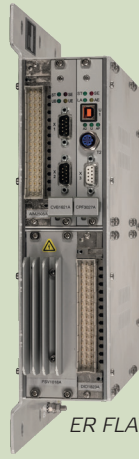



 ER FLAT
3U x 12TE


ER 20TE



ER FLAT 6U x 12TE



ER 44TE

Event Recorders

FUNCTIONS

A Trainnet® Event Recorder (ER) is an on-board data recorder for collecting and storing vital train-borne information. The Trainnet® Event Recorder can record all kinds of data including audio and video streams.

KEY FEATURES

Trainnet® Event Recorders are able to record virtually any available signals, analogue or digital. The Event Recorder can be programmed to record safety critical information like train speed, train position or brake temperature.

The Event Recorder can also record video streams from onboard digital video recorders (DVR) or directly from the cameras. For easy data retrieval, the stream format can be made compatible with your CCTV Software or any other video analysis Software that you are using.

Alternatively, we can develop customized video analysis tools to fit your needs.

Trainnet® Event Recorders have an Ethernet port, a USB port and an RS-485 port at the front for easy access. The Ethernet port

COMPARING TRAINNET® EVENT RECORDERS

	ER FLAT 3U X 12TE	ER 20TE	ER FLAT 6U X 12TE	ER 44TE	ER 84TE	RMM 84TE (e.g. JRU)
External Dimensions (W x H x D)	87 x 229 x 215	158 x 133 x 215	87 x 363 x 215	280 x 133 x 215	280 x 133 x 215	280 x 133 x 215
Rugged Memory Module (RMM)	-	-	-	-	-	☑
Storage Memory	500MB or 4GB	500MB or 4GB	500MB or 4GB	500MB or 4GB	500MB or 4GB	2GB or 16GB
Connectivity <i>Included interfaces:</i>	1 x Ethernet M12 1 x USB 3 x RS-485	1 x Ethernet M12 1 x USB 3 x RS-485	1 x Ethernet M12 1 x USB 3 x RS-485	1 x Ethernet M12 1 x USB 3 x RS-485	1 x Ethernet M12 1 x USB 3 x RS-485	1 x Ethernet M12 1 x USB 3 x RS-485
<i>Optional interfaces:</i>	no free slot	2 free slots for:	3 free slots for:	7 free slots for:	17 free slots for:	10 free slots for:
. Bus interfaces		MVB, CAN, SIU	<u>MVB</u> , <u>CAN</u> , <u>SIU</u>	MVB, CAN, SIU, 3U ESU	MVB, CAN, SIU, 3U ESU	MVB, CAN, SIU, 3U ESU
. I/O Interfaces		<u>AIM</u> , <u>HSA</u> , <u>DIO</u> , <u>DRO</u> , <u>AOM</u> , <u>PTI</u>	AIM, <u>HSA</u> , DIO, DRO, AOM, PTI	<u>AIM</u> , <u>HSA</u> , <u>DIO</u> , <u>DRO</u> , <u>AOM</u> , <u>PTI</u>	<u>AIM</u> , <u>HSA</u> , <u>DIO</u> , <u>DRO</u> , <u>AOM</u> , <u>PTI</u>	<u>AIM</u> , <u>HSA</u> , <u>DIO</u> , <u>DRO</u> , <u>AOM</u> , <u>PTI</u>
. Remarks		Note: Max 1 <u>un-</u> <u>derlined</u> module	Note: Max 1 <u>un-</u> <u>derlined</u> module	Note: Max 5 <u>un-</u> <u>derlined</u> modules. 3U ESU = 3 slots	Note: Max 15 <u>un-</u> <u>derlined</u> , Max 9 not underlined modules. 3U ESU = 3 slots	Note: Max 6 <u>un-</u> <u>derlined</u> modules. 3U ESU = 3 slots
Power Supply Input Voltage	24, 36, 48, 52, 72 or 110 V DC	24, 36, 48, 52, 72 or 110 V DC	24, 36, 48, 52, 72 or 110 V DC	24, 36, 48, 52, 72 or 110 V DC	24, 36, 48, 52, 72 or 110 V DC	24, 36, 48, 52, 72 or 110 V DC
Power Supply Cabling	Back	Back	Back	Front	Front	Front
Option for side mounting	side mounted	☑	side mounted	-	-	-
Included Software	Trainnet® TIP	Trainnet® TIP	Trainnet® TIP	Trainnet® TIP	Trainnet® TIP	Trainnet® TIP
Optional Software	CODESYS, PST	CODESYS, PST	CODESYS, PST	CODESYS, PST	CODESYS, PST	CODESYS, PST



