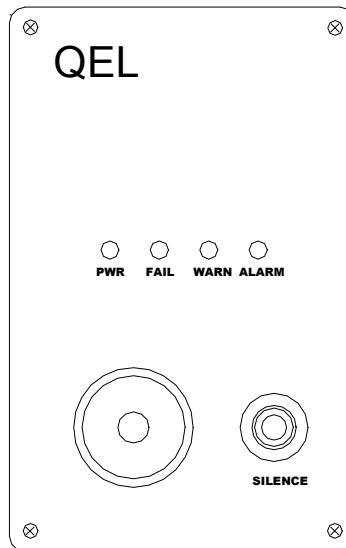


M-SERIES ANNUNCIATOR PANEL



INSTALLATION OPERATION AND MAINTENANCE MANUAL

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1 Glossary

RS-485 (properly EIA-485): A wiring and electrical standard for digital communication in a multi drop environment. It is a 2-wire system, with a differential signal allowing relative immunity to variations in grounds between devices. RS-485: maximum 32 transceivers per loop, 4000 ft (1300 meters) max. 120 ohm line termination required. (Line termination resistors are available on all M-Series devices via selectable jumpers).

MAP: An acronym of M-Series Annunciator Panel.

2 General System Overview

The M-Series Annunciator Panel (MAP) is a device, located at some distance from the M-controller and provides a user an audible and visual indication of the status of the M-Controller. The MAP has the following features:

- An RS-485 interface to communicate with the M-controller
- A series of four (4) LED's, 3 of which can be programmed to indicate a certain state of the M-controller
- A piezo-electric buzzer that can be programmed by DIP-switch settings to sound on specific M-controller conditions
- A single push-button that can be used to disable the audible buzzer
- Diagnostic check of RS-485 communication failure
- Powered by 24VAC (non grounded) or 24VDC

3 M-Series Annunciator Panel Specifications

Power Supply:

- Voltage 24V \pm 4V AC or DC
AC Power must be non-grounded (Floating)
- Amps: Max 100mA

Button SPST, Momentary Contact

Indicators 4 Status LED's

- POWER LED green
- FAIL LED red
- WARN LED yellow
- ALARM LED red

Buzzer 90 db at 10 cm, 3600 Hz

- Alarm: Continuous
- Warning: Double-tap Intermittent
- Fault: Continuous
- Communication Fault: Chirp every 10 seconds

4 Functions and Configuration

The MAP is designed to allow 1) Easy installation on the RS-485 network and 2) Easy control by the M-controller. It can display the status of M-Controller and can be configured by the M-Controller with the M-View software application or with the M-Controller's keypad. Controlled over an RS-485 communication link, they allow flexibility in installation and wiring. They operate from 24VAC/VDC and may be powered via the port power of the M-Controller or directly from a local power source

4.1 Visual Indicators

The MAP uses 4 LED's that are colored and identified as follows:

PWR: Green LED

- ON condition: Indicates that the MAP's internal power supplies are functional
- Blinking condition: RS-485 communications failure

Fail: Red LED

- On/OFF condition: Programmable to respond to specific M-controller states.

Warn: Yellow LED

- On/OFF condition: Programmable to respond to specific M-controller states.

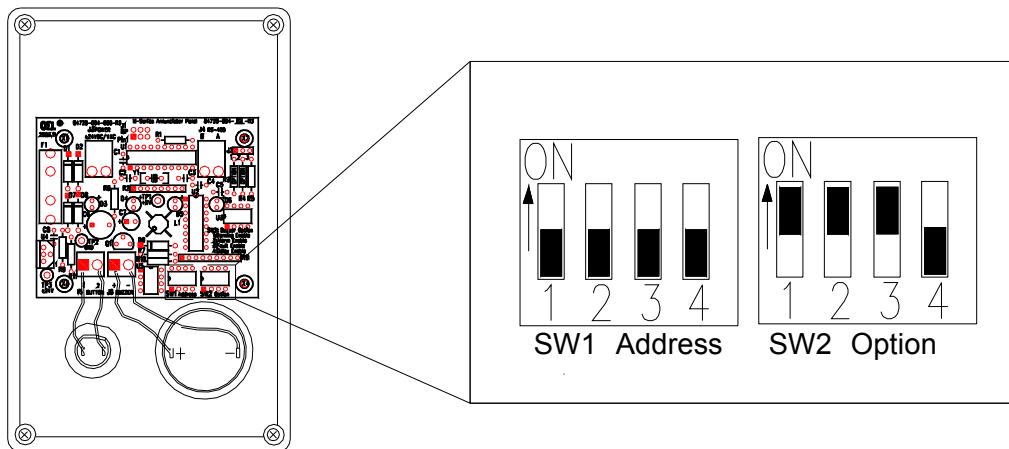
Alarm: Red LED

- On/OFF condition: Programmable to respond to specific M-controller states.

