4AI / 4DI / 4RO Modbus Remote I/O Module

Compact Modbus RTU remote I/O module with four
0-20mA analog inputs, four digital inputs, and four relay outputs.

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Compact Modbus RTU remote I/O module with four 0–20mA analog inputs, four digital inputs, four relay outputs, configurable alarm logic, pulse counting, RPM calculation, and output delay control.

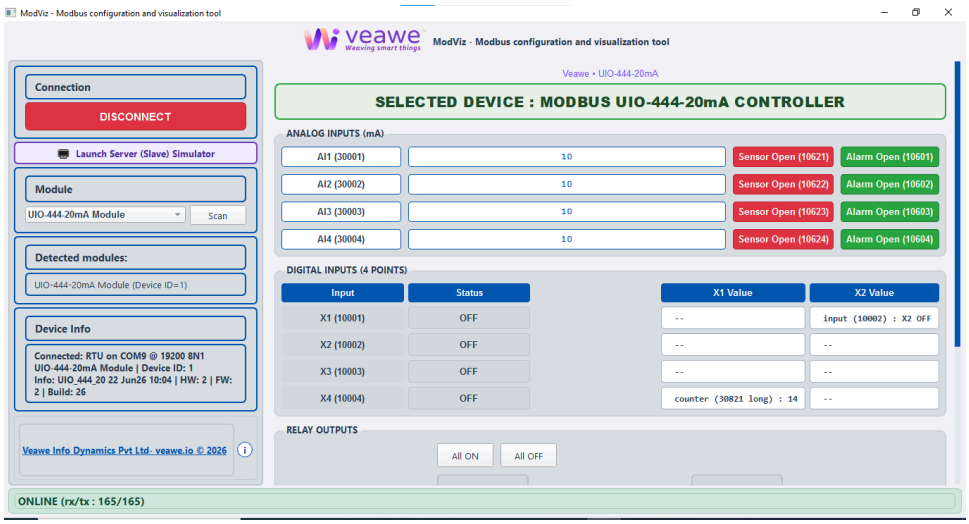
Key Features

- 4 Channel 0–20mA Analog Inputs
- 16-bit analog resolution
- Raw analog value resolution of 0.001mA
- 4 Relay Outputs with configurable alarm or manual control
- 4 Digital Inputs, 24V compatible
- 2 High-speed production counters and RPM measurement (DI1–DI2)
- All inputs have latched status – never miss an input change
- All inputs have individual counter functions
- Configurable relay ON delay and OFF delay
- Sensor open / broken wire indication
- Individual channel offset and gain calibration
- Integer and IEEE754 float value support
- Modbus RTU over RS-485
- Rotary address switch for address selection from 1 to 99
- Wide supported baud rates from 300 to 115200
- DIN rail mountable
- Dimensions: 110 mm x 70 mm x 55 mm (L x W x H)

ModViz – Modbus Configuration & Visualization Tool

ModViz is a powerful yet simple configuration and visualization tool designed to work seamlessly with **Veawe Modbus I/O modules**. It enables engineers, system integrators, and technicians to quickly configure, monitor, and test field devices through an intuitive graphical interface.

The software can be downloaded from https://veawe.io/modviz/



Ordering Information

Product Code	Description
UIO-444-20MA	**4-Channel Analog Input with DI and DO**
UIO-4IN-20MA	4-Channel Analog Input Module (0–20mA)
MIO-2AI-VI	2-Channel Analog Input Module (0–20mA / 0–36V DC)
UIO-8IN-20MA	8-Channel Analog Input Module (0–20mA)
UIO-4IN-10V	4-Channel Analog Input Module (0–10V DC)

Applications

- **Industrial Automation** – Combine analog sensing, digital status, and relay control on a single Modbus node for PLC/SCADA integration
- **Process Control** – Drive relay-controlled actuators based on analog alarm thresholds via alarm-to-output selection
- **Motion & Production Monitoring** – Track RPM, RPS, and production counts from high-speed digital inputs
- **Machine Interlocks & Safety** – Latch digital input state changes so no transient signal is missed by the controller
- **Remote Monitoring** – Consolidate analog, digital, and relay I/O for distributed installations over a single Modbus RTU connection

Specifications

Parameter	Value
Mounting	DIN rail
Dimensions	110 mm x 70 mm x 55 mm (L x W x H)

Electrical Specifications

Parameter	Value
Supply Voltage	15–24V DC
Analog Input Range	0–20mA
Relay Output Rating	230VAC 1A max / 30VDC 2A max
Digital Input Voltage	15–24V DC
Communication Port	RS-485

