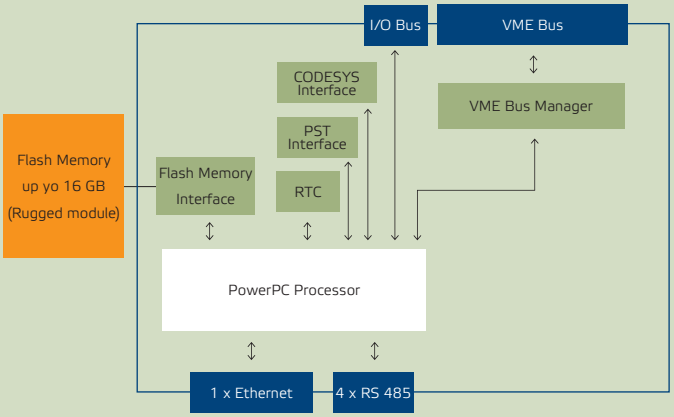

Rugged Memory Module (RMM)

EN 50155, EN 45545
IEEE 1482.1-1999
IEC 62625-1:2013
GM/RT2472:2014
EEIG 97E461-3.1998

MODULE FUNCTIONS

The Trainnet® Rugged Memory Module (RMM) is a highly protected memory module to be used as part of a Trainnet® Event Recorder. As the essential part of the Train Event Recorder, it collects and stores vital train-borne information. Depending on your needs, it can record all kinds of data including audio and video recordings.

KEY FEATURES

The Trainnet® Rugged Memory Module is used together with a Trainnet® 3U 84TE Rack and a power supply (usually Trainnet® PSV and Trainnet® PIU modules) to build a fully functional and standalone Event Recorder. The Trainnet® RMM can also be integrated to a larger Trainnet® System, for instance in a 6U 84TE Rack, as an addition to a Gateway, VCU or TCMS.

The Trainnet® Rugged Memory Module (RMM) is meant to be used whenever a high level of data protection is needed. Its crash-proof construction guarantees that the memory board is protected against fire, magnetic fields and any liquids, as well as any mechanical stress during an impact or a continued pressure. In practice, the memory board is embedded in a protected fire insulation block, surrounded by a special steel case that is hermetically sealed.

The design of the Trainnet® Rugged Memory Module fulfils the British (GM/RT2472-1.2002) and European (EEIG 97E461-3.1998) crashworthiness as well as the IEEE (1482.-1.1999) standards.

The Trainnet® RMM can store both analogue and digital signal data. The desired train information can be stored for a predetermined period of time. Data can be retrieved at any time using the Trainnet® TIP Software (Train Inspection Program) which enables system performance analysis and optimization. Data can be copied from the RMM to a USB stick for convenient transport and storage.

The Ethernet and USB ports located on the front of the module can be used to retrieve data from the memory module. The Trainnet® RMM can acquire data from the Ethernet port but also via the VME back plane (thus from added interface modules) and the RS 485 port located on the front panel. The module gets power from the VME back plane.

The RMM can record video streams from onboard digital video recorders (DVR) or directly from cameras. For easy data retrieval, the stream format can be made compatible with your CCTV Software or any other video analysis Software that you use. Alternatively, we can develop customized video analysis tools to fit your needs.

OPTIONS

Memory:
Memory can be 2GB or 16 GB.

Front-panel Inprints:
Front-panel imprints are available on request in English or any other language of your choice.

GPS/GNSS:
A GNSS (Global Navigation Satellite System) receiver can be integrated to the RMM to provide location and time information. One version with GPS+GLONASS and one version with GPS+BeiDou are available. Please note this option will increase the module's width by 4TE.

TECHNICAL SPECIFICATIONS

Dimensions (W x H x D): 32 TE x 3 U x 160 mm
Weight: 7 Kg
Input Power: 5 V DC ± 5 % (1 A max., 0.5 A typ.)
Temperature Range (operational): -40 ºC...+70 ºC
MTBF (40 ºC ambient temperature)
890 000 h (2 GB) and 870 000 h (16 GB)
Interfaces
3 or 4 Isolated RS-485
1 x 10/100 Mbit/s Ethernet, M12 connector
1 x USB 2.0 Host for retrieval
Memory: 2 GB or 16 GB

Protection Levels (Rugged Memory Module)

Ingress Protection (IP) rating: 68
Shock: Up to 100 g / 10 ms and 55 g / 100 ms
Crush: Up to 110 kN for 5 minutes in all axes
Penetration
Up to 23 kg drop from a height of 1,5 m focussed on an area of 30 mm2
Temperature
Up to 700 ºC for 5 minutes and 650 ºC for 30 minutes followed by 300 ºC for 1 hour followed by 100 ºC for 5 hours
Chemical Immersion
Winter Diesel (*), Summer Diesel (*), Regular Water (*), Salt Water (*), Lubricating Oil (*), Transformer Oil (**), Hydraulic Oil (**), Anti Fire Fighting Foam (*), Refrigerant R134A (**), Alcohol (**), Anti Freeze (**), Battery Acid (**)
(*) minimum for 48 hours (**) minimum for 60 min
Magnetic Field
Current flow of 64 kA at rising rate of 107 A/s
Hydrostatic pressure
Immersion in salt water at a depth of 15 meter for 48 hours