

**FIRE PROTECTIVE SMOKE CURTAINS & STEEL- TEX FIRE® SHUTTERS**

**OPERATIONAL PERFORMANCE & REQUIRED**

**PREVENTATIVE MAINTANENCE MANUAL**

**SD60GS®**

## **IMPORTANT**

### **Testing Protocol**

1. Deploy Curtain to lower limit via the fire alarm system or by local smoke detector.
2. Retract Curtain via fire alarm system
3. Hold curtain at headbox for 1 minute
4. Deploy curtain to lower limit, via fire alarm system and retract
5. Test complete to prove system
6. Take Curtains off line and bypass control panel so that you do not yo-yo the system.
7. All other smoke/IR detector testing will be at fire alarm relay only for red indicator light for positive notification
8. Once all fire alarm testing complete, remove the bypass of the curtain system.

Tests is undertaken using our UL 864 listed Control Panel (CP) and Motor Controller (MC). Consistent cycling of the low voltage motors during fire alarm system may damage curtain systems. All SD series Fire Protective Curtains and Hose Stream series Fire Shutter gravity motors are NOT designed to be consistently cycled per the manufacturers guidelines. This is critical is repeated fire alarm testing. Per NFPA 80 Chapter 20, there shall be only two drop tests. If the smoke detectors of the building or general alarm is continually being tested, the curtains shall not be repeatedly cycled.

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**PLEASE NOTE: SURGE PROTECTOR IS REQUIRED TO BE FURNISHED & INSTALLED BY OTHERS AT EACH DEDICATED CIRCUIT FOR THE CONTROL PANELS. WITHOUT THE SURGE PROTECTOR(S), ANY AND ALL WARRANTIES WILL BE VOIDED AND ANY DAMAGE TO ELECTRICAL COMPONENTS DURING COMMISSIONING AND IN THE WARRANTY PERIOD WILL BE CHARGED BACK TO THE RESPONSIBLE PARTY.**

## PREVENTATIVE MAINTENANCE SERVICE

The preventative maintenance service performs the following **36 point** electrical and mechanical service on your product annually.

<b>1</b>	Check all fuses	<b>19</b>	Spray anti-static printed circuit board (PCB)
<b>2</b>	Check back-up power supply	<b>20</b>	Spray PCB Board for dust collection
<b>3</b>	Check MC supply in / out at CP- retracted state	<b>21</b>	Test override & Test grounds
<b>4</b>	Check MC supply in / out at CP at deployment	<b>22</b>	Check accessible wiring terminations
<b>5</b>	Check MC supply in / out at MC – retracted state	<b>23</b>	Grease all contacts
<b>6</b>	Check MC supply in / out at MC at deployment	<b>24</b>	Lubricate side rails & housing check for obstruction
<b>7</b>	Check motor supply in / out at MC out	<b>25</b>	Adjust curtain fabric tabs and bottom bar
<b>8</b>	Check line voltage supply in / out	<b>26</b>	Inspect curtain fabric, push buttons, and bottom bars for damage
<b>9</b>	Check transformed voltage & transformer – retracted state	<b>27</b>	Bottom Bar Fabric slack removed
<b>10</b>	Check transformed voltage & transformer at deployment	<b>28</b>	Obstruction Bar Bent
<b>11</b>	Check voltage at IOI at CP – retracted state	<b>29</b>	Obstruction of Headbox
<b>12</b>	Check voltage at IOI at CP at deployment	<b>30</b>	Obstruction of side rails
<b>13</b>	Check loop voltage for short degradation	<b>31</b>	Apply fire coating as necessary
<b>14</b>	Test key switch contact to fire alarm circuit	<b>32</b>	Cycle curtain system for efficient and safe operation per NFPA 3 guidelines
<b>15</b>	Check delayed reset control	<b>33</b>	Video / photograph – Curtain drop test
<b>16</b>	Check mains failure, all trouble lights & annunciator	<b>34</b>	Video / photograph – Curtain open
<b>17</b>	Check (Bldg. Mgmt. System) BMS	<b>35</b>	Video / photograph – Curtain deploy
<b>18</b>	Spray anti-static printed circuit board (PCB)	<b>36</b>	Video / photograph – Curtain close

All work to be done at day hours with Control Panel (CP) Display.  
There is no need to call out fire alarm system.

If there are any parts that will require replacement upon testing at time of visit, the technician(s) will change the component at the prices listed below for electrical components per the preventative maintenance rates.

Separate Time & Materials appointment for any service that needs to be performed outside the scope of this preventative maintenance agreement or any components that may be replaced on site.

**PLEASE NOTE: THE MANUFACTURER'S WARRANTY IS SUBJECT TO OBTAINING THE ANNUAL PREVENTATIVE MAINTENANCE AGREEMENT CONDUCTED BY FACTORY-CERTIFIED TECHNICIANS PER NFPA 3 GUIDELINES AND THE MANUFACTURER'S FOLLOW UP SERVICE AND LABELING PROGRAM. ANY SYSTEM THAT DOES NOT PARTICIPATE IN THE MANUFACTURERS MAINTENANCE PROGRAM WILL VOID THE LABELING OF THE SYSTEM.**

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## **Chapter 1: System Overview**

### **1.1 – Description**

When a curtain is required to deploy in an emergency situation it is probable that the main supply to the control panel may have already failed and that the cables linking the curtains to the control panel might become damaged. Under these circumstances with no power available the curtain will have to deploy by gravity. For this reason, the system will always deploy by gravity and every time the system is tested it sends a 100% confirmation of the fail-safe operation.

The fail-safe fire protective automatic curtain systems utilizes the latest in electronic technology per UL 864.

### **1.2 – Operation**

Under normal conditions the curtain is retracted in the head box and is held in position by the electronics contained within a remote enclosure. The bottom bar rests against the underside of the box or below the box if a stopping bar is installed. The stopping bar will sit below the headbox.

In the event of a fire condition or operation of the testing oled display, the control panel removes the power to the curtain motors. The curtain descends in a controlled manner under the power of gravity and stops in the lower position when all the fabric is unwound from the roller. When the signal is reset the control panel reestablishes power to the motors which will retract the curtains.

Should the main power fail to the control panel, the supply is automatically switched to an optional standby battery. The curtain remains in the retracted position for 1 to 4 hours (factoring a fully loaded system).

**1.3 – Fabric** The fabric used in the manufacture of our SD series curtain is a micronized aluminum polymer coated glass fabric with a nominal weight of 420g/ m<sup>2</sup>. This fabric is tested to withstand 1800°F. The fabric used in the manufacture of the curtain is a micronized aluminum polymer coated glass fabric interwoven with steel thread with a nominal weight of 550g/ m<sup>2</sup>. This fabric is tested to UL 10D. All curtain fabrics are sewn together utilizing stainless steel thread. A minimum of two bolt /washer fabric tabs is utilized to hold fabric inside side guides for up to a ten foot drop.

The fabrics for the Hose Stream 120, Hose Stream 120 First Responder, Hose Stream 180 First Responder, Hose Stream 120 Horizontal Fire Shutter Series curtains are mult-layer Steel-TEX® with Vermiculite coating.

#### **1.4 – Standard Features**

- Gravity fail safe operation.
- Current limiting device incorporated, motor limit switches are not required.
- Synchronized motor control circuitry, variable speed control is not required.
- Control panel can control up to 5 curtain motors.
- Optional 12 volt batteries for Control Panel
- Standby battery deep discharge protection.

1.

#### **1.5 - Electrical**

##### **Requirements Control**

##### **Panel**

**Mains Supply:** 120v 60Hz Mains supply required at each panel position.

**Fire Alarm Interface:** Pair of dry contacts per Control Panel.  
Every Control Panel and Independent Motor Controller shall receive 1 dry, volt free contact to each Control Panel.

**Motors:** If the curtain has more than 4 motors in one multi-roller curtain then the Control Panels will be wired in series and only one fire alarm contact will be required.

GR 53 motor- 80 lbs lift force,

GR42 motor 40 lbs lift force (SD60GS elevator curtains only)

## 1.6 - Components

<b>Control Panel:</b>	The Control Panel (CP) can support up to 4 curtain GR 53 motors. In normal operation the CP provides a constant 24v AC supply to the rollers. Should a fire condition occur, the CP removes the 24v and the curtains deploy via gravity. HS120 Horizontal deploys by 120v with battery
<b>Battery:</b>	Optional 2 no. 12 v 7 Ah batteries are installed in each CP. The battery allows full operation of the system in the event of a main power failure for a period of time.
<b>Motor:</b>	The motor assembly is responsible for driving and stopping the curtain under normal operation. The curtain position is affected by a current limiting circuit that provides a controlled speed of descent via back EMF generation.
<b>Motor Control:</b>	The motor controller (MC) for the motor is housed in a remote enclosure. The MC is recommended to be mounted onto the motor end of the curtain head box
<b>Head Box:</b>	The head box is manufactured from 18 ga. galvanized steel. Headbox sizes are single roller and multi-roller sizes and are contingent on drop height and either single roller headbox, or multi-roller headbox which is under and over or side by side.
<b>Roller:</b>	Curtain rollers are manufactured from galvanized steel and come in 3 inch diameter tubes. Fabric is fastened to roller tube via rivets.
<b>Roller Brackets:</b>	Fixed to the head box endplates/roller support plates the brackets secure the rollers in place using a split pin fixing.
<b>Fabric:</b>	SD series Glass and wire reinforce fabric with polymer emulsion coated to both sides. HS series steel-tex with vermiculite coating.
<b>Bottom Bar:</b>	The lower edge of the curtains will incorporate a twin inverted steel angle or tower bar profile which acts as a weight bar to enable the curtain to unwind upon receipt of a signal from the fire alarm panel.

