Xtralis VESDA VLF MCC Product Guide

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VESDA

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Convention	Description
Bold	Used to denote: emphasis Used for names of menus, menu options, toolbar buttons
Italics	Used to denote: references to other parts of this document or other documents. Used for the result of an action.

The following icons are used in this document

Convention	Description
	Caution: This icon is used to indicate that there is a danger to equipment. The danger could be loss of data, physical damage, or permanent corruption of configuration details.
	Warning: This icon is used to indicate that there is a danger of electric shock. This may lead to death or permanent injury.
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We strongly recommend that this document is read in conjunction with the appropriate local codes and standards for smoke detection and electrical connections. This document contains generic product information and some sections may not comply with all local codes and standards. In these cases, the local codes and standards must take precedence. The information below was correct at time of printing but may now be out of date, check with your local codes, standards and listings for the current restrictions.

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Contents

1. Scope

This guide describes the features and operating procedures for the VIC-020 and VIC-030 Xtralis VESDA VLF MCC Cards. The VLF MCC is specifically designed for installation in Xtralis VESDA VLF smoke detectors. This Product Guide covers installation, configuring, troubleshooting, maintenance and specifications.

2. Introduction

VLF smoke detectors incorporate world leading Xtralis VESDA very early warning laser based aspirated smoke detection technology. They provide localized fire risk management solutions for small, business critical environments. VLF smoke detectors are available in two models: the VLF-250 protects areas up to 250 m² (2500 sq. ft.), while the VLF-500 protects areas up to 500 m² (5000 sq. ft.)*. Xtralis VESDA smoke detectors are designed for absolute smoke detection, easy installation and reliable and consistent response to smoke events.

The VLF MCC provides VLF detectors with additional connectivity and monitoring capacity together with monitored annunciation of alarms (VIC-030 only).

The main benefits of installing a VLF MCC into your VLF detector are:

Additional Fire Alarm Control Panel (FACP) Connectivity. The VLF MCC provides two additional alarms that are configured to report FACP status Alert and Fire 2. Together with the VLF's existing two relays, this allows the reporting of all four alarm levels (Alert, Action, Fire 1 and Fire-2). When the Monitored Power Output (MPO) is disabled (VIC-030 model), a third relay set to Disabled or Standby is available (consistent with VLF Disabled or Standby status).

Improved Monitoring Capacity. The VLF MCC provides a General Purpose Input (GPI) in addition to the VLF detector's GPI. Connecting the VLF MCC GPI enables VLF detectors to detect and report a fault with external equipment. This means the VLF's GPI can be set for another purpose.

Annunciation of Alarms. The VLF MCC VIC-030 model includes a 24VDC Monitored Powered Output (MPO), which allows for the annunciation of alarms by providing power to devices such as strobes or sirens.

Diagnostic Light Emitting Diodes (LEDs). Both the VIC-020 and VIC-030 models have a range of diagnostic LEDs that make it easy to identify the card's status and configuration.

Quick and Easy Installation. Out-of-the-box operation makes the VLF MCC easy to install. In most cases, no configuration is required.

*These figures are indicative and may vary according to local standards and codes.

3. Safety Instructions

Note: You should read and follow all instructions *carefully.* Keep this guide in a safe place for future reference.

Caution: You should turn the power to the detector off *before* you install the VLF MCC. If you do not turn the power off, you may damage the detector. You should advise the monitoring authority that power to the detector will be turned off and the system disabled.

Caution: Do not disassemble the connectors.

4. Installation

Note: If a VLF detector previously contained a VESDAnet card, installing a VLF MCC will delete the configuration data associated with the VESDAnet card.

Note: You should save the VLF detector's configuration file using VESDA System Configurator (VSC) before you install the VLF MCC.

Note: The VLF MCC is only compatible with VLF software version 3.02.00 or later versions.

You have been supplied with all the connectors and cables you require to install the VLF MCC. No additional power source is required for the VIC-020 model as the VLF MCC is powered by the detector. An additional power source is required for the Monitored Powered Output (MPO) (VIC-030 only), but only when the MPO is configured.