Input/Output Specifications

Analog Input

Parameter	Value
Channel Count	4
Signal Range	0–20mA
Resolution	0.001 mA

Digital Input

Parameter	Value
Channel Count	4
Digital Input Voltage	15–24V DC

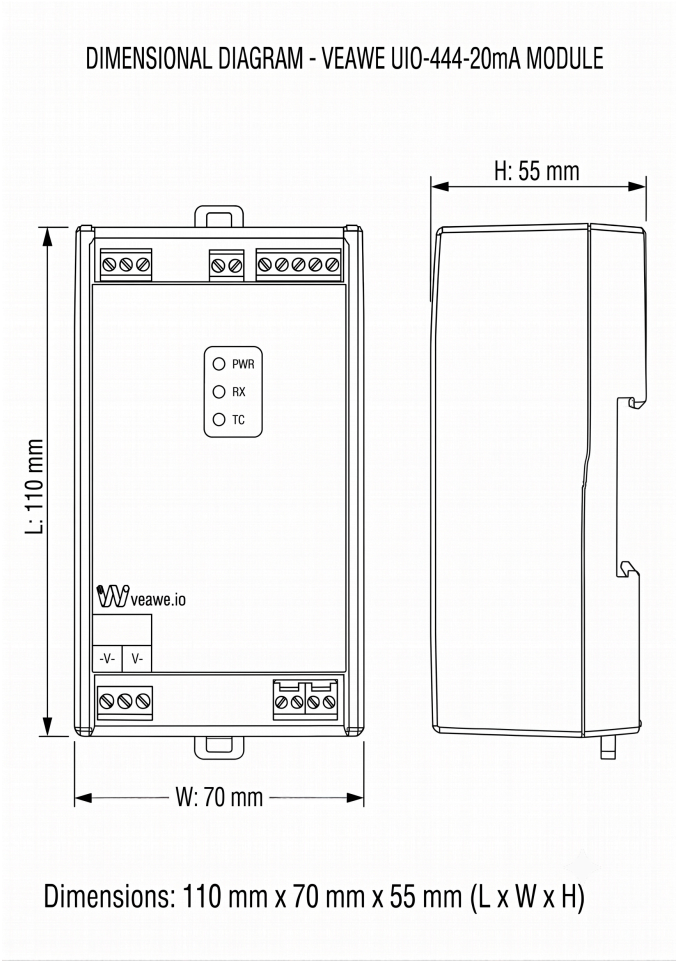
Relay Output

Parameter	Value
Channel Count	4
Relay Output Rating	230VAC 1A max / 30VDC 2A max

Isolation & Protection Specifications

Parameter	Value	Notes / Description
Supply Reverse Polarity Protection	Integrated	Series protection diode (continuous protection, zero reverse leakage)
Transient Voltage Clamping	Up to 600W	Clamps overvoltage spikes (10/100 µs peak pulse rating)
EMC & Immunity Standards	Class-Compliant	Meets IEC 61000-4-2 (ESD), IEC 61000-4-4 (EFT), & IEC 61000-4-5 (Surge)
RS-485 Bus ESD Protection	15kV HBM/Air	IEC61000-4-2 Integrated high-ESD protected transceiver on A/B lines

