



# 760 Series

## Battery Back Up System (110VDC)



Long Life Reliability  
does not cost the earth

LPA-EXCIL ELECTRONICS

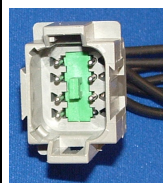
### Feature Summary

- High reliability battery-maintained DC supply with intelligent power management.
- Supports a 40W load for over three hours in the event of vehicle power loss.
- In-built diagnostic facility, with automatic fault reporting.



### Product Codes

- The 760 series main product is #760100. This unit is capable of supporting a 40W load for 3 hours.
- LPA-Excil's Emergency Lighting System Sender Units, #729132 & #729133 are compatible with the #760100 BBUS. These units provide an additional high-integrity deactivation facility to the stock #760100 product.
- Replacement NiMH battery packs for #760100 are available from Excil, part number #760105.

760100 BBUS Product Features	
Input Voltage Range	67-140VDC
High Capacity Internal Ni-Mh Battery Pack	84 x 1500mAh AA Cells
Fault Reporting	Current Sinking Optically Isolated Output
Enclosure Type	Aluminium Extrusion
Input Connector	Deutsch Connector* DT04-8P 

\* Other connector styles available by request. More details available on request.

## General Unit Behaviour

The BBUS has two main modes of operation.

1. **Energised (Vehicle Supply Present)**
  - Electrical power is drawn from the vehicle supply.
  - Power for the load is derived from the same vehicle supply and automatically routed to the Output, via an internal power relay.
  - If required charging of the internal batteries will commence.
  - The BBUS continually monitors the incoming vehicle supply. If the voltage falls to less than the minimum operating level, the BBUS enters battery backup mode.
2. **Battery Backup Mode (Vehicle Supply Absent)**
  - Power for the load is derived from the internal batteries and automatically routed to the Output, via an internal power relay.
  - The output will be active until either, the batteries are fully discharged or the output is deactivated via the Sender Unit.
  - During Battery Backup Mode, the condition of the internal batteries are continually monitored. When they reach the discharged threshold the output is deactivated, via an internal power relay, to prevent deep discharging of the batteries.

When Energised the BBUS continuously monitors the internal battery state.

- **If the battery has been significantly discharged Boost charging commences**
- The battery pack is fast-charged via a tightly regulated low-loss switched charging circuit.
- Charging is automatically halted when the internal circuitry detects a zero voltage slope at the battery.
- **If the battery is fully charged the BBUS stands-by, and continues to monitor the condition of the internal battery.**
- Any drop in voltage at the battery terminals is detected by the unit and a top-up charge is automatically supplied.

During Backup Mode, the Output can be selectively deactivated via an LPA-Excil Sender Unit, part nos. #729132/#729133.

- **When triggered, the sender unit supplies a 15V 218Hz square wave signal to the ELU.**
- This signal will shutdown any Battery Backup Unit that has been triggered by disconnecting the BBUS from the vehicle supply (e.g. Vehicle Shutdown).
- The BBUS will only respond to this frequency. Thus false deactivation in a crash scenario where vehicle cabling may be disturbed is avoided.

## Input Specification

### Input Voltages and Currents

<b>Acceptable Input Supply Voltage Range</b>	67-140	<b>V DC</b>
<b>Nominal Input Voltage</b>	110	
<b>Input Voltage Limit Without Damage</b>	160	

<b>DC Input Current - Boost Charge</b> (neglecting output current)	<b>@ 110V DC</b>	1.1	<b>A DC</b>
<b>DC Input Current - Off Charge</b> (neglecting output current)		0.02	

\* Input current values across the entire operational voltage range are available on request

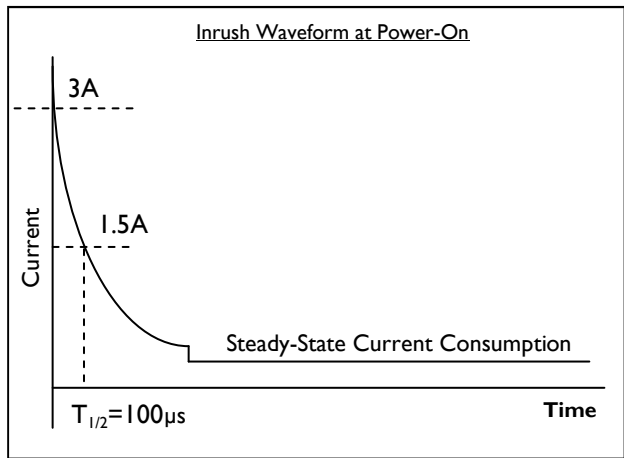
Battery Management and Protection Features