Components supplied:

VIC-020	VIC-030
1 Multi-function Control Card	1 Multi-function Control Card
1 Interface cable	1 Interface cable
1 Mounting screw	1 Mounting screw
1 x 2-pin connector for the GPI	1 x 2-pin connector for the GPI
2 x 3-pin connectors for Relay 1 & Relay 2	2 x 3-pin connectors for Relay 1 & Relay 2
1 x End of Line Resistor (EOL) (2.7K ohms)	1 x 4-pin connector for MPO or Relay 3
	2 x End of Line Resistors (EOL) (2.7K ohms)

Table 1 - Components Supplied with the VIC-020 and VIC-030
Multi-function Control Card

You will need:

A copy of your VLF Product Guide and a flat blade screw driver.

Figure 1 shows the main components of the VLF MCC and Figure 2 shows the layout of the connectors. You should familiarize yourself with these diagrams before continuing.
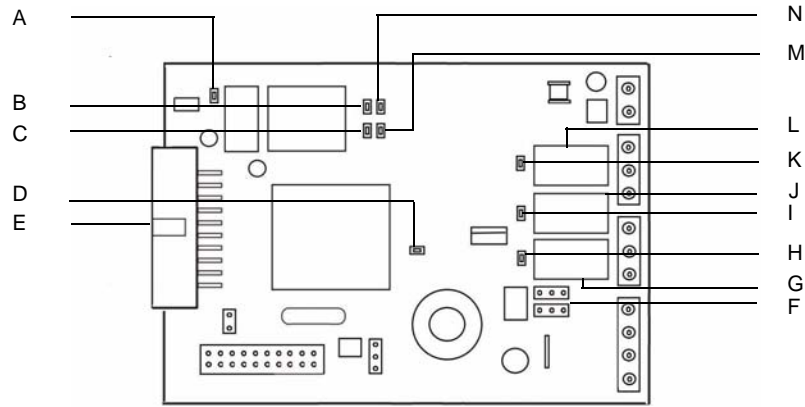
Legend		Label on PCB	Legend		Label on PCB
A	LED - Power	D1/Power	H	LED - Relay 3 (VIC-030 model only)	RLY 3
B	LED - MPO.0 (VIC-030 model only)	D3	I	LED - Relay 2	RLY 2
C	LED - OK	D4	J	Relay 2	K2
D	LED - MPO.1 (VIC-030 model only)	D7	K	LED - Relay 1	RLY 1
E	Interface cable socket	J1	L	Relay 1	K1
F	Jumpers (VIC-030 model only)	J9 & J10	M	LED - DET	D5
G	Relay 3 (VIC-030 model only)	K3	N	LED - GPI	D6

*Figure 1 - Main Components of the Multi-function Control Card
(VIC-030 model shown)*

Legend		
1	GPI+	General Purpose Input
2	GPI-	
3	NO1	Relay 1
4	COM1	
5	NC1	
6	NC2	Relay 2
7	COM2	
8	NC2	
9	NO3/MPO+	Monitored Powered Output or Relay 3 (VIC-030 model only)
10	COM3/MPO-	
11	NC3/0VDC	MPO: Power Input (VIC-030 model only)
12	24VDC	

Figure 2 - Layout of MCC Connectors

4.1   Procedure

Caution: Turn the power to the detector off *before* you install the VLF MCC.

1.   Remove the front cover from the detector. Refer to the VLF Product Guide for instructions.
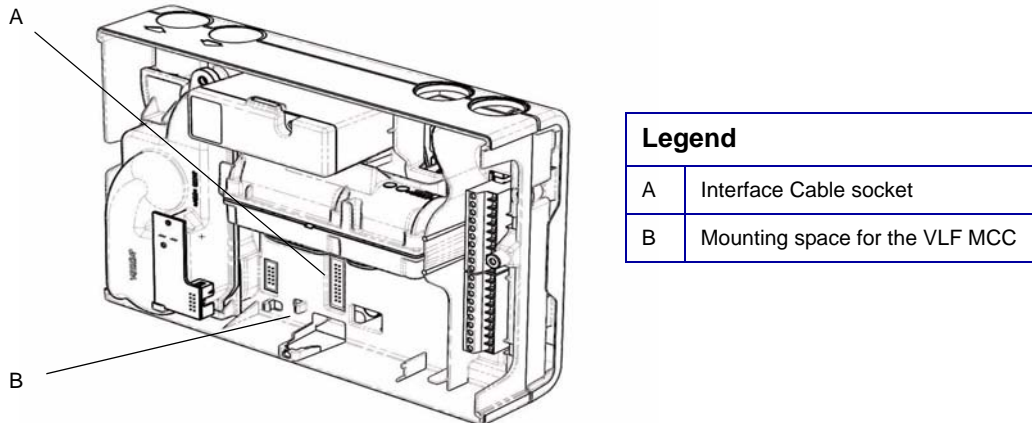

