Control Panel

Operation Manual

Document Ref: SL-023 v1.8

2-Wire Battery Backup & Power Booster Modules

Operation and Maintenance

V1.8

INVESTORS IN PEOPLE

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Requirements

This product must be earthed in accordance with local safety regulations.

Power Boosters and Battery Backup modules leave the factory configured for 230V AC 50/60Hz operation. Units can be switched to 110V AC 50/60Hz operation in field. Ensure the correct operating voltage is selected prior to connection. Damage may occur if the operating voltage is not correctly selected. This series of battery chargers and boosters are intended for indoor installaton.

Mains power should be connected first and then the batteries. Note battery polarity when fitting

The Battery Charge Control PCB checks for battery connection at power up and will report a fault until it is correctly connected.

Standard features are indicated below.

Should the control panel be used in conjunction with portable generating equipment, care should be taken to ensure that the electrical supply is within the tolerance band.

The control panel may be stored at temperatures between 0^0C and 55^0C. If stored at low temperatures and then brought into a warmer environment, condensation may form on some components. In such a situation , this condensation should be allowed to evaporate prior to use of the equipment. If stored at high temperature, care should be taken to ensure that humidity condensation does not enter critical electrical components, for example the power supply.

The Control Panel is designed to operate within specification for ambient temperature between 0°C and 55°C, relative humidity up to 95% (non-condensing).

Standard Specifications

Power	110/230V AC 50/60Hz
Construction	TOC-750-BAT1 ABS Enclosure TOC-750-BAT2 Powder Coated Mild Steel Enclosure TOC-750-BAT3 ABS Enclosure TOC-750-BAT-4 ABS Enclosure
Display	2 x 16 LCD With RGB Back Light
Outputs	2 off SPCO Relays 5A Non-Inductive @ 250V AC 1 off Solid State Output 100mA @ 24V DC See later for operation detail Battery Output to Controller Fused at 10A Highway Output 1.7A at 24V DC
Temperature	-5 to 55 Deg C Full Specification.
Humidity	0-95% RH Non-Condensing
Sealing	IP54
Mounting	Wall Mount
Overvoltage Catagory	OVC II
Pollution Degree	PD 2

Standard Features

Use With Any IGD Control Panel

LCD Multi-Colour Display Gives Clear Indication of Power Source and Charge Status

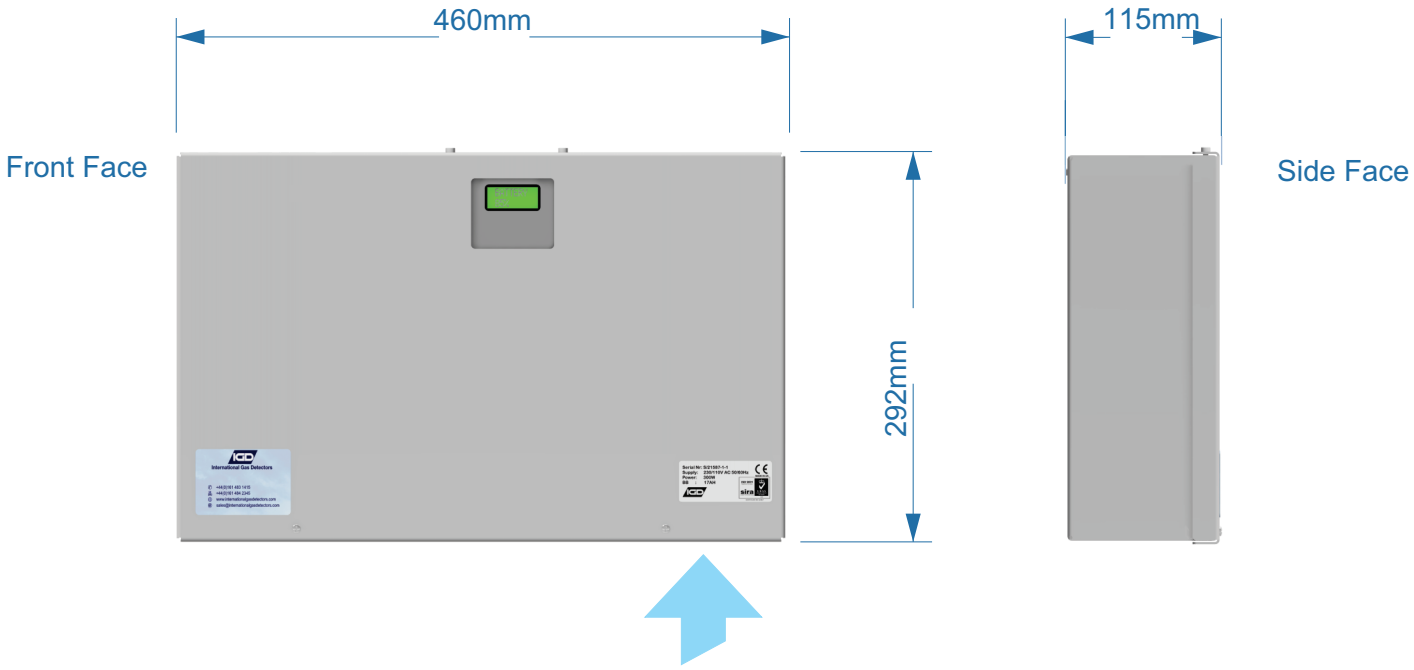
Solid State Output Changes State on Switch Over From Mains Power to Battery Power