## 1.7 - Optional Extras

<b>Powder Coating:</b>	An optional powder-coat finish to a standard RAL color can be applied at the factory to the head box, bottom bar and side guides.
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### 1.8 - Roller Sizing Chart

Drop (ft.)	Curtain Width (ft.)										
	3.5'	5'	6.5'	8'	9.5'	11'	12.5'	14'	15.5'	17'	18.5'
5'	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
6.5"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8'	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
9.5"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
11'	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
12.5'	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
14'	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
15.5'	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
17'	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
18.5'	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

The above table details the sizes of curtains available. When using a multiple roller there is a 24 "overlap

### 1.9 - Head Box Sizing Chart (in.)

**SD SERIES WITH OR WITHOUT GUIDES (W x H)**

CURTAIN DROP	SINGLE ROLLER	MULTIPLE ROLLER SIDE BY SIDE	MULTIPLE ROLLER OVER/UNDER
Down to 9' 10"	5-7/8" x 5-7/8"	10" x 5-7/8"	5-7/8" x 10"
Down to 19' 8"	7-1/8" x 7-1/8"	12-1/4" x 7-1/8"	7 1/8" x 12-1/4"
Down to 29' 6"	8-1/4" x 8-1/4"	13-3/4" x 8-1/4"	8-1/4" x 13-3/4"
Down to 39' 4"	9" x 9"	15-3/8" x 9"	9" x 15-3/8"

**\*ADD 2" [50mm] TO HEIGHT FOR HEADBOXES WITH TOWER BOTTOM BAR PROFILE (TYPICALLY USED WITH EXPOSED HEADBOX BOTTOM COVER APPLICATIONS)**

**HOSE STREAM SERIES MODELS (W x H)**

<b>CURTAIN DROP</b>	<b>SINGLE ROLLER</b>	<b>MULTIPLE ROLLER SIDE BY SIDE</b>	<b>MULTIPLE ROLLER OVER/UNDER</b>
Down to 9' 10"	7-1/8" x 7-1/8"	12-1/4" x 7-1/8"	7 1/8" x 12-1/4"
Down to 19' 8"	8-1/4" x 8-1/4"	13-3/4" x 8-1/4"	8-1/4" x 13-3/4"
Down to 29' 6"	9" x 9"	15-3/8" x 9"	9" x 15-3/8"
Down to 39' 4"	10" x 10"	17-3/4" x 10"	10" x 17-3/4"

**\*ADD 2" [50mm] TO HEIGHT FOR HEADBOXES WITH TOWER BOTTOM BAR PROFILE (TYPICALLY USED WITH EXPOSED HEADBOX BOTTOM COVER APPLICATIONS)**

## Chapter 2: Installation

### 2.1 - Head Box

The head box constructed from galvanized mild-steel head box which is normally supported from a framework of Unistrut channel and M10 studding, supplied by others. The unistrut frame shall be installed at 4' 0" on center.

It is imperative the head box be installed level. Failure to do so may result in the curtain "travelling" when it is retracting.

The head box can be mounted directly onto the building structure through fixings on the top or side of the box, the fixings shall be maximum 4' 0" on center and 6" from each end of the headbox.

The installer must ensure the fixings do not protrude into the head box and tear the curtain fabric.

### 2.2 – Roller

The roller, supplied with the fabric curtain attached, will be wrapped inside a protective polythene casing. Remove the polythene and position the roller inside the corresponding head box. The roller is supported by a bracket at each end of the headbox. Once in position, secure the roller at both ends using the bolts and nuts provided from the factory.

When the roller is secured, the cover plate can be fitted. For ease of commissioning it is recommended that approximately 2" of fabric is pulled from the roller and left protruding from the head box.

Ensure that the cores of the flexible motor cable are not in contact while the roller is being turned. Electrical contact between the cable can cause resistance to the rotation and result in damage if forced.

### **2.3 - Motor Control (MC)**

The MC is housed in a metal enclosure. This should be mounted onto the motor end of the head box above an access panel furnished and installed by others. The maximum distance between the MC and Motor should not exceed 40 feet.

### **2.4 - Motor Supply Loop**

The supply for the roller motors is provided from the control panel. The supply loop should be wired in a radial configuration of no more than 100' with a maximum voltage drop of 1.75v.

### **2.5 - Control Panel**

The Control Panel (CP) power supply relies on natural convection through the case louvers to cool the electronics. For correct operation, the CP **can** be mounted vertically or horizontally allowing free air clearance around the case of 2" all around. The CP should be mounted indoors in a dry environment free from water splashes or spills.

Ensure all wiring is routed into the control panel via the  $\frac{3}{4}$ " knockouts provided.

The printed circuit boards contained within the Control panel contain static sensitive components. Suitable precautions should be taken when handling circuit boards. Upon the connection of any components **DO NOT USE** any high voltage test equipment on the circuit.

1. Mount the CP as near as possible to the first curtain motor on the supply loop.
2. Remove the input fuse and then connect the AC supply to the mains input terminals adjacent the transformer.
3. Remove the 20A output fuse do not connect the supply loop.
4. If the fire alarm contact is available leave disconnected in the panel. Link out the "Fire Alarm" connection.
5. Connect the 2 no. batteries using the link provided. Ensure that you have correct polarity.

### **2.6 Optional Features**

The CP has a number of standard features that can be activated by simply adjusting individual switches.

#### **2.6.1 Delay Drop**

The delay drop timer delays the deployment of the curtain. The CP panel is shipped with this option disabled

### 2.6.2 Delay Reset

The delay reset timer delays the deployment of the curtain. The CP panel is shipped with this option at 30 seconds .

### 2.7.4 Two-Stage Descent

The two-stage decent function can be set at CP and MC.

## Chapter 3: Commissioning

### 3.1 - Fitting the Bottom Bar

1. Pull the extent of the fabric from the head box
2. Clamp the "T" bar to the bottom of the fabric to aid stability.
3. Determine the drop height of the curtain and mark at each end.
4. Using a chalk line to mark the full width of the curtain.
5. Hold the "T" bar flat against the chalk line and fix to the fabric using screws. Ensure that the "T" bar is gripping the fabric tightly, a loose fit may result in the fabric tearing.
6. Trim of any excess material from under the "T" baR. Where multiple rollers are used to make up continuous curtains the curtain fabric should be overlapped by 24" depending on the fabric drop length. The bottom bar should be arranged to clamp both fabrics.

It is recommended that long drop curtains should be made up in this way or be fitted with two motors and motor control circuits to prevent deployment at excessive speed in the event of a motor or component failure. Do not allow the roller to deploy by gravity without the motor controller being connected. This could result in the motor rotating at excessive speed and being damaged.

### 3.2 – Main Power supply

A 120v 60Hz, permanent supply is required before commissioning can be undertaken. It is recommended that the main power supply to the smoke curtain is designated **as dedicated** supply. A surge protector is required to be furnished and installed by others at each dedicated circuit for the control panels.

### **3.3 - Control Panel**

1. OLED display to "Normal"
2. Insert the 20A Output fuse & connect the battery.
3. Insert the mains fuse, the green "Mains On" LED will illuminate. The output should now have switched over to 24v AC.
4. OLED display button to the "Test" position, the 24v supply should have been removed and the "Fire Alarm Status Normal" LED will be extinguished.
5. With the OLED display still in the "test" position remove the 20A fuse and connect the 24v supply cables into the "24v MC Output" connections.
6. Install the 20A fuse and press display test to the "Normal" position. The curtains connected to the CP will now retract.
7. Check that all the curtains connected to the CP are fully retracted.
8. Connect the fire alarm contacts. Activate the fire alarm, all the curtains should descend to their lower limit position.
9. Reset the fire alarm and all the curtains will retract to their upper limit. Close and secure all Control Panels.

### **The System Is Now Fully Operational**

### **3.4 - Override Key Switch**

The facility to add an optional remote key switch is available to aid testing / commissioning. The test key switch should be located so the zone under control can be viewed. It is recommended that one key switch per fire zone is installed.

The key which can only be removed in the "Normal" position is mounted on an IP65 rated enclosure and is suitable for external use.

## Chapter 4: Preventative Maintenance

### 4.1 - Semi-Annual Maintenance- Only to be carried out by factory-certified personnel

The preventative maintenance service performs the following **36 point** electrical and mechanical service on your product semi- annually.

