ViMEAS-II
Industrial Modular Measurement Unit

1. Features

- 24 VDC nominal industrial power input
- 24-bit high-resolution ADC measurement
- Differential and Single-ended analog input measurement capability
- Programmable PGA gain
- Programmable IDAC external current sources
- 10 V external voltage output
- Supports RTD, thermocouple, 4–20 mA, voltage-output, load-cell, and bridge-type sensors
- 8-position DIP switch for sensor input configuration
- Internal temperature sensor
- RS-485 industrial communication interface
- DIN-rail compatible mechanical design

2. Applications

- Industrial sensor measurement and monitoring systems
- RTD-based temperature measurement:
  - PT100 2-Wire
  - PT1000 2-Wire
  - PT100 3-Wire
  - PT1000 3-Wire
- Thermocouple measurement (Types B, E, J, K, N, R, S, and T)
- 4–20 mA industrial sensor signal acquisition
- Load-cell measurement
- Pressure transmitter and voltage-output sensor measurement
- Test, calibration, and measurement systems
- Industrial data acquisition systems

3. Description

ViMEAS-II is a precision industrial measurement module designed for analog sensor measurement, signal conditioning, and data acquisition applications. The module provides high-resolution differential analog measurement capability using a 24-bit ADC with programmable PGA gain.

The device supports multiple industrial sensor measurement configurations, including RTD, thermocouple, 4–20 mA current-loop sensors, voltage-output sensors, pressure transmitters, load cells, and bridge-type sensors. Programmable IDAC current sources are provided for RTD/resistive sensor excitation and user-defined external applications.

ViMEAS-II is powered from a nominal 24 VDC industrial supply and provides an RS-485 communication interface for integration into industrial monitoring, test, calibration, and data acquisition systems. Its DIN-rail compatible mechanical design makes it suitable for control cabinets and industrial field installations.

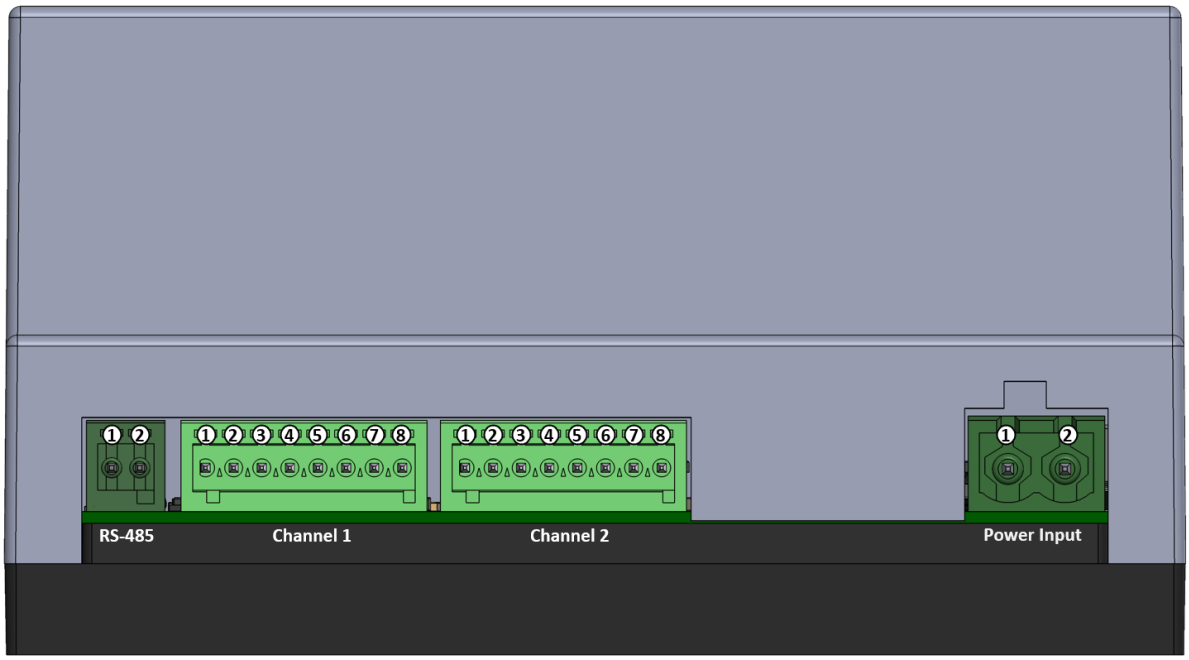
Device Information

Part Number	Body Size	Weight
VIMSMM-U21A	105 x 86 x 58 mm	150 g

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4. Pin Configuration and Functions