Mechanical Dimensions



Terminal Details

Top Connector – RS-485

Pin	1	2	3
Signal	A	B	Shield

Bottom Connector – Power

Pin	1	2
Signal	24V	GND

Analog Input Connector

Pin	1	2	3	4	5
Signal	CH1+	CH2+	CH3+	CH4+	GND

Digital Input Connector

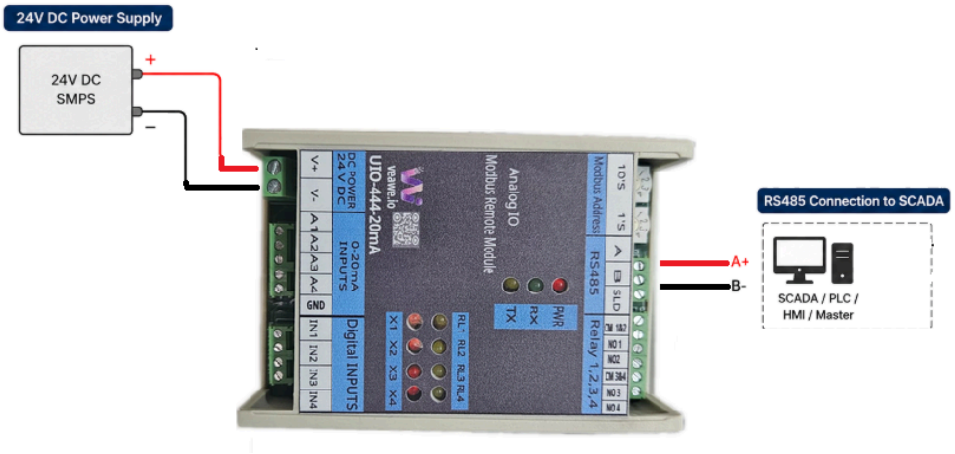
Pin	1	2	3	4
Signal	IN1	IN2	IN3	IN4

Relay Connector

Pin	1	2	3	4	5	6
Signal	CM1&2	NO1	NO2	CM3&4	NO3	NO4

Wiring Diagrams

Note: All images and connection diagrams shown are for illustrative purposes only and may differ from the actual product.



Communication Interface

Protocol	Physical Layer	Default Baud Rate	Default Format
Modbus RTU	RS-485	19200	8N1

Basic Process Registers

Signal	Address	Type	Description
AI1–AI4	30001–30004 / 30021–30028	int16 / float	Raw analog (0.001mA) / Scaled engineering value
DI1–DI4	10001–10004	Bit	DI1 to DI4 live digital input status
DO1–DO4	00001–00004	Bit	DO1 to DO4 output control and status

Supported Modbus Function Codes

Read	Write
01 – Read Coils	05 – Write Single Coil
02 – Read Discrete Inputs	06 – Write Single Register
03 – Read Holding Registers	15 – Write Multiple Coils
04 – Read Input Registers	16 – Write Multiple Registers

Register Map Overview

Function	Address Range	Type	Description
Discrete Inputs	10001–10004	Bit	DI1 to DI4 live status
Discrete Inputs	10201–10204	Bit	DI1 to DI4 latched state
Discrete Inputs	10601–10604	Bit	AI1 to AI4 alarm indication
Discrete Inputs	10621–10624	Bit	AI1 to AI4 sensor open indication
Discrete Inputs	10641–10644	Bit	AI1 to AI4 latched alarm indication
Coils	00001–00004	Bit	DO1 to DO4 control and status
Coils	00251–00254	Bit	Reset slow counter
Coils	00401–00404	Bit	Pending DO delay status and override control
Coils	00601–00604	Bit	Reset AI alarm counter
Coils	00801–00802	Bit	Reset production counter
Input Registers	30001–30004	int16	AI1 to AI4 raw value
Input Registers	30021–30028	float	AI1 to AI4 scaled value
Input Registers	30251–30254	int16	DI1 to DI4 slow counter
Input Registers	30601–30604	int16	AI1 to AI4 alarm counters
Input Registers	30801–30802	int16	HSC1 to HSC2 RPS value
Input Registers	30811–30812	int16	HSC1 to HSC2 RPM value
Input Registers	30821–30824	int32	HSC1 to HSC2 production counter
Holding Registers	40101	int16	Slave address
Holding Registers	40102	int16	Baud rate selection
Holding Registers	40103	int16	Serial format
Holding Registers	40401–40404	int16	DO1 to DO4 ON delay
Holding Registers	40451–40454	int16	DO1 to DO4 OFF delay
Holding Registers	40601–40604	int16	AI1 to AI4 offset
Holding Registers	40621–40628	float	AI1 to AI4 gain

Function	Address Range	Type	Description
Holding Registers	40661–40664	int16	AI1 to AI4 alarm mode
Holding Registers	40681–40684	int16	AI1 to AI4 alarm minimum
Holding Registers	40701–40704	int16	AI1 to AI4 alarm maximum
Holding Registers	40801–40802	int16	HSC1 to HSC2 mode
Holding Registers	40811–40812	int16	HSC1 to HSC2 PPR

Detailed Register Tables

Discrete Inputs (1xxxx)

Function	Address Range	Type	Description
Discrete Inputs	10001–10004	Bit	DI1 to DI4 live status
Discrete Inputs	10201–10204	Bit	DI1 to DI4 latched state
Discrete Inputs	10621–10624	Bit	AI1 to AI4 sensor open indication