Legend	
A	Interface Cable socket
B	Mounting space for the VLF MCC

Figure 3 - VLF Smoke Detector with the Front Cover Removed

2.   Plug one end of the interface cable into the VLF MCC and the other end into the detector's interface cable socket. This connects the VLF MCC to the VLF's Printed Circuit Board.
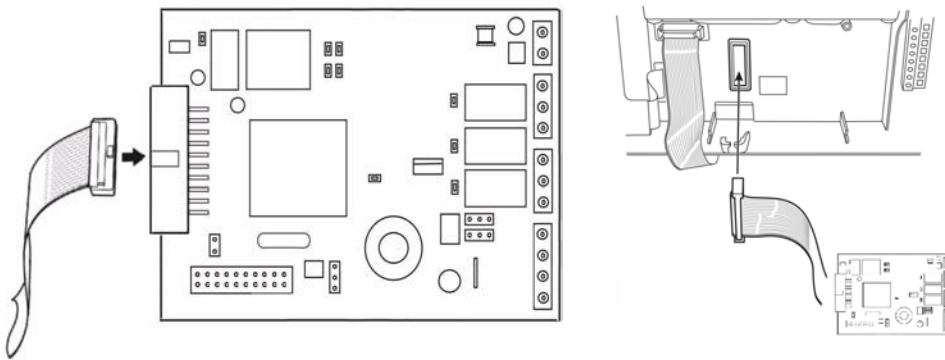

Figure 4 - VLF MCC (VIC-030 model shown)

3.   Fold the interface cable under the card and insert the card in the space provided.
4.   Align the hole in the card with the mount for the screw. Use the screw to secure the card to the detector. You must secure the card to the detector to ground the card.
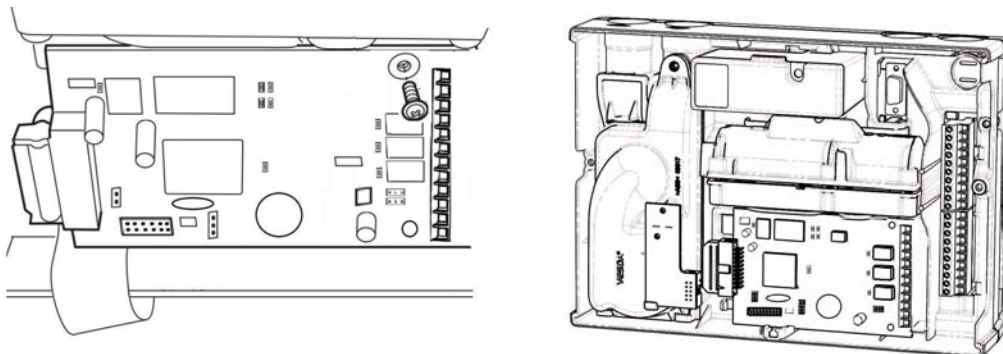

*Figure 5 - VLF Detector with a VLF MCC
Installed (VIC-030 model shown)*

5. Plug in the VLF power connector.
6. Check that the card is correctly installed by reviewing the status of the Light Emitting Diodes (LEDs). If the card is correctly installed, the OK LED will be blinking and the DET and Power LED will be ON (see Figure 1 and Table 2).

LED	Label on PCB	LED is On	LED is Blinking	LED is Off
Power	Power	Card has host power	Not applicable	Card is not powered
OK	OK	Card status - not working	Card status - OK	Card status - booting up or faulty
DET	DET	Card status - OK	Card status - OK	Card status - booting up or communications FAULT

Table 2 - Status of Light Emitting Diodes after installing the VLF MCC

5. Field wiring for the VIC-020 model

Caution: You must turn the power to the detector OFF before you connect the field wiring.

Supplied with the VLF MCC:

1 x 2-pin connector

2 x 3-pin connectors

1 x End of Line (EOL) resistor (2.7K ohms)

5.1 Connect Relay 1 and Relay 2

Relays allow alarm and fault signals to be hard-wired to external devices such as a FACP.

On the VLF MCC, Relay 1 and Relay 2 are preconfigured to report Alert and Fire 2 status (outputs follow latching configuration of VLF Alert and Fire 2 status). Connecting both relays will enable all four alarms to be reported on your FACP (Alert, Action, Fire 1 and Fire 2).