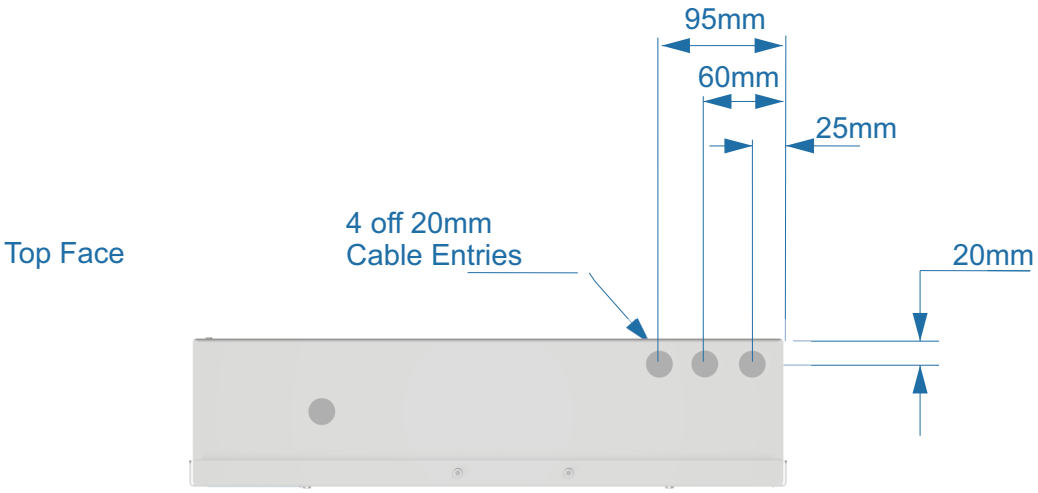
Volt Free Change Over Relay Changes State on Switch Over From Mains Power to Battery Power