<p><b>Over-Charging Protection</b> As soon as the battery is fully charged, the zero-voltage slope that occurs at the battery terminals is detected. Boost charging halts and the unit enters top-up charge mode.</p>
<p><b>Over-Discharge Protection</b> During discharge the battery terminal voltage is monitored. When this voltage drops below a critical value discharging is halted.</p>
<p><b>Thermal Cut-Out Protection</b> Charging only occurs when the battery pack is within the correct temperature range.</p>
<p><b>Under/Over Voltage Protection</b> The battery will only be charged when the terminal voltage lies within a valid specified range. If this condition is not satisfied a battery recovery procedure is instigated. If this fails to bring the battery within specification, the unit will then latch in a non-charging state.</p>
<p><b>Charging Time Protection</b> If charging is not complete after a specified time period charging halts and the system latches. Charging will not begin again until the unit power supply is reconnected.</p>

<b>Battery Lifetime</b>	~500 charge/discharge cycles
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Power-On Inrush Data

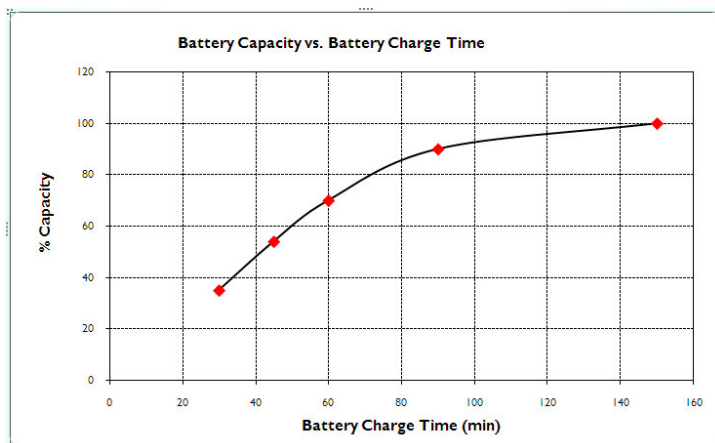
<b>Peak Inrush Current</b>	3 (@ 110V DC)	<b>A</b>
<b>Time to Half Value</b>	100 (@ T=25°C)	<b>µs</b>



**Output Specification**

<b>Output Voltage (nom)</b>	101VDC	
<b>Output Voltage Range</b>	84 - 140VDC	
<b>Output Power*</b> Fully charged	<b>Typical Load - 40W</b>	>3hrs
	<b>Maximum Load - 80W</b>	>1hr 20m

\* Assumes a constant power load



## Environmental Specification

<b>Unit Weight</b>		5.5	<b>kg</b>
<b>Dry Heat (steady state)</b>	<b>RIA 13 1990 1995</b>	70	<b>°C</b>
		6	<b>Hrs</b>
<b>Sealing Rating</b>		IP4X	
<b>Shock and Vibration</b>		EN50155 & EN61373	
<b>Crash Pulse</b>		AV/ST9001	
<b>Operating Temperature Range</b>		-25 to 55	<b>°C</b>
<b>MTBF Ground Mobile 40°C</b>		72,000	<b>Hrs</b>
		12	<b>Yrs</b>

## Compliance

The 760 Series Battery Backup System complies with the following standards:

- EN50121-3-2
- EN61373
- EN50155
- EN60529 to IP65
- AV/ST9001

\* All immunity tests comply with performance criteria 'A'



## Safety Specification

#760100 is equipped with the following protection circuitry as standard:

- All inputs protected against DC voltage reversal.
- Under voltage cut-off.
- Output Short-Circuit (user replaceable fuse)

**CAUTION:** When replacing battery packs we recommend that only LPA-Excil NiMH battery packs, #760105, should be used. Use of other battery packs may result in damage to both unit and battery pack, and may cause personal injury for which LPA-Excil cannot be held responsible.

## System Condition Reporting

- The BBUS is fitted with an optically isolated output for connection to fault monitoring equipment e.g. Train Management System.
- The BBUS has a built in condition monitor to determine the battery capacity. The batteries are first allowed to fully charge. Then allowed to discharge into the load. The discharge time is then monitored. The result of the capacity test is then presented on the FAULT output.
- On the next power up of the BBUS, the Fault Output will be in one of two states.  
Hi-Impedance = PASS  
Current Sinking = FAIL
- Note: The maximum voltage to be applied to the fault output should be 27VDC  
The output sink is limited to 5mA