Use two 3-pin connectors to connect Relay 1 and Relay 2. Both relays are usually wired Normally Open and will report Alert (Relay 1) or Fire 2 (Relay 2) when the contact is closed (short circuit).
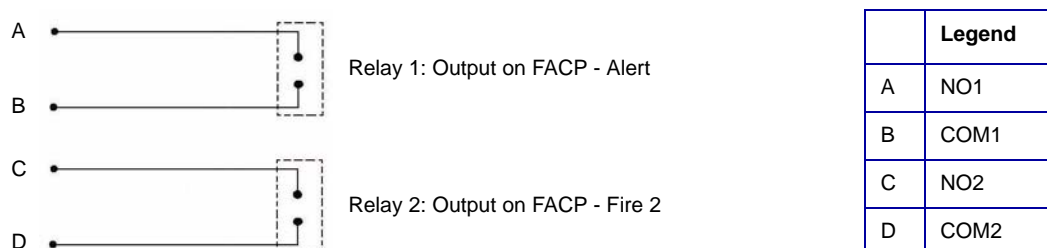

	Legend
A	NO1
B	COM1
C	NO2
D	COM2

Figure 6 - Field Wiring for Relay 1 and Relay 2

5.2   Connect the GPI

With a VLF MCC, VLF detectors have two GPIs connecting the VLF MCC GPI enables VLF detectors to detect a fault with external equipment. Typically, this input is used to monitor external power supply units. The GPI monitors line impedance and the End of Line (EOL) resistor provides a known termination to the external equipment, allowing the VLF or VLF MCC to detect open circuit wiring faults.

If the GPI is active (short circuit or contact closed), the detector indicates an Instant Fault Finder Number 6. If the wire to the monitoring device is broken (open circuit), the detector indicates an Instant Fault Finder Number 8. See *9. Troubleshooting* on page 13 for information on VLF Fault indications.

Refer to Figure 7 and use the 2-pin connector and the EOL resistor to connect the GPI. The EOL resistor should be assembled as close as possible to the external device.
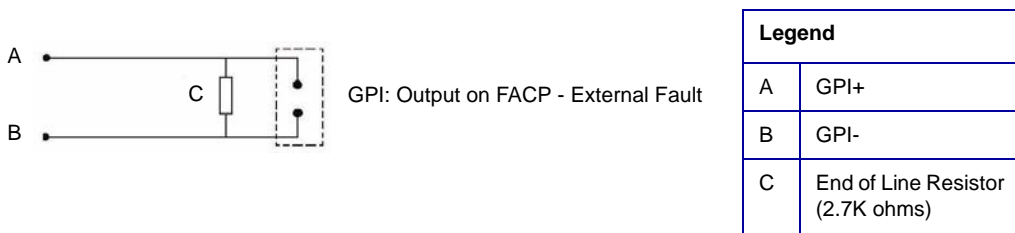

Legend	
A	GPI+
B	GPI-
C	End of Line Resistor (2.7K ohms)

GPI: Output on FACP - External Fault

Figure 7 - Field Wiring for the GPI

5.3   LEDs on the VIC-020 model

After you have connected the field wiring, plug in the VLF power connector. Check that the card is correctly configured by reviewing the status of the Light Emitting Diodes (LEDs) (see Table 3).

LED	Label on PCB	LED is On	LED is Blinking	LED is Off
Power	Power	Card status - card has host power	Not applicable	Card status - not powered
OK	OK	Card status - not working	Card status - OK	Card status - booting up or faulty
DET	DET	Card status - OK	Card status - OK	Card status - booting up or communications FAULT
GPI	GPI	GPI status - active (short circuit)	GPI status - line fault (termination)	GPI status - inactive and terminated OK.
RLY1	RLY1	Relay is energised	Not applicable	Relay is de-energised
RLY2	RLY2	Relay is energised	Not applicable	Relay is de-energised

Table 3 - Status of LEDs on VIC-020 model following connection of
Relay 1, Relay 2 and the GPI

6. Field wiring for the VIC-030 model

Caution: You must turn the power to the detector OFF before you connect the field wiring.

Supplied with the VLF MCC:

1 x 2-pin connector

2 x 3-pin connectors

1 x 4-pin connector

2 x End of Line (EOL) resistors (2.7K ohms)

6.1 Connect Relay 1 and Relay 2

Connect Relay 1 and Relay 2 as for the VIC-020 model. See *Connect Relay 1 and Relay 2* on page 7

6.2 Connect the MPO

The VIC-030 model provides a 24V Monitored Powered Output to allow for annunciation of alarms and faults by providing power to external devices such as strobes or sirens.

