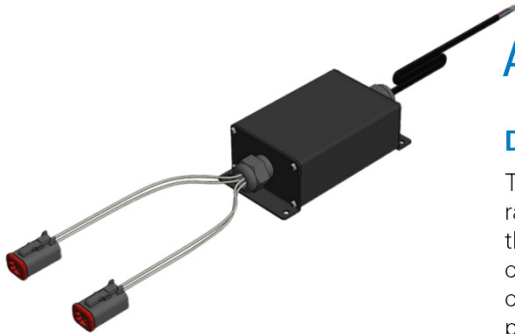




AC/DC & DC/DC USB Chargers for railway applications

Description

The USBR converter is a very cost-effective USB charger designed specifically for use on rail vehicles. Housed in a rugged chassis mounting enclosure rated to IP40, IP56, or IP65, the converter's small size makes it ideal for mounting almost anywhere in the passenger compartment such as within passenger seat frames. Models are available for direct connection to the vehicle battery (dc input), or an auxiliary 110/230Vac supply, and provide two independent 5V outputs, each rated at 2A. The range is fully compliant with the latest international railway standards including shock and vibration, EMC and fire protection.



IP54 & IP65 (Option 'S') versions

Special features include:

- ac and dc input models available
- dc input model is ultra wide range covering all nominal vehicle battery voltages
- Two independent, separately regulated and protected outputs
- EN 50155 (2017), EN 50121.3.2 (2016) and EN 45545 (2013) compliant
- IP54 rated (IP65 version and IP40 version with connectors as an option)



IP40 version (Option 'P')



Available models

Part number	Nominal Input	Input Range
USBR 0500-Z/1	230Vac	207 – 253Vac
USBR 0500-XZ/1	110 / 230Vac	90 – 253Vac
USBR 0500-DC/1	24 / 36 / 72 / 110Vdc	16.8 – 137.5Vdc

AC input specifications

Parameter	Detail	
Nominal input voltage	See table above	
Input voltage range	See table above	
Input frequency	47 – 63Hz	
Inrush current	To EN50155	
Efficiency	83% typical	
Supply interruptions	EN 50155 Class S1 (no hold up)	
Input fuse	Internal fuse protects against catastrophic converter failure (factory replacement only)	
Isolation (tested at dc equivalent voltage)	Input to output	3.0kV ac
	Input to case	1.5kV ac
	Output to case	1.5kV ac
	Output to output	None