Weight

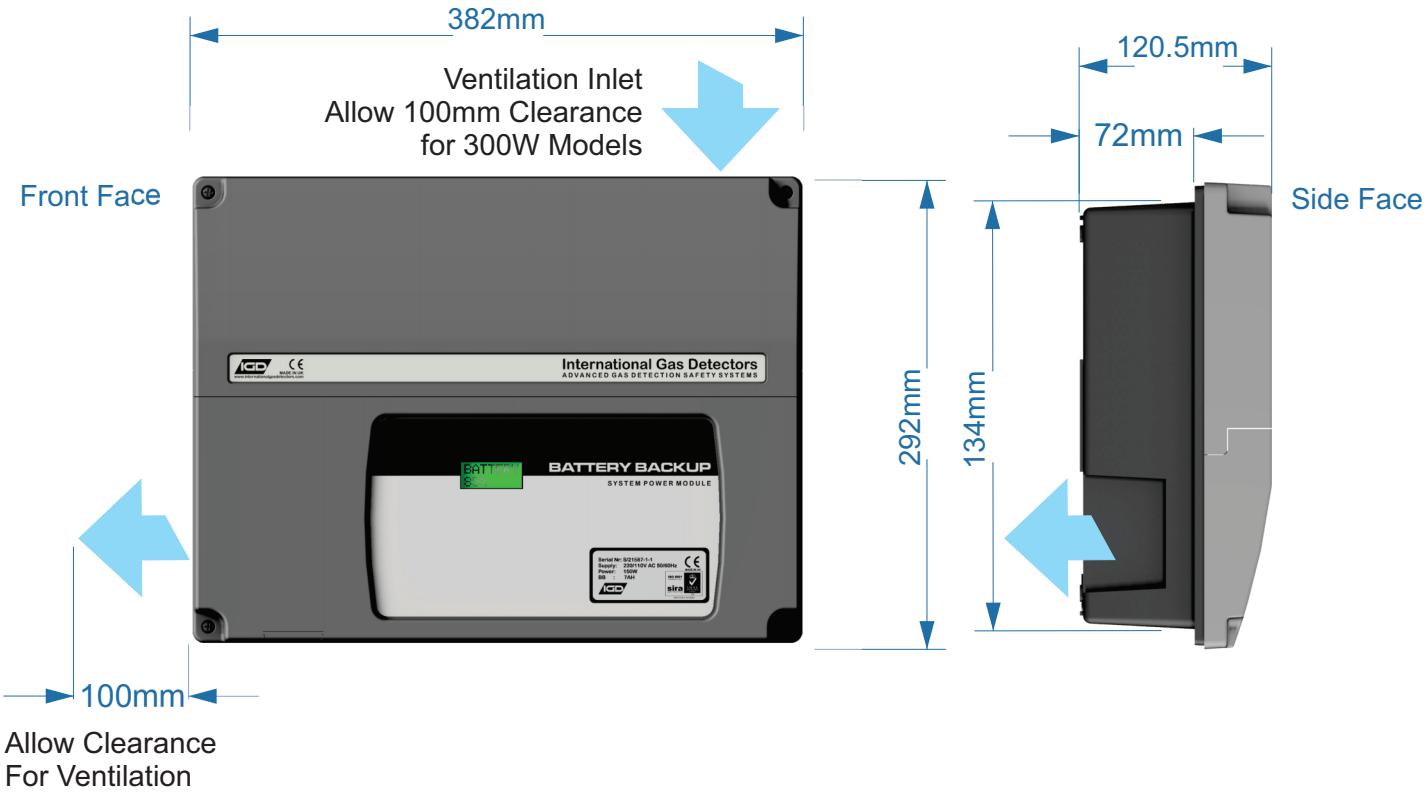
TOC-750-BAT1 6Kg With Batteries Fitted
TOC-750-BAT2 18Kg With Batteries Fitted
TOC-750-BAT3 6Kg With Batteries Fitted
TOC-750-BAT4 1.5Kg No Batteries

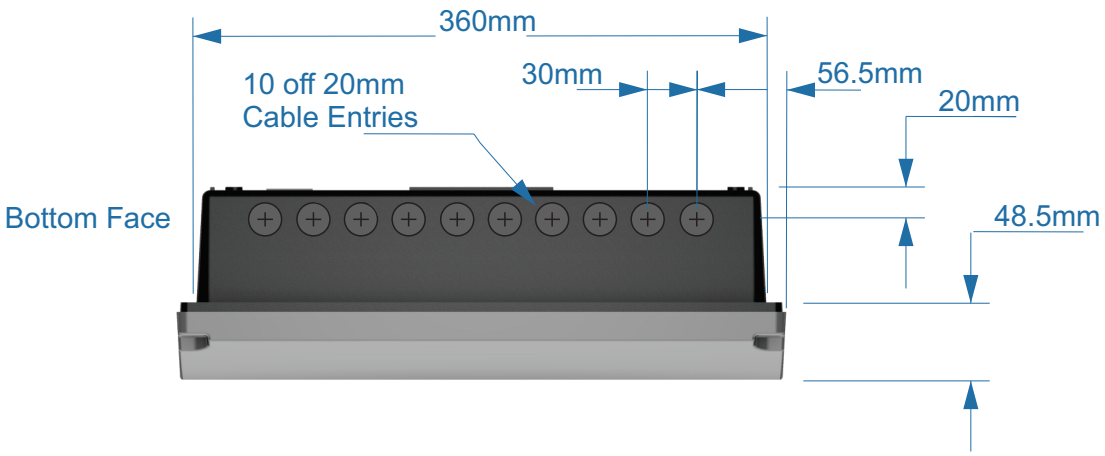
TOC-750-BAT2 PHYSICAL





TOC-750-BAT1,3 and 4 PHYSICAL





Overview

All versions of the TOC-750-BAT series utilise the same PCB set in two case styles to provide a range of battery backup and/or power booster modules. The options are