An End of Line (EOL) resistor must be assembled with the MPO. The EOL resistor provides a known termination to the external equipment and allows the VLF MCC to detect open or short circuits.

Refer to Figure 8 and use the 4-pin connector to connect the MPO. Set the jumpers on the VLF MCC as shown in Figure 8.

MPO power is supplied to the VLF MCC through pins NC3 (0VDC) and 24VDC (see C and D in Figure 8). These pins should be connected to a 24 VDC supply and may draw up to 2 Amp.

Note: An acceptable voltage range for the MPO power supply input is between 21 and 30 VDC.

Alternatively, if the VLF is connected to a suitable power source with sufficient current output, connect these pins to the VLF's power out terminals (0 VDC and 24 VDC) (see VLF Product Guide).
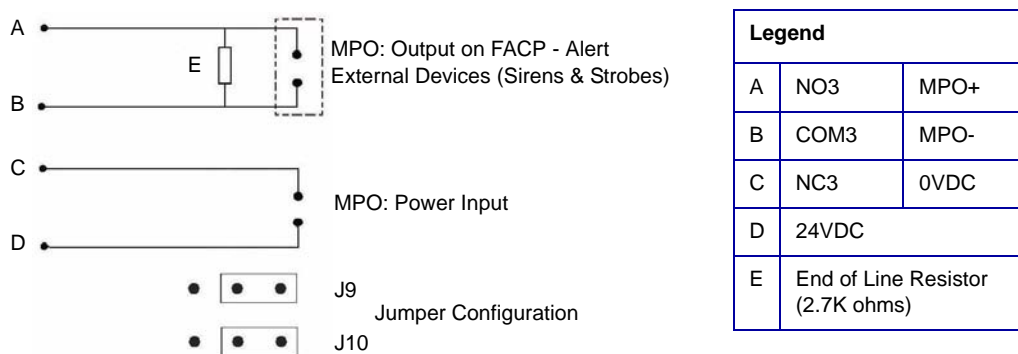

Legend		
A	NO3	MPO+
B	COM3	MPO-
C	NC3	0VDC
D	24VDC	
E	End of Line Resistor (2.7K ohms)	