- |           |   |           |   |
|-----------|---|-----------|---|
| <b>1</b>  | Check all fuses   | <b>19</b> | Spray anti-static printed circuit board (PCB)                               |
| <b>2</b>  | Check back-up power supply                                | <b>20</b> | Spray PCB Board for dust collection   |
| <b>3</b>  | Check MC supply in / out at CP- retracted state           | <b>21</b> | Test override & Test grounds  |
| <b>4</b>  | Check MC supply in / out at CP at deployment              | <b>22</b> | Check accessible wiring terminations  |
| <b>5</b>  | Check MC supply in / out at MC – retracted state          | <b>23</b> | Grease all contacts   |
| <b>6</b>  | Check MC supply in / out at MC at deployment              | <b>24</b> | Lubricate side rails & housing check for obstruction                        |
| <b>7</b>  | Check motor supply in / out at MC out                     | <b>25</b> | Adjust curtain fabric tabs and bottom bar                                   |
| <b>8</b>  | Check line voltage supply in / out                        | <b>26</b> | Inspect curtain fabric, push buttons, and bottom bars for damage            |
| <b>9</b>  | Check transformed voltage & transformer – retracted state | <b>27</b> | Bottom Bar Fabric slack removed   |
| <b>10</b> | Check transformed voltage & transformer at deployment     | <b>28</b> | Obstruction Bar Bent  |
| <b>11</b> | Check voltage at IOI at CP – retracted state              | <b>29</b> | Obstruction of Headbox  |
| <b>12</b> | Check voltage at IOI at CP at deployment                  | <b>30</b> | Obstruction of side rails   |
| <b>13</b> | Check loop voltage for short degradation                  | <b>31</b> | Apply fire coating as necessary   |
| <b>14</b> | Test key switch contact to fire alarm circuit             | <b>32</b> | Cycle curtain system for efficient and safe operation per NFPA 3 guidelines |
| <b>15</b> | Check delayed reset control                               | <b>33</b> | Video / photograph – Curtain drop test                                      |
| <b>16</b> | Check mains failure, all trouble lights & annunciator     | <b>34</b> | Video / photograph – Curtain open   |
| <b>17</b> | Check (Bldg. Mgmt. System) BMS                            | <b>35</b> | Video / photograph – Curtain deploy   |
| <b>18</b> | Spray anti-static printed circuit board (PCB)             | <b>36</b> | Video / photograph – Curtain close  |

All work to be done at day hours with CP Maintenance key.  
There is no need to call out fire alarm system.

If there are any parts that will require replacement upon testing at time of visit, the technician(s) will change the component(s).  
for electrical components per the preventative maintenance rates.

## Chapter 5 : Fault Finding

### 5.1 - Common Fault Conditions

**Fault:** Automatic smoke curtains drop to the lower limit without warning and remain lowered.

**Possible Cause:**

- Fault on the alarm input to any control panel. Check fire alarm contact is not open circuit.
- Extended mains failure. Restore the mains to the system. This is a common fault when other trades are working on the site.
- Failure of battery back up. Check the condition of the battery and measure the voltage. During installation the mains power can be disconnected for long periods of time, excessive use of the battery back up may cause premature failure of the cells.
- Fault on wiring from the control panel. Check wiring for continuity. Commonly caused by other trades working in ceiling voids. A broken cable will cause the curtain to descend.
- The test key has been operated

**Fault:** The curtain fails to drop to the lowered position on test or receipt of an alarm or test signal.

**Possible Cause:**

- Check the bottom bar or curtain fabric is not obstructed.
- Extra weight may be required, this should be inserted into the polycarbonate extrusion.

**Fault:** Curtain fails to rise or stops during ascent.

**Possible Cause:**

- Check the curtain has not “snagged” on any obstructions.

**Fault:** Curtain descends immediately when the mains power fails.

**Possible Cause:**

- Failure of the battery or charger unit within the control panel. Replace the battery as required. This fault is usually a symptom of excessive power failures.

ASA  
Control Panel (CP)  
USER MANUAL  
REVISION A3-**UL 864**

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## OVERVIEW

The Control Panel (CP) is part of a smoke and fire control system that raises and lowers metalized curtains to help contain smoke and fire during an emergency. Curtains are deployed over elevator doors, atria openings, and other spaces that can permit smoke/fire to spread between floors or major sections of a commercial building.

The CP operates from AC mains power (120 or 240VAC) and contains an optional internal battery backup. The CP communicates with the building's fire alarm and building management systems (BMS) to monitor status and deploy curtains during a fire condition. The CP provides 24VDC power and control signals to one or more motor controllers (MCs) responsible for raising and lowering individual smoke and fire control curtains.

The Control Panel is in a ventilated steel enclosure designed for wall-mounting. External status indicator lights and an audible alarm provide indication of critical status. A text display and buttons allow operator configuration and control of the CP.

## KEY FEATURES

- **Power Efficient Operation** – *The CP operates from nominally 120 or 240VAC power at 50 or 60Hz and is power factor corrected (PFC) >98% at 115VAC and >95% at 230VAC. Overall power conversion efficiency is typically 89%.*
- **Powers and manages up to 10 curtain Motor Controllers (MCs)**
- **Solid State Power switches** – *improves power switching speed and reliability*
- **Optically Isolated Fire Alarm Interface** – *reduces risk of damage due to wiring faults*
- **Fire Alarm Chaining** – *Multiple CPs can be daisy-chained on a single alarm circuit*
- **Delayed Curtain Reset** – *the CP can delay raising curtains for a configurable period after a fire alarm has cleared to provide alarm hysteresis.*
- **Building Management System Interface** – *the CP can report a variety of status conditions to a BMS using dry-contact (relay) outputs for central monitoring.*
  - *Power present – AC mains power present*
  - *Fault detected – System fault detected including battery option enabled but battery missing/failed, service required*
  - *Alarm raised – Fire alarm condition or curtain test activated*
  - *Delay timer – delay after alarm cleared before raising curtains*

- *Manual Override active – user has overridden alarm and raised curtains*
- *Obstructed descent – one or more curtain descents blocked (requires network)*
- *Descent OK – all curtains deployed successfully (requires network)*
- **Power Loss Synchronization**- *When one CP in a chain loses power and depletes its battery backup, it will open the fire alarm so that all chained CPs deploy curtains simultaneously.*
- **Alarm Silencing** – *The CP audible alarm can be silenced temporarily*
- **Audible and Visual Status Indicators** – *multiple LED indicators provide status at a glance. An integrated text display provides additional details. An audible alarm (with alarm cut-off function) alerts users to serious conditions.*

## OPTIONAL FEATURES

- **Internal Battery Backup**– *The CP can charge and maintain two 12V/7.2Ah sealed lead-acid batteries to provide 170Wh (2-24 hours) of backup power to prevent nuisance deployments during power outages and to support emergency egress during deployments even when AC mains power has been lost.*
- **Two-stage Curtain Descent** – *Curtains deployed with optional brake-clutch motors can be deployed in two stages: a partial lowering in the first stage helps contain smoke while occupants egress followed by a second stage where curtains are fully deployed. The durations of the first stage, delay for egress, and final stage are fully configurable.*
- **External Override** – *allows curtains to be manually raised from a central control switch. The override switch can be daisy-chained to control multiple CPs simultaneously.*
- **RS485 Network** – *A multi-drop RS485 network can be used to connect the CP with the MCs it powers allowing it to monitor them and report status to the BMS including the optional Positive Deployment and Obstructed Descent features.*
- **Positive Deployment Monitoring/Reporting** – *the CP monitors all MCs equipped with the positive deployment detection feature and reports to the BMS when all curtains have been deployed. (requires network option)*
- **Obstructed Descent Monitoring/Reporting** – *the CP monitors all MCs equipped with the safety-edge feature used to detect obstructions encountered during deployment and reports obstructed descent(s) to the BMS. (requires network option)*

## WIRING

Wiring information provided in this manual is for reference only; in all cases, wiring must comply with local and national electrical codes and should be certified by a licensed electrician.

### AC MAINS Power

The CP requires a 120 or 240VAC at 60 or 50Hz single-phase hot + neutral circuit rated to provide at least 8A. Current under peak (500W) load is 5.3A @ 115VAC or 2.65A @ 230VAC. **Do not connect two hot phases.**

External overvoltage protection devices are recommended. The AC power cable should enter the CP through the knockout above the internal 3-circuit fused terminal block and be secured with a UL listed cable clamp.

**NOTE:** AC Mains wiring is CLASS 1 and must not share conduit or clamps with low-power signal wiring.

A qualified electrician should land AC power to the 3-circuit fused terminal block (see figure 1). A 5x20mm 250V/8A surge withstanding fuse provides overcurrent protection and a convenient way to locally remove power. Replace with Littelfuse [0215008](#). Connect AC hot (line) to the fused circuit L (black wire). Connect AC neutral to the fused circuit N (white wire). Connect safety ground to the fused circuit G (green wire). Safety (earth) ground is required for operation of the Control Panel; failure to connect the safety ground may result in hazardous conditions. A minimum of 14AWG is required for AC mains wiring.

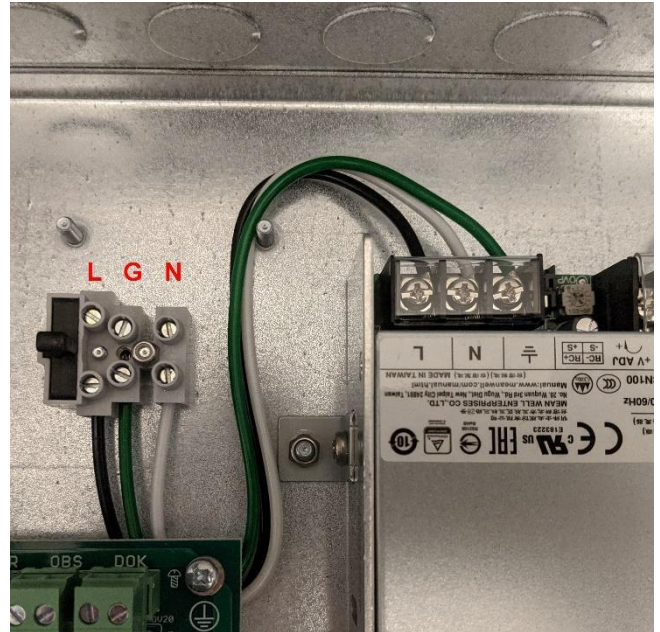


Figure 1 AC Mains Wiring



**WARNING:** AC Mains Voltages are hazardous and can be potentially lethal. Connections should only be made by qualified personnel and **only** with AC mains power disconnected (i.e. with the circuit breaker turned off).

