



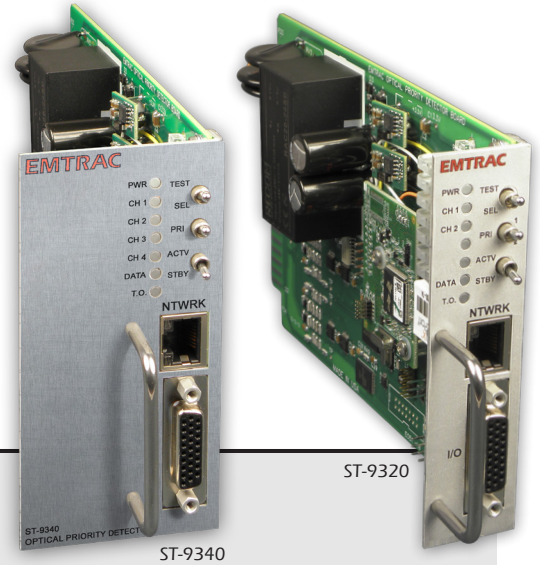
# EMTRAC

# Optical Priority Detectors

## ST-9320/ST-9340

The ST-9320 and ST-9340 Optical Priority Detectors are single-card, two and four channel devices to be used for encoded or non-encoded optical priority requests from all major brands of optical emitters. The Priority Detectors respond to frequencies from all major optical emitter brands, and recognize the frequency rates of requesting vehicles to differentiate their levels of priority. The Priority Detectors are capable of prioritizing simultaneous signal requests by priority level and class of vehicle.

The Priority Detectors can be installed directly into the input file of Type 170 controller cabinets or may be provided with a Priority Detector Case for NEMA cabinets (when input-file space is not available).



The ST-9320 and ST-9340 Priority Detectors are equipped with robust onboard memory and are capable of storing up to 5,000 detailed activity logs, which include the following information:

- Intersection ID
- Vehicle ID (if provided by emitting system)
- Vehicle Class (if provided by emitting system)
- Vehicle Priority Level
- Directional Code
- Priority Request Duration
- Signal Controller Priority Confirmation (Optional)
- Priority Request Start/Stop Date and Time

### Specifications:

| Priority Detector     |  |
|-----------------------|--|
| <b>Dimensions:</b>    | Rack-Mount: 4.5" (H) x 1.125" (W) x 6.95" (D)  |
| <b>Compatibility:</b> | All Major NEMA and 170 Type Cabinets   |
| <b>Mounting:</b>      | Rack-Mount, Shelf-Mount  |
| <b>Comm. Ports:</b>   | 100Base-T Ethernet, 26-Pin Serial (RS-232)   |
| <b>Outputs:</b>       | 4 Standard (more available with optional case)   |
| <b>Inputs:</b>        | 4 Optical Directional  |
| <b>Power:</b>         | 89 to 240 VAC, 50/60 Hz OR 24 VDC  |
| <b>Temperature:</b>   | -34°C (-30°F) to +74°C (+165°F)  |
| <b>Humidity:</b>      | 5% to 95% Relative   |
| <b>Connections:</b>   | <b>Card-Edge:</b> Up to four optical inputs<br><b>Detector Case Rear D-Sub</b> (shelf-mount controller connections): Up to four optical inputs<br><b>RJ45 Ethernet</b> (local computer or network)<br><b>26-Pin D-Sub</b> (serial): See connections on back<br><br><i>Additional inputs are available to allow for signal-request confirmation and signal-phase recognition.</i> |

### Priority Detector Features

- Detects & calls up to four optical channels from all major brands of optical emitters.
- Records vehicle-request activity, logging each event by request type
- Logs up to 5,000 locally-stored events
- Capable of monitoring and logging signal phase states as well as priority-request confirmations
- Standby/Active switch enables testing and configuration without affecting live signal
- Receives two-channel (ST-9320) and four-channel (ST-9340) ranging probe frequencies
- Multiple vehicle priority levels (to accommodate EVP and TSP)
- Compatible with all major brands of NEMA and 170/2070 controllers
- Optically-isolated outputs (and auxiliary inputs)

## Software Settings and Features

- Time to Hold Request After Loss of Signal
- Max. Request Time/Min. Request Times (by channel)
- Priority Service Control (define how simultaneous priority requests are served)
- Allow/Deny signal priority by Vehicle ID
- Configurable Output Channels (by direction)
- Vehicles Allowance or Denial (by vehicle ID)
- Optical Signal-Range Thresholds by Direction: Range up to 2,500 feet (3,000 feet in optimal conditions)
- Activity Log Display of Most Recent Events