Figure 8 - Field Wiring and Jumper Setting for the MPO

6.2.1   MPO Wiring Length

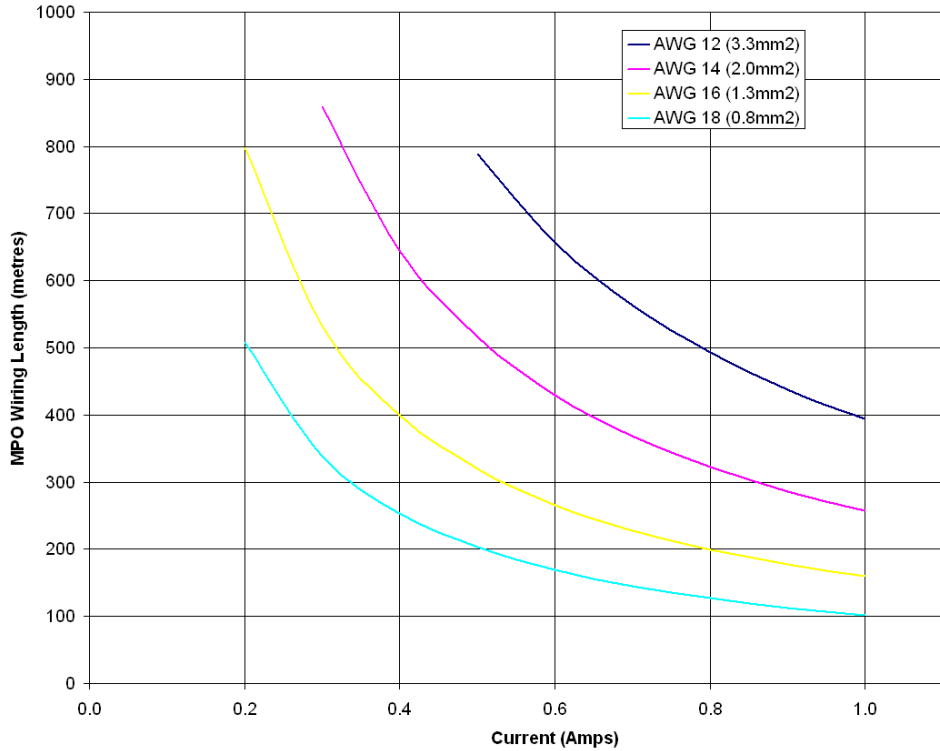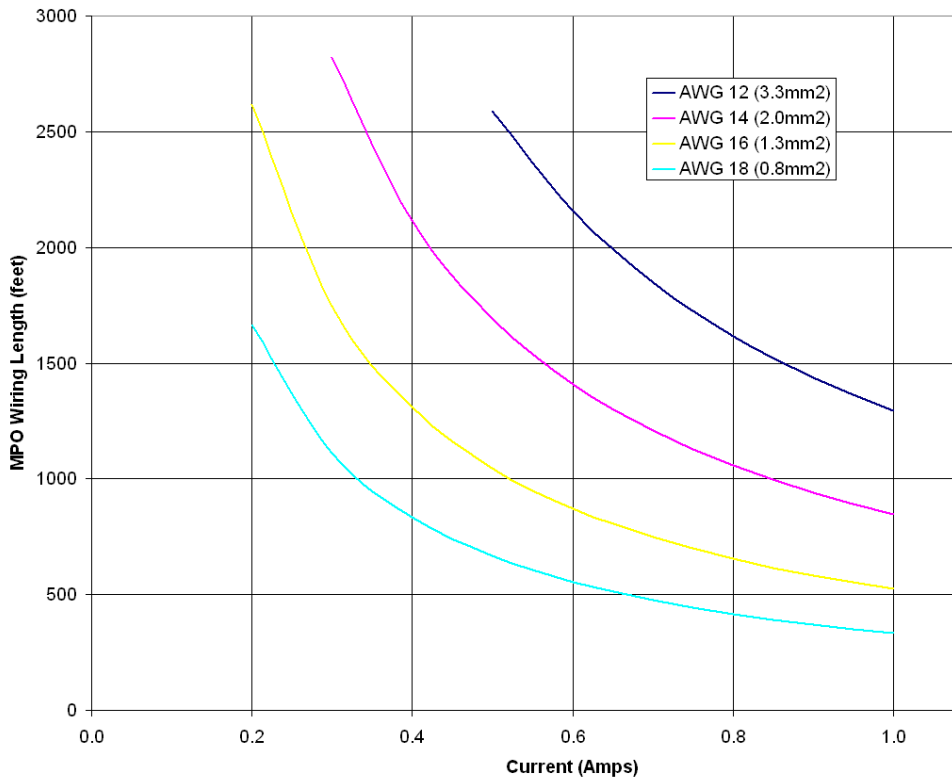Follow the guidelines shown in the graphs below to determine the maximum wiring length for each wiring gauge.

Figure 9 - Imperial and Metric Wiring Lengths for MPO

6.3   Disable the MPO (silence)

When the jumpers are configured for MPO operation, the GPI may be used to disable the MPO output (for example, to silence a siren).

Note: When the jumpers are configured for MPO operation, the GPI cannot be used to monitor for external equipment faults. In this mode, the GPI will only function to disable the MPO.

The GPI monitors line impedance and the End of Line (EOL) resistor provides a known termination to the external equipment, allowing the VLF MCC to detect open or short circuits.

If the GPI is active (short circuit/contact closed) the MPO output will be turned off until the GPI is deactivated.

Refer to Figure 10 on page 11 and use the 2-pin connector and the EOL resistor to connect the GPI. Leave the jumpers set as shown in Figure 10.
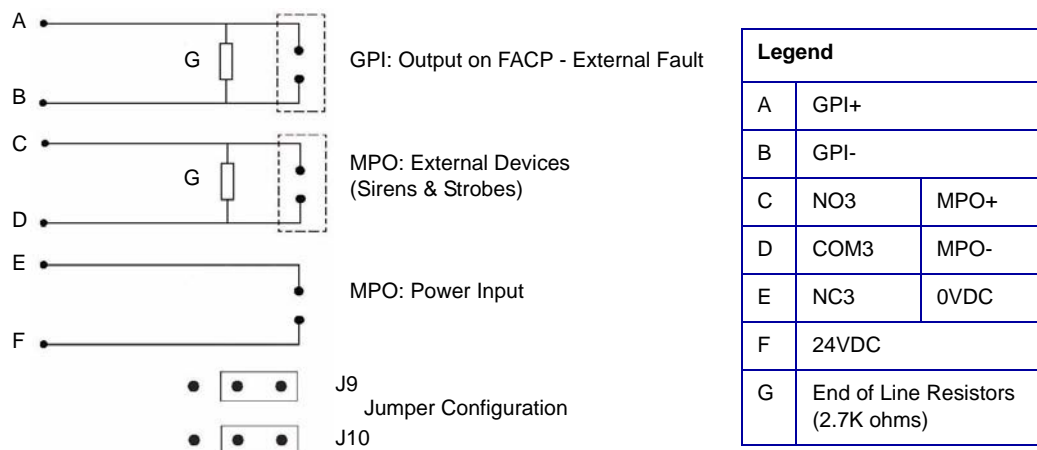