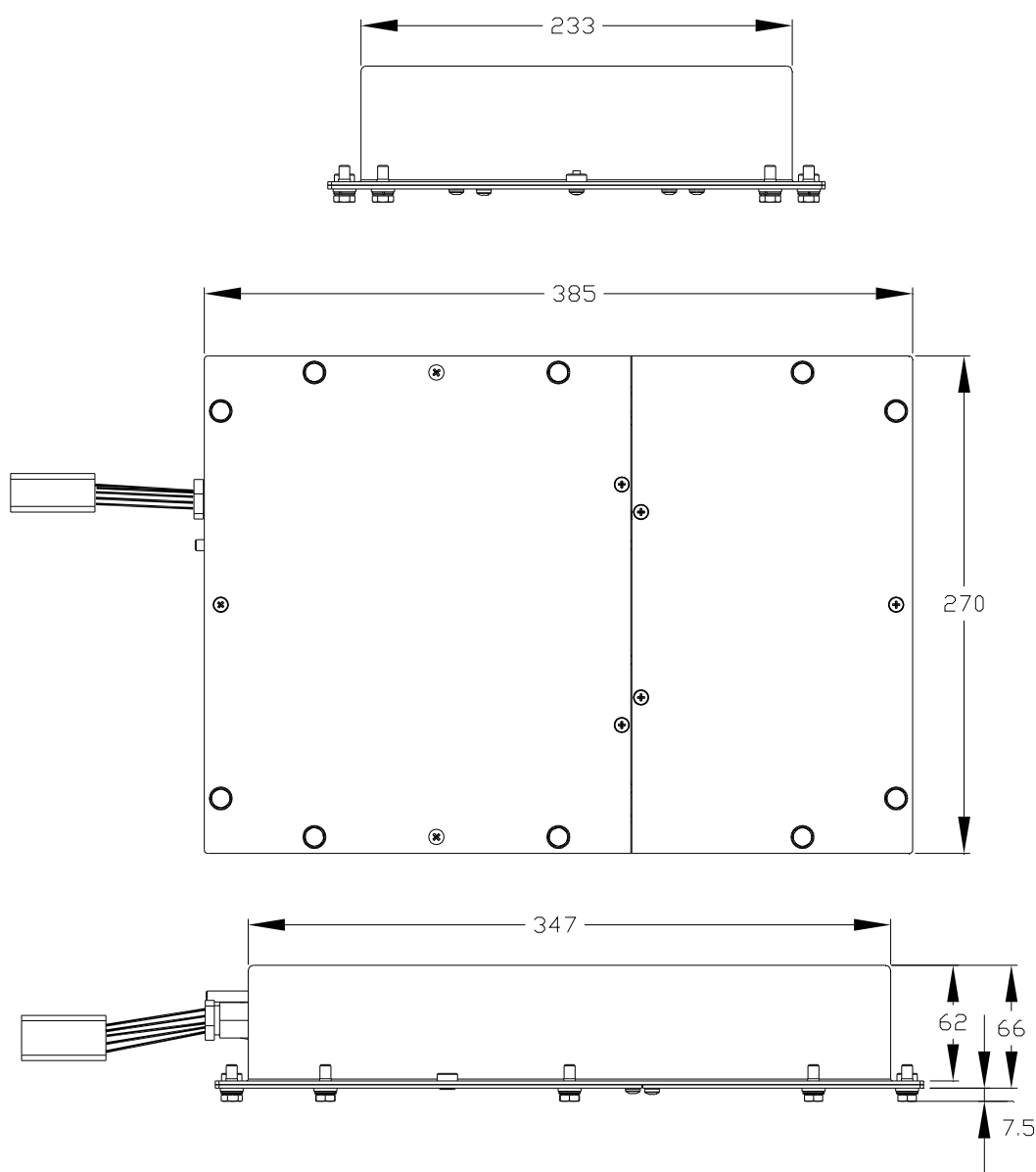
## Installation Guide

ELU Unit Connector Pin Out - Deutsch DT04-06†	
Pin 1	Input Supply +110V DC
Pin 2	Input Supply 0V DC
Pin 3	Output Supply +110VDC
Pin 4	Not Used
Pin 5	Battery Disable Input +15V 218Hz square wave
Pin 6	Battery Disable Input 0V
Pin 7	Fault Signal Output +Ve
Pin 8	Fault Signal Output -Ve

† Other connector types are available on request. Contact us for details.

# Mechanical Specification

All Dimensions in mm unless stated otherwise



Note: Mounting Brackets are required for correct installation. Custom mounting brackets are available on

LPA-Excil makes every effort to ensure the accuracy of the information contained within this datasheet. However we reserve the right to withdraw and re-issue this datasheet at a later date.



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