unit. In addition to the extensive displays to aid in intersection setup, monitoring, and operation, the

resident diagnostic program enhances the maintenance and troubleshooting of the controller assembly.

- Monitor Compatibility Diagnostics
- Monitor Field Status Diagnostics
- Cycling Diagnostics
- Detector Diagnostics
- Port 1 Message Display
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- Port 3 Comm Status Display
- Hardware I/O Status Display
- MMU Status Display

Time Base Control

Internal Time Base Control is a highly flexible routine operating within the M50 Series Controller Unit. Included are:

- 250 Events for the control of Pattern Selection, Free, Flash, Dimming, Detector Diagnostic Parameters, System Detector Logging, 3 Auxiliary Functions, 8 Special Functions, 16 Traffic functions
- 99 Day Programs
- 10 Week Programs

Hardware Design

The M50 Series Controller Unit is designed for efficient operation and ease of maintenance. The chassis is made of injection molded, high impact polycarbonate and is designed for easy access to the boards for testing without disassembly. A molded handle makes the lightweight controller easy to carry.

The controller is convection cooled with vent slots in the back and openings along the bottom. Adjustable rubber feet along the front allow users to change the angle of the display and create more or less space around the controller. Grounding metal feet in the rear stabilize the controller.

The M50 features a removable, hand-held LCD alphanumeric backlit display unit, with 8-line, 40 characters per line display capability. The display unit connects to the controller via a dedicated C60 port.

TS-2 Advantages

Controller assemblies with TS-2 Detector Racks provide increased capability, consume less power, and provide additional diagnostic data to the Controller Unit via the SDLC port. The Controller Unit can take corrective action much earlier than one based on internal diagnostics.

Controller assemblies with TS-2 Monitors provide additional diagnostic data to the Controller Unit via the SDLC port.



EPAC 300 Family - M50

Six Modes of Coordination

Permissive Mode provides non-actuated coord phase, vehicle and pedestrian, with permissive windows opened phase by phase to the non-coord phases.

Yield Mode provides non-actuated coord phase, vehicle and pedestrian, with a single permissive window for all non-coord phases.

Permissive Yield Mode provides for actuated coord phase, vehicle and pedestrian, with permissive windows opened phase by phase to the non-coord phases.

Additionally, the coord phase vehicle may extend its green time at the beginning of the first permissive window.

Permissive Omit Mode provides operation similar to the Permissive Yield Mode, except that the coord phase, once terminated, is prevented from occurring prior to the end of the last permissive.

Sequential Omit Mode provides operation similar to the Permissive Yield Mode, except the permissive is a phase by phase sliding window (only one phase in a ring will be allowed service at any time).

Full Actuated Mode provides operation similar to the Permissive Yield Mode, except that any phase may be serviced and reserviced in the standard sequence following the first permissive and through the last permissive.

Adaptive Traffic Control

Simple or highly complex control including:

- 16 Vehicle Phases
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- 4 Timing Rings
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Adaptive Maximum Routines which are enabled via Time Base, offer three separate Step values to cause the running maximum to increase or decrease smoothly based on current traffic conditions. Separate Dynamic Maximum parameters are available for each Step value.

Adaptive Protected / Permissive Routines measure the volume of Left Turn vehicle traffic and available gap windows in the conflicting Through-Vehicle traffic to determine whether the Left Turn should operate protected or permissive.

Coordination Virtual Split Routine provides for actuated coord phase vehicle and pedestrian modes. This control provides for a period of time of each cycle which is distributed to the Coord Phase(s) or non-coord phases, based on Coord Phase vehicle traffic activity.

Coordination Adaptive Split Routines which are enabled via Time Base adjust split times smoothly based on current traffic conditions.

Security

The M50 Series Controller Unit provides for a user specified security code entry before data may be altered. This security code entry is not required to view any parameters. The M50 Series Controller Unit can also disable security code requirements for perpetual access.