**WARNING:** Connect only Hot, Neutral, and Ground. The CP must not be connected to two hot power lines (e.g. L1/L2).

## DC WIRING OVERVIEW

The remainder of the CP wiring carries DC low voltages (24VDC). The wiring diagram below presents recommended wire gauges for the low-voltage connections. Wire gauges are specified for reference and should be considered minimums; heavier gauges may be used as required by the supervising electrician or for compliance with electrical codes. Class 1 wires must be in separate conduit and clamps from Class 2/3 wiring. All wiring should be performed according to the supervising electrician and should meet local and national electrical codes.

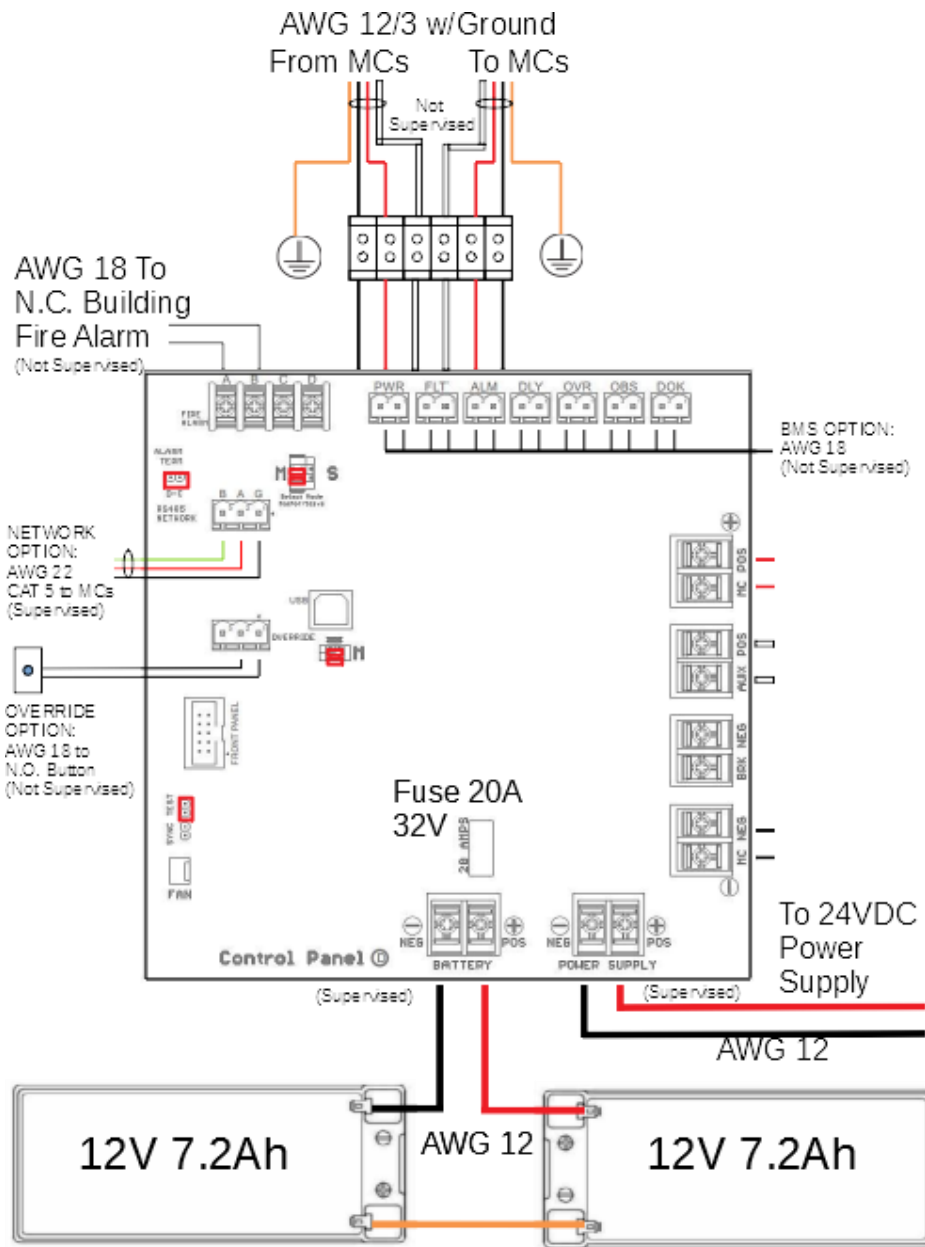


Figure 2 CP Low Voltage Wiring



## MC POWER

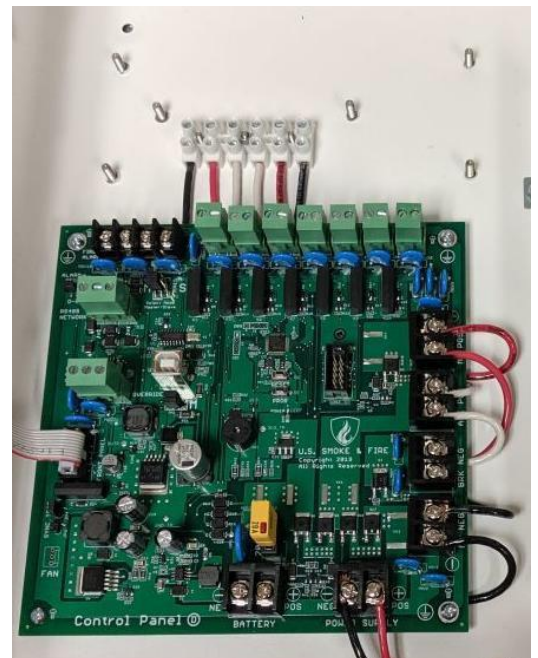
The Control Panel supplies 24VDC at up to 20A to the Motor Controllers (MCs) that raise and lower the fire curtains. These connections should be made using 12AWG wire; where code permits it, sheathed 12/3 with ground is recommended. Connections are made to the 6- terminal wiring block above the CP main board as shown in the wiring diagram above. The MCNOTE: MC Power wiring is CLASS 1 and must not share conduit or clamps with the low power signaling wires (e.g. alarm, network, override, or BMS wiring)

When connecting wires to the terminal block, AC mains power to the CP should be turned off either at the main breaker or by removing the fuse from the 3-circuit AC mains terminal block in the CP. Although the DC power supplied is less than 30VDC, which reduces the risk of electrocution, high DC currents can create the risk of severe burns or other hazardous conditions. When using stranded wire, check for proper connections and for stray whiskers before turning

CP mains power back on; incorrect wiring can result in damage to the CP and can create safety hazards. Only properly trained and licensed personnel should perform wiring.

DC power connections should be performed according to the table below. When using the 6-circuit terminal block, match wires by color:

- MC POS – 12AWG Red wire – supplies +24V to MCs when there is no fire alarm condition. Power on this line indicates a normal condition that triggers MCs to raise the curtains
- AUX POS – 12AWG White wire – supplies +24V to MCs at all times: during normal and fire conditions. Power on this line allows MCs to continue operating during a fire emergency including providing power for EUB operation.
- MC NEG – 12AWG Black wire – supplies the ground return for MC\_POS and AUX\_POS.
- Bare (or Green) Wire should be connected to one of the chassis ground lugs on either side of the 6-pin connector to connect MC chassis and motors to earth (safety) ground.



- *BRK NEG – When using optional external brake clutch motors to manage 2-stage descent, a fifth 12AWG wire (of a different color such as brown or yellow) should be connected from BRK NEG on the CP to BRK NEG on each MC. The brake clutch connected to each MC should be connected to AUX POS and BRK NEG. To activate the brake clutch, the CP connects BRK NEG to the ground return to complete the circuit through the brake clutch coils. To release the clutch, BRK NEG is disconnected from the ground return path, opening the brake clutch circuit.*

The wiring from the CPs to the MCs may be performed in series as a daisy chain with the last MC in the chain connected back to the CP so that the wires form a loop with, for example, the circuit starting at the left red wire of the CP should loop through each MC and finally return and terminate at the right red wire of the CP. The loop configuration effectively doubles the wires to each MC, reducing voltage drop and/or providing redundancy in the event a cable is broken.

MCs may also be wired to the CP in a star configuration with each MC wired directly to the CP, using a junction box or appropriate wire nuts. In this configuration, the use of lever nuts (where permitted by code) is recommended where all wires of the same color should be connected to an individual lever block.

### ***Power Vs. Distance***

The amount of current a wire can safely carry is limited by the wire thickness (gauge). The length of the wire is limited by how much voltage loss is permitted (which is impacted by the thickness of the wire and the amount of current that will be used).

Ohms Law specifies that:

$$\text{VOLTAGE DROP} = \text{CURRENT} \times \text{RESISTANCE}$$

The current is determined by the type of motor used. For example, a GR53x30 motor can draw as much as 13.5A when starting or stalled and draws 2.3A nominally while raising a curtain.