ER 84TE



RMM 84TE

EN 50155, EN 45545
 IEEE 1482-1.1999
 IEC 62625-1
 GM/RT2472-1.2002
 EEIG 97E461-3.1998

and the USB port can be used to download the data stored in the recorder. Alternatively, the Ethernet port can be used to connect to a sub-system or an Ethernet Switch. The RS-485 port can also be connecting sub-systems.

All the Trainnet® Event Recorders are protected against shocks, vibration, humidity, temperature variations, excessive emissions and excessive voltages (follows the EN50155 standard). Front-panel imprints are available upon request.

MODULARITY

Additional interfaces can be easily added to the Event Recorder, as the system is modular. You can add bus interfaces such as MVB, CAN, S/L or Ethernet to connect with train sub-systems or Train Communication Network (TCN) in order to acquire data. You can also add Input/Output Interfaces to record various signals. Available I/O Interface Modules include Analogue Input, High Speed Analogue Input, Digital Input/Output, Digital Relay Output, Analogue Output and Pt-100 temperature Sensor Input.

For a compact and efficient system, Trainnet® Event Recorder can be used as part of a broader Trainnet® system, for instance integrated to a Gateway, a VCU or a TCMS.

DATA RETRIEVAL AND ANALYSIS

Data can be retrieved at any time via the Event Recorder Ethernet port using the Trainnet® TIP Software (Train Inspection Program). The TIP Software enables the download and the analysis of the train data. Alternatively, the data can be transferred to a USB stick, for convenient transport or storage. The data is easily imported from the USB stick to the TIP Software.

The Trainnet® Event Recorder proves useful beyond traditional use following an incident. The retrieved data can be visualized with the TIP Software in order to perform regular system performance analysis and train operational optimization.



Illustration: TIP Software

RUGGED MEMORY MODULE

The Trainnet® Rugged Memory Module (RMM) is available as an option whenever a high level of data protection is needed. This crash-proof construction guaran-

tees that the memory board is protected against fire, magnetic fields and any liquids, as well as against any mechanical stress during an impact or 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.

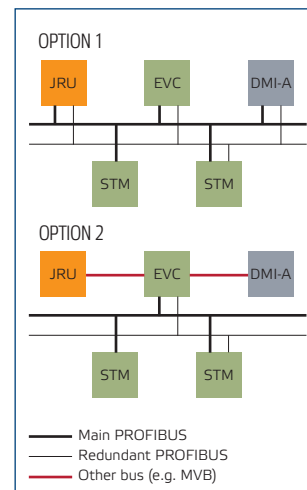
The design of the Trainnet® Rugged Memory Module fulfils the British (GM/RT2472-1.2002) and European (EEIG 97E461-3.1998) crashworthiness as well as the IEEE (1482-1.1999) standards. This makes the Trainnet® Event Recorder suitable for trains worldwide.

JURIDICAL RECORDING UNIT

The Trainnet® Juridical Recording Unit (JRU) is a train event recorder complying with the ERTMS/ETCS standard. The Trainnet® JRU has all the features of other Trainnet® Event Recorder and is equipped with the Trainnet® Rugged Memory Module for data protection.

The Trainnet® JRU can record data from the ETCS (i.e. European Vital Computer, EVC) and/or from nation-specific control systems (i.e. Specific Transmission Module, STM). The ETCS architecture illustration highlights the two standard setup options.

Illustration: ETCS architecture



GPS/GNSS

As an option, a GNSS (Global Navigation Satellite System) receiver can be integrated into the Event Recorder. Versions with GPS+GLONASS and GPS+BeiDou are available. This option requires 4TE of additional space in the rack (one free bus interface slot).

RACKS AND SIZES

The modularity of the Trainnet® Event Recorders means you can choose a rack size based on your needs: the more additional interfaces or features you need, the larger is the rack that you need to select. The table on the previous page presents some of the possible alternatives.