MGD-32 and AGD-048

Remote Multiplex Graphic Driver Annunciators and Adder Boards
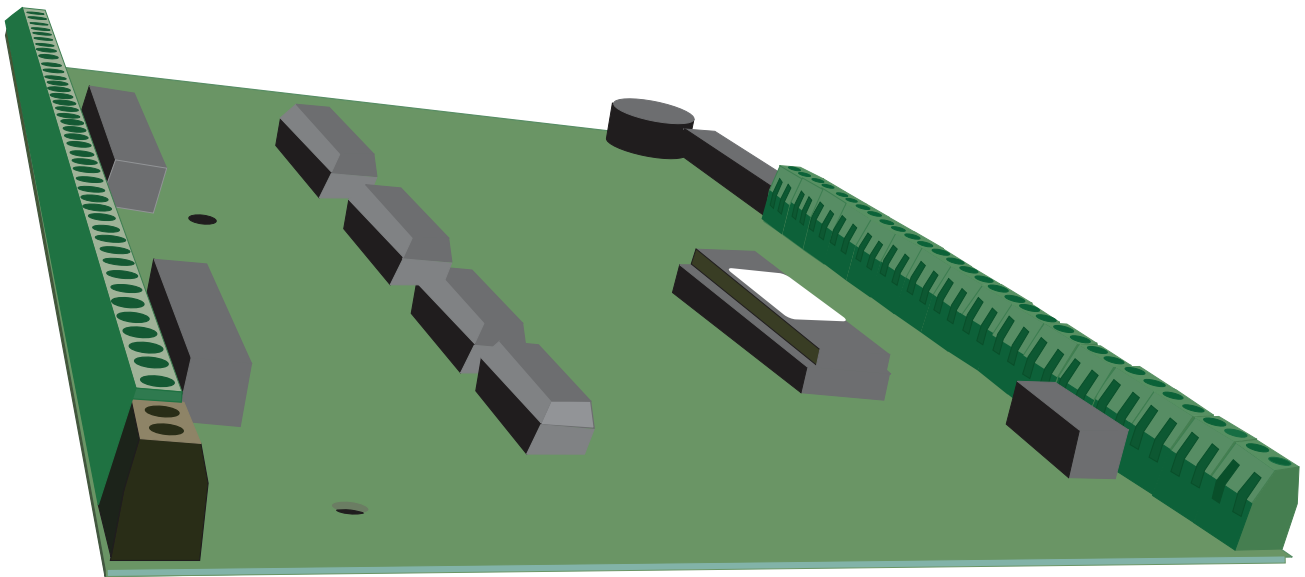
Table of Contents

1.0   Introduction

MGC's modularly designed Remote Multiplex Graphic Driver Annunciators provide a large capacity of annunciation (up to 224 points) with FA-200, FA-300, SFC-200, MR-2300, FR-320, MR-2320, FX-350, MR-2350, SFC-500, FX-3500, MR-3500, FA-1000, SFC-300, FX-2000, FleX-Net™ and MMX™ Series Fire Alarm Control Panels. The MGD-32 Main Annunciator Chassis is a 32 Circuit Annunciator which may be expanded with up to four AGD-048 Adder Annunciator Chassis' to a maximum of 224 Circuit Display Points. The MGD-32 has no button or LEDs on the board. Each Circuit Output will drive off board Indicators such as LEDs or LAMPS on a GRAPHIC DISPLAY to form a graphic annunciator. The drivers may be mounted by using the metal plate (included in the package) to any of the approved backboxes or within a graphic display. It is intended that the MGD-32 and the AGD-048 are combined with a GRAPHIC DISPLAY to make a graphic annunciator. These graphic drivers have individual lamp supervision circuitry which helps to identify burned out lamps.

2.0 Specifications & Features

2.1 Enclosure Models

1. Steel enclosure finish: painted semi-gloss off-white

2. Material: BB-5008 16 GA. (0.060") thick CRS
   BB-5014 GA. (0.060") thick CRS
   Doors are available in 14 GA (0.075") thick CRS, painted or Anodized Aluminum Extrusion.

3. Enclosure Dimensions: BB-5008 30"w x 36"H x 7"D
   BB-5014 30"w x 60"H x 7"D

2.2 Module Models

2.2.1 MGD-32 Annunciator Chassis (32 Display Points)

- 24V DC nominal, range 20 to 39 V DC (filtered or full-wave-rectified).
- Connections for Indicators (Lamp Fail, Common Trouble, Remote Failure, A.C. General Alarm, Acknowledge, and Signal Silence), and Controls (System Reset, Lamp Test, Fire Drill, Aux. Disconnect, General Alarm, Buzzer Silence, Acknowledge, and Signal Silence), Local Buzzer
- Annunciation of up to 32 Points.
- Expandable by using up to four AGD-048 Adder Modules.
- Standby: 35 mA, Alarm: 1.6A Max.

2.2.2 AGD-048 Graphic Annunciator Chassis (48 Display Points)

- 24V DC nominal, range 20 to 39 V DC. (filtered or full-wave-rectified)
- Annunciation of up to 48 Points.
- Up to four AGD-048 Adder Modules may be driven from one MGD-32
- Standby: 25 mA, Alarm: 2.4A Max.

2.3 Environmental Specifications

This annunciator is intended for indoor use only.

3.0 Installation Instruction

In Figure 1, Figure 2 and Figure 3 below, the MGD-32 and AGD-048 may be mounted into backboxes BB-5008 and BB-5014. The MGD-32 and the AGD-048 are packaged with a metal cover plate and are mounted into the backbox.

Exterior View

Cutout to mount
Graphic Annunciator
(Occupies 6 display positions)

Cutout Dimensions:
20.5"H x 22"W

Cutout to mount a
MGDS-16/16 Driver
module

Cutout to mount any
blank metal plate
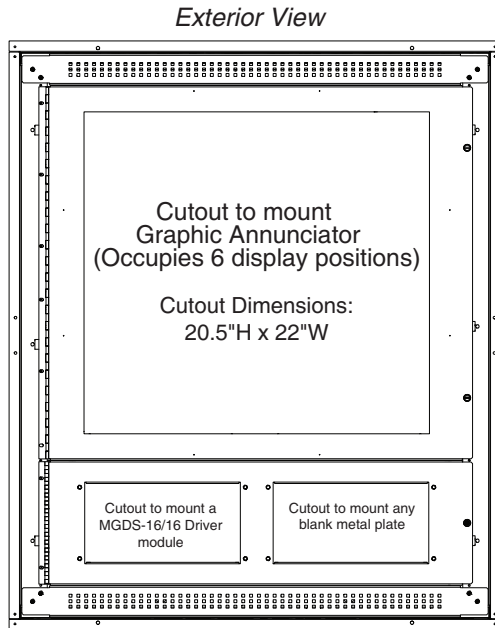
Figure 1   Sample Layout in BB-5008

Interior View

Brackets for
AGD-048

4 x HD-050
nuts

Brackets for
MGD-32

4 x HD-050
nuts
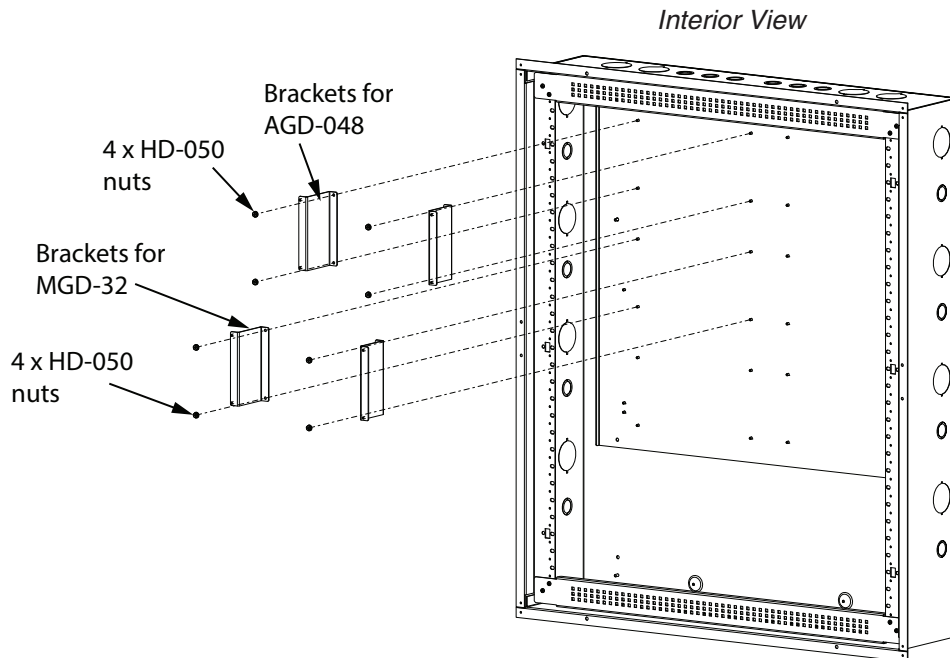
Figure 2   Installation of brackets in BB-5008