TOC-750-BAT1

This is a Mains powered battery backup module in IGD's standard ABS enclosure with two 5AH Batteries and 150W PSU

TOC-750-BAT2

This is a Mains powered battery backup module in a powder coated steel enclosure with two 17AH Batteries and 300W PSU

TOC-750-BAT3

This is a combined Battery Backup and power booster module with two 5AH batteries and provision for 24V DC output at 150W to add additional power onto 2-Wire cable highways. Note that the booster allows 24V DC to be injected onto the 2-Wire highway without affecting communication. Additional power cannot be added to 2-Wire highways using a normal PSU as this will stop communication over the power lines and could cause device damage.

TOC-750-BAT4

This is a 24V DC at 150W power booster module used to add more power to a 2-Wire cable highway. Battery backup is not included with this module.

In all cases the PCB handling battery charge and changeover is the same The layout is indicated in Fig 1

IMPORTANT NOTES

1. Voltage Setting on 150W PSU Versions

BAT1,3 and 4 options use a 150W Switched mode power supply. On the side of the PSU is a voltage selection switch for either 230V or 110V AC operation. The label on the PSU will indicate the current setting. Ensure the voltage is correctly selected before powering up to avoid damage to the module.

2. Units are shipped with the correct cable harness for the supplied batteries. Failure to use the correctly supplied cable can result in damage to the unit. On batteries a link cable is provided to join + and - terminal from each battery and then take the + terminal from one battery and the - terminal from the other back to the charge management PCB. See fig 3

3. Three Stage Battery Charging
:
The charger circuit provides for 3 stage battery charging:

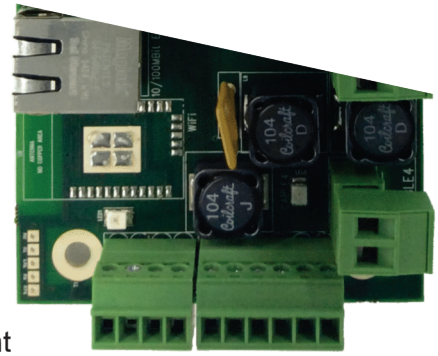
Stage 1: Buck or Bulk Charging at Variable Current

Stage 2: Boost of Absorption Charge at Constant Voltage and Current

Stage 3: Float or Maintenance Charge at constant voltage and a lower fixed current

Hardware protection is provided for Over Voltage, Over Current and Over Temperature monitoring. Faults are reported on the 2 x 8 LCD Display.

Tocsin 650 or 750 Series
Main PCB Showing Power
Connection Points

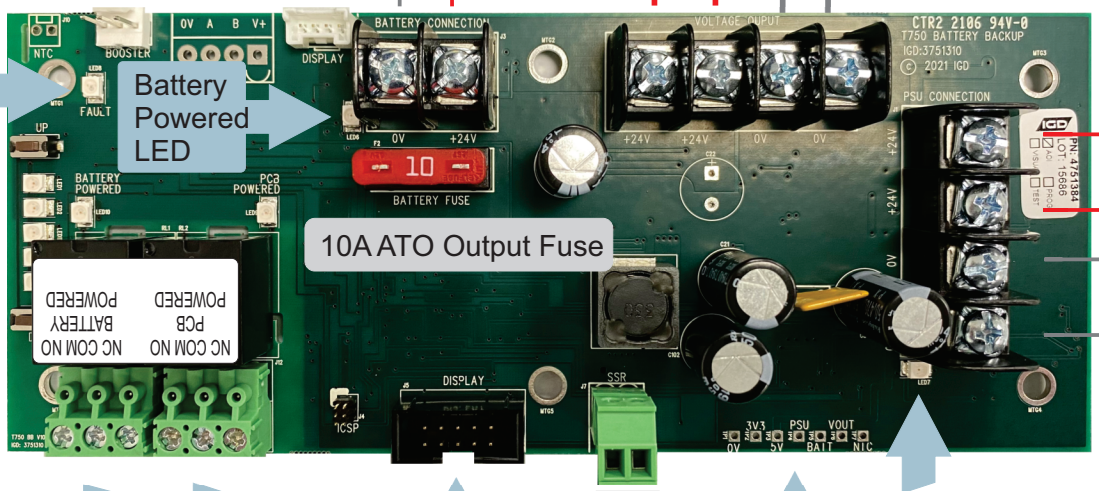


Power Connections
to 650/750 Control
Panel. Note This is
a 4 Core Cable to
Share Load and as
a Minimum 1.5mmSQ
Cable as Short as
Possible

