



CMT Internal Sign Model 2

1.0: Introduction:

The ADR requires that such signs be self-illuminating when the vehicle is in motion, and that the sign should remain illuminated for more than 15 minutes:

- After the vehicle stops.
- In the event of the failure of the main vehicle battery.

The C.M. Technology EMERGENCY EXIT2 sign is a small (130mm by 40mm by 25mm) sign that satisfies these requirements of the ADR. It uses the latest super bright Light Emitting Diodes (LED's) to backlight a red sign of the required size. The time duration is set by the charge stored in the internal super capacitors.

2.0: Technical Specification:

2.1: Mechanical Assembly:

The case of the sign is a small plastic box that supports an acrylic diffuser. The legend is cut into a vinyl label attached to the diffuser. All screws are hidden from view. All the electronics are contained in the case, with two connecting wires coming out of the back face. These wires are colour coded and polarity and RFI protected.



2.2: Mounting:

An access hole (12mm) is required for the fly leads. The unit is held in place by 2 pks insulated from the main PCB..

2.3: Electrical Connection:

Two wires are needed. All Exit signs can be connected together. The two connections are

- Vehicle Battery Plus (12 or 24 volts)
- Vehicle Battery Negative

This connection ensures that the super capacitor in the sign is always fully charged.



**C.M. TECHNOLOGY**

Designed and Manufactured in Australia

www.cmtechnology.com.au**FULL DATA SHEET****Tel: + 61 2 9764 6550**

2.4: Operation:

The operation of the sign is as follows:

- Ignition On: capacitor charge up ~5 minutes
- Ignition goes Off: Sign on for >15 minutes after.
- Battery connection Broken: Sign on for >15 minutes

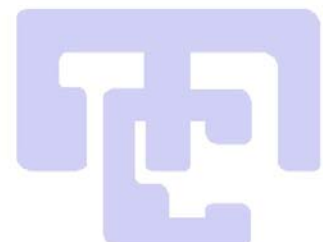
It is quite safe to disconnect the vehicle battery for extended periods. The super capacitor does not have any memory effect.

2.5: Protection:

The sign is fully protected against reverse connection, and the transients found in automotive applications.

2.6: Temperature:

The Exit sign is rated from -10 C to +60 C

**A Caspian Technology Company**

all materials presented are trade mark and copyright protected by C.M. TECHNOLOGY Pty Ltd



1.3 Australian Content:

The power supplies are designed and manufactured in Australia from Australian sourced materials where that is possible. The Australian content is >80% and the units qualify for the Australian made symbol.

2.0 Equipment Electrical Specification:

2.1: Input Voltage:

- | | | |
|------------|----------|-----------|
| • Type 24 | Min 15 V | Max 32V |
| • Type 24 | Min 40 V | Max 60 V |
| • Type 74 | Min 55 V | Max 100 V |
| • Type 110 | Min 70 V | Max 150 V |

2.2: Transient Protection:

The supplies are not susceptible to voltage spikes applied to the input terminals with the following characteristics:

- Peak Voltage 5000 Volts
- Rise Time < 0.1 microseconds
- Fall time to 2000V 160 microseconds , RC type time constant
- Energy in Spike <100 joules

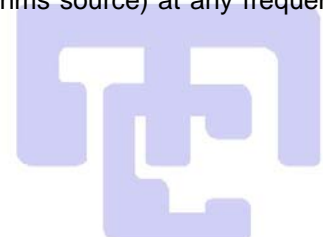
2.3: Input-Output Voltage Isolation:

Both input and output terminals float with respect to the metal case, which is grounded.

- Isolation input to case > 1000 V rms AC 50 Hertz for 1 minute
- Isolation output to case > 1000 V rms AC 50 Hertz for 1 minute
- Isolation input to output > 1000 V rms AC 50 Hertz for 1 minute

2.4: Input Noise Immunity:

Power Supply Operation is not affected by the application of 200 mV rms (50 ohms source) at any frequency from DC to 50 M Hz. A multi-pole input EMC/EMI filter is used.





2.5: Reverse Polarity Protection:

The supplies are input diode isolated. They are not affected by indefinite reverse power within the input voltage limits 0 to 150 V DC. (0 to 55V DC PSTR 24) Normal operation is restored immediately upon the correct application of power. Under reverse power, no output voltage is present. The reverse polarity is indicated by a RED daylight visible high brightness LED labeled "POLARITY". Correct polarity DC is shown by a GREEN high brightness "xxx V DC" LED, both adjacent to the input DC CR socket.

2.6: Output Voltage:

2.61:Nominal:

The nominal output voltage is 13.8 V DC at 16 amps. Other voltages on request. Output voltage present is shown by a GREEN high brightness LED, "12 V", adjacent to the output DC CIR sockets.

2.62: Regulation:

When measured at the back of the output connector (i.e.. not including drops in the output plug itself), the regulation is:

- Over load 0-16 amps (input nominal) < +/- 1%
- Over Input Range (Load 16 amps) < +/- 1%
- Over Temperature (Input Nominal, Load 16 amps) < +/- 1%

2.7: Output Current:

The rated output is **16 amps rms, maximum continuous at 60 Celsius**. The supply has a constant current type of limiting behavior, and allows parallel connection & redundant operation. The **current limit** is 22 amps. The supply is limited by its passive (no fans) heat sink. The supply can be short circuited. The "rms" figure allows duty cycle ratings e.g.:

- 22 Amps for 1minute, 12 Amps for 4 minutes cyclic duty at 60°C
- At 50 C, the available current is 20 amps in a free air flow of > 1m/sec

2.8: Output Voltage Ripple & Transients:

The output voltage ripple and transients are less than 100mV for any load.