Interior View

AGD-048

4 x HD-050 nuts

MGD-32

4 x HD-050 nuts

Figure 3   Installation of Modules in BB-5008

4.0 Wiring Instruction

4.1 RS-485 Wiring

The RS-485 Wiring to the MGD-32 Annunciator Driver module needs to be Twisted Shielded Pair as shown in the diagram. The wire gauge may be

- 22 AWG up to 2000 ft.
- 20 AWG up to 4000 ft.

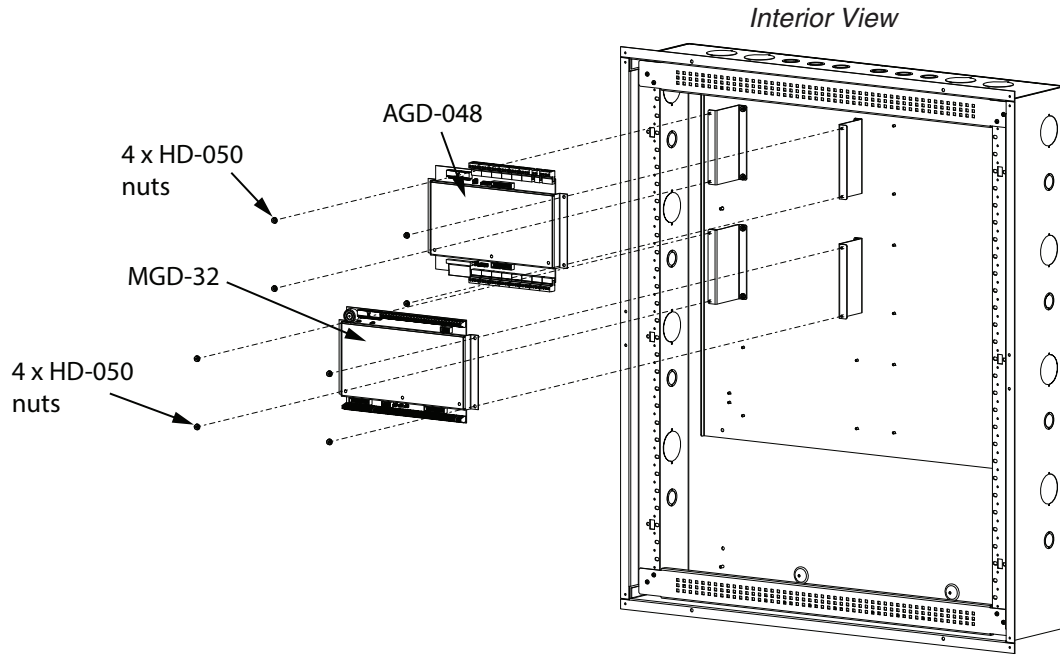The RS-485 wiring from the Fire Alarm Control Panel to the Annunciator(s) must be point-to-point from the FA Panel to the first Annunciator, then the next Annunciator, and so on. **No star-wiring or T-tapping is allowed.**
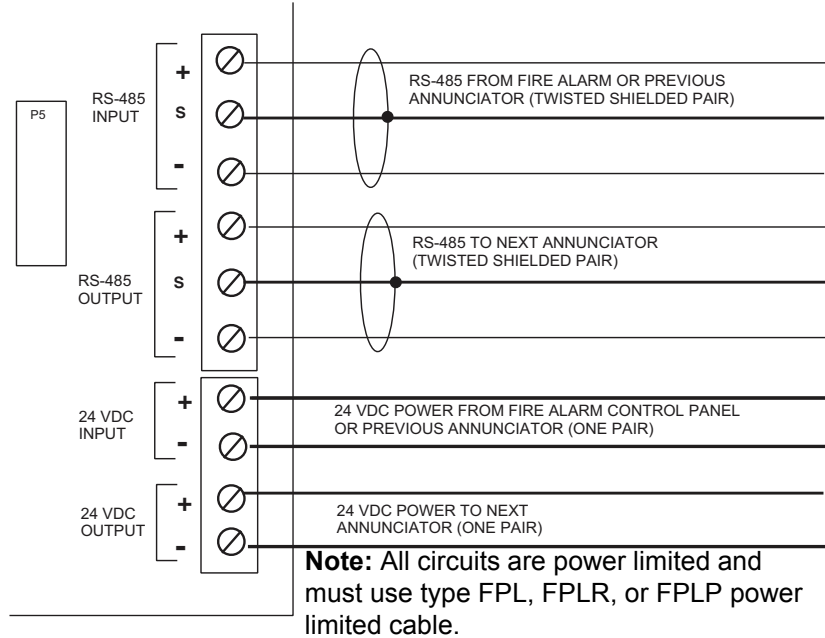
Figure 4   RS-485 and 24V DC Power Wiring

4.2 24V DC Power Wiring

Each MGD-32 Annunciator Driver module has a 120 ohm End-of-Line Resistor on its RS-485 output terminals. This is removed on all except the last wired Module.

The 24 V DC field wiring needs to be of an appropriate gauge for the number of annunciators and the total wiring run length. Refer to section 7.0 on page 21 to calculate the maximum current for all annunciators summed together, then use chart below to calculate size of wire for specific length of wire run.

Table 1   Annunciator 24V DC Power Wiring Table

Total Maximum Current for all Annunciators	18AWG		16AWG		14AWG		12AWG		Maximum Loop Resistance
Amperes	ft.	m.	ft.	m.	ft.	m.	ft.	m.	Ohms
0.06	2350	716	3750	1143	6000	1829	8500	2591	30
0.12	1180	360	1850	567	3000	915	4250	1296	15
0.30	470	143	750	229	1200	366	1900	579	6
0.60	235	71	375	114	600	183	850	259	3
0.90	156	47	250	76	400	122	570	174	2
1.20	118	36	185	56	300	91	425	129	1.5
1.50	94	29	150	46	240	73	343	105	1.2
1.70	78	24	125	38	200	61	285	87	1.0

!

Attention: Accidentally connecting any of the 24 VDC wires to the RS-485 wiring **will result in damage** to the annunciator and/or to the fire alarm control panel to which it is connected.

5.0 DIP Switch Settings & Cabling

Each Master Graphic Driver MGD-32 needs to be assigned a unique, sequential "Address" via the Main Chassis DIP Switch SW1. The AGD-048 does not require addressing.

The Annunciator address (refer to the manual for the specific fire alarm control panel being used) is set according to the table below.

Table 2   MGD-32 Annunciator Addresses

Dip Switch Positions	Annunciator Address						
	1	2	3	4	5	6	7
SW1-1 (A0)	ON	OFF	ON	OFF	ON	OFF	ON
SW1-2 (A1)	OFF	ON	ON	OFF	OFF	ON	ON
SW1-3 (A2)	OFF	OFF	OFF	ON	ON	ON	ON
SW1-4 (A3)	ON - when used with FX-2000, version 2.X.X or higher, FX-350, MR-2350, FX-3500, MR-3500, FleX-Net™, MMX™, and SFC-500 (16 bit checksum) OFF - when used with FX-2000, FA-1000, FA-300, MR-2300, FR-320, MR-2320, FA-200, and SFC-200 (8 bit checksum)						

i

Notes: Annunciators on a common RS-485 connection must be numbered sequentially; i.e.: 1, 2, 3, 4, and not randomly such as 5, 3, 2, 1.