Figure 10 - Field Wiring to Disable the MPO (silence)

6.4   Connect Relay 3 (MPO Disabled)

Relay 3 is preconfigured to report Disabled and/or Standby status on your FACP. When Relay 3 is configured it will energize when the VLF is disabled and when the VLF is set to Standby.

When the VLF MCC is configured for Relay 3 operation,

1.   the MPO is not available
2.   the GPI functions to detect external equipment faults.

Refer to Figure 11 on page 12 and use the 4-pin connector to connect Relay 3. Relay 3 is wired Normally Open. You must alter the jumper setting as shown in Figure 11.
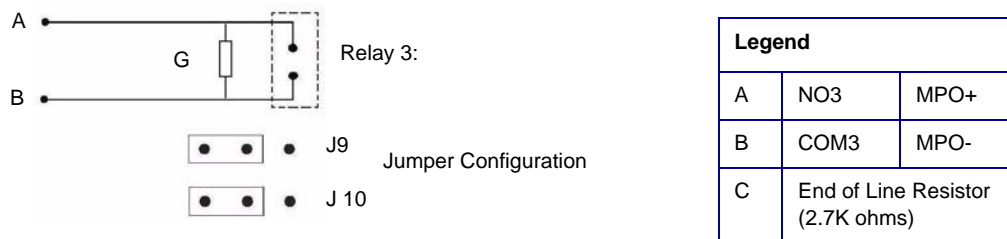

Legend		
A	NO3	MPO+
B	COM3	MPO-
C	End of Line Resistor (2.7K ohms)	

Figure 11 - Field Wiring and Jumper Setting for Relay 3
(GPI connected and MPO Disabled)

6.5   LEDs on the VIC-030 model

After you have connected the field wiring, turn the power to the detector on at the mains power switch. Check that the card is correctly configured by reviewing the status of the Light Emitting Diodes (LEDs) (see Table 4).

LED	Label on PCB	LED On	LED Blinking	LED Off
Power	Power	Card has host power	Not applicable	Card is not powered
OK	OK	Card status - not working	Card status - OK	Card status - booting up or faulty
DET	DET	Card status - OK	Card status - OK	Card status - booting up or communications FAULT
GPI	GPI	GPI status - active (short circuit)	GPI status - line fault (termination)	GPI status - inactive and terminated OK
RLY1	RLY1	Relay is energised	Not applicable	Relay is de-energised
RLY2	RLY2	Relay is energised	Not applicable	Relay is de-energised
RLY3	RLY3	Relay is energised	Not applicable	Relay is de-energised
MPO Power	MPO.0	MPO power input is available	MPO power input is out of range	MPO is not configured
MPO Line	MPO.1	MPO line is active	MPO line is faulty (termination or over-current)	MPO line is not active and is terminated OK

Table 4 - Status of LEDs on VIC-030 model following configuration

7. Configuring the VLF MCC

The only configuration required for the VLF MCC is the selection between MPO or Relay 3 on the VIC-030 model.

For MPO operation, set the jumpers (J9 and J10) as shown in Figure 8 *Connect the MPO* on page 9. When the jumpers are set for MPO operation, the GPI will function to disable the MPO.

For Relay 3 operation, set the jumpers (J9 and J10) as shown in Figure 11 on page 12. When the jumpers are set for Relay 3 operation, the GPI will monitor for external fault conditions.

8. Maintenance

There are no specific maintenance requirements for the VLF MCC. However, you should follow local approvals and regulations to ensure that regular testing requirements are satisfied. Refer also to the Maintenance section of the VLF Product Guide. Following the maintenance requirements for the VLF detector will support the operation of the VLF MCC.

9. Troubleshooting

9.1 Faults reported directly on the VLF

The VLF Detector's Instant Fault Finder displays fault summary numbers on the front panel of the VLF.