4.2 Audible Indicators

The buzzer shall sound according to the user-selected settings of the DIP-switches SW2 on the Board as defined below.

The buzzer shall “chirp” if RS-485 communication is lost, this feature is independent of the SW2 setting. The chirp shall be ON for 50ms every 10 seconds.



Buzzer Actuation Options SW2 4-position DIP-switch:

Switch functions:

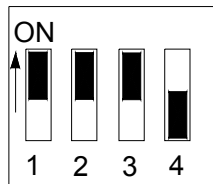
Position 1, ON: Audible Warning enabled, buzzer shall be pulsed if the Warning LED is turned ON

Position 1, OFF: No audible sound for Warning condition

- Position 2, ON: Audible Alarm enabled, buzzer shall be continuous if the Alarm LED is turned ON
- Position 2, OFF: No audible sound for Alarm condition
- Position 3, ON: Audible Fault enabled, buzzer shall be continuous if the Fault LED is turned ON
- Position 3, OFF: No audible sound for Fault condition
- Position 4, ON: Delay enabled, audible alarm sounded for 10 minutes max.
- Position 4, OFF: Delay disabled, audible alarm sounded for duration of Warning/Alarm/Fault state or until Alarm Acknowledge button is pressed

The sound priority: Alarm Condition is highest
Warning Condition is lower
Fault Condition is lowest

Factory Default Setting:



SW2 Option

1. Audible Warning Enable
2. Audible Alarm Enable
3. Audible Fault Enable
4. Delay Disable

4.3 Hush Button

Press the Hush button to silence the buzzer. The Buzzer will sound again when another condition is ON or the hushed condition is reset and ON again.

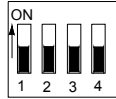
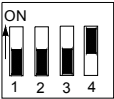
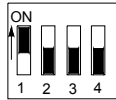
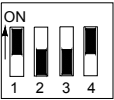
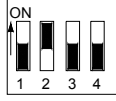
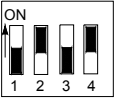
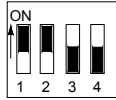
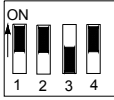
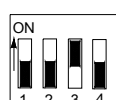
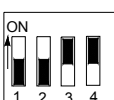
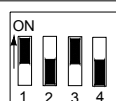
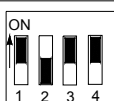
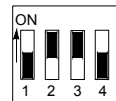
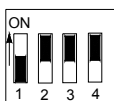
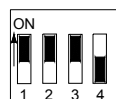
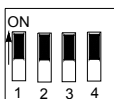
5 Addressing

The Map address is defined on a four position dipswitch SW1 on the circuit card.

In fact, the MAP will appear as an M-Relay module when configuring the M-controller with the M-View software application. Accordingly, the M-Annunciator will share the following address with M-Relay module:

NOTE: Don't use the address that has been assigned to a M-Relay Model, this will cause an RS-485 communication conflict.

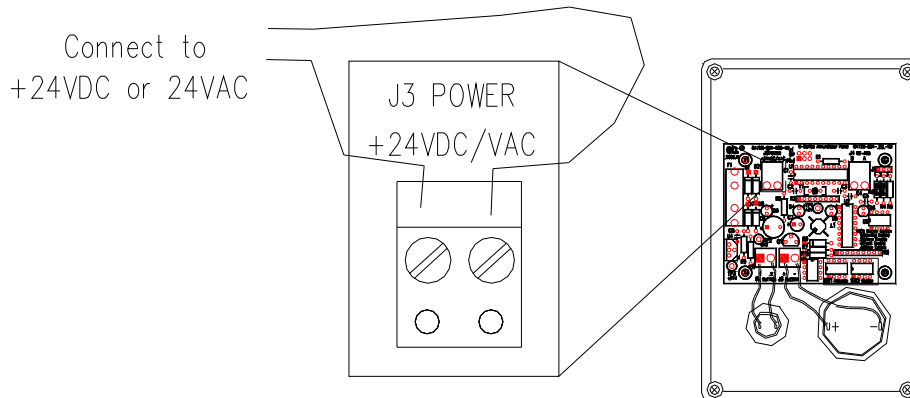
The following table indicates the relationships.