Not all Annunciator addresses are valid for all fire alarm control panels. Address ZERO (all switches off) is not allowed and will generate an annunciator remote fail trouble. Refer to the Fire Alarm Control Panel Manual for further information.

5.1 Cabling for the AGD-048 Adder Annunciator

P1: Connects to the MGD-32 Main Annunciator Chassis, or to the previous AGD-048 Adder Annunciator Chassis. The AGD-048 receives its power from the Master Graphic Driver

P2: Connects to the next AGD-048 Adder Annunciator Chassis.

Terminals: Terminals L1 to L48 are annunciation zones.

5.2 Cabling for the MGD-32 Master Graphic Driver Annunciator

P2: Connects to the first AGD-048 Adder Annunciator Chassis.

P1,P3,P4: Connectors for custom displays, see the Appendix on page 22 for pin layout connections.

Jumpers: For buzzer and indicator supervision.

Terminals: For zone annunciation. Refer to section 6.1 on page 12 for details.

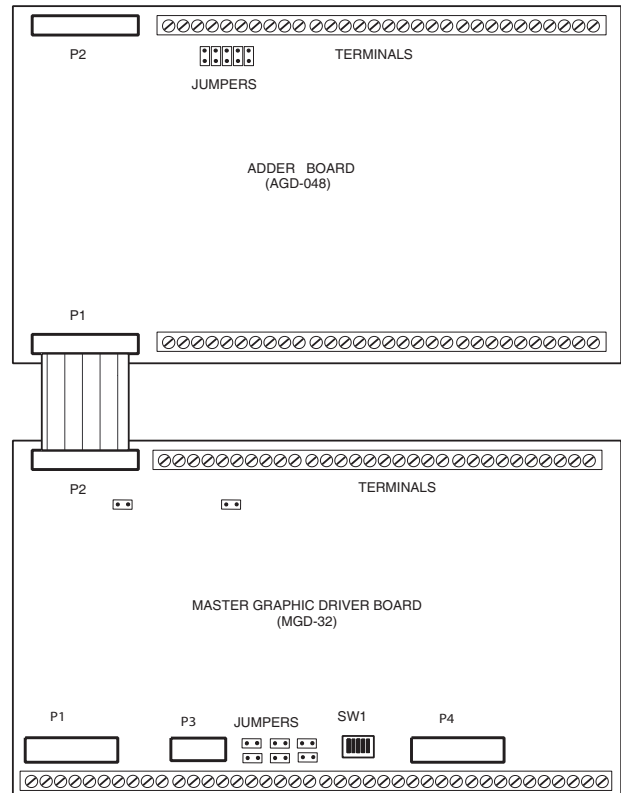**SW1:** DIP switches for annunciation address (Note address 'zero' is illegal).

Figure 5   Cabling Diagram

6.0 Graphic Drivers And Adder Wiring

6.1 Connections For The MGD-32 Graphic Driver Annunciator

6.1.1 Terminals Marked L1 To L12 (MGD-32 Only)

This first group of connections (L1 to L12) is for the common indicators. If the jumper is installed on JW8 then all connections L1 through L12 will be supervised as a group and any unused outputs will have a factory installed LISTED 3.9 K resistor connected from the particular unused output to the 24 V DC LAMP SUPPLY so as not to cause an erroneous lamp fail condition. This also applies to the external buzzer connection. The GRAPHIC DISPLAY must provide current limit resistors for LED use and the recommend ed value is 6.8 K, ¼ W to provide about 4 mA each; LAMPS can be wired directly and must have a rating of 24 volts at less than 50 mA.

Table 3   Terminal Indicators for L1 to L12

Terminals L1 to L12 Common Indicators for MGD-32 only	
L1	AC On
L2	Test
L3	Reset
L4	Fire Drill
L5	Auxiliary Disconnect
L6	Signal Silence
L7	Common Trouble
L8	General Alarm
L9	Acknowledge
L10	Remote Fail
L11	Lamp Fail
L12	External Buzzer

See Figure 6 on the following page for board layout for MGD-32.

i

Note: Removing JW8 on the MGD-32 eliminates the supervision from indicators L1 to L12.

