

**T210 4G datasheet**

**Version: 20220627**

**Revision: 1**

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## 1 Introduction

T210 is a smart terminal which is able to collect and analyse information. Information can be measured directly from generic voltage and current signal sensors attached to the smart terminal. Information can also be read using digital buses via Ethernet/RS485 connection. Information usually consists of industrial machinery usage hours, temperatures, pressures, RPM, vibrations, moistures or any other information which is used to determine the health condition of the monitored asset. Information is sent to cloud service using either wireless mobile 4G connection or wired Ethernet connection.

## 1.1 Product number and variants

T210 terminal has multiple variants. These variants are identifiable via the sticker that is on the cover of the T210 terminal. Follow the chart 'Model identification' for instructions on identifying the T210 terminal models.

### Model identification

T210	-XX-	-XX-	-XX-	-XX
<b>IEPE</b> 01: Yes				
<b>PT100</b> 00: No 01: Yes				
<b>Sampling rate</b> 00: 48kHz 01: 9,7/48kHz				
<b>Modem</b> 00: 3G 01: 4G				

T210 without the PT100 and with the selectable sampling rate and 4G mode: T210-01-00-01-01

## 2 Device properties

### 2.1 Supply voltage

- Class II power supply is required
- 10-50 VDC possible
  - Recommendation: 24V
- Maximum power consumption: 4 W
- Overvoltage withstand: 60 VDC (continuous)
- Reverse polarity protected
- Non-isolated power input - negative pin is connected to system ground
- Integrated 1 m power cable included

### 2.2 Inputs

#### 2.2.1 8 x IEPE type of vibration sensor interfaces

- 24-bit simultaneous AD conversion for all interfaces
- Interfaces are not isolated
- Frequency range
  - Full signal amplitude available between 10Hz - 23kHz (hardware high pass and low pass filters active)
- Maximum input voltage range +- 10V
- Over-voltage protection
- Constant current max 24V@4mA for transducers

### 2.2.2 8 x Voltage or current signal type of sensor interfaces

- Using DIP switches on the board, each of the 8 interfaces are individually selectable between two measurement modes:
  - Voltage
  - Current
- Voltage mode can operate in two software selectable measurement ranges:
  - 0 ... 10 V
  - 0 ... 60 V
- Current mode has fixed measurement range:
  - 0 ... 25 mA
- 12-bit AD conversion for all interfaces
- Voltage input resistance: more than 120 k $\Omega$  (depends on the selected range)
- Current input resistance: 100  $\Omega$
- Over-voltage and reverse polarity protection
- Non-isolated inputs - negative pin of all inputs are connected to system ground
- Sensor output voltage is the same as non-filtered input voltage from power supply. It's connected through 0.75A 60V resettable PTC fuse. All sensor output voltage pins share one fuse. False polarity connection is shielded with diode.

### 2.2.3 3 x Pt-100 and Pt-1000 type of temperature sensor interfaces

T210 has different variants, with some not equipped with the PT100 temperature sensor. You can identify the models without PT100 by looking at the sticker on the front cover. Follow the section '1.1 Product number and variants' for additional details on identifying the different T210 terminal models.

PT100 details:

- Bank isolated, functional isolation for extra-low voltage circuit, 1kV RF isolation (Si8662AB-B-IS1) on SPI bus connected to ADC (ADS1248IPWR)
- Temperature range with Pt-100 -200 to +850 °C (18ohm to 390ohm) excitation 500 uA gain x1 tested
- Temperature range with Pt-1000 -200 to +850 °C (18ohm to 3.9kohm) excitation 500 uA gain x1 tested
- Accuracy in the range of 1 Celsius (tested over operating temperature)

## 2.3 Output

- None

## 2.4 Wired communication interfaces

- 1 x 10/100 MBit ethernet (100BASE-TX)
- 1 x RS485 interface with 115 kbps maximum tested signalling rate
- 120-ohm termination for RS485 selectable by a jumper
- Over-voltage and reverse polarity withstand for serial buses: 100V (continuous)
- Non-isolated serial buses: bus ground is connected to system ground

## 2.5 Wireless communication interfaces

- Integrated 4G mobile broadband (SMA antenna included)
  - Five-band UMTS/HSPA+ 700/800/850/900/1700/1800/1900/2100/2600 MHz
  - Quad-band GSM 850/900/1800/1900 MHz
  - Data rates DL: max. 14.4 Mbps, UL: 5.76 Mbps
- SMA connectors for external antennas
- MicroSIM (3FF)