Battery Connection Point
For 2 17AH Batteries
Note the External Link Cable
is Provided with the Battery Harness

-+-+

Booster PCB
Comms Port



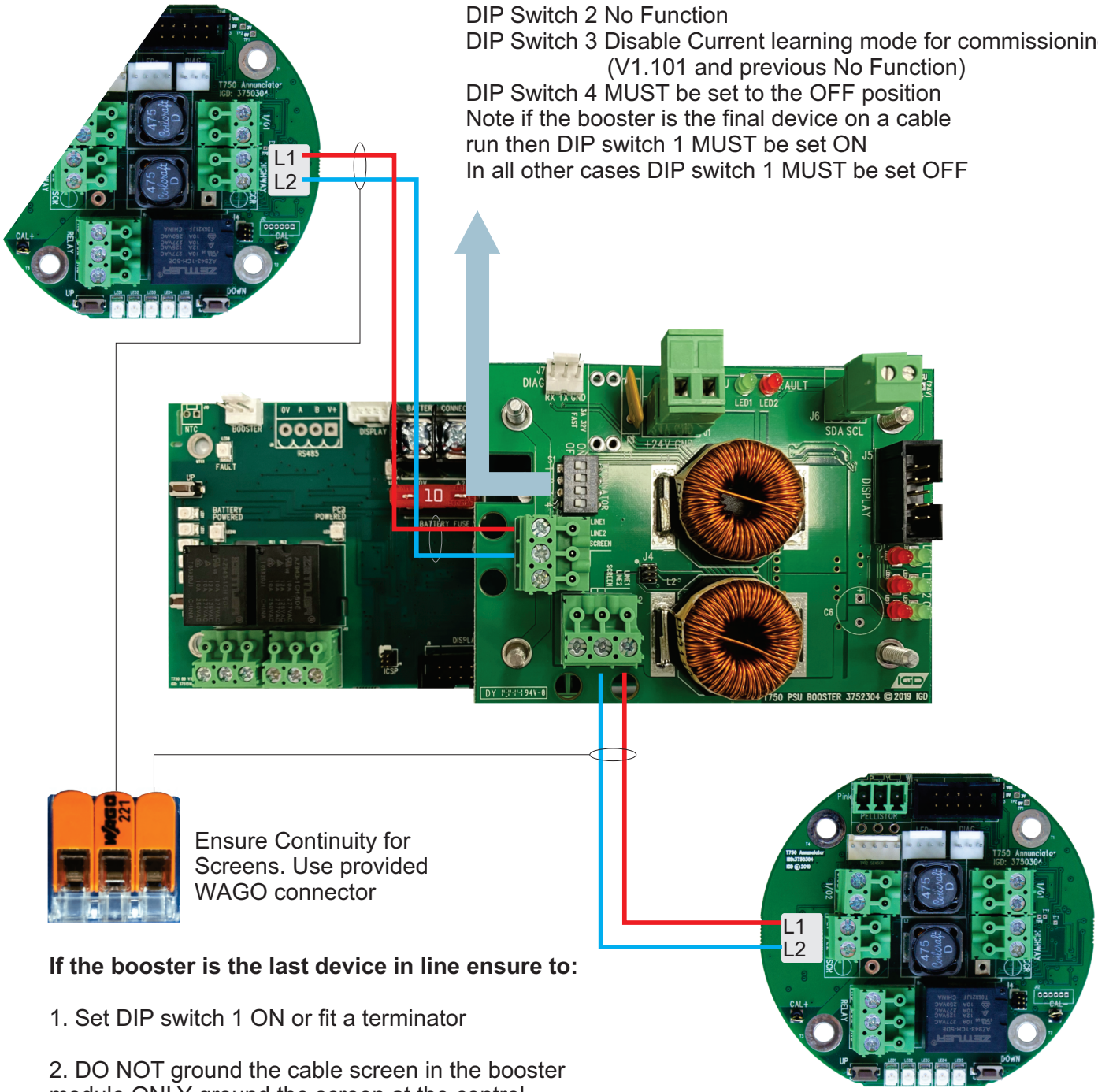
Booster PCB (Shown With Battery Charge Management PCB)