TERMINALS FOR CONNECTION TO A
GRAPHIC DISPLAY

P2 CONNECT TO
ADDER AGD-048

NOT USED

JUMPER JW1 -DISCONNECTS
BUZZER IF JUMPER REMOVED

JUMPER JW2- CONNECT
(JUMPER ON) TO SUPERVISE
ADDER BOARD AGD-048

JUMPERS JW3 TO JW7 FOR
ZONE INDICATOR SUPERVISION

P1, P3 AND P4
CONNECTORS
FOR CUSTOM
DISPLAYS

L1 to L12
CONNECTION FOR EXTERNAL
COMMON INDICATORS
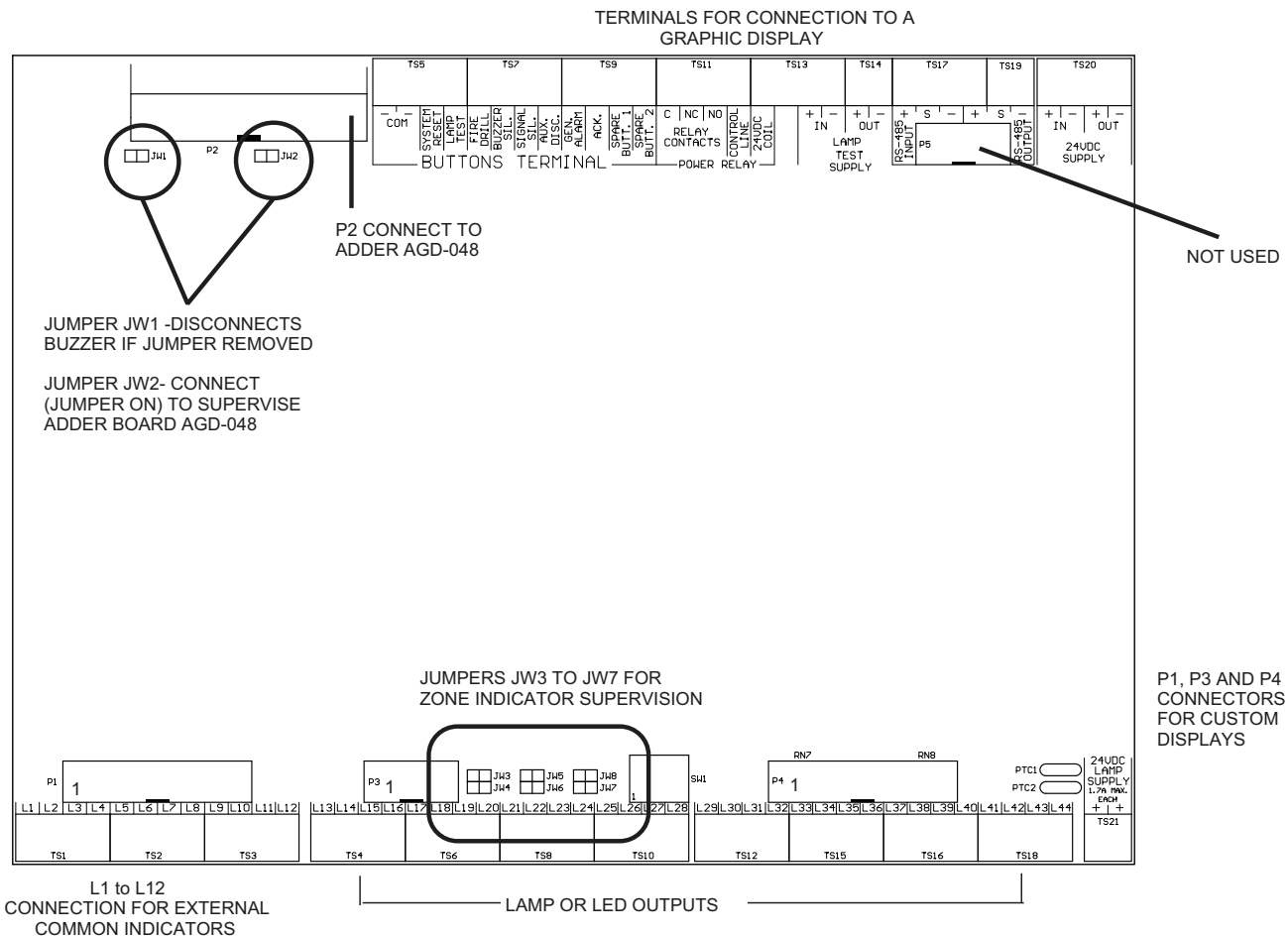
LAMP OR LED OUTPUTS

Figure 6   MGD-32 Board Layout Showing Terminals, Jumpers, and Connectors

6.1.2 Wiring Within Same Enclosure or Same Room

All wiring for these products (except the RS485 plus the 24VDC connections indicated in Figure 4) must be in the same enclosure or within the same room.

6.1.3 Terminals Marked L13 To L44

This next group of connections L13 to L44 is for the zone indicators. To simplify indicator supervision, the driver terminals are grouped as follows:

Table 4   Terminal Indicators for L13 to L44

1st Group Terminals		2nd Group Terminals		3rd Group Terminals		4th Group Terminals	
L13	ZONE 1	L21	ZONE 9	L29	ZONE 17	L37	ZONE 25
L14	ZONE 2	L22	ZONE 10	L30	ZONE 18	L38	ZONE 26
L15	ZONE 3	L23	ZONE 11	L32	ZONE 19	L39	ZONE 27
L16	ZONE 4	L24	ZONE 12	L33	ZONE 20	L40	ZONE 28
L17	ZONE 5	L25	ZONE 13	L34	ZONE 21	L41	ZONE 29
L18	ZONE 6	L26	ZONE 14	L35	ZONE 22	L42	ZONE 30
L19	ZONE 7	L27	ZONE 15	L36	ZONE 23	L43	ZONE 31
L20	ZONE 8	L28	ZONE 16	L37	ZONE 24	L44	ZONE 32

If the jumper is installed on JW7 (on MGD-32) then connections L13 through L44 are supervised in groups depending on the installation of jumpers JW3 through JW6 as follows:

- JW6 installed - supervise 1st group of outputs L13 to L20 (MGD-32 only)
- JW5 installed - supervise 2nd group of outputs L21 to L28 (MGD-32 only)
- JW4 installed - supervise 3rd group of outputs L29 to L36 (MGD-32 only)
- JW3 installed - supervise 4th group of outputs L37 to L44 (MGD-32 only)

Any unused supervised outputs must have a 3.9K ohm resistor installed from the unused terminal to 24 VDC lamp supply. By removing certain jumpers, unused groups of terminals need not have supervision resistors installed.

i

Note: If jumper JW7 is removed, then none of the indicators on L13 through to L44 will be supervised regardless of the installation of JW3 to JW6.

Figure 7 below shows the wiring for terminals L1 to L12 of the common indicators for the MGD-32 Master Graphic Driver board only.
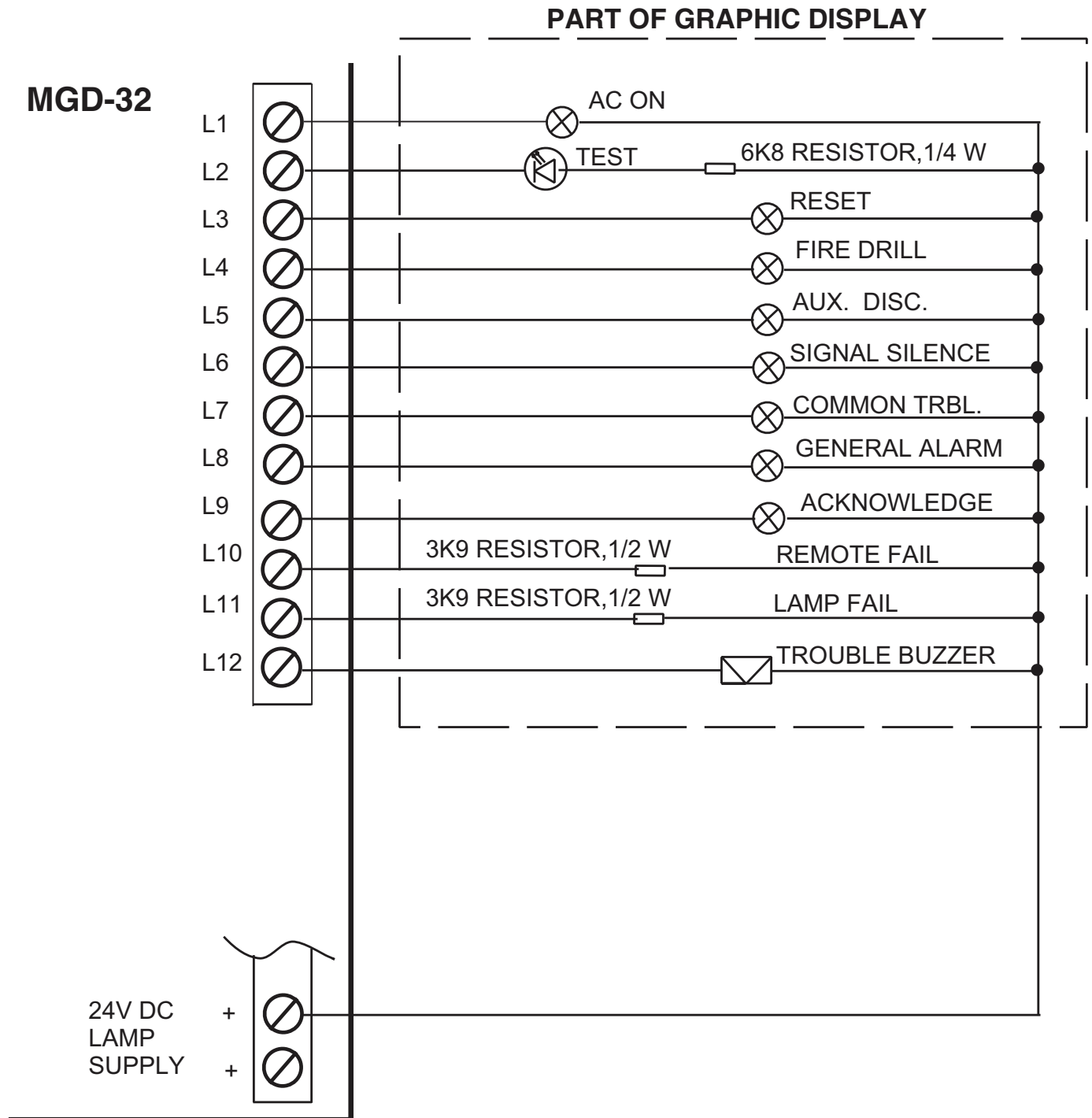
PART OF GRAPHIC DISPLAY

MGD-32

Terminal	
L1	AC ON
L2	TEST — 6K8 RESISTOR,1/4 W
L3	RESET
L4	FIRE DRILL
L5	AUX. DISC.
L6	SIGNAL SILENCE
L7	COMMON TRBL.
L8	GENERAL ALARM
L9	ACKNOWLEDGE
L10	3K9 RESISTOR,1/2 W — REMOTE FAIL
L11	3K9 RESISTOR,1/2 W — LAMP FAIL
L12	TROUBLE BUZZER

24V DC LAMP SUPPLY
+
+

Figure 7   Common Indicator and Buzzer Wiring for the MGD-32

> **Notes:** All unused supervised outputs must have a 3K9 resistor connected to the 24V DC lamp supply +.
>
> Lamps rated at 24V DC 50 mA max.
>
> When using LEDS, a 6K8, ¼ W resistor is required.