The resistance is determined by the wire gauge and length. For example, 12AWG solid wire has a resistance of 1.6 ohms per 1000 feet at room temperature. Each 100' length of 12AWG wire introduces  $1.6 * 100 / 1000 = 0.16$  ohms of resistance. Since a circuit involves



two lengths of wire, an MC located 100' from the CP and wired directly to the CP would present  $0.16 * 2 = 0.32$  ohms of resistance.

Putting it together, when a GR53x30 motor is connected to an MC located 100' from the CP, when the motor is starting or stalled, drawing the maximum 13.5A of current, the voltage drop would be:

$$\text{VOLTAGE DROP} = 13.5\text{A} \times 0.32 \text{ ohms} = 4.32\text{V}$$

If the CP is supplying 24VDC, the motor would receive  $24 - 4.32 = 19.68\text{VDC}$ . When the motor starts turning and the current drops to 2.3A, the voltage drop would also be reduced:

$$\text{VOLTAGE DROP} = 2.3\text{A} \times 0.32 \text{ ohms} =$$

$$0.736\text{V} \quad 24\text{V} - 0.736\text{V} = 23.264\text{V}$$

### ***Number of MCs***

The number of MCs that can be supported by a CP is determined by the current requirements

of each motor, the total power that can be supplied by the CP, and the permissible voltage drop.

The CP is equipped with a 500W power supply and can deliver up to 20A of DC current. In normal operation, each GR42x40 motor draws 1.3-1.5A of current and each GR53x30 motor consumes 2.3-2.5A. This creates a theoretical maximum of up to 13 GR42 motors or 8 GR53 motors. The formula for the theoretical maximum is:

$$20\text{A} \geq (1.5 \times \text{GR42\_motors}) + (2.5 \times \text{GR53\_motors})$$

There are other practical limitations to the number of motors that can be supported in a real deployment due to the peak start/stall currents drawn by each type of motor. In practice, no more than 10 GR42 motors or 4 GR53 motors may be supported by a single CP. If deploying more than 2 GR53 motors or 4 GR42 motors, the RS-485 network connection should be installed.

To minimize voltage drop associated with high currents, reset delays may be configured in each MC to minimize the number of curtains starting or stalling (finishing) simultaneously.

## BATTERY BACKUP OPTION

The CP supports an internal battery backup to supply 2-24 hours of power when AC mains power is lost. Two 12V 7.2Ah AGM sealed lead acid batteries connected in series form a 24V battery which should be connected to the BATTERY POS and NEG screw terminals (see BatteryBackup Wiring Diagram). When AC mains power is present, the CP charges the batteries.

When AC mains power is lost, the CP directs power from the batteries to the MCs.

If power is not restored and the batteries are depleted, the CP will disconnect the batteries from the MCs and the curtains will deploy. The CP disconnects the batteries before excessive discharge occurs which can result in damage to the batteries (undervoltage lockout).

Batteries are periodically monitored by the CP and when they can no longer hold a suitable charge, the CP raises a Fault/Trouble alarm indicating maintenance is required.



NOTE: It is critical that the correct polarity be observed when connecting the batteries; connecting batteries in reverse WILL damage the CP and can result in hazardous conditions. The BATTERY NEG connector must connect to the negative (-)

terminal of one of the batteries; the positive (+) terminal of that battery should connect to the negative terminal of the other battery whose positive terminal should connect to the CP BATTERY POS terminal.

A 32VDC 20A fuse must be installed in the CP to provide over-current protection for the batteries. The fuse should be replaced with Littelfuse [0297020.U](#) or [0297020.L](#)

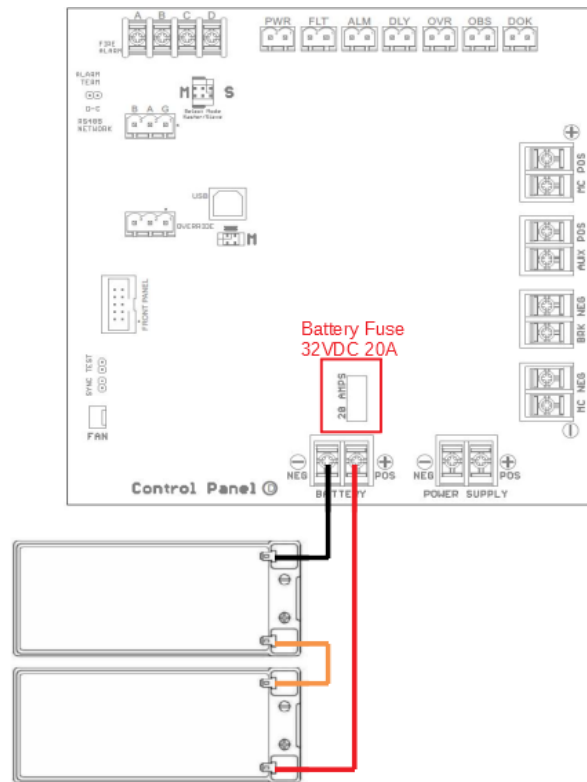


Figure 3 Battery Backup Wiring Diagram

## **Battery Replacement**

Sealed Lead Acid (SLA) batteries have a limited service life and must be replaced periodically. The service life varies according to several factors including ambient temperature. In a typical 20C indoor environment, battery service life is 3-5 years. The batteries shall be replaced at the earlier of the battery service life or when the CP determines that the battery can no longer maintain a suitable charge as indicated by a Fault status indicator with the detailed status showing: "BATTERY FAILED". Suitable replacement batteries are:

- *Powersonic PS-1270F1 (service life 5 years)*
- *SigmaTek SP12-7.5AH/T1 (service life 3 years)*



NOTE: USE 12V 7.2Ah AGM SLA BATTERIES ONLY: RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE

## **Battery Disposal**

CAUTION: This product contains sealed lead-acid batteries which must be disposed of in accordance with current waste disposal and pollution legislation. Batteries must NEVER be disposed of in household waste. To reduce environmental impact, bring your spent lead-acid batteries to a certified recycling

depot. Lead-acid batteries are 97% recyclable and are the most recycled consumer product in the world. Closed-loop manufacturing and recycling programs allows nearly all of the components to be recycled or re-purposed. A credit by weight for lead may be offered by recycling depots or facilities for spent batteries. An improperly disposed battery can be harmful to the environment and human health. For more information on lead-acid battery recycling, visit <https://battery council.org>



## FIRE ALARM INTERFACE

The CP fire alarm interface must be connected to a dry-contact Form B (normally closed) relay output of the building fire alarm system. In normal (non-fire) conditions, the relay is closed; when the fire alarm system detects a fire condition, it opens the contacts signaling the CP to enter the fire condition.

For a single CP, configure as follows:

- *Install two jumpers in the left (M) positions of the Alarm Master/Slave Mode header*
- *Connect the building fire alarm relay to FIRE ALARM interface terminals A and B*
- *Install a jumper on the ALARM TERM header or connect terminals C and D*

More than one CP can share a single building fire alarm output in a chained configuration while maintaining electrical isolation between CPs. To share a single fire alarm connection with multiple CPs, the CPs must be wired in a chain configuration as follows:

- *Connect FIRE ALARM terminals A and B of the FIRST CP to the building fire alarm relay*
- *Install two jumpers in the left (M) positions on the Alarm Master/Slave Mode header of the FIRST CP (the one connected to the building fire alarm system relay).*
- *Install two jumpers in the right (S) positions on the Alarm Master/Slave Mode header of all other CPs in the chain.*
- *Connect FIRE ALARM terminal C of each CP to terminal B of the next CP in the chain*
- *Connect FIRE ALARM terminal D of each CP to terminal A of the next CP in the chain*
- *Install the ALARM TERM jumper or connect terminals C and D of the LAST CP in the chain*
- *Remove the ALARM TERM jumper from all other CPs*

When multiple CPs are chained, if the alarm loop is opened at any point, all of the CPs will enter the Fire Alarm state and signal their MCs to deploy their curtains.

The CP supports an ALARM TEST function that can be accessed from the front panel or USB user interfaces. If the ALARM TEST is enabled, the CP will open the alarm loop causing all CPs in the chain to signal their connected MCs to deploy their curtains.

The CP supports deployment synchronization: if any chained CP loses power and its battery backup is depleted, it will open the alarm loop to cause all CPs in the chain to signal their connected MCs to deploy curtains which can prevent curtain damage if multiple CPs power a single curtain.

The alarm circuit places 24VDC on the alarm loop current-limited to under 26mA.



**NOTE:** The fire alarm interface is not supervised by the CP and should be supervised by the building Fire Alarm System.