There are three faults that relate to the VLF MCC: Fault Summary 6, Fault Summary 7 and Fault Summary 8. A summary of these faults and their actions are listed in Table 5.

The VLF MCC cannot report a communications fault between it and the VLF. The VLF will report this fault as Fault Summary 7.

The VLF MCC cannot report a firmware incompatibility fault between it and the VLF. The VLF will report this fault as Fault Summary 7

Fault summary 6 - External Device	
Explanation:	**Action:**
GPI on the detector or VLF MCC is set to monitor an external fault condition and a short-circuit condition is present across the GPI terminals.	Check external equipment for fault conditions. Check for a short circuit in wiring between the GPI terminals and the external device being monitored.
Fault summary 7 - Interface Card	
Explanation:	**Action:**
• The detector is configured for an interface card but a card has not been installed or the card installed is faulty. • The cable has been disconnected from the interface card or the detector. Alternatively, the interface card, the interface cable or the detector are faulty. • The firmware version on the VLF is incompatible with the card (for example, the firmware is an old version and does not support the card).	1. If you do not wish to use an interface card, use VSC to configure your VLF to 'no card installed'. 2. If you have installed an interface card, check the status of the 'Power' and 'DET' LEDs (refer to Table 2 on page 7). • If the 'Power' LED is not lit, check the connection from the VLF to the VLF MCC. If this connection is secure, then the VLF MCC is faulty and should be replaced. • If the 'Power' LED is lit but the 'DET' LED is not lit, check the connection to the VLF. If the connection is secure, then the card, cable and/or the detector is faulty. Replace each in turn until the fault is resolved. • If the 'DET' LED is lit, then the VLF MCC is working and communicating with the VLF but the detector firmware version is incompatible. Use VSC connected to check the fault number. Follow the instructions in the VSC Help to resolve the issue.
Fault Summary 8 - Field Wiring	
Explanation:	**Action:**
The field wiring has a fault.	Check the field wiring and End of Line resistors.

Table 5 - Instant Fault Finder Summaries (VLF)

9.2   Faults reported via VSC

The following Fault information may be reported through VSC:

Fault #	Explanation	VLF IFF #	Action
105	Card has experienced multiple intermittent failures within a time period.	7	If faults cannot be explained through other circumstances then card is faulty and should be returned for repair.
111	Card input termination impedance out of expected range	8	Check all connections and end of line resistor for line faults between card GPI terminals and external device. Line termination resistor must be fitted even if GPI functionality is unused.
112	Card output termination impedance out of expected range or line sinking unexpected amount of current.	8	Check all connections and end of line resistor for line faults between card MPO output terminals and external device. Line termination resistor must be fitted if MPO is selected (via jumpers).
113	Card external power source supply voltage out of expected range	8	Check external 24 VDC power supply for correct voltage. Check all connections between power supply and card MPO Power. External powers must be connected if MPO is selected (via jumpers).
115	GPI on VLF MCC card is configured for external fault and GPI is asserted	6	Configure as required.

Table 6 - VLF MCC faults reported via VSC

10. Specifications

Dimensions	Length x Width x Height 110 mm (4 5/16 inches) x 70 mm (2 3/4 inches) x 20 mm (13/16 inches)	
	Weight	0.08 kg (0.176 lb)
	Terminals	0.2 - 2.5 mm² (30-12 AWG)
Electrical Ratings: Product	Power Consumption	Less than 1 W from the detector at 24 VDC (less that 42 mA) **Note:** Not including MPO power consumption.
	Relay outputs	2A at 30 VDC
Electrical Ratings: MPO Functionality	MPO input power supply (VIC-030 only)	24 VDC
	MPO input current (VIC-030 only)	100 mA more than MPO output load
	MPO output current (VIC-030 only)	1 A (maximum)
	End of line resistor (MPO & GPI)	2.7K ohms
Operating Conditions	Detector ambient temperature Humidity	0 to 40°C (32 to 104° F) 5% to 95% (non-condensing)
Visual Status Indicators	Diagnostic LEDs indicate: • host power to the VLF MCC • power to the MPO (VIC-030 only) • relay activated state • MPO activated state (VIC-030 only) • MPO power and line fault (VIC-030 only) • internal communications status • GPI state • GPI line fault	
Detector Compatibility	Compatible with VLF-250 and VLF-500	

Table 7 - VLF MCC Technical Data

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