M-Annunciator Address	SW1 Setting	Assignment	M-Annunciator Address	SW1 Setting	Assignment
0		Warning = Relay4 Alarm = Relay5 Fault = Relay6	8		Warning = Relay68 Alarm = Relay69 Fault = Relay70
1		Warning = Relay12 Alarm = Relay13 Fault = Relay14	9		Warning = Relay76 Alarm = Relay77 Fault = Relay78
2		Warning = Relay20 Alarm = Relay21 Fault = Relay22	10		Warning = Relay84 Alarm = Relay85 Fault = Relay86
3		Warning = Relay28 Alarm = Relay29 Fault = Relay30	11		Warning = Relay92 Alarm = Relay93 Fault = Relay94
4		Warning = Relay36 Alarm = Relay37 Fault = Relay38	12		Not Available
5		Warning = Relay44 Alarm = Relay45 Fault = Relay46	13		Not Available
6		Warning = Relay52 Alarm = Relay53 Fault = Relay54	14		Not Available
7		Warning = Relay60 Alarm = Relay61 Fault = Relay62	15		Not Available

6 Power Supply and Wiring

6.1 Power Installation

The MAP power supply Voltage requirements are nominally 24 VDC or 24VAC. This increases flexibility in the field and reduces costs, especially in those areas where 24 VAC power is available as standard. In those situations where 24 VAC/DC is not already available it is necessary to purchase a standard power supply.



6.2 RS-485 Installation

The RS-485 (EIA-485) standard specifies the electrical characteristics for a digital communication link allowing communication between multiple devices on a single link. The RS-485 uses two wires, A and B, and works on the voltage difference between them. If the voltage difference is positive, then that is a “1” if negative then that is a “0”.

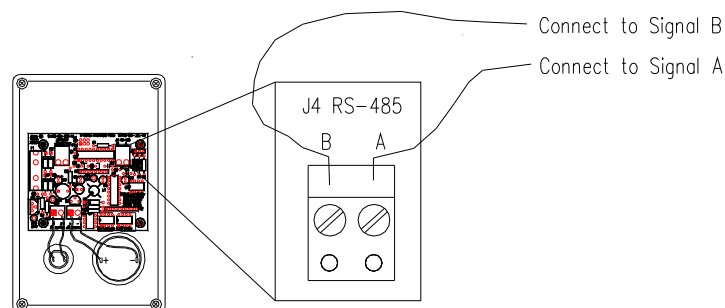
Ground Independence. This scheme allows differences between grounds among the devices on the line of as much as ± 7 Volts; however, it is not wise to design that close to the tolerance, and we recommend keeping the differences within ± 5 volts.

Wire Standard: The cable standard is specified in the EIA-485 standard as twisted, balanced, shielded pair; with characteristic impedance of 120 ohms. Several manufacturers produce cable specifically for RS-485 installations. (e.g. Belden 9841).

Some people do use **Instrument Wire** for RS-485; however, a number of problems arise:

- The characteristic impedance is unknown and variable, and so the signals may not be robust, it becomes difficult or impossible to define an end-of-line matching resistance.
- Maximum installation distances are less, and somewhat unpredictable. typically about one half that of proper cable.
- There is typically no significant cost saving, often the reverse.
- **QEL warrants and support only covers installation with proper cable. If in doubt please contact QEL support personnel.**

Connections. Wire terminals A to A to A etc., and B to B to B etc.



End-Of-Line Termination Resistance. A long wire behaves as an infinite series of inductors and capacitors, and so if nothing is done about it, the high speed digital signals cause a variety of peculiar effects such as positive or negative echoes and ringing. If we add a resistor across the terminals of the device at each end of the line which matches the characteristic impedance then the echoes and ringing are removed. For RS-485 cable this is 120 ohms. We need one at each end because the signal is bi-directional. **All QEL**

equipment supplies the end-of-line resistor on the circuit card. It is enabled or disabled with a shunt jumper. (See relevant Installation Drawings for information)

Distances. The RS-485 standard allows up to 1300 meters (4000 feet) of line length. It is best to avoid lines of this length if at all possible.