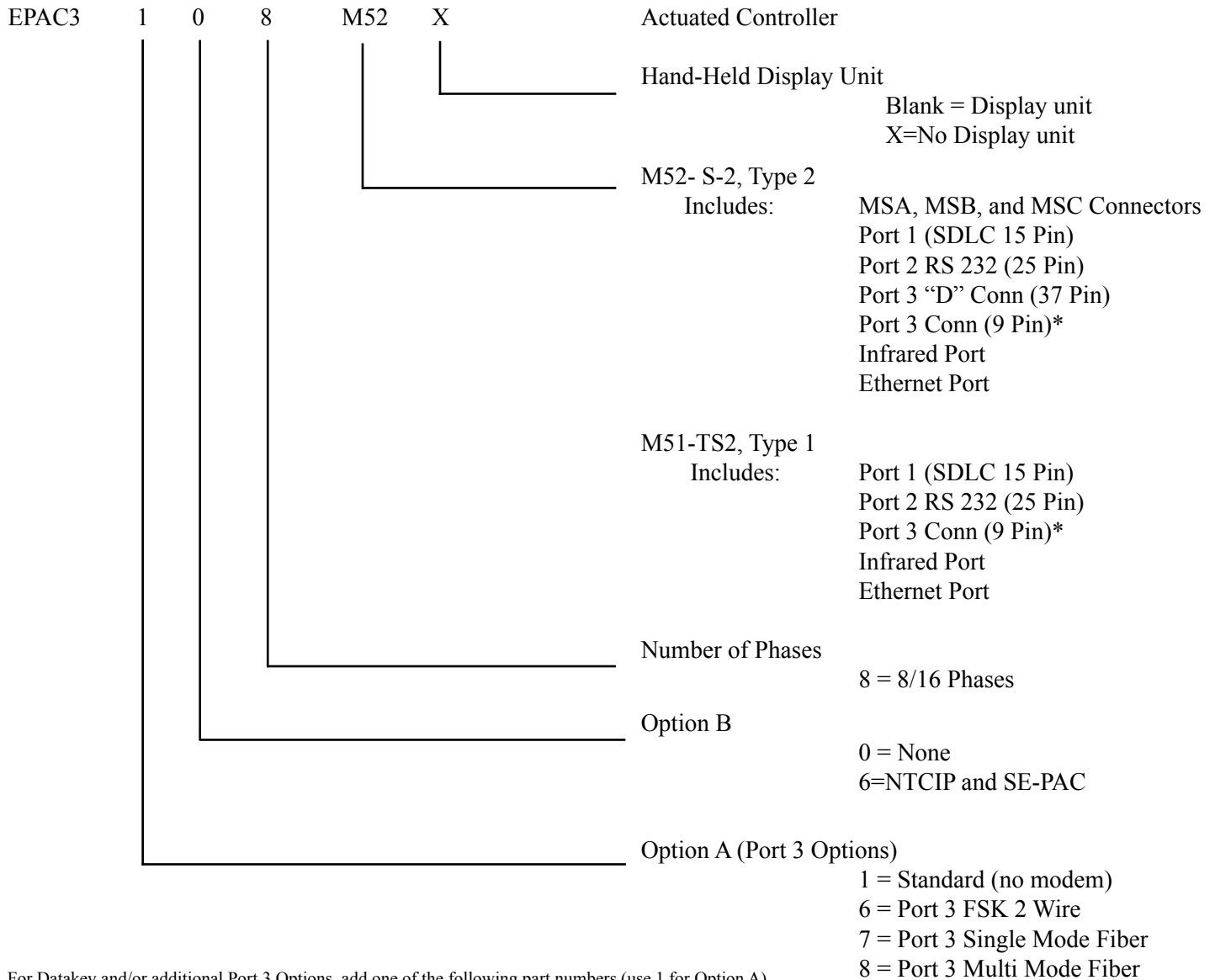
The next generation engine board, standard on the ATCNx and available as an option for the other M50 models, provides advanced functionality and software support.

- Faster, more powerful engine board with substantial increase in flash memory drive and RAM.
- Runs both Linux and OS-9 operating systems, providing more options for third-party development.
- Preloaded with the SafeSuite software package, which includes NextPhase, SEPAC, SeMARC, NTCIP, Monitor, Enforce and more, making it a comprehensive intersection control and monitoring system.
- Can run multiple-concurrent transportation software applications, offering true multitasking traffic control.



Models

EPAC 300 Family - M50



For Datakey and/or additional Port 3 Options, add one of the following part numbers (use 1 for Option A)

Part Number	Description	Part Number	Description
AAD15288P001	Datakey*, Port 3 RS-232	AAD15288P007	Datakey*, Port 3 RS-232, Single Mode Fiber
AAD15288P002	Datakey*	AAD15288P008	Datakey*, Port 3, Single Mode Fiber
AAD15288P003	Port 3 RS-232	AAD15288P009	Port 3 RS-232, Single Mode Fiber
AAD15288P004	Datakey*, Port 3 RS-232, FSK	AAD15288P0010	Datakey*, Port 3 RS-232, Multi-Mode Fiber
AAD15288P005	Datakey*, Port 3 FSK	AAD15288P0011	Datakey*, Port 3, Multi-Mode Fiber
AAD15288P006	Port 3 RS-232, FSK	AAD15288P0012	Port 3 RS-232, Multi-Mode Fiber

* Datakey reader ONLY. Datakeys must be purchased separately.

Hand-held display can be ordered as a separate item (AAD14767P001). Unit can also be ordered with NextPhase firmware (MBU13995P100). Please contact TAPCO or order SCOOT enabled controllers.



Order by Phone 1-262-814-7000 Toll-free 1-800-236-0112
or Order by Fax 1-262-814-7017 Toll-free 1-800-444-0331



EPAC 300 Family - MARC Master Controller



Model MARC 38M34 Shown

The MARC300 series controllers are the coordinating masters in Siemens ITS's closed-loop traffic control system. As a master controller, the MARC combines system management control, monitoring, and data collection capabilities for up to thirty-two (32) intersections. One MARC controller can control and supervise the Traffic Program Selection for two (2) independent groups.

The MARC master controller, fully compatible with local controllers, provides continuous real-time monitoring and reporting of conditions for each interconnected SE-PAC equipped controller.