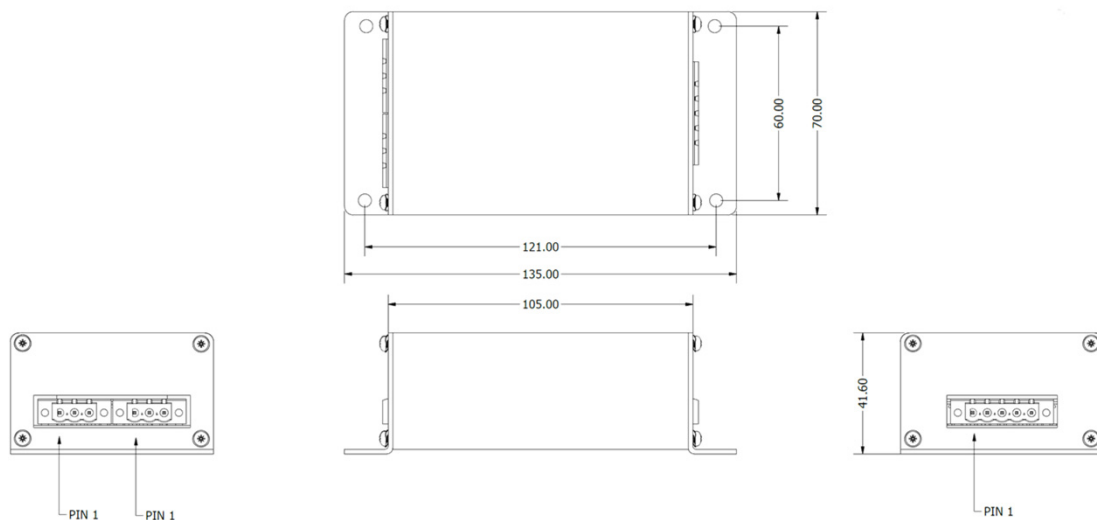
DC input specifications

Parameter	Detail								
Supply fluctuation	Temporary supply over-voltages and dips in accordance with EN50155								
Input ripple	To EN50155								
Input protection	Reverse polarity protection by series device Surges and transients to EN50155 (direct and indirect)								
Inrush current	To EN50155								
Efficiency	80% typical (75% 24V input), 40-100% load								
Supply interruptions	EN50155 class S1 (no hold up)								
Input fuse	Internal fuse protects against catastrophic converter failure (factory replacement only)								
Isolation (tested at dc equivalent voltage)	<table border="1"> <tr> <td>Input to output</td> <td>2.0kV ac</td> </tr> <tr> <td>Input to case</td> <td>1.0kV ac</td> </tr> <tr> <td>Output to case</td> <td>1.0kV ac</td> </tr> <tr> <td>Output to output</td> <td>None</td> </tr> </table>	Input to output	2.0kV ac	Input to case	1.0kV ac	Output to case	1.0kV ac	Output to output	None
Input to output	2.0kV ac								
Input to case	1.0kV ac								
Output to case	1.0kV ac								
Output to output	None								

Output specifications (per output)

Parameter	Detail
Number of outputs	Two. Independently regulated and protected.
Nominal output voltage	5.15V (set at 50% load, measured at the output connector)
Output current	2A maximum
Minimum load	Zero
Output voltage range	4% total for setting tolerance, line and load regulation. N.B. output not to exceed 5.25V under any condition.
Temperature coefficient	<0.02% / °C
Output ripple	<50mV Pk-Pk of output voltage
Output noise	<50mV Pk-Pk superimposed (up to 20MHz)
Response time	0.5ms to within 2% (for a 20% - 90% load change)
Output protection	Output protected against indirect transients to EN50121.3.2
Current limit	Operates at <3.0A. Auto recovery
Short circuit protection	Stop & retry (hiccup mode)
Thermal protection	Shuts down PSU if safe internal temperature is exceeded. Auto recovery.

Outline drawing (option 'P')



Environmental details

Parameter	Detail						
Operating Temperature	EN 50155 class OT3: -25°C to +70°C (no de-rating). (85°C for 10 minutes)						
Storage Temperature	-40°C to +85°C						
Cooling	Convection						
Relative Humidity	95% max.						
Shock & Vibration	EN 50155 (EN 61373) for mounting in any orientation						
Environmental Protection	<table border="1"> <tr> <td>Standard (flying leads):</td> <td>IP54</td> </tr> <tr> <td>Option 'P' (pluggable connectors):</td> <td>IP40</td> </tr> <tr> <td>Option 'S' (flying leads, sealed):</td> <td>IP65</td> </tr> </table>	Standard (flying leads):	IP54	Option 'P' (pluggable connectors):	IP40	Option 'S' (flying leads, sealed):	IP65
Standard (flying leads):	IP54						
Option 'P' (pluggable connectors):	IP40						
Option 'S' (flying leads, sealed):	IP65						

Mechanical characteristics

Parameter	Detail
Construction	Extruded aluminium enclosure with mounting flanges front and rear
Dimensions (LxWxH)	105x70x41.6mm (enclosure dimensions excluding mounting flanges and cable glands)
Finish	Black anodised
Weight	270g (option 'P' model)
Input connection	1m length 3 core rail approved cable, unterminated Option 'P' – 5 way Phoenix Contact MSTB
Output connections	4 x 1.5mm ² cables, length 500mm. Each output terminated in a Deutsche 4 way connector, type DT06-4S (plus W4S wedgelock). Two unused pins connected together to identify converter to connected device as DCP (Dedicated Charging Port)
Fixings	Option 'P' – 3 way Phoenix Contact MSTB (2 off) 4 x Ø4.5mm clear holes in mounting flanges

Applicable norms

Parameter	Detail
General	EN 50155 (2017)
EMC	EN 50155 (2017), EN 50121-3-2 (2016)
Fire & Smoke	EN 45545-2 (2013) HL3
Safety	EN 50153 (2014), EN 50124-1 (2017)