## Card-Edge Connections:

| Pin | Connections                          |                                     |
|-----|--------------------------------------|-------------------------------------|
|     | 2-Channel (ST-9320)                  | 4-Channel (ST-9340)                 |
| A   | DC Ground                            |                                     |
| B   | +24V DC (optional - jumper required) |                                     |
| C   | No Connection                        |                                     |
| D   | <b>Optical Sensor INPUT, Ch. 1*</b>  |                                     |
| E   | Optical Sensor +24V DC Output        |                                     |
| F   | <b>OUTPUT, Ch. 1 collector (+)*</b>  |                                     |
| H   | Output, Ch. 1 emitter (-)            |                                     |
| J   | <b>Optical Sensor INPUT, Ch. 2*</b>  |                                     |
| K   | Optical Sensor Ground                |                                     |
| L   | Chassis Ground                       |                                     |
| M   | AC Neutral (AC-)                     |                                     |
| N   | 120V (AC+)                           |                                     |
| P   | (NC)                                 | <b>Optical Sensor INPUT, Ch. 3*</b> |
| R   | (NC)                                 | Optical +24V DC Output              |
| S   | (NC)                                 | <b>OUTPUT, Ch. 3 collector (+)*</b> |
| T   | (NC)                                 | Output, Ch. 3 emitter (-)           |
| U   | (NC)                                 | <b>Optical Sensor INPUT, Ch. 4*</b> |
| V   | (NC)                                 | Optical Sensor Gnd.                 |
| W   | <b>OUTPUT, Ch. 2 collector (+)*</b>  |                                     |
| X   | Output, Ch. 2 emitter (-)            |                                     |
| Y   | (NC)                                 | <b>OUTPUT, Ch. 4 collector (+)*</b> |
| Z   | (NC)                                 | Output, Ch. 4 emitter (-)           |

\*Default connections shown. Inputs and outputs are software configurable.

## 26-Pin Front Connector (high-density Sub-D):

| Pins    | Wire Color                  | Connections                 |
|---------|-----------------------------|-----------------------------|
| 1 - 4   | Blck, Brwn, Red, Orange     | OUTPUTS 1 - 4 respectively  |
| 5 - 12  | No Wires                    | No Connection               |
| 13      | Brown/Orange                | NEMA Logic Ground (outputs) |
| 14      | Brown/Yellow                | DC Ground                   |
| 15      | Brown/Green                 | +3.3V DC                    |
| 16      | Brown/Blue                  | RX Port D (RS-232)          |
| 17      | Brown/Purple                | TX Port D (RS-232)          |
| 18      | Brown/Gray                  | Serial Data Ground          |
| 19      | Yellow/Black                | I2C Serial Data             |
| 20      | Yellow/Red                  | I2C Serial Clock            |
| 21      | Yellow/Gray                 | +5 DC Bus Voltage           |
| 22 - 25 | Ylw w/Grn, Blu, Prpl, & Gry | INPUTS 1 - 4 respectively   |
| 26      | White/Purple                | NEMA Logic Ground (inputs)  |

## Detector Case Rear Connectors (optional):

| 37-Pin High-Density Sub-D |                     |                                    |
|---------------------------|---------------------|------------------------------------|
| Pins                      | Wire Color          | Connections                        |
| 1                         | <b>White/Orange</b> | <b>Optical Sensor INPUT, Ch. 1</b> |
| 2                         | White/Purple        | Optical Sensor +24V DC             |
| 3                         | <b>White/Gray</b>   | <b>Optical Sensor INPUT, Ch. 2</b> |
| 4                         | Brown/Yellow        | Optical Sensor Ground              |
| 5                         | <b>Brown/Black</b>  | <b>Optical Sensor INPUT, Ch. 3</b> |
| 6                         | Brown/Red           | Optical Sensor +24V DC Output      |
| 7                         | <b>Brown/Blue</b>   | <b>OUTPUT, Ch. 3 collector (+)</b> |
| 8*                        | Brown/Orange        | Output, Ch. 3 emitter (-)          |
| 9                         | <b>Brown/Green</b>  | <b>Optical Sensor INPUT, Ch. 4</b> |
| 10                        | Brown/Gray          | Optical Sensor Ground              |
| 11                        | <b>Brown/Purple</b> | <b>OUTPUT, Ch. 4 collector (+)</b> |
| 12*                       | Yellow/Black        | Output, Ch. 4 emitter (-)          |
| 13                        | Yellow/Red          | Ground Negative                    |
| 14                        | Yellow/Blue         | +24V DC                            |
| Remaining                 | See Manual          |                                    |

\*Connect to controller logic ground.

| 15-Pin Sub-D (DB-15) |               |                            |
|----------------------|---------------|----------------------------|
| Pin                  | Wire Color    | Connection                 |
| 1                    | White         | 120V AC Neutral            |
| 2*                   | Yellow        | NEMA Logic Ground          |
| 3                    | Black         | 120V (AC+)                 |
| 4                    | White/Red     | NC                         |
| 5                    | White/Black   | NC                         |
| 6                    | <b>Blue</b>   | <b>OUTPUT, Channel 3**</b> |
| 7                    | <b>Red</b>    | <b>OUTPUT, Channel 1</b>   |
| 8                    | White/Yellow  | NC                         |
| 9                    | <b>Orange</b> | <b>OUTPUT, Channel 4**</b> |
| 10                   | <b>Brown</b>  | <b>OUTPUT, Channel 2</b>   |
| 11                   | White/Blue    | NC                         |
| 12                   | Purple        | NC                         |
| 13                   | White/Green   | NC                         |
| 14                   | Gray          | NC                         |
| 15                   | Green         | Chassis Ground             |

\*\*Pins 6 and 9 have NO CONNECTION when used with the ST-9320, two-channel Optical Priority Detector.