Analog Input Live Alarm Status

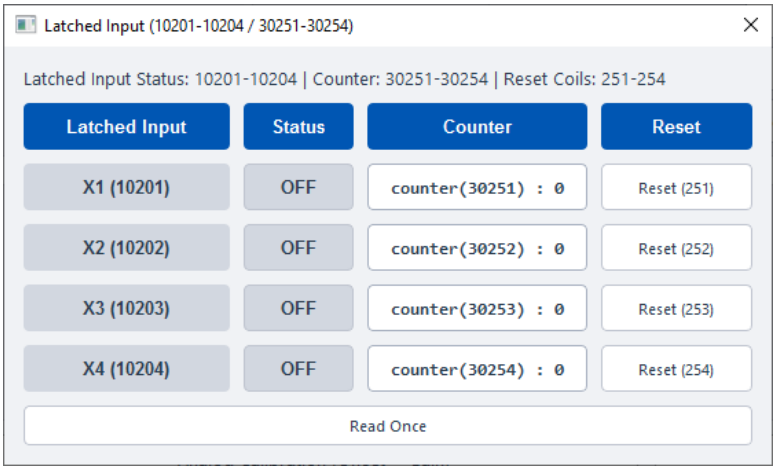
Function	Address Range	Type	Description
Discrete Inputs	10601–10604	Bit	AI1 to AI4 alarm indication

If an analog sensor vale is out of the range set in Alarm Configuration:

- Corresponding Relay is ON when configured for alarm
- Alarm indication status bit is set

Latched Alarm Status

Function	Address Range	Type	Description
Discrete Inputs	10641–10644	Bit	AI1 to AI4 latched alarm indication

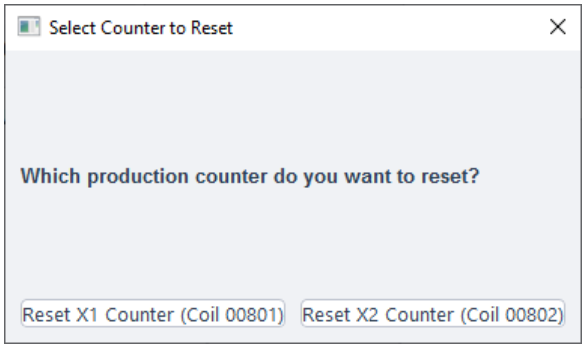


Coils (0xxxx)

Function	Address Range	Type	Description
Coils	00001–00004	Bit	DO1 to DO4 control and status
Coils	00251–00254	Bit	Reset slow counter
Coils	00401–00404	Bit	Pending DO delay status and override control
Coils	00601–00604	Bit	Reset AI alarm counter

Production Counter Reset

Function	Address Range	Type	Description
Coils	00801–00802	Bit	Reset production counter



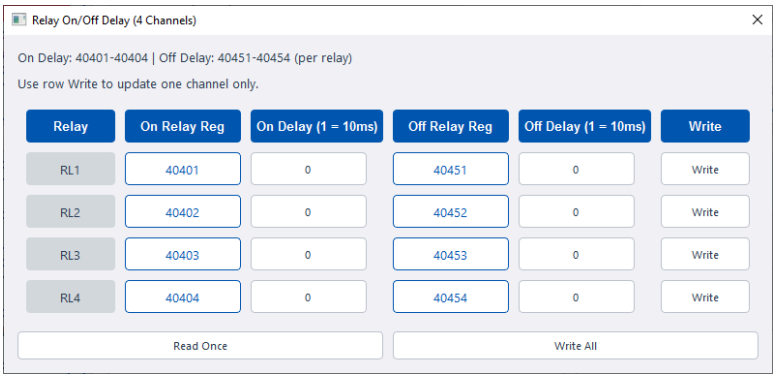
Input Registers (3xxxx)

Function	Address Range	Type	Description
Input Registers	30001–30004	int16	AI1 to AI4 raw value
Input Registers	30021–30028	float	AI1 to AI4 scaled value
Input Registers	30251–30254	int16	DI1 to DI4 slow counter
Input Registers	30601–30604	int16	AI1 to AI4 alarm counters
Input Registers	30801–30802	int16	HSC1 to HSC2 RPS value
Input Registers	30811–30812	int16	HSC1 to HSC2 RPM value
Input Registers	30821–30824	int32	HSC1 to HSC2 production counter

Holding Registers (4xxxx)