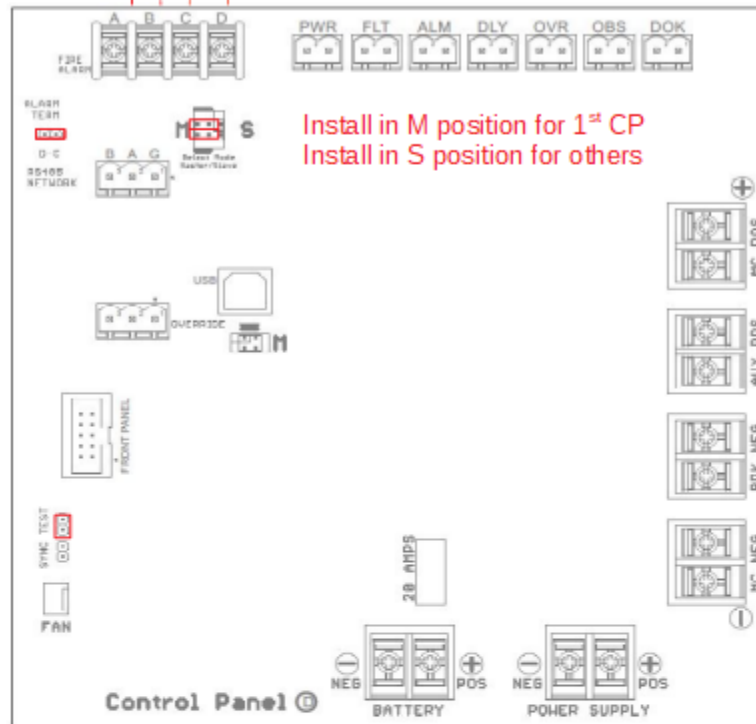
To Fire Alarm  
or Prior CP

Fire Alarm Out  
To Next CP

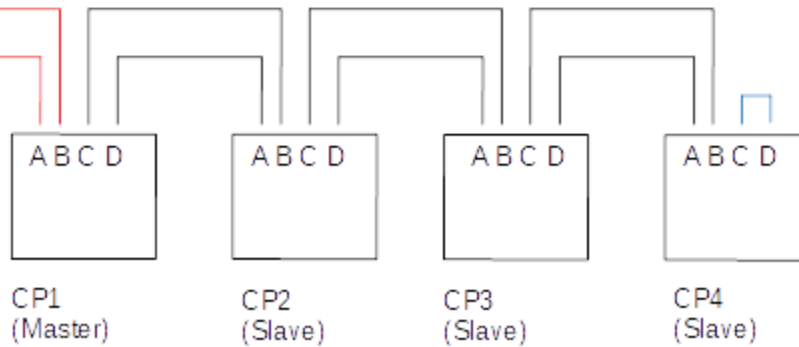
Install terminator  
jumper for last CP  
Remove for others

Install in M position for 1<sup>st</sup> CP  
Install in S position for others

Test jumper  
should always be  
installed.



To Building  
Fire Alarm  
N.C. Relay



Install terminator  
jumper for last CP  
Remove for others

Figure 4 Fire Alarm Interface Wiring

## BULIDING MANAGEMENT SYSTEM INTERFACE

The CP provides dry-contact relay outputs to signal status to a remote building managementsystem (BMS). The outputs are normally open (N.O.) and are rated to switch up to 10W. All outputs are Common type and voltages should not exceed 200vdc and current through the relays should not exceed 500mA.

- *PWR – (Power) Closed indicates AC Mains power is present*
- *FLT – (Fault/Trouble) Closed indicates system fault detected and service is required*
- *ALM – (Fire Alarm)*
  - *firmware versions up to 0.0.32: active = Closed*
  - *firmware versions 0.0.34 and above: active = Open*
  - *Active indicates a fire alarm condition has been received on the fire alarm inputs or a fire alarm test has been initiated via by the operator.*
- *DLY – (Delay) Closed indicates that the CP is delaying its response to a fire alarm condition being raised or cleared. The delay period is configurable by the user and is used to prevent nuisance deployments/retractions due to transient alarm conditions.*
- *OVR – (Override) Closed indicates that the CP operator has overridden a fire alarm condition and raised the curtains. Override should only be enabled with an external key-switch.*
- *OBS – (Obstruction Detected) Closed indicates that an MC has detected an obstruction during curtain deployment (safety edge sensor activated). NOTE: this is an optional feature*
- *DOK – (Deployment OK) Closed indicates that all MCs that are equipped with positive descent detectors on their bottom bars have reported successful deployment. NOTE: this is an optional feature.*

Note: for the DOK output to function, MCs must be configured with positive descent detectors and must be networked to the CP using the RS485 network feature. The DOK output will close only when all networked MCs with the positive descent (bottom) detection option enabled are in the fully deployed position.

Note: For the OBS output to function, MCs must be configured with safety edge sensors **and** positive descent detectors and must be networked to the CP using the RS485 network feature. The OBS output will close when **any** of the MCs with the safety edge option enabled encounter an obstacle during deployment.

## RS-485 NETWORK

An optional RS-485 multi-drop network may be used to connect the CP to one or more of the MCs it powers. This connection allows the CP to monitor conditions such as whether the curtain on each MC is fully descended (both BOTTOM switches closed), or an obstruction has been detected during curtain descent (SAFETY edge switch closed), as well as monitoring various aspects of the MCs' health.

When using the Network interface, each connected MC must be configured with a unique address (1 - 10). The A and B screw terminals of the CP should be connected to the A and B screw terminals of the MCs using shielded twisted-pair wire (CAT5 recommended); the drain/shield of the wire should be connected to the G terminal. The CP network connection includes a 120-ohm resistor for termination of its end of the RS-485 network chain; the A and B terminals on the last MC should be connected to a 120-ohm 1/2W terminating resistor.

The Network connections are over-current protected by integral self-resetting fuses (PTC) and protected against overvoltage and ESD by thyristors compliant with IEC 61000-4-5 2nd edition and GR 1089 Intra-building. Networked MCs and CP must be deployed within the same building. For inter-building deployments, additional ESD protection may be required.

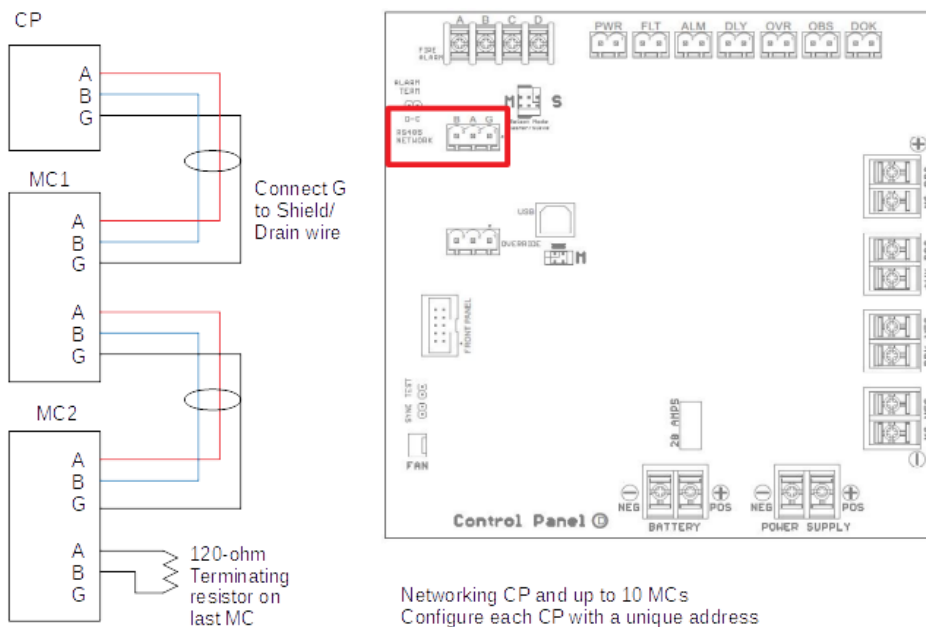


Figure 5 RS485 Network Wiring Diagram

## VERRIDE SWITCH

An optional external key switch may be used to provide a manual override capability for one or more control panels. The key switch should be normally-open and should retain the key mechanically when in the closed (override) position to prevent it from being left accidentally in the override position.

For a single CP with override, configure as follows:

- Install two jumpers in the horizontal position on the Override Master header
- Connect the external key switch to pins 1 and 2 of the Override Connector

More than one CP can share a common override switch while maintaining electrical isolation between CPs. To share a single Override switch between multiple CPs, the CPs must be wired in a chain configuration as follows:

- Install two jumpers in the horizontal position on the Override Master header
- Remove the jumpers from the Override Master header for all other CPs in the chain.
- Connect pin 1 of the first (Master) CP to one pin of the external override key-switch. Connecting to pin 1 of each CP in the chain may make wiring easier but is not necessary.
- Connect pin 2 of each CP to pin 3 of the next CP in the chain
- Connect pin 2 of the last CP in the chain to the other pin of the external switch.