When the Booster Supply is to be In-Line With Detector Nodes Then Cabling MUST be Consistent as:

L1 (Detector Node) to L1 Booster to L1 Detector Node
L2 (Detector Node) to L2 Booster to L2 Detector Node

As Indicated Below in Fig 4

DIP Switch 1 ON : End of Line Terminator ON
DIP Switch 2 No Function
DIP Switch 3 Disable Current learning mode for commissioning (V1.101 and previous No Function)
DIP Switch 4 MUST be set to the OFF position
Note if the booster is the final device on a cable run then DIP switch 1 MUST be set ON
In all other cases DIP switch 1 MUST be set OFF



Ensure Continuity for Screens. Use provided WAGO connector

If the booster is the last device in line ensure to:

1. Set DIP switch 1 ON or fit a terminator

2. DO NOT ground the cable screen in the booster module ONLY ground the screen at the control panel.

Device Loadings for Boosted Cable Highways

Note the booster will only supply up to 1.7A at 24V DC to supplement normal system power.

The booster output is only active if voltage is detected from the main control panel.

Once running if the main control panel shuts down the booster will sense the increase in current load and also shut down.

During the first 24 hours of operation the booster will 'learn' its normal operating current and set this as a shutdown threshold. Beacon sounders and relays used on the system are taken into account.

The following table can be used to check current loading on a detector highway cable run. Highways are limited to 2A at 24V DC (48 Watts). Note that in normal operation the booster is supplementing highway power and never delivers the full load.

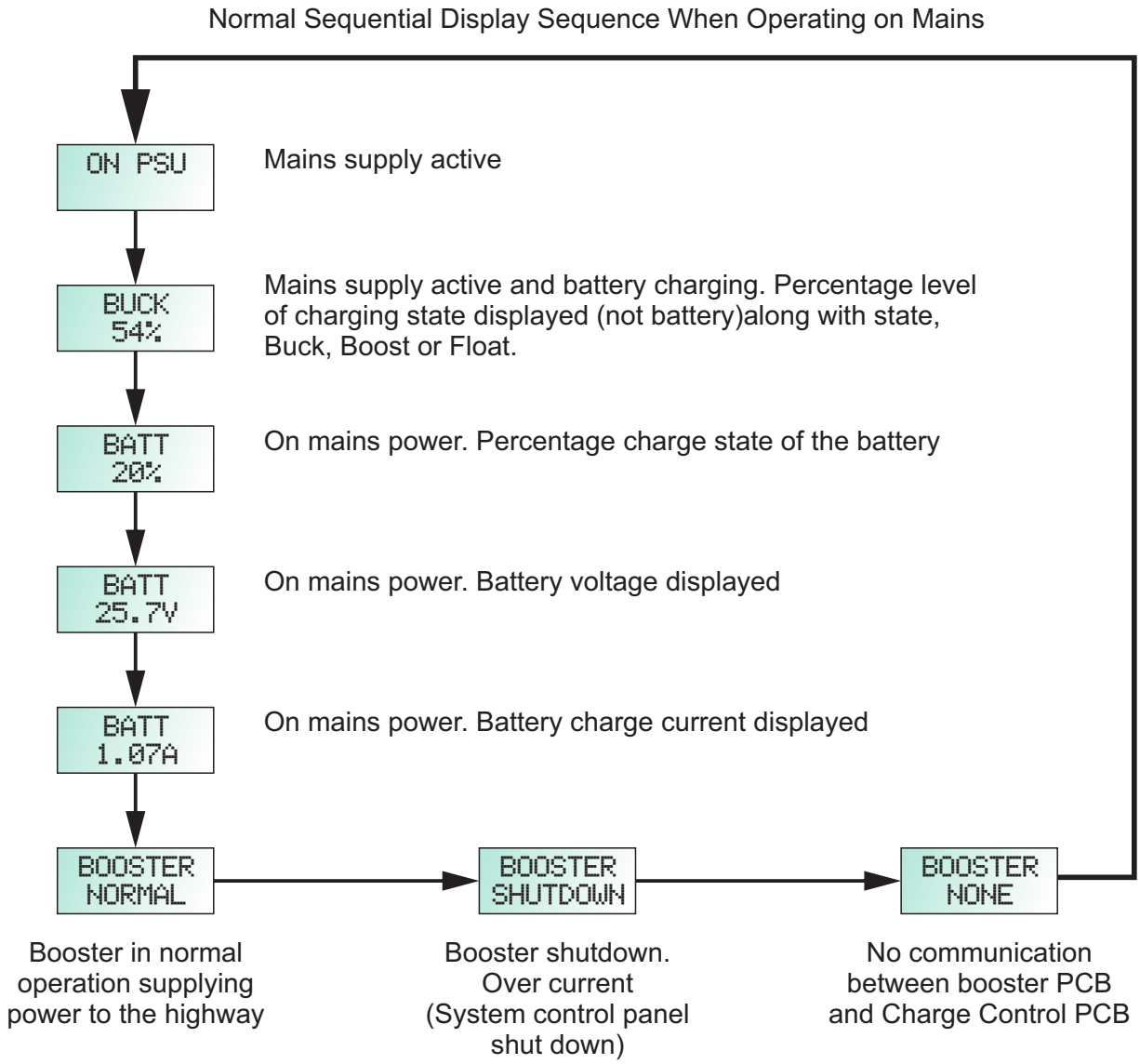
If the booster is fitted with backup batteries note that battery run time is determined by the batteries fitted to the main controller. The booster will switch off when the main controller switches off.