Figure 8 below shows the wiring for indicators Zones 1 to 32 on the MGD-32, corresponding to terminals labelled L13 to L44.
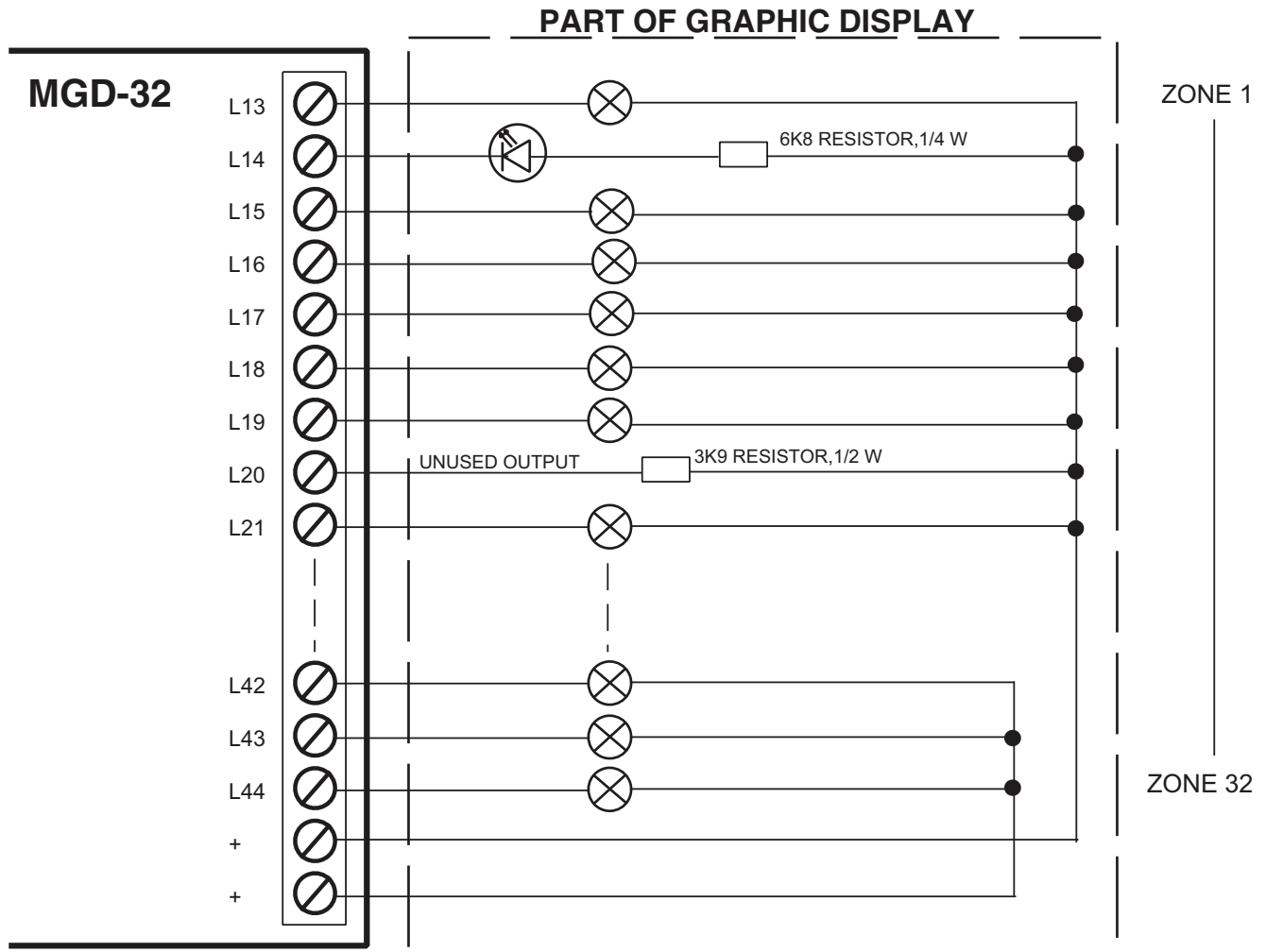

Figure 8   MGD-32 Indicator Zone Wiring

Notes: All unused supervised outputs must have a 3K9 resistor connected to the 24V DC lamp supply +.

Lamps rated at 24V DC 50 mA max.

When using LEDS, a 6K8, ¼ W resistor is required.

6.1.4   Terminals Marked "Buttons"

These connections are for the common controls switches. Any or all of these terminals must be wired to the appropriate push button switch with a return connection to the 'COM - ' terminals. Refer to Figure 9 for connection of the common control switches.
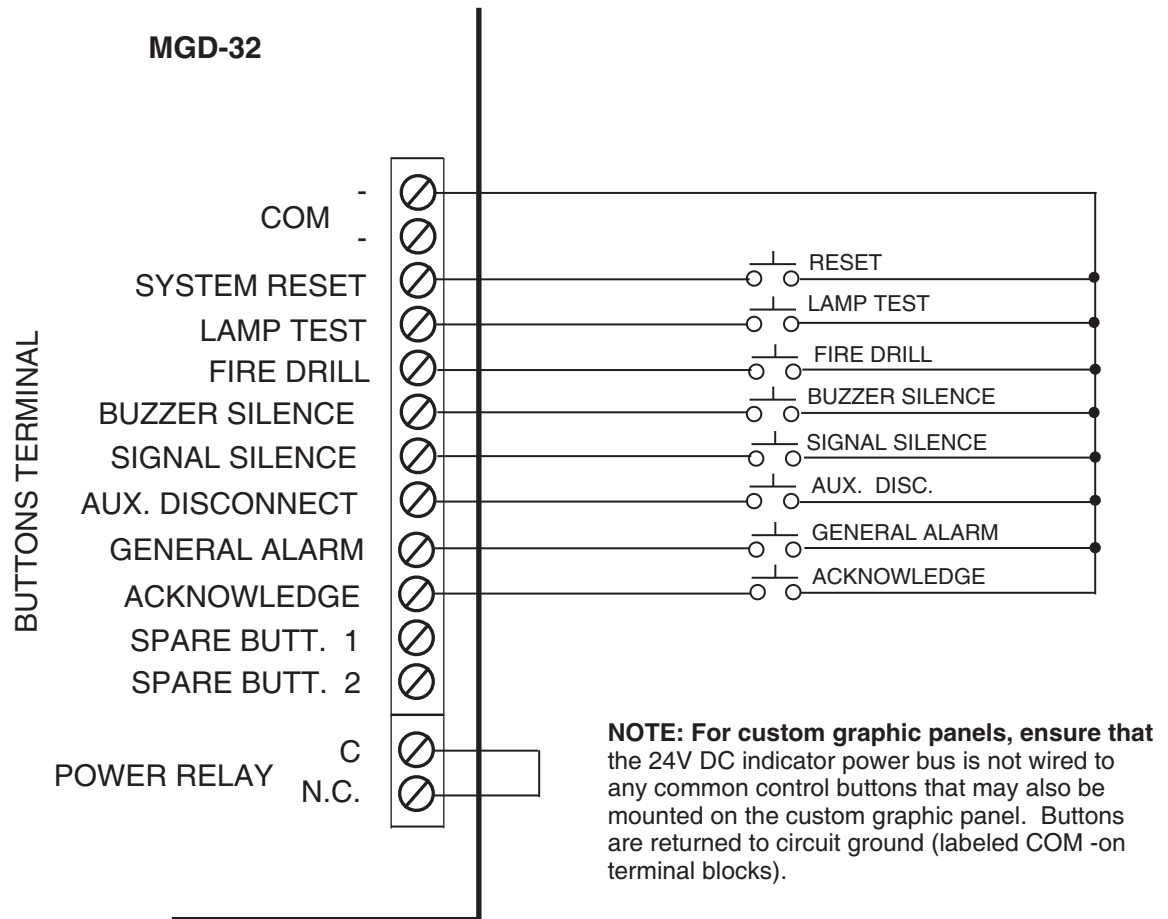
MGD-32

NOTE: For custom graphic panels, ensure that the 24V DC indicator power bus is not wired to any common control buttons that may also be mounted on the custom graphic panel. Buttons are returned to circuit ground (labeled COM -on terminal blocks).