2.9: Output Noise:

The output noise under all load conditions is <100 mV peak , DC to 100 MHz.





2.10: Over Voltage Protection:

The output is disconnected if it should exceed an internal preset for 1mS.



Over Volts disconnect 14.9 VDC +/- 3% (Hysteresis 0.6 Volt DC)

No fuses are used. The output cannot reverse under any condition.

2.11: Current Limiting:

The supplies do not require a load for proper operation. The outputs are current limited electronically. No fuses are used. Disconnection and Re-connection of the load during operation will not damage the supplies.

2.12: Parallel Operation:

The supplies are designed for parallel operation, either for load sharing or redundant operation techniques.

2.13: Efficiency:

The efficiency at 16 amps (75% load) is >80% (83% typical PSTR 24 &74 84% PSTR 110)

2.14: Cooling:

The unit is convection cooled. Provision for free air circulation around the inner case (~110 mm deep) should be made, as up to 70 watts can be dissipated at maximum load. 1 metre/sec of air flow should be provided.

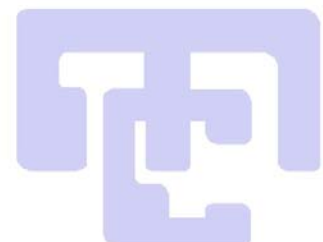
The supply should not be used in a confined space that is not fully ventilated.

2.15: MTBF:

The unit is manufactured using only well specified and qualified components. In particular, the electrolytics are IEC 384-4, long life grade, climatic category IEC 68 (-40 +85) with a life in excess of 60,000 hours at a 60 Celsius ambient and full ripple current. Infant mortality is eliminated with a full load burn in at final test (8Hrs) before dispatch. The MTBF is **predicted** at > 60, 000 hours in normal service.

2.16: Temperature Rating:

The power supplies are specified for operation from -10 to +60°C.





2.17: Options:

Series Type "PSTRxxF" has the options:

- Input Ripple filter for high ripple (>5%) DC sources.
- Power good (13.8+/- %5) floating contact set

3.0: Equipment Mechanical Specification:

3.1: General:

The power supplies are designed and manufactured with the rigors of railway application in mind. The major components like electrolytics have multiple terminations into the printed circuit board, which itself is made of 70 micron (twice normal), through hole plated, tinned fibre glass. Critical joints are bolted for extra strength and other components supported with Loctite 480 adhesive. The PCB is also conformal coated to stabilize the minor components and for dust protection. All components mount to the PCB. There are no looms other than short jumper wires from the PCB and soldered to the CIR in-out connectors. The wires used are silicone insulated high temperature grade. The power supplies consist of a 19 inch standard rack mount, extruded aluminium front panel assembly anodized black. To this is bolted a removable inner safety case that is made from laser cut stainless steel. All parts mount to a single PCB screwed at many places to the front panel. A back screen printed lexan label covers the annunciator LEDs, effectively sealing the front panel. The supply is mounted to the rack with 4 front panel screws. All electrolytics are mechanically clamped to the frame independent of the PCB mounts.

3.2: Mechanical Stability:

To provide an independent assessment of the product, the mechanical stability of the unit was tested by the Philips NATA laboratory for the Freight Rail Corporation project. The tests comprised a vibration test at the resonance frequency to the test specifications for Railway based electronic equipment and dust penetration tests to IP50.

3.3: Maintainability and Warranty:

The supplies are manufactured from discrete components soldered to a double sided through hole plated PCB. Complete parts lists (with suppliers), circuit diagrams, overlays, descriptions of operation and calibration details are included in the purchase price.

Within warranty (12 months) return to factory freight paid applies. The unit will be returned freight paid. Outside warranty, the units can be returned freight paid to the factory for maintenance for a fixed fee + freight (if the unit is in good mechanical condition)



C.M. TECHNOLOGY

Designed and Manufactured in Australia

www.cmtechnology.com.au

FULL DATA SHEET

Tel: + 61 2 9764 6550

3.4: Revision Notes:

Rev. 1.0 December 1992	Initial Release
Rev. 1.1 March 1993	Increase Efficiency to >80% due to 3F3 ferrites being available.
Rev 1.2 June 1993	Modified mechanical design. Type 24 added. Maintainability spec added
Rev 1.3 February 1994	Add Operation & Calibration Description to full specification.
Rev 1.4 March 1994	Tidy up. PSTR24 18 now 21V note qualifying this.
Rev 1.5 February 1995	Include new graphics
Rev 2.0 July 1996	Improved PSTR24 at 15 V. Add duty cycle or "rms" to current limit
Rev 2.1 Sept 2001	Improved graphics
Rev 2.2 July 2003	Include Telstra (1996) 48 V variant in main spec.



A Caspian Technology Company

all materials presented are trade mark and copyright protected by C.M. TECHNOLOGY Pty Ltd