

## Analogue Input Module (AIM)

**SIL-2**

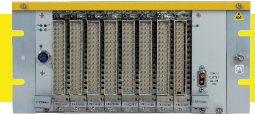
EN 50126

EN 50128

EN 50129

EN 50155

EN 45545



### MODULE FUNCTIONS

The Trainnet® Analogue Input Module (AIM) provides a standard interface for analogue input signals. Signals can be current (-20...+20mA) and voltage (-10...+10V). Separate channels are provided for frequency signal measurements with the capability to measure pulse-width ratio (PWM). The Trainnet® AIM converts the analogue signals and makes them available to the train computer's CPU Module.

The Trainnet® Analogue Input Module can be used as a part of a Trainnet® TCMS, VCU or Event Recorder. Alternatively, the Trainnet® AIM can be fitted into the Trainnet® Remote I/O Module (RIOM).

### KEY FEATURES

The Trainnet® AIM2505A has 10 current channels and 10 voltage channels divided in three isolated groups. 4 frequency channels are also available.

The Trainnet® AIM5250A has 6 current channels, and 6 voltage channels, and 4 frequency input channels in two groups: two for the low-voltage tachometer measurements and two for the

high-voltage pulse width modulation measurements.

The current measurement channels can measure currents between -20 and +20 mA. The module has the capability to supply voltage to external sensors or to supply loop voltage to the current loops. The module's voltage measurement channels can measure voltages between -10 and +10 V. The resolution of the input A/D conversion is sign+12 bits, and the cut-off frequency of the hardware low pass filter is 10 Hz. Both current and voltage channels are capable of giving over range indications which can be used for diagnostic purposes.

The frequency input channels can measure frequencies up to 16 kHz, period, pulse width, pulse count and rotary decoding with direction indication (compatible with most industry standard tachometers).

The module has its own 32-bit embedded processor that uses factory calibration values to convert the measurement value to mV or  $\mu$ A with great accuracy. The embedded processor also implements diagnostics

functions and reports to the system CPU module if it suspects that the input values cannot be trusted.

### SIL 2 CERTIFIED

The module development is based on the railway standards EN 50126, EN 50128 and EN 50129 in accordance with safety integrity level SIL 2. A non-SIL version of the module is also available.

### TECHNICAL SPECIFICATIONS

#### Dimensions (W x H x D)

4 TE x 3 U x 160 mm

#### Weight

160 g

#### Input Power

5 V DC  $\pm$  5 % (700 mA typ. 3 A max.)

#### Temperature Range (operational)

-40 °C...+70 °C

#### MTBF (40 °C ambient temperature)

500 000 h (AIM2505A)

1 600 000 h (AIM5250A)

#### I/O Connector

DIN41612-F48 (at front)

#### Host Interface

RS 485 serial

#### Input Channels, Analogue

10 voltage channels, -10...+10 V (Vin) (AIM2505A)

10 current channels, -20...+20 mA (Iin) (AIM2505A)

6 voltage channels, -10...+10 V (Vin) (AIM5250A)

6 current channels, -20...+20 mA (Iin) (AIM5250A)

#### Input Channels, Frequency

4 input channels (AIM2505A)

4 input channels in 2 groups: 2 low-voltage tachometer, 2 high-voltage PWM (AIM5250A)

#### Frequency Input Voltage Range

0...36 V DC

#### Frequency Input Threshold level

Each channel has its own software configurable threshold level, fixed hysteresis

#### Frequency Input Range

DC to 16 kHz, 0.25 Hz resolution

#### Frequency Input Pulse Width Measurement

0.1% resolution

#### Tachometer Supply Outputs (Vout)

15 VDC, max. 100 mA