Figure 9   MGD-32 Common Control Button Wiring

6.1.5 Terminals Marked "Power Relay And Lamp Test Supply"

Install a wire jumper between terminal points POWER RELAY 'C' AND POWER RELAY 'NC'.

6.1.6 Terminals Marked "RS-485"

These are the standard communications connections required from the main panel and remote annunciators. Refer to Figure 4 24V DC POWER AND RS-485 WIRING diagram and wire the MGD-32 as shown.

6.1.7 Terminals Marked "24 V DC Supply"

This is the connection from the main fire alarm panel Aux Power supply (typically 24V DC, 1.7A) to the MGD-32 Graphic Driver Annunciator unit.

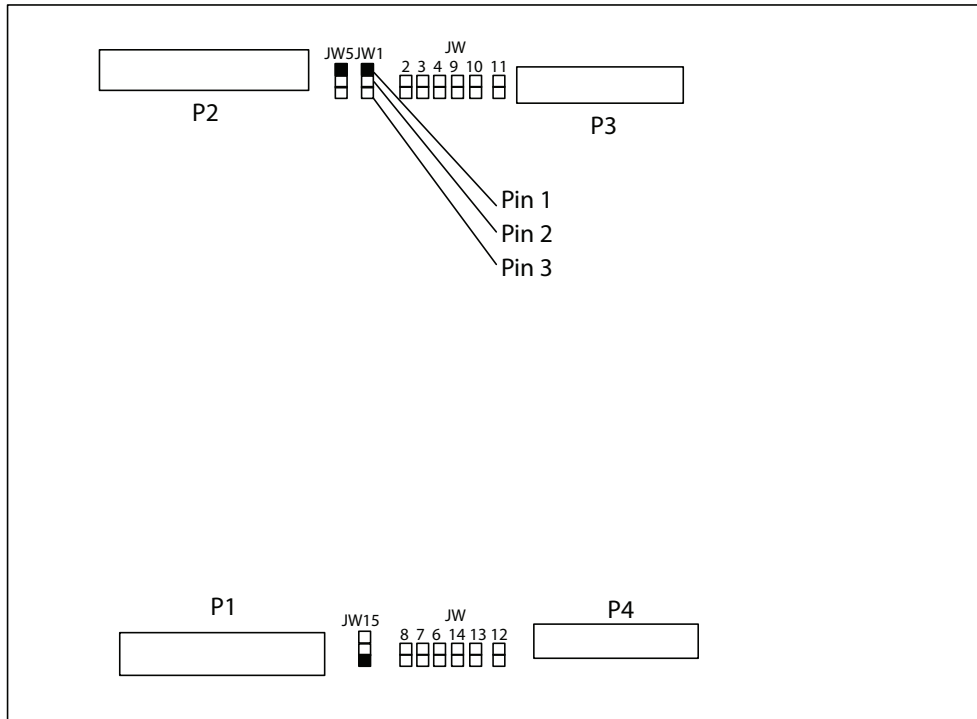## 6.2 Connections for the AGD-048 Adder Annunciator Board

Figure 10   AGD-048 Board Layout Showing Terminals, Jumpers and Connectors

JW2 to JW6 and **JW6** to **JW14:** Used for selecting the supervision of the 48 indicator zones. They are all installed by factory default.

JW2 & **JW9** supervise **L1** to **L8**.

JW3 & **JW11** supervise **L9** to **L16**.

JW4 & **JW9** supervise **L17** to **L24**.

JW6 & **JW12** supervise **L25** to **L32**.

JW7 & **JW13** supervise **L33** to **L40**.

JW8 & **JW14** supervise **L41** to **L48**.

6.2.1 Getting the AGD-048 to Work with the MGD-32

Jumpers **JW1, JW5,** and **JW15** (pins 1 & 2) are used when the AGD-048 is connected to an MGD-32. These settings are the factory default.

1. Short pins #1 & #2 of JW15.
2. Short pins #1 & 2 of JW5 & JW1.

6.2.2 Getting the AGD-048 to Work with the FX-2000 or RAX-LCD

Jumpers **JW12**, **JW5** and **JW15** (pins 2 & 3) are used when the AGD-048 is connected to an FX-2000, FleX-Net™, MMX™, RAX-LCD, RAXN-LCD, or RAXN-LCDG.

1. Short pins #2 & #3 of JW15.
2. Short pins #2 & 3 of JW5 & JW1.

6.2.3 Terminals Marked L1 To L48

These connections are for the zone indicators, 48 zone. See the description for Figure 10 above for details.

> *i*
>
> **Note:** For any supervision of the first 24 zones, jumper JW1 must be installed.
>
> For any supervision of the last 24 zones, jumper JW5 must be installed.

6.2.4 Terminals Marked "Power Relay Contacts"

These terminals marked C for common, NC for normally closed and NO for normally open are connections meant for an external power relay which is required for large graphic displays consuming more than 1.7 amps during lamp test. Please refer to section 7.0 on page 21.

6.2.5 Terminals Marked "Lamp Test Supply"

If additional power is required for lamp test (which is determined by calculation in section on Current Drain Calculations), then the power supply is connected here to + and - IN and the OUT + and _ to the next adder module IN + and -.

6.2.6 Terminals Marked "24V DC Lamp Supply"

These terminals provided the positive power for all the external LAMPS or LEDs that are connected to terminals L1 to L48. Typically these terminals will wire to a 'power bus' as part of the graphic display.

6.2.7 Terminals Marked "24V DC Supply"

The IN + and - terminals are connected from the MGD-32 Main Driver Annunciator board 24V DC output + and - terminals. The OUT + and - terminals are connected to the next AGD-048 Adder module.
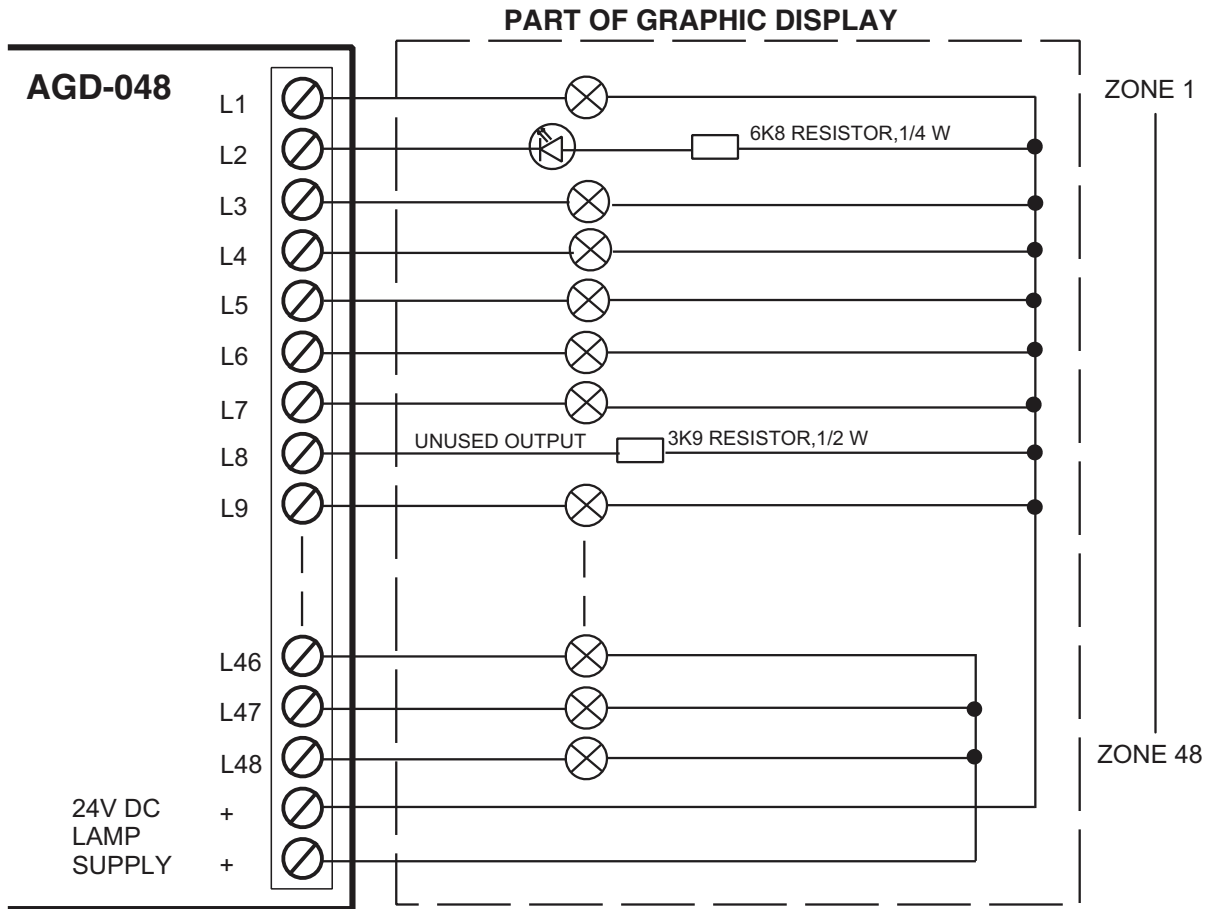
PART OF GRAPHIC DISPLAY