4.1. Power Input Terminal Block

Pin	Name	Description	Type
1	GND	0 V power return	Power Return
2	+24 V	Nominal 24 VDC industrial power input	Power Input

4.2. Channel 1 Terminal Block

Pin	Name	Description	Type
1	IDAC1	Programmable external current source output 1	Current Output
2	IDAC2	Programmable external current source output 2	Current Output
3	AIN0 (1)	Configurable analog input	Analog Input
4	AIN1 (1)	Configurable analog input	Analog Input
5	REFP (2)	Positive ADC reference input / sensor reference node	Reference
6	VOUT	+10 V external output	Power Output
7	GND	Analog Ground	Analog GND
8	BODY	Cable shield connection	Shield

(1) AIN0 and AIN1 are configurable analog input terminals. Each input can be used for single-ended measurement with respect to AINCOM, or both inputs can be used together for differential measurement. The input polarity for differential measurement is selectable through the user interface.

(2) For 3-wire PT100/PT1000 RTD measurements, connect one of the two same-side RTD leads to the REFP terminal. In typical 3-wire RTD sensors, these are the two same-colored wires, usually red. This connection is used for lead-wire compensation.

4.3. Channel 2 Terminal Block

Pin	Name	Description	Type
1	IDAC1	Programmable external current source output 1	Current Output
2	IDAC2	Programmable external current source output 2	Current Output
3	AIN0 (1)	Configurable analog input	Analog Input
4	AIN1 (1)	Configurable analog input	Analog Input
5	REFP (2)	Positive ADC reference input / sensor reference node	Reference
6	VDD	+10 V external output	Power Output
7	GND	Analog ground	Analog GND
8	BODY	Cable shield connection	Shield

(1) AIN0 and AIN1 are configurable analog input terminals. Each input can be used for single-ended measurement with respect to AINCOM, or both inputs can be used together for differential measurement. The input polarity for differential measurement is selectable through the user interface.

(2) For 3-wire PT100/PT1000 RTD measurements, connect one of the two same-side RTD leads to the REFP terminal. In typical 3-wire RTD sensors, these are the two same-colored wires, usually red. This connection is used for lead-wire compensation.

4.4. RS-485 Terminal Block

Pin	Name	Description	Type
1	B	RS-485 Line B / D-	RS-485
2	A	RS-485 Line A / D+	RS-485

Note: RS-485 A/B naming may vary between manufacturers. Verify signal polarity before connecting ViMEAS-II to an external RS-485 device.

4.5. Sensor Configuration Switch

Each measurement channel includes an integrated 8-position configuration switch used to adapt the analog front-end for different sensor types. The switch positions must be configured according to the connected sensor before starting measurements.

Parameter	Value
Switch Type	DIP Switch
Number of Positions	8
Configuration Method	Manual
Function	Sensor Interface Selection

Supported Configurations

Sensor Type	Switch Configuration							
	S1	S2	S3	S4	S5	S6	S7	S8
Default	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Load Cell	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
LVDT	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
4–20 mA (2-Wire/ 3-Wire/ 4-Wire)	OFF	OFF	OFF	OFF	OFF	OFF	**ON**	OFF
Thermocouple	OFF	OFF	OFF	**ON**	OFF	**ON**	OFF	OFF
PT100 (2-Wire)	OFF	**ON**	**ON**	OFF	OFF	OFF	OFF	**ON**
PT1000 (2-Wire)	**ON**	OFF	**ON**	OFF	OFF	OFF	OFF	**ON**
PT100 (3-Wire)	OFF	**ON**	OFF	OFF	**ON**	OFF	OFF	**ON**
PT1000 (3-Wire)	**ON**	OFF	OFF	OFF	**ON**	OFF	OFF	**ON**

Note: For detailed sensor connection diagrams, switch configuration settings, and application examples, refer to the ViMEAS-II User Guide.