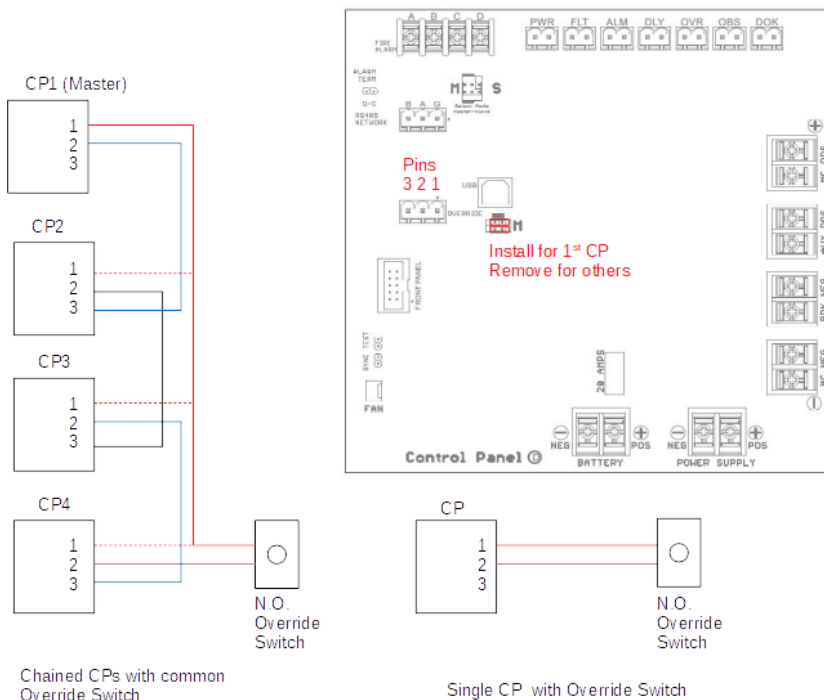


Figure 6 Override Wiring Diagram



## CONFIGURATION SETTINGS

The CP has several configurable settings which can be adjusted using the front panel text display and Menu/Next/Prev/Select buttons or using a computer with the CP USB interface.

The configurable settings are:

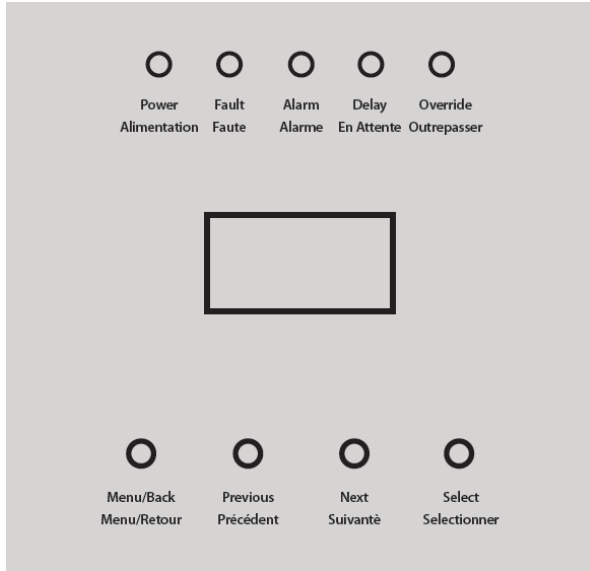
- **Drop Delay** – *The number of seconds after a fire alarm condition is raised before curtain deployments begin. Used to limit nuisance curtain deployments. (default is 0s)*
- **S1 Descent** – *For CP-controlled two-stage descent, the time (in seconds) the curtain is allowed to descend in the first stage. After the configured number of seconds, the curtain descent is paused to contain smoke near the ceiling while allowing emergency egress to continue. Set S1 Descent to 0s to disable two-stage descent. (default is 0s)*
- **S1 Delay** – *The number of seconds the curtain should be held in the partially descended position during a two-stage descent to allow emergency egress. When the S1 Delay expires, the curtain will resume descent until it is fully deployed. (default is 30s)*
- **S2 Descent** – *The number of seconds required for all curtains to complete their descent to be fully deployed. For a single stage descent, this is the time required from headbox to floor; for a two-stage descent, this is the time required from the partially-descended position to the floor. This is a failsafe feature used in conjunction with the optional Bottom Detect sensor; if the feature is enabled and the bottom descent sensors are not all activated within the S2 Descent period, a fault is declared and the alarm sounds. (default is 40s).*
- **Reset Delay** – *The number of seconds after a fire alarm condition clears before the curtains are raised (used to limit nuisance curtain raises). (default is 30s)*
- **Override** – *Selects the number of seconds the curtains should remain raised after the Override button has been pressed and released. (default is 60s).*
- **Latch** – *If enabled, retracts optional bottom-bar latches prior to raising curtains. NOTE: Incompatible with 2-stage descent managed by CP.*
- **Battery** – *Backup battery option: if enabled, battery is monitored and the CP raises a fault alarm if the battery is removed or fails to hold a proper charge.*
- **Net Reset** – *Clear and re-discover the networked MCs.*

See USER INTERFACE section for additional details.

## STATUS MONITORING

The CP status can be monitored using its 5 status indicator lights with additional detail accessible via the text/button display or using a computer connected to the USB interface.

### Status Indicator LEDs



The 5 status indicators lights on the front cover are:

- **Power (Green)**
- **Fault (Yellow)**
- **Alarm (Red)**
- **Delay (Blue)**
- **Override (White)**

Each indicator can be on, off, or blinking to provide status at a glance as detailed in the following table:

Indicator	On	Off	Blinking
Power	Normal	AC Mains power Lost	
Fault	Hardware error, Service required, MC or Battery is missing or failed	Normal	Battery depleted (connect AC mains to recharge battery)
Alarm	Fire Alarm	Normal	
Delay		Normal	Delaying before curtain deployment or raise.
Override		Normal	Curtains raised due to manual override.

## Audible Alarm Indicator

An audible alarm is provided for conditions that require attention such as a fire alarm condition or loss of power. The alarm may be in one of 5 states:

- *OFF – Normal condition*
- *ON – Fire Alarm Condition, curtains deploying/deployed*
  - *Alarm Test in progress – fire alarm loop has been opened in test mode*
  - *Synchronized deployment – the fire alarm loop has been opened due to depletion of the backup battery*
  - *Fire alarm loop opened externally (typically by the building Fire Alarm System)*
- *BEEPING QUICKLY (500ms rate) – Abnormal condition, curtains raised*
  - *AC mains power lost*
  - *Backup battery option enabled and battery missing or failed*
  - *Internal fault detected*
- *BEEPING SLOWLY (3s rate) – Service is required, curtains raised*
  - *System operating normally but service required*
- *ACO – Alarm Cutoff: alarm has been temporarily silenced manually*

When any abnormal condition exists, additional detail is displayed on the text display.

## Alarm Cutoff

The CP sounds an audible alarm when certain fault conditions are detected. The alarm will turn off automatically when the underlying condition clears or is corrected, but may also be temporarily disabled for up to 60 minutes using the Alarm Cutoff function. When the audible alarm is being suppressed, the alarm cutoff feature will show **enabled**. When an alarm is sounding, the alarm cutoff feature will show **disabled**. When no alarm is raised, the alarm cutoff feature will show **no alarm**. The alarm is silenced while a user is in the menu system.

## OLED Detail Display

A high-contrast graphical OLED display shows up to 4 lines of 20 characters. The display is activated when any abnormal condition exists and provides additional details. The display is

also activated when a user presses any front panel button to and can be used to request and display additional CP status including:

- *Power – voltage detected on the DC power supply output and battery backup inputs*
- *Firmware – the running firmware version*
- *Uptime – the time the CP has been running continuously since last reset/power loss*

## **DEPLOY TEST**

During installation and regular maintenance, the operator can manually create a fire alarm condition by opening the Fire Alarm loop locally on the CP (note that this will open the loop for all devices connected to the same fire alarm loop). During the fire alarm test, the front panel will display ALARM TEST and the ALM BMS output will close. Curtains will be deployed as though the building fire alarm system had opened the loop. When the Deploy Test is in effect, the feature will show **enabled**. When the Deploy test ends, the feature will show **disabled**.

Note that if the user forgets to end the Deploy Test, it will automatically terminate after 1 hour.

## **REQUIRED MAINTENANCE**

The CP must be tested at least annually to ensure proper operation. Testing must include, at a minimum:

- *Basic Function:*
  - *Open the Alarm input either from the fire alarm panel or using the CP Deploy Test*
  - *Observe the curtains fully deployed*
  - *If Override Button present,*
    - *Press Override button*
    - *Observe curtains raise*
    - *If BMS connected observe that Override relay output has closed*
    - *Observe that the Override LED indicator blinks*
    - *Release Override button*
    - *Observe that curtain stays raised for configured number of seconds*
    - *Observe that curtain re-deploys after configured override period*
    - *If BMS connected observe that Override relay output has opened*
  - *Close the Alarm input or end the CP Deploy Test*

- *If a Reset Delay is configured*
  - *Observe the reset delay indicator is lit for the configured period*
  - *If BMS connected observe that the Reset delay relay output has closed*
  - *After the configured reset delay, observe the delay indicator turns off*
  - *If BMS connected observe that the Reset delay output has opened*
- *Observe the curtains raise and return to normal state*
- *Battery Backup Option:*
  - *Turn off AC mains power*
  - *Observe that the power LED indicator turns off*
  - *Observe that the audible alarm beeps rapidly*
  - *Observe that the OLED display indicates “AC POWER OUT”*
  - *If BMS connected, observe that Power relay output has opened*
  - *Restore AC mains power*
  - *Observe that the CP returns to normal status*
  - *Disconnect one of the battery wires*
  - *Observe that within 10 seconds, the Fault indicator illuminates*
  - *Observe that within 10 seconds, the audible alarm is beeping*
  - *Observe the display indicates BATTERY MISSING*
  - *Reconnect the battery wire*
  - *Observe that within 10 seconds the CP returns to normal state*

## **FUSE MAINTENANCE**

The CP is equipped with two over-current protection devices:

- *The AC Mains input is protected using a 5x20mm 250V 8A surge tolerant fuse. The fuse is located in the 3-circuit terminal block above the main board. Replace with Littelfuse [215008](#)*
- *The battery input is protected using a 32VDC 20A mini automotive fuse. The fuse is located above the battery connection terminals.*

*Replace with Littelfuse [0297020.U](#) or [0297020.L](#)*

## USER INTERFACE

The CP is controlled by a 32-bit microcontroller that manages all functions of the CP and offers numerous monitoring and configuration options using its primary and secondary user interfaces. The primary interface is an OLED display with 4 buttons on the CP front panel. The secondary interface is a type-B USB interface inside the CP chassis:

### OLED Display

A high-contrast graphical OLED display shows up to 4 lines of 20 characters. The display is activated when any abnormal condition exists and provides additional details. The display is also activated when a user presses any front panel button to access the primary user interface.