MARC controllers are designed for on-street operation and meet NEMA TS1-1989 and NEMA TS2-1992 environmental standards for actuated controllers. The friendly, English language-based user interface allows full system access from the on-street master or from an optional central office site via ITS's MARCNX Windows™ based software. The remote access allows master and local intersection programming and monitoring, providing improved programming efficiency while reducing errors.

SPECIFICATIONS

Power Requirements:

Voltage: 95 to 135 VAC
Frequency: 57 to 63 Hz
Consumption: 25 watts

Physical Dimensions:

9"H x 15"W x 8"D
(229mm H x 381mm W
x 203mm D)

Temperature Range:

-30°F to +165°F 14 Pounds
(-34°C to +74°C)

Weight:

14 lbs.
(30.8 kg)

Highlights

System Control

- 32 Local Intersections
- 2 Independent Traffic Control Groups
- 64 System Detector
- 48 Traffic Coordination Patterns
- 16 Timing Plans with Cycle Length, Splits, Offsets
- Priority Based Program Selection (Manual, Remote, Time Based, Traffic Responsive)
- Common Group Sync Reference (Crossing Arterials)
- Group Traffic Responsive Operation
- Matching Program Technique (based on V+O)
- Group Time Base Traffic Operation
- 180 Event Capacity
- 10 Week Programs, 99 Day Programs
- Group Time Base, Manual and Remote Traffic Plans Report Generation
- System Data Reporting by User Request
- Reports Output via Hard Copy

- Reports Uploaded to Central System

Parameter Modification and Entry

- Display and/or Modify Field Master Parameters
- Display and/or Modify ALL Local Intersection

Parameters

- Remote Timing Modification
- Remote System Parameter Modification and Entry

System Real-Time Monitoring

- Automatic and Continuous Master/Local Alarms
- Master and Intersection Alarms for Status/Activity
- Automatic Central Dial-up Capability (Modem Option)
- Remote Real-Time Displays

System Logging

- Automatic and Continuous Alarm Logging
- System Detector Status
- System Program Changes
- Traffic Responsive Computations



Order by Phone 1-262-814-7000 Toll-free 1-800-236-0112
or Order by Fax 1-262-814-7017 Toll-free 1-800-444-0331



EPAC 300 Family - MARC Master Controller

Features, Continued-

Hardware Design

MARC controller units are designed for efficient operation and ease of maintenance. The metal chassis offers ready access to boards for testing without disassembly. MARC units have minimum components for maximum reliability. Maintenance and troubleshooting is facilitated using the internal diagnostic program.

Displays & Memory

The MARC controller unit display provides true visibility into program entries, system data and status. Related parameters are visible simultaneously.

EEPROM technology is used to retain all system timing and control parameters to insure the accuracy of traffic control parameters even during power outages. No batteries are required for retention of traffic system parameters. Clock Time and Event Logging functions use RAM memory with long life battery support.

Programmability

The MARC controller unit offers on-site programming via the front panel keyboard and LCD display or upload/download.

Programming is easy using the English Language Menus. Within menu, each parameter may be viewed, and a cursor movement for that parameter makes any changes easy and error free.

System Management

MARC provides the user system configuration and/or operation controls including:

- Add/Delete Controllers and System Detectors
- Enable Traffic Responsive Mode
- Assign Intersections to Groups
- Assign System Detectors to Computational Channels
- Assign Computational Channels to Pattern Select Routines

Front panel access is permitted to each local controller from the master location or from the optional central office for modification of intersection parameters. Special and/or standard detectors can be assigned as system sampling detectors for use with Traffic Responsive computational channels or for historical activity logging.

Security

MARC permits unrestricted viewing of system parameters, data or reports but requires a user-specified security code entry for data alteration. The code can be disabled for perpetual access capability.

Diagnostics

An internal diagnostic program enhances the maintenance and troubleshooting of the MARC controller. Automatic diagnostics begin at power up and continue as long as the unit is operating. ROM, RAM and Processor checks are included. Other features of the Resident Diagnostics Program provide total indication of unit operation including verification of input and output ports, keypad and display.

Warranty

A standard one year warranty from date of manufacture is provided.

Miscellaneous Options

The MARCNX system offers full access capability of on-street controllers from an optional central office location via Windows-based PC software.

System components can communicate via hardwire, cable, optical fiber, or radio.

MARC3_xM34*

- | | | |
|---|---|--|
| 2 | = | "D" Conn +
Port 3 RS-232 (25P) |
| 3 | = | "D" Conn +
Port 3 FSK 2 wire + RS-232 (25P) |
| 4 | = | "D" Conn +
Port 3 FSK 4 wire |
| 5 | = | "D" Conn +
Port 3 FSK 4 wire + RS-232 (25P) |
| 6 | = | "D" Conn +
Port 3 FSK 2 Wire |
| 7 | = | "D" Conn +
Port 3 Fiber Modem Single Mode |
| 8 | = | "D" Conn +
Port 3 Fiber Modem Multi-Mode |
| 9 | = | "D" Conn +
2-Port 3 RS232 (25P) |

x (for use with Fiber Modem options only)

0 = no additional Port 3

1 = Port 3 RS-232 (25P)

* Memory module option available.