5. Specifications

5.1. Recommended Operating Conditions

Parameter	Min	Typ	Max	Unit
POWER SUPPLY				
Supply Voltage	+21.6	+24	+26.4	VDC
Input Current		50	750	mA
Power Consumption		1.2		W
Input Fuse Rating		1.5		A
ANALOG INPUTS				
V_{AIN0} : AIN0 absolute input voltage	−11.5		+11.5	V
V_{AIN1} : AIN1 absolute input voltage	−11.5		+11.5	V
V_{DIFF} : Differential input voltage (1)	-20		+20	V
ENVIRONMENTAL CONDITIONS				
T_A : Operating ambient temperature	-20		+60	°C
RH: Operating relative humidity, noncondensing	0		90	%RH

(1) The full differential input voltage range may be limited by the selected PGA gain, reference voltage, and absolute input voltage limits. See the Analog Interface Characteristics section for details. V_{DIFF} = VAIN0 − VAIN1.

5.2. External Sources

Parameter	Min	Typ	Max	Unit
EXTERNAL VOLTAGE SOURCES				
Output Voltage		+10		VDC
Output Current per Channel			250	mA
EXTERNAL CURRENT SOURCES				
Programmable Output Current (IDAC1 / IDAC2) (1)	50, 100, 250, 500, 750, 1000, 1500, 2000, 2500, 3000			µA
Absolute Error	–6	±0.7%	+6	%

(1) The availability of IDAC outputs for external use depends on the selected RTD measurement configuration. For 2-wire PT100/PT1000 measurements, IDAC1 is reserved for RTD excitation. For 3-wire PT100/PT1000 measurements, both IDAC1 and IDAC2 are reserved for RTD excitation. Reserved IDAC outputs must not be used as external current sources.

5.3. RS-485 Interface Characteristics

Parameter	Min	Typ	Max	Unit
Standard		TIA/EIA-485		
Line Type		Half-duplex differential RS-485		
Differential Input Sensitivity	-0.2		+0.2	V
Common-Mode Input Range	−7		+12	V
Differential Output Voltage	+1.5		+3.5	V
Cable Length			1200	m
Supported Baud Rate		115200		bps
Transceiver Signaling Rate		50		Mbps
Termination Resistor		120		Ω

5.4. Internal Temperature Sensor

Parameter	Min	Typ	Max	Unit
Temperature Range	–40		+125	°C
Temperature Resolution		0.01		°C
Accuracy		±0.4		°C

Note: The internal temperature sensor is used for cold-junction compensation in thermocouple measurements and can also be used for optional temperature monitoring. The measured value represents the local PCB temperature and may differ from the ambient temperature.

5.5. Analog Interface Characteristics

Parameter	Min	Typ	Max	Unit
Number of Channels		2		channels
Resolution		24		bits
Data Rate	2.5		40000	SPS
Input Impedance	1	20		GΩ
Gain		0.125, 0.1875, 0.25, 0.5, 1, 2, 4, 8, 16, 32, 64, 128		V/V
Reference Voltage		2.5		V

5.5.1. ADC Input Range

The values in this table are valid only when the internal 2.5 V reference is selected. The PGA gain is configurable through the user interface.

GAIN	INPUT RANGE	
	DIFFERENTIAL	SINGLE-ENDED
0.125	±20 V	0 V to +11.5 V or 0 V to −11.5 V
0.1875	±13.3 V	0 V to +11.5 V or 0 V to −11.5 V
0.25	±10 V	0 V to +10 V or 0 V to −10 V
0.5	±5 V	0 V to +5 V or 0 V to −5 V
1	±2.5 V	0 V to +2.5 V or 0 V to −2.5 V
2	±1.25 V	0 V to +1.25 V or 0 V to −1.25 V
4	±0.625 V	0 V to +0.625 V or 0 V to −0.625 V
8	±0.312 V	0 V to +0.312 V or 0 V to −0.312 V
16	±0.156 V	0 V to +0.156 V or 0 V to −0.156 V
32	±0.0781 V	0 V to +0.0781 V or 0 V to −0.0781 V
64	±0.0391 V	0 V to +0.0391 V or 0 V to −0.0391 V
128	±0.0195 V	0 V to +0.0195 V or 0 V to −0.0195 V

Note: Single-ended input ranges are referenced to AINCOM. Either AIN0–AINCOM or AIN1–AINCOM can be selected through the user interface. For differential measurements, the input polarity can be selected as AIN0–AIN1 or AIN1–AIN0.