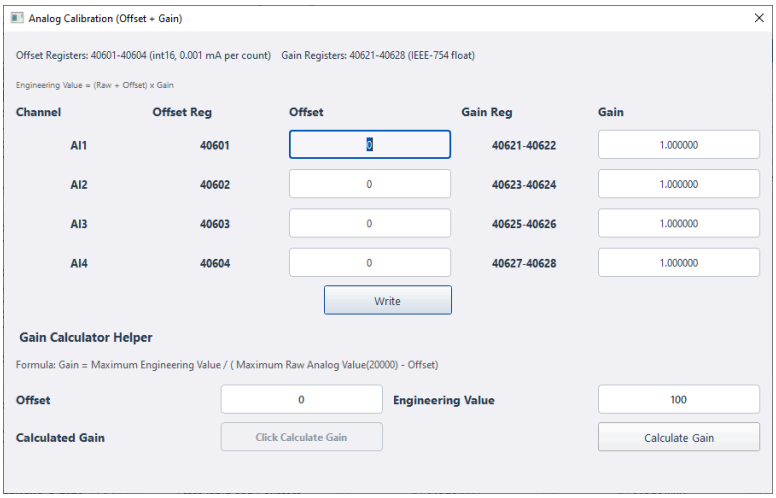
Relay Delay Configuration

Function	Address Range	Type	Description
Holding Registers	40401–40404	int16	DO1 to DO4 ON delay, 1 = 10 milli Sec
Holding Registers	40451–40454	int16	DO1 to DO4 OFF delay, 1 = 10 milli Sec



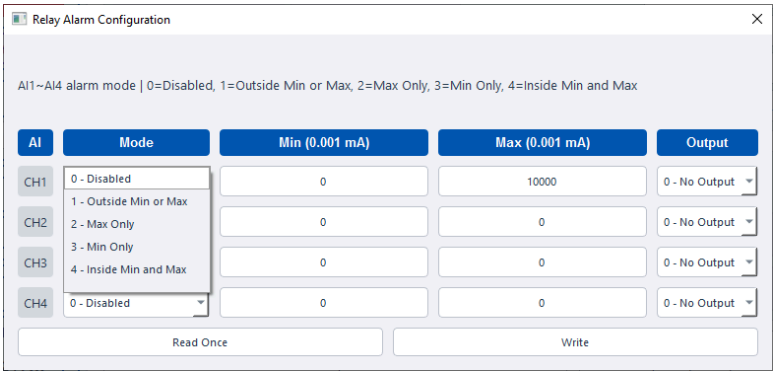
Gain Calibration

Function	Address Range	Type	Description
Holding Registers	40601–40604	int16	AI1 to AI4 offset
Holding Registers	40621–40628	float	AI1 to AI4 gain



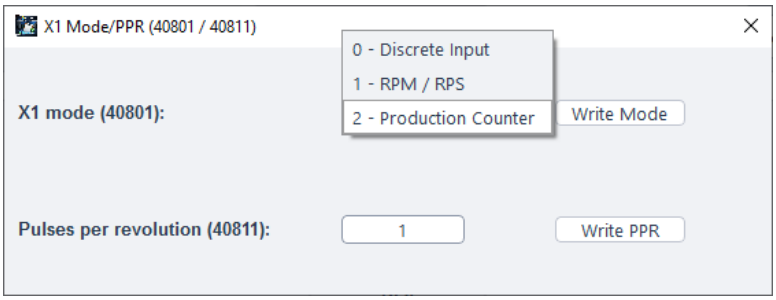
Alarm Configuration

Function	Address Range	Type	Description
Holding Registers	40661–40664	int16	AI1 to AI4 alarm mode
Holding Registers	40681–40684	int16	AI1 to AI4 alarm minimum
Holding Registers	40701–40704	int16	AI1 to AI4 alarm maximum



Input Mode and Pulse Per Revolution

Function	Address Range	Type	Description
Holding Registers	40801–40802	int16	HSC1 to HSC2 mode
Holding Registers	40811–40812	int16	HSC1 to HSC2 PPR



Communication Settings

Address	Type	Description
40101	int16	Modbus server (slave) address (switch value)
40102	int16	Baud rate selection
40103	int16	Serial format selection
40105	int16	Remote read/write poll interval. Example: 10 = 1 second
40106	int16	Watchdog interval. Example: 10 = 1 second
40107	int16	Watchdog action. 0 = Modbus Watchdog Disabled, 1 = Reset Outputs on Modbus Watchdog Expire