Device	**Max Power in Watts**
Relay Card (All 8 Relays Energised)	8.5
I/O Node	1
IR/Pellistor/PID Detector Node	1.24
IR/Pellistor/PID Detector Node with MK7 Pellistor	1.87
Toxic Gas/ Oxygen Detector Node	1.1
Toxic Gas/ Oxygen Detector Node with MK7 Pellistor	1.73
Node with 2 x 8 RGB Display	1.89
Node With Pellistor & 2 x 8 RGB Display	2.52
750 Series Sampler Toxic Gas/ Oxygen Detector	
750 Series Samper IR/Pellistor/PID Detector	
IGD Beacon Sounder (PN 5083101)	1.2
Cable Dissipation 1000M 1.0mmSQ (Approximation)	4.25
Cable Dissipation 1000M 1.5mmSQ (Approximation)	2.17
Cable Dissipation 1000M 2.5mmSQ (Approximation)	1.18

Indicated power is with the device in full alarm with all its I/O points energised.

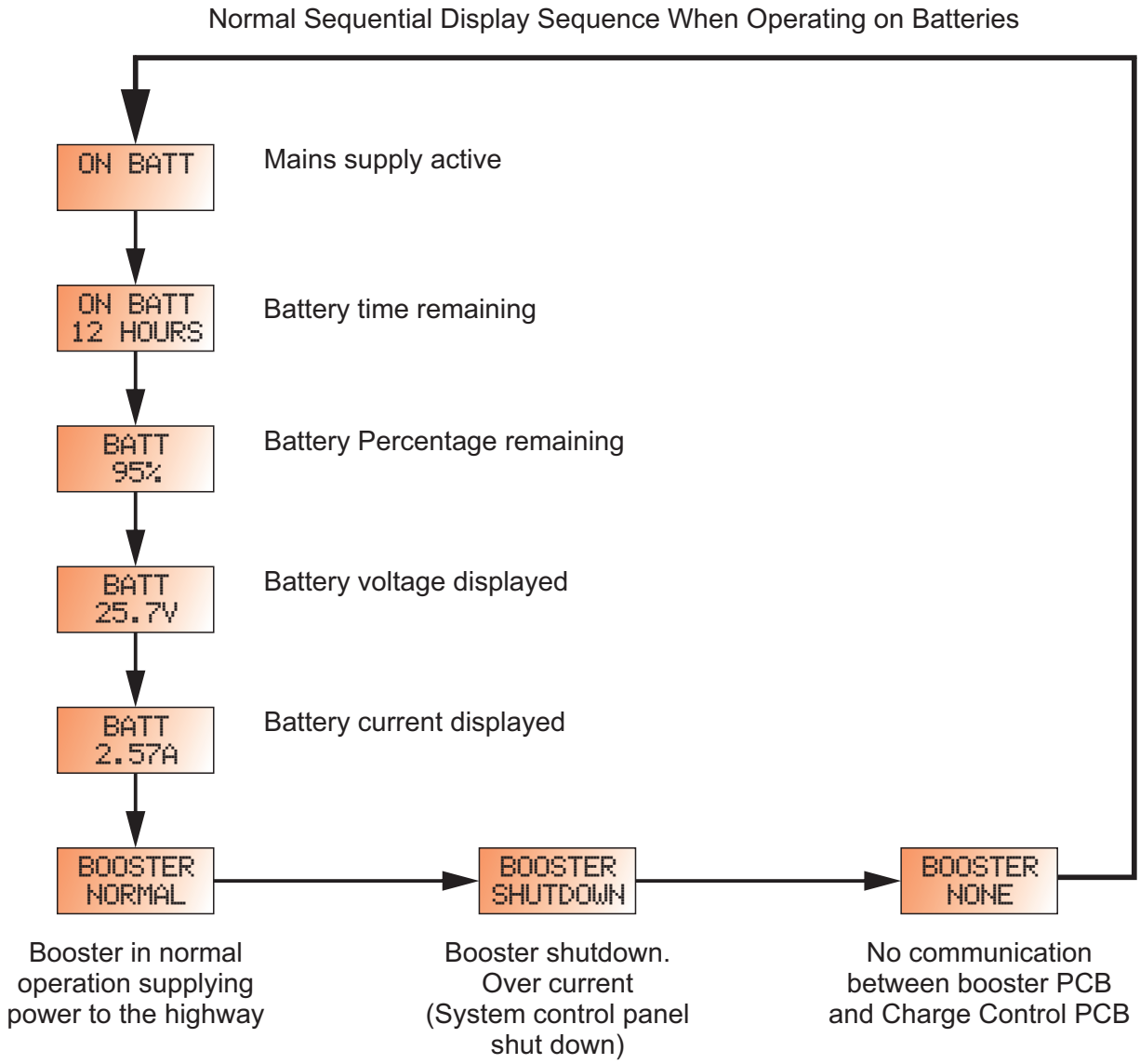
Module Displays

The following shows system displays indicated by the module during operation and their descriptions



Notes

Module Displays



Notes

Troubleshooting
Booster

Possible Fault	Possible Reason	Possible Solution
Booster not powering highway	<5V line voltage on highway	Check control panel is powered. Check appropriate cable type has been used & booster is installed in correct location on cable highway.
	<22V supplied to booster from battery backup PCB	Check Battery backup PCB is not in fault. Check PSU & battery voltage.
Booster shutdown / stops powering highway	>1.7A being provided by booster	Check control panel is powered & has not shutdown. Check for cable faults.