5.5.2. 4–20 mA Measurement Performance

Parameter	Min	Typ	Max	Unit
Input Range	4		20	mA
Supported Transmitters		2-wire, 3-wire, 4-wire		
Measurement Accuracy		±0.05	±0.10	%FS
Repeatability Error		0.08	0.20	%FS

Validation Conditions: Performance values were verified using calibrated 4–20 mA pressure transmitters over the full-scale measurement range. Results are based on four independent validation runs performed under laboratory conditions at 25 °C.

5.5.3. Load Cell Measurement Performance

Parameter	Min	Typ	Max	Unit
Measurement Accuracy		±0.30	±0.50	%FS
Repeatability Error		0.20	0.50	%FS

5.5.4. LVDT Measurement Performance

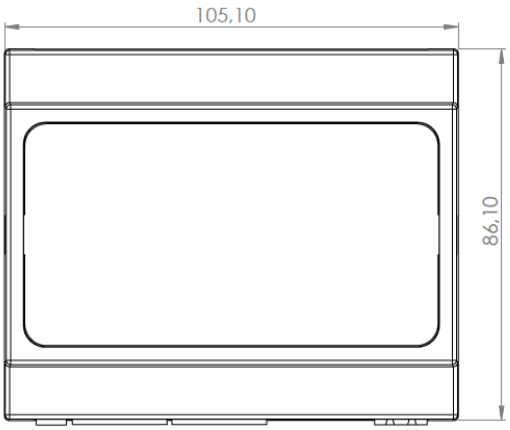
Parameter	Min	Typ	Max	Unit
Measurement Accuracy		±0.10	±0.20	%FS
Repeatability Error		0.10	0.20	%FS

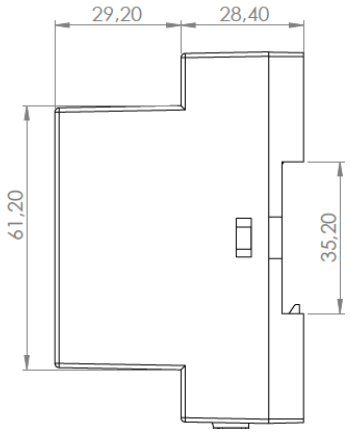
5.5.5. P100 Measurement Performance

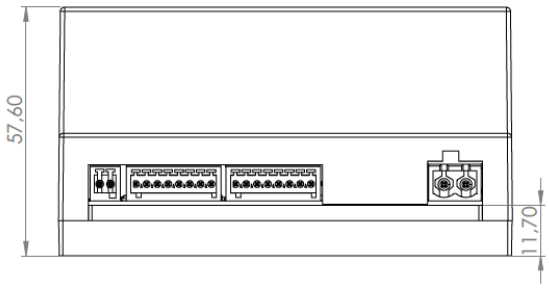
Parameter	Min	Typ	Max	Unit
Measurement Accuracy		±0.20	±0.50	°C
Repeatability Error		0.10	0.3	°C
Display Resolution		0.10		°C

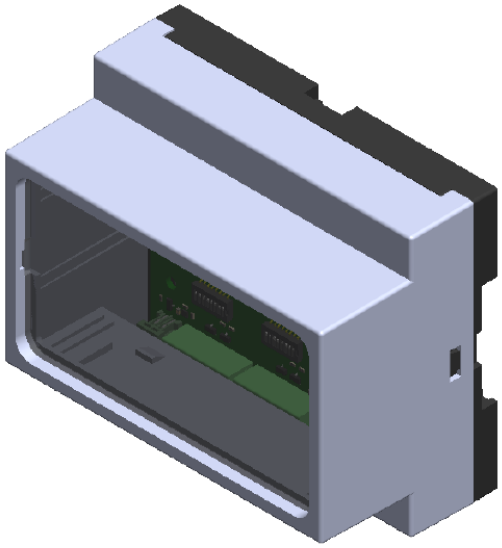
Validation Conditions: Temperature measurement performance was verified against a reference temperature instrument over the 5 °C to 80 °C range. The stated accuracy represents the maximum deviation between the displayed temperature and the reference temperature under laboratory conditions.

6. Dimensional Drawing









Note: All dimensions are in millimeters.

Mounting Type: Snap-fit mounting on 35 mm DIN rail (EN 60715).