Figure 11   Indicator Zone Wiring for the AGD-048 Adder Board

Notes: All unused supervised outputs must have a 3K9 resistor connected to the 24V DC lamp supply +.

Lamps rated at 24V DC 50 mA max.

When using LEDS, a 6K8 ohm, $\frac{1}{4}$ W resistor is required.

7.0   Current Drain Calculations

The maximum current drain will occur during Lamp Test when all LAMPS/LEDs are illuminated at one time. The power provided by the fire alarm panel is 24V DC, 1.7A. Therefore the total current draw for all the LAMPS and LEDs must not be greater than 1.7A. The total current must be calculated in order to determine if the fire alarm power supply is sufficient. If not, then an additional transformer and relay is required.

To calculate total current draw, fill the current charts below.

Lamp Test Loading Calculations

MGD-32   _____   X 35 mA   =   _____
                        number of boards

AGD-048   _____   X 35 mA   =   _____(a)
                        number of boards

Lamp/LED Current

_____   X _____   =   _____
total number of lamps   lamp current

_____   X 4 mA   =   _____(b)
total number of LEDs

7.1   Total Current Draw

Total board current (a) + Total lamp/LED current (b)   =   _____(c)

If the total current draw [value (c)] is less than or equal to 1.7A, then no external power supply or relay is required, but a short wire must be connected between the N.C. and C POWER RELAY terminals of the power relay on all main and adder boards. Split the total number of LAMPS/LEDS/BUZZER evenly between the two positive (+) LAMP TEST SUPPLY terminals. For example, if you are using 30 output LEDS/LAMPS, hook up 15 to the one positive terminal of LAMP TEST SUPPLY and the other 15 to the other positive terminal of LAMP TEST SUPPLY.

If the total current draw [value (c)] is greater than 1.7A, then an external power supply and relay is required.

8.0   Appendix A

8.1   Pin Layout for Connectors on MGD-32 and AGD-048

Table 5   Pin Layout for the P1 Connector on the MGD-32 Driver Board

P1 24-Pin Header	Pushbuttons/Indicators/Buzzer
1	Reset (Pushbutton)
2	Lamp Test (Pushbutton)
3	Fire Drill (Pushbutton)
4	Buzzer Silence (Pushbutton)
5	Signal Silence (Pushbutton)
6	Auxiliary Disconnect (Pushbutton)
7	General Alarm (Pushbutton)
8	Acknowledge (Pushbutton)
9	NOT USED
10	NOT USED
11	NOT USED
12	NOT USED
13	AC ON (Indicator)
14	Test (Indicator)
15	Reset (Indicator)
16	Fire Drill (Indicator)
17	Auxiliary Disconnect (Indicator)
18	Signal Silence (Indicator)
19	Common Trouble (Indicator)
20	General Alarm (Indicator)
21	Acknowledge (Indicator)
22	Remote Fail (Indicator)
23	Lamp Fail (Indicator)
24	Buzzer Connection
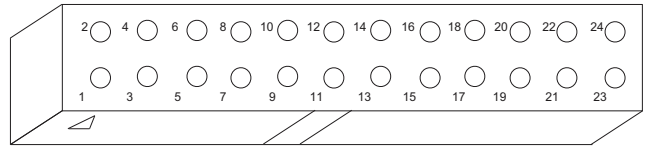
Table 6   Pin Layout for the P3 Connector on the MGD-32 Driver Board

P3 10-Pin Header	Indicator Zone
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	NO CONNECTION
10	NO CONNECTION
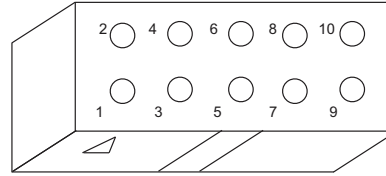
Table 7   Pin Layout for the P4 Connector on the MGD-32 Driver Board

P4 26-Pin Header	Indicator Zone
1	9
2	10
3	11
4	12
5	13
6	14
7	15
8	16
9	17
10	18
11	19
12	20
13	21
14	22
15	23
16	24
17	25
18	26
19	27
20	28
21	29
22	30
23	31
24	32
25	NO CONNECTION
26	NO CONNECTION
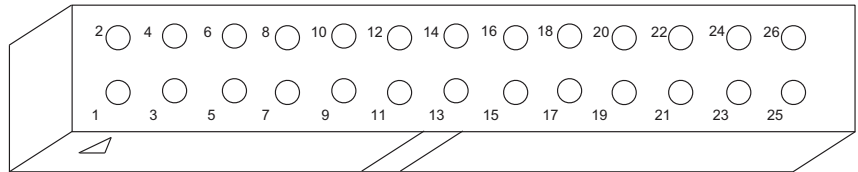
Table 8   Pin Layout for the P3 Connector on the AGD-048 Driver Board

P4 26-Pin Header	Indicator Zone
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	NOT USED
26	NOT USED
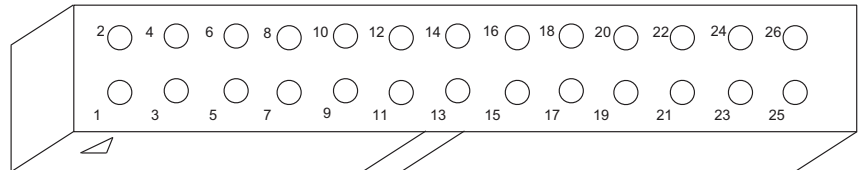
Table 9   Pin Layout for the P4 Connector on the AGD-048 Driver Board

P4 26-Pin Header	Indicator Zone
1	25
2	26
3	27
4	28
5	29
6	30
7	31
8	32
9	33
10	34
11	35
12	36
13	37
14	38
15	39
16	40
17	41
18	42
19	43
20	44
21	45
22	46
23	47
24	48
25	NOT USED
26	NOT USED
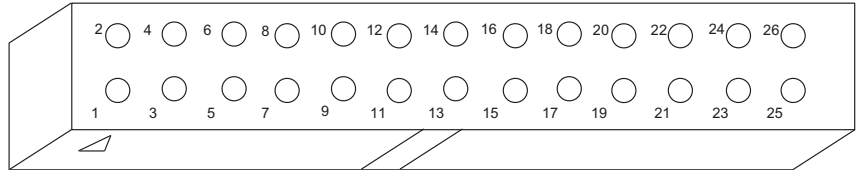
9.0   Warranty and Warning Information

WARNING!

