



Product size and connectors may vary depending on configuration

## TrainWise® Event Recorder System

The TrainWise® Event Recorder (ER10) Computer collects critical information about train systems, driver activities, and vehicle performance and stores it in a Hardened Memory Module (MM01). Recorded data provides vital information following an incident to determine root cause and identify preventive measures.

Redundant network connections allow the ER10 to obtain data reliably from train subsystems over the Ethernet network, reducing the need for discrete wired connections.

## Technical compliance

Railway standards	Compliant with IEEE and IEC rail design standards (including IEEE 16 and IEC60571/ EN50155) IEC 61375-3-4 Electronic railway equipment – Train communication network (TCN) – Part 3-4: Ethernet Consist Network (ECN)
Fire, smoke and toxicity	Compliant to 49 CFR Part 238.103 guidelines and NFPA-130
Data logging capacity	Hardened Memory Module (HMM) available in 1GB to 16GB versions

## Options

Expanded I/O	Digital and analog I/O capacity can be expanded by adding one or more I/O modules to the unit. Custom modules for specialized I/O and communication channels available on request.
Dual controller modules	For systems requiring high availability, dual Controller Modules can be installed in a hot-standby configuration.
Full or half width chassis	The ER Computer is available in a 5-slot 6U half- rack chassis. Alternately, if more card slots are required, a full 10-slot full-width 19" chassis is available.

## Processor and storage

Processor	i.MX6 with ARM Cortex A9 processor
Operating system	Linux, QNX
OS memory	1 GB DRAM, 1 GB NAND flash
Data logging capacity	4 GB Solid State Flash Memory (Larger memory configurations available)
Real-time clock	Battery backup for up to 8 years

## Communication

Ethernet ports <sup>1</sup>	2	IEEE 1473 (Type E) Ethernet, 100 Mbps, M12 D-Coded
USB ports <sup>1</sup>	1	x Type C USB 2.0 On-The-Go (OTG)
Protocol support	✓	Protocols included in IEC 61375-3-4 Electronic railway equipment – Train communication network (TCN) – Part 3-4: Ethernet Consist Network for Standard End Devices
Secure web server	✓	Secure web server providing remote access for PTU, operations, and maintenance

## Mechanical characteristics

Power supply	1	Operating voltage range: 16VDC – 90VDC
Power consumption <sup>1</sup>		45Watts
Status output <sup>1</sup>	1	Form A, 0.5 Amp, normally open, solid state output
Configuration inputs <sup>1</sup>	4	Self-powered, jumpered in vehicle interface connector cable plug to define unit location or other identification
Digital inputs <sup>1</sup>	32	Type I. Status inputs, sampled, with wetting current. 4kV protection
	4	Type II. Frequency / PWM / Digital inputs. 4kV protection
Analog inputs <sup>1</sup>	4	4-20 mA
Discrete outputs <sup>1</sup>	4	Form A, 1 Amp, normally open, solid state outputs
Status LEDs	✓	Power, Health status, Network status

## Mechanical characteristics

Dimensions <sup>1</sup>	Control unit: 9.5 in x 10.5 in x 12.7 in (24.1 cm x 26.7 cm x 32.3 cm) (5-slot enclosure) HMM: 10.1" x 8.7" x 6.5" (25.7cm x 22.1cm x 16.5cm) (cable length 35" / 90cm))
Weight <sup>1</sup>	Control unit: 17 lbs / 7.7 kg (Approximate) HMM: 32 lbs / 14.5 kg
Connectors <sup>1</sup>	Control unit: Ethernet: M12 D-coded; USB M8; USB Type C; MIL-DTL-5015; DIN 41612 Rectangular HMM: USB M8
Ingress protection	Control unit: Front: IP40 – Back / Top / Sides: IP30. HMM: Greater than IP68

<sup>1</sup>I/O quantity, number of ports, power consumption, dimensions, and weight are based on the QFG-ER10-2211 19" 5-slot chassis with 1x Controller Module and 1x I/O modules.

## Environmental conditions

Operating temperature	-40°F to +158°F (-40°C to +70°C)
Storage temperature	-40°F to +185°F (-40°C to +85°C)
Shock and vibration	IEC 61373; Category 1, Class A
Dielectric withstand	1.15kVAC circuit to circuit and circuit to chassis

## Electromagnetic compatibility

Surge immunity	Outputs: IEC 62236-3-2, Table 7 Digital inputs: IEEE 1482.1-1999
Conducted emissions	IEC 62236-3-2, Table 3, 4, & 5
Conducted immunity	IEC 62236-3-2, Table 7 & 8
Radiated emissions	IEC 62236-3-2, Table 6
Radiated immunity	IEC 62236-3-2, Table 9 (with RF susceptibility verified to 6 GHz)
Electrical fast transient	IEC 62236-3-2, Table 7 & 8
Electrostatic discharge	IEC 62236-3-2, Table 9