## 2.6 Other interfaces

- MicroSD slot combined with MicroSIM slot
- High-speed USB host interface
- 3 x LEDs:
  - 1 x for indicating that power supply is OK
  - 1 x (LED1) for indicating that software status is OK

- 1 x (LED2) for indicating that cloud connection is OK

## 2.7 Built-in features

- RTC for keeping wall clock time back up maximum of two week depending on the temperature conditions

## 2.8 Processor specifications

Main processor

- Freescale® Vybrid™
  - Core 1:
    - 500 MHz ARM Cortex™-A5
  - Core 2:
    - 167 MHz ARM Cortex™-M4
- Memory: 256MB DDR3
- Flash: 512MB NAND

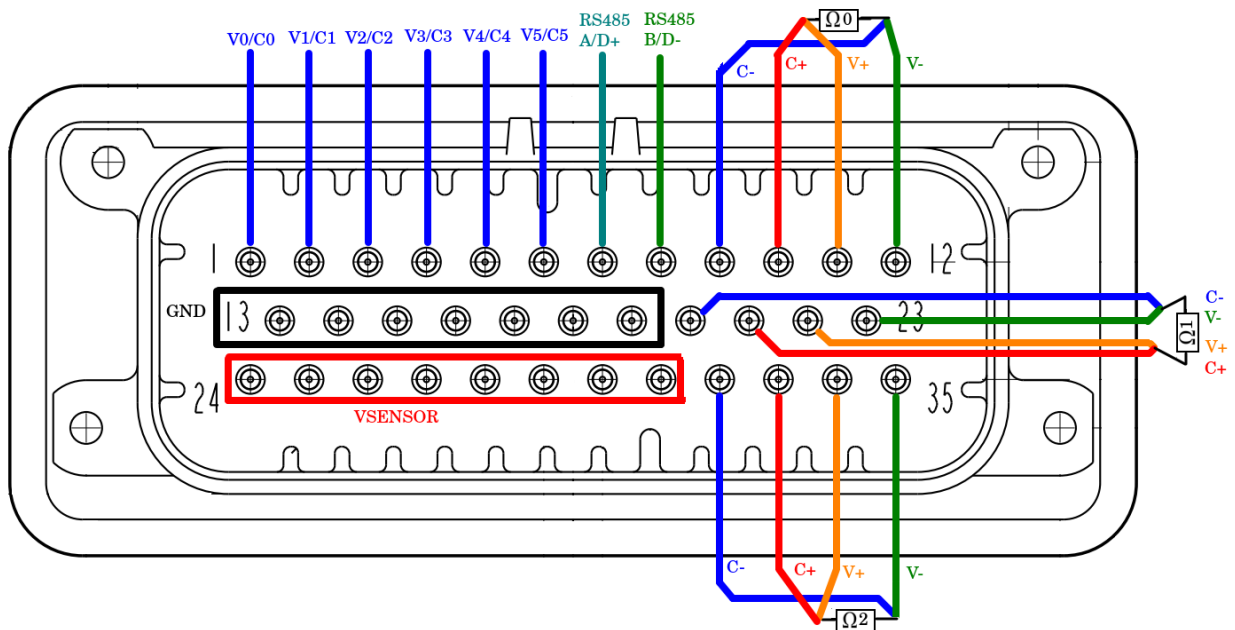
Co-processor for analog IO and CAN:

- Atmel AT32UC3C1512C 32-bit AVR flash microcontroller
  - 64KB SRAM

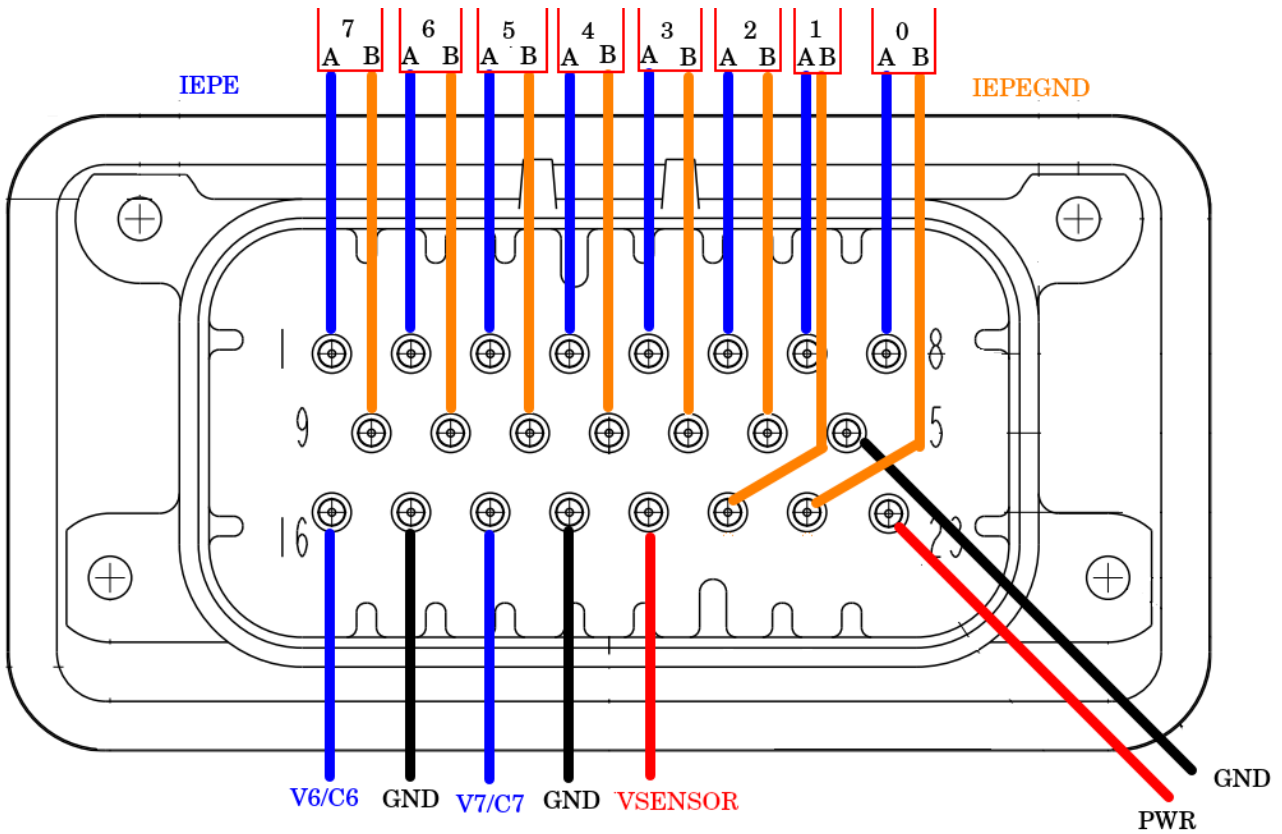


## 2.9 Pinouts

### 2.9.1 35 pin connector



2.9.2 **23 pin connector**



## 2.10 Mechanical specifications

- Ensto custom modified 175x125x60 mm based on [ENSTO SPCP131806T](#)
- UL 746 C 5V flame rated
- Fibreglass reinforced polycarbonate
- IK08 impact-proof
- BVPC-11 ventilation against condensing humidity
- Shipped with ENSTO SFL1 mounting legs [ENSTO SFL1](#)
- Additional mounting style directly to wall hiding the mounting screws under the lid
- Tested both IP66 and IP67 requirements passed

## 2.11 Environmental specifications

### 2.11.1 Temperature

- Operating temperature range: -40...+70°C

### 2.11.2 IP class

- IP67

### 2.11.3 Test specification

- EN 55032:2015/AC:2016
- CISP 16-2-3:2016+AMD1:2019
- IEC 61000-4-3:2006+AMD1:2007+AMD2:2010+I1
- IEC 61000-4-4:2012
- IEC 61000-4-5:2014+AMD1:2017
- IEC 61000-4-6:2013
- IEC 61000-4-8:2009
- IEC 61010-1

- IEC62368-1
- EN 301 908-1 clause 4.2.2
- EN 301 908-1 clause 5.3.1 3 m FAR
- EN 301 908-1 TX clause 4.2.2.2
- EN 55032
- ETSI TS 51.010
- IEC 61000-4-9
- IEC 61000-4-11
- IEC 61000-4-29