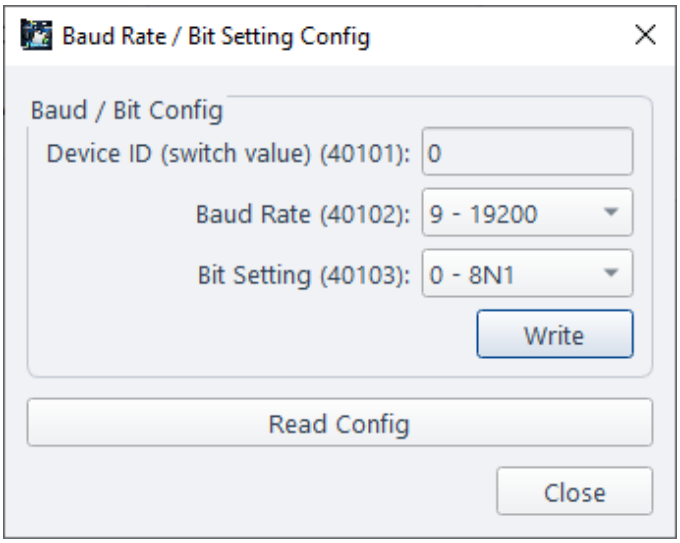
Modbus Address (40101)

This is set using the rotary or DIP switches.

Baud Rate Register (40102) and Serial Format Register (40103)

Value	Baud Rate	Value	Baud Rate	Value	Format
0	300	7	9600	0	8N1
1	600	8	14400	1	8E1
2	1200	9	19200	2	8O1
3	1800	10	38400	3	8N2
4	2400	11	57600	4	8E2
5	4800	12	62500	5	8O2
6	7200	13	115200		

Default: 19200 baud, 8N1.



Default Settings

Setting	Default
Slave Address	As per switch position
Baud Rate	19200
Serial Format	8N1

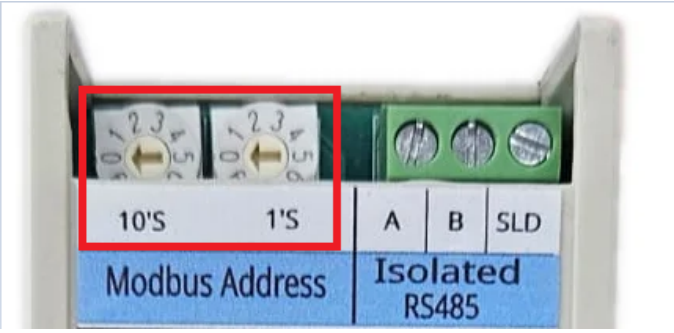
Configuration Settings

Default Mode

Default mode is useful when communication settings are unknown.

When the rotary address switch is set to 00:

- Server address = 1
- Baud rate = 19200
- Serial format = 8N1



Changing to default mode does not overwrite stored settings. Stored settings remain unchanged until written through Modbus.

LED Indications and Diagnostics

LED	Description
Power	Module power ON indication
Tx	RS-485 transmit activity
Rx	RS-485 receive activity
X1–X4	Digital input status
RL1–RL4	Relay output status

Calibration and Engineering Values

The module internally measures analog current input as a raw integer value.

Example:

- 0mA = 0
- 4mA = 4000
- 12mA = 12000
- 20mA = 20000

Raw values are stored in int16 registers with a resolution of 0.001mA.

Engineering value registers allow the raw current value to be converted into user units such as:

● Pressure ● Temperature ● Tank level ● Flow ● Weight ● Percentage

Example conversions:

Sensor Type	Input Range	Engineering Value Range
Pressure Transmitter	4–20mA	0 to 10.0 Bar
Tank Level Sensor	4–20mA	0 to 100 %
Temperature Transmitter	4–20mA	0 to 200 °C

Engineering values are available in float format using IEEE754 registers.

Formula:

Engineering Value = (Raw Value + Offset) × Gain

Where:

- Raw Value = measured current in 0.001mA units
- Offset = calibration correction in 0.001mA units
- Gain = engineering unit multiplier

Example:

- Raw input = 12000
- Offset = −4000
- Gain = 0.01
- Engineering Value = 80

This can be used for a transmitter scaled from 0–20mA to −40 to +160 °C.

Examples:

Raw to mA	Raw Value	Offset	Gain	Result
4–20mA to 0–100 %	12000	0	0.001	50.0 %
4–20mA to 0–10 Bar	12000	−4000	0.00625	5.0 Bar
4–20mA to 0–200 °C	12000	−4000	0.0125	100.0 °C

Revision History

Revision	Date	Changes
Rev 1.0	2026-08-10	Initial datasheet, HW Version = 3, FW Version = 2

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