Please read this document **CAREFULLY**, as it contains important warnings, life-safety, and practical information about all products manufactured by the Mircom Group of Companies, including Mircom and Secutron branded products, which shall include without limitation all fire alarm, nurse call, building automation and access control and card access products (hereinafter individually or collectively, as applicable, referred to as "**Mircom System**").

NOTE TO ALL READERS:

1. **Nature of Warnings.** The within warnings are communicated to the reader out of an abundance of caution and create no legal obligation for Mircom Group of Companies, whatsoever. Without limiting the generality of the foregoing, this document shall NOT be construed as in any way altering the rights and obligations of the parties, governed by the legal documents that apply in any given circumstance.

2. **Application.** The warnings contained in this document apply to all Mircom System and shall be read in conjunction with:

   a. the product manual for the specific Mircom System that applies in given circumstances;

   b. legal documents that apply to the purchase and sale of a Mircom System, which may include the company's standard terms and conditions and warranty statements;

   c. other information about the Mircom System or the parties' rights and obligations as may be application to a given circumstance.

3. **Security and Insurance.** Regardless of its capabilities, no Mircom System is a substitute for property or life insurance. Nor is the system a substitute for property owners, renters, or other occupants to act prudently to prevent or minimize the harmful effects of an emergency situation. Building automation systems produced by the Mircom Group of Companies are not to be used as a fire, alarm, or life-safety system.

NOTE TO INSTALLERS:

All Mircom Systems have been carefully designed to be as effective as possible. However, there are circumstances where they may not provide protection. Some reasons for system failure include the following. As the only individual in contact with system users, please bring each item in this warning to the attention of the users of this Mircom System. Failure to properly inform system end-users of the circumstances in which the system might fail may result in over-reliance upon the system. As a result, it is imperative that you properly inform each customer for whom you install the system of the possible forms of failure:

4. **Inadequate Installation.** All Mircom Systems must be installed in accordance with all the applicable codes and standards in order to provide adequate protection. National standards require an inspection and approval to be conducted by the local authority having jurisdiction following the initial installation of the system and following any changes to the system. Such inspections ensure installation has been carried out properly.

5. **Inadequate Testing.** Most problems that would prevent an alarm a Mircom System from operating as intended can be discovered by regular testing and maintenance. The complete system should be tested by the local authority having jurisdiction immediately after a fire, storm, earthquake, accident, or any kind of construction activity inside or outside the premises.

The testing should include all sensing devices, keypads, consoles, alarm indicating devices and any other operational devices that are part of the system.

NOTE TO USERS:

All Mircom Systems have been carefully designed to be as effective as possible. However, there are circumstances where they may not provide protection. Some reasons for system failure include the following. The end user can minimize the occurrence of any of the following by proper training, testing and maintenance of the Mircom Systems:

6. **Inadequate Testing and Maintenance.** It is imperative that the systems be periodically tested and subjected to preventative maintenance. Best practices and local authority having jurisdiction determine the frequency and type of testing that is required at a minimum. Mircom System may not function properly, and the occurrence of other system failures identified below may not be minimized, if the periodic testing and maintenance of Mircom Systems is not completed with diligence and as required.

7. **Improper Operation.** It is important that all system users be trained in the correct operation of the alarm system and that they know how to respond when the system indicates an alarm. A Mircom System may not function as intended during an emergency situation where the user is unable to operate a panic or emergency switch by reason of permanent or temporary physical disability, inability to reach the device in time, unfamiliarity with the correct operation, or related circumstances.

8. **Insufficient Time.** There may be circumstances when a Mircom System will operate as intended, yet the occupants will not be protected from the emergency due to their inability to respond to the warnings in a timely manner. If the system is monitored, the response may not occur in time enough to protect the occupants or their belongings.

9. **Carelessness or Safety Hazards.** Moreover, smoke detectors may not provide timely warning of fires caused by carelessness or safety hazards such as smoking in bed, violent explosions, escaping gas, improper storage of flammable materials, overloaded electrical circuits or children playing with matches or arson.

10. **Power Failure.** Some Mircom System components require adequate electrical power supply to operate. Examples include: smoke detectors, beacons, HVAC, and lighting controllers. If a device operates only by AC power, any interruption, however brief, will render that device inoperative while it does not have power. Power interruptions of any length are often accompanied by voltage fluctuations which may damage Mircom Systems or other electronic equipment. After a power interruption has occurred, immediately conduct a complete system test to ensure that the system operates as intended.

11. **Battery Failure.** If the Mircom System or any device connected to the system operates from batteries it is possible for the batteries to fail. Even if the batteries have not failed, they must be fully charged, in good condition, and installed correctly. Some Mircom Systems use replaceable batteries, which have a limited life-span. The expected battery life is variable and in part dependent on the device environment, usage and type. Ambient conditions such as high humidity, high or low temperatures, or large temperature fluctuations may reduce the expected battery life. Moreover, some Mircom Systems do not have a battery monitor that would alert the user in the event that the battery is nearing its end of life. Regular testing and replacements are vital for ensuring that the batteries function as expected, whether or not a device has a low-battery monitor.

12. **Physical Obstructions.** Motion sensors that are part of a Mircom System must be kept clear of any obstacles which impede the sensors' ability to detect movement. Signals being communicated by a Mircom System may not reach the receiver if an item (such as metal, water, or concrete) is placed on or near the radio path. Deliberate jamming or other inadvertent radio signal interference can also negatively affect system operation.

13. **Wireless Devices Placement Proximity.** Moreover all wireless devices must be a minimum and maximum distance away from large metal objects, such as refrigerators. You are required to consult the specific Mircom System manual and application guide for any maximum distances required between devices and suggested placement of wireless devices for optimal functioning.

14. **Failure to Trigger Sensors.** Moreover, Mircom Systems may fail to operate as intended if motion, heat, or smoke sensors are not triggered.

    a. Sensors in a fire system may fail to be triggered when the fire is in a chimney, walls, roof, or on the other side of closed doors. Smoke and heat detectors may not detect smoke or heat from fires on another level of the residence or building. In this situation the control panel may not alert occupants of a fire.

    b. Sensors in a nurse call system may fail to be triggered when movement is occurring outside of the motion sensors' range. For example, if movement is occurring on the other side of closed doors or on another level of the residence or building the motion detector may not be triggered. In this situation the central controller may not register an alarm signal.

15. **Interference with Audible Notification Appliances.** Audible notification appliances may be interfered with by other noise sources such as stereos, radios, televisions, air conditioners, appliances, or passing traffic. Audible notification appliances, however loud, may not be heard by a hearing-impaired person.

16. **Other Impairments.** Alarm notification appliances such as sirens, bells, horns, or strobes may not warn or waken a sleeping occupant if there is an intervening wall or door. It is less likely that the occupants will be alerted or awakened when notification appliances are located on a different level of the residence or premise.

17. **Software Malfunction.** Most Mircom Systems contain software. No warranties are provided as to the software components of any products or stand-alone software products within a Mircom System. For a full statement of the warranties and exclusions and limitations of liability please refer to the company's standard Terms and Conditions and Warranties.

18. **Telephone Lines Malfunction.** Telephone service can cause system failure where telephone lines are relied upon by a Mircom System. Alarms and information coming from a Mircom System may not be transmitted if a phone line is out of service or busy for a certain period of time. Alarms and information may not be transmitted where telephone lines have been compromised by criminal tampering, local construction, storms or earthquakes.

19. **Component Failure.** Although every effort has been made to make this Mircom System as reliable as possible, the system may fail to function as intended due to the failure of a component.

20. **Integrated Products.** Mircom System might not function as intended if it is connected to a non-Mircom product or to a Mircom product that is deemed non-compatible with a particular Mircom System. A list of compatible products can be requested and obtained.

Warranty

Purchase of all Mircom products is governed by:

https://www.mircom.com/product-warranty

https://www.mircom.com/purchase-terms-and-conditions

https://www.mircom.com/software-license-terms-and-conditions