	<10V on highway	Check for cable faults.
	No communication between booster & battery backup PCB	Check comms cable between battery backup & booster PCB is connected
	A change in current of >0.25A on the highway after the current is learnt (this is on V1.100 and newer & can be disabled using DIP 3 in V1.102 and newer for commissioning purposes	Check the control panel has not shutdown. Check for cable faults.

Battery Backup

Possible Fault	Possible Reason	Possible Solution
Temperature fault	Temperature >60DegC	Battery backup PCB has overheated from installed location or from constant charging – remove cover & allow PCB to cool.
Battery voltage high	Battery >30V	Check the correct battery type is used. If the battery is correct contact IGD
PSU voltage high	PSU voltage >29V	Contact IGD
PSU current high	PSU >10A	Check power rating of connected devices. Check for cable faults.

Possible Fault	Possible Reason	Possible Solution
High charge current of batteries	>1.5A charge current	Check for short circuit
High discharge current of batteries	>10A while discharging	Check power rating of connected devices. Check for cable faults.
Low PSU voltage	If battery backup is powered from PSU and voltage is <22V	Contact IGD
Battery charge Buck fault	Dead battery, taking too long to charge	Change batteries
Battery charge Boost fault	Dead battery, taking too long to charge	Change batteries
Battery fault – not present	Batteries <10V when battery backup powered up	Change batteries