The primary interface uses a hierarchical menu system to allow the user to view detailed status and configure many aspects of CP operation. The menu hierarchy is accessed by pressing the Menu button, using the Next/Prev buttons to select a menu option, and pressing the Select button to view or change that option. The CP offers the following menu choices:

- **Status**
  - *Power – display the DC power supply and Backup Battery voltages*
  - *Firmware – display the CP executive firmware revision number*
  - *Uptime – display the time elapsed since the last CP reset/power cycle*
  - *Network – display list of networked MCs. Problems are shown in inverse text.*
  - *Exit – return to the top-level menu*
- **Login**
  - *Before a valid PIN has been entered, a padlock icon is shown next to configuration and test settings indicating that they are locked and cannot be accessed until the user has logged in.*

*Use this menu to enter the 4-digit PIN required to access and change configurable settings.*

*Use the Next/Prev keys to move between digits; press the Select key to select a digit for changing, use the Next/Prev keys to change its value, then use the Select key again to set its value. The default PIN is '1111'; this PIN can be changed from*

*the USB secondary interface.*

*For example: the key sequence to login using the default PIN is:*

- 1. Select (edit first digit) –*  
*when a digit is selected it will show its number value instead of \**
- 2. Next (change digit to 1)*
- 3. Select (accept the setting of 1 for the first digit)*  
*the digit will change back to a \* when it is not selected*
- 4. Next (move to the second digit)*
- 5. Repeat steps 1-4 for digits 2, 3, and 4*
- 6. Next (move the cursor to “OK”)*
- 7. Select (login using the PIN you’ve entered in each of the 4 digits)*

When the proper PIN has been entered, the padlock icons will disappear and the configuration settings will be accessible.

- *Settings – the configurable settings for the CP. User must be logged in to access.*
  - *Drop Delay – the number of seconds after a fire condition has been detected before curtains are deployed. Can be used to prevent nuisance deployments. Default is 0 seconds (deploy curtains immediately when fire alarm loop opens)*
  - *S1 Descent – for systems supporting 2-stage descent using brake motors, this is the number of seconds the CP will allow after curtain deployment has started before it applies power to the brake clutches to temporarily halt curtain descent.*
  - *S1 Delay- for systems supporting 2-stage descent: the number of seconds the curtain is held in the partially descended position before final descent*
  - *S2 Descent – the maximum number of seconds it should take the curtains to fully descend.*
  - *Reset Delay – The number of seconds to wait after the Fire Alarm condition has cleared before raising the curtain. Used to provide alarm hysteresis.*
  - *Override – The number of seconds the curtain should remain raised after the optional Override button has been pressed and released.*
  - *Latch – Enabled indicates MCs are being used with bottom-bar locking latches*
  - *Battery – Enables battery backup option and associated monitoring and*

*alarms.*

*NOTE: connecting the battery will automatically enable the battery backup feature. To disable the feature, disconnect the battery and then set the feature to disabled.*

- *Exit – return to main menu*
- *Silence – alarm cutoff function: silences audible alarm temporarily if sounding. Alarm will automatically be re-enabled when the alarm/fault condition clears or after 1 hour.*
- *Deploy Test – set Enabled to open the alarm loop to deploy curtains*
- *Exit – exit menu subsystem and return to summary status display*

## **USB Command Line Interface**

A USB interface supports field-service by technicians (not for customer use). The USB interface can be used for advanced diagnostics and for upgrading the CP firmware (operating software) in the field. A standard USB A-B cable is required.

The USB interface creates a virtual serial port on the connected computer which will appear in the list of ports as CH340G. Using serial terminal software such as TeraTerm or PuTTY, you can manage the MC using its command-line interface (CLI). The serial parameters are

- *57600bps*
- *8 data bits*
- *No parity*
- *1 stop bit.*

When you first connect to the terminal, pressing the Enter key will result in a prompt to enter a password if one has been configured or a 'ready>' prompt indicating that the CP is ready for the user to enter a command.

To enter a command, type the command and press the enter key. Some commands require additional data, for example the config command requires additional sub-commands such as:

- *config display*
- *net list*

When a command requires additional data and you only type the command, the CP will display help about what the available sub-commands are or the required data.



## Default commands:

- *help* – displays a list of all top-level commands
- *hwinfo* – displays information about the CP hardware
- *fwinfo* – displays the CP firmware (software) version and release date
- *status* – displays power sources and voltages, motor currents, switch and relay statuses.
- *uptime* – displays the time elapsed since the CP was last powered or reset
- *reset* – resets the CP microprocessor
- *config display* – used to view the configurable settings of the CP. Most of the settings are described in the CONFIGURATION section above, but some additional configurable settings may be accessed only using the USB interface.
- *bms* – displays the state (open/closed) of the building management system interfacerelays.
- *battery status* – displays the status of the backup battery including its voltage and whether it is detected/removed, and being charged or not.
- *admin <password>* - enter the administrator password for access to privileged commands.

## Administrator Commands

When a user authenticates using the admin command and the proper password, the prompt will change to admin> so it's clear what mode the user is in. The default password for administrative access is **admin**. In addition to the Default commands above, administrators gain access to the following commands:

- *alarm status* – displays the current status of the fire alarm interface
- *alarm test* – opens the fire alarm interface, simulating a fire alarm. Note that this opens the fire alarm loop exactly as if the building fire alarm were raised and will trigger all chained CPs to deploy their curtains.
- *alarm testoff* – returns the fire alarm interface to normal (so it can detect a fire alarm raised by the building fire alarm system).
- *aco* - alarm cutoff command silences the audible alarm for up to 60 minutes
- *deferservice* – defers a required maintenance service for up to 7 days (silencing the service alarm).

- *config*
  - *setdefaults* – resets all configurable settings to their factory default values.
  - *password* – if configured, after the next reset, locks the USB interface until password is entered. Note: there is no back-door, if you change the password and forget it, factory service is required.
  - *nopassword* – removes a configured password so that no password is required for USB admin command access. Note that this can only be done after the user has logged in successfully with the correct password.
  - *svcdefer* – defers required service for up to 7 days (used to silence the service alarm until factory service can be performed)
  - *override* – set the deployment override duration (in seconds)
  - *dropdelay <seconds>* – the delay after a fire alarm is raised before curtains are deployed. This is used mainly to reduce nuisance deployment during deployment and testing
  - *resetdelay <seconds>* – the delay after a fire alarm clears before curtains are raised.
  - *s1descent <seconds>* – set to 0 for single-stage deployment. For a two-stage descent, the number of seconds curtains should be allowed to descend before applying the electromechanical brake to pause descent.

○ *s1delay <seconds>* – For two-stage descent: the time (seconds) electromechanical brakes should hold the curtain in place after the *s1descent* and before *s2descent*.

○ *s2descent <seconds>* - For use with the positive deployment detection feature: The maximum time a curtain should be descending without reaching the floor. If the curtain is equipped with bottom bar detectors in the side rails and this much time elapses without the bottom bar sensors closing, a descent failure has occurred (e.g. curtain caught in side rail)

○ *override <seconds>* - the time the curtains are held raised after the override button is released before they are re-deployed.

- *Net*
  - *reset* – clear the list of provisioned MCs and re-discover connected MCs
  - *list* – display list of provisioned MCs and their statuses
- *exit* – leave administrator privilege and return to default privilege level

## SPECIFICATIONS

- *Physical Dimensions (enclosure): 16”h x 15”w x 4”d*
- *Wire knockouts: 13x 0.75”*
- *Operating Temperature Range: 0 – 50C*
- *Use minimum 75C rated wire*
- *Operating Voltage: Universal Input: 120 or 240VAC 60/50Hz*
  - *Power Factor Corrected (PF > 0.95)*
  - *Overcurrent and Overvoltage protected*
  - *Fuse: 5mm 250V / 8A surge tolerant: Littelfuse [251008](#)*
- *ESD/Transient Voltage Protection:*
  - *Inputs: 8KV 8x20uS non-repeating, compliant with IEC61000-4-2, IEC61000-4-4, and IEC61000-4-5*
  - *Network Interface: compliant with IEC 61000-4-5 2nd edition and GR 1089 Intra-building*
- *Output Voltage: 24VDC*
- *Maximum Output Current: 20A*
- *Battery Backup:*
  - *2x 12V/7.2Ah AGM sealed lead-acid batteries with F1 terminals*
  - *Replace with: Powersonic [PS-1270F1](#) or SigmasTek [SP12-7.5AH/T1](#)*
  - *20A Fuse replace with: Littelfuse [0297020.U](#) or [0297020.L](#)*
- *Fire Alarm Interface – 24VDC output, optically isolated input 1.5kV isolation*
- *BMS Interface – Dry contact relays (N.O.)*
  - *Maximum voltage: 200VDC*
  - *Maximum current: 500mA*
  - *Maximum power: 10W*