Stubs. Short lengths of cable from the main cable over to a device are called Stubs. When the Baud rate (communication bit rate) is low – e.g. 2400 baud, then it is often possible to use short lengths of a few inches without seriously impairing the signal integrity, especially when overall distances are relatively short; however, this is taking a chance on garbling your signals and is not recommended.

Cable Shields: Cable shields are aluminum and so only protection against electrical fields, not against magnetic fields. The twist in the pair is to reduce the effects of magnetic fields. Take care not to run cable close to magnetic sources. Iron conduit is a good shield for both electrical and magnetic fields.

Shield Grounding. There are certain things to keep in mind for the shield.

- The shield must be grounded otherwise it can make the situation worse.
- Ground the shield at only one end to prevent ground loops.
- If you cut the cable then either ground each section of the shield at that point or connect the shields together to ground back at an origin point.

7 Troubleshooting Hints

This troubleshooting guide is intended as an aid in identifying the cause of unexpected behavior and determining whether the behavior is due to normal operation or an internal or external problem.

Identify the symptom or unexpected behavior you are observing from the **SYMPTOMS** listed in the table. A **PROBABLE CAUSE** is provided and a suggested **SOLUTION** is proposed including references to manual sections that provide information that may be of assistance.

SYMPTOMS	PROBABLE CAUSE	SUGGESTED SOLUTION
PWR LED is flash and Buzzer chirp	<ul style="list-style-type: none"> • RS-485 port connection is broken • RS-485 Driver LTC485 is damaged • M-Controller is turned off • M-Controller is in Menu Mode • M-Controller is communicating with host PC or M-View 	<ul style="list-style-type: none"> • Check RS-485 connections • Change LTC485 chip • Turn on M-Controller • Wait or exit menu • Wait
PWR LED is OFF	<ul style="list-style-type: none"> • No power in • Internal regulator is damaged 	<ul style="list-style-type: none"> • Check Power Supply in • Change LM2574 chip.
M-Controller reports “Rxx Offline” and the relay address is the address you have assigned to the MAP.	<ul style="list-style-type: none"> • Connection is wrong • RS-485 Driver LTC485 is damaged • End-of-line matching resistors are not properly set. 	<ul style="list-style-type: none"> • Check connection between M-Controller and MAP. Make sure all have power on and no shorts or opens in wiring. Be certain that polarity for RS-485 connections is correct. A-A and B-B • Change LTC485 chip • Review end-of-line resistor settings

WARRANTY STATEMENT

The information contained in this manual is based upon data considered accurate; however, no warranty is expressed or implied regarding the accuracy of this data. All QEL equipment is warranted against defects in material and workmanship for a period of two years from date of shipment with the following exceptions:

Electrochemical Sensors (Toxic)	Six Months
Catalytic Sensors (Combustible)	One Year

During the warranty period we will repair or replace, at our discretion, any components or complete units that prove, in our opinion, to be defective. We are not liable for consequential or incidental damage to auxiliary interfaced equipment.

A returned material authorization number should be obtained from the factory prior to returning any goods. All return shipments must be shipped freight prepaid and a copy of the maintenance records should accompany the unit concerned.

Warranty should be considered F.O.B. the factory. Labour and travel time are chargeable for any field site visits required for warranty work.

LIMITED LIABILITY

All QEL systems shall be installed by a qualified technician/electrician and maintained in strict accordance with data provided for individual systems in the form of installation/maintenance manuals. QEL assumes no responsibility for improper installation, maintenance, etc., and stresses the importance of reading all manuals. QEL shall not be responsible for any liability arising from auxiliary interfaced equipment nor any damage resulting from the installation or operation of this equipment.

QEL's total liability is contained as above with no other liability expressed or implied as the purchaser is entirely responsible for installation and maintenance of systems.

This warranty is in lieu of all other warranties, expressed or implied, and no representative or person is authorized to represent or assume for QEL any liability in connection with the sales of our products other than that set forth herein.

NOTE: Due to on-going product development, QEL reserves the right to change specifications without notice and will assume no responsibility for any costs as a result of modifications.

For further information or assistance, contact:

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