Parsmega
industrial automation

User Manual

Signal Isolater

PM-ISO11

Version: 1.1 Release Date: 01/31/2023

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Conexts

1 Introduction

1.1 Purpose of the manual

This manual contains all the information needed to set up, install, wiring and communicate with the PM- ISO11 module.

1.2 Technical knowledge required

In order to understand this booklet, a basic acquaintance with electrical topics is required.

1.3 Manual validation

This manual is valid for this specification

MODEL	Hardware	Software
PM- ISO11	V2.1	V12.0

1.4 technical support

To get technical support through the following contact:

- Email: **info@parsmega.com**
- Phone: **+98 21 91009955**
- WhatsApp: **+98 9981122566**

2 safety tips

- Starting the module by non-experts and ignoring the commands may cause serious damage to the module.
- This module does not directly pose a risk to human life.
- The use of this module is not approved for use in life-threatening devices.

3 Description

3.1 Basic Description

PM-ISO11 is a signal isolator that can convert analog signals 0-10V, +10V, 0-5V, +5V, 0-20mA and 4-20mA to the following types of signals.
0-10 V and +10 V and 0-5 V and +5 V and 0-20 mA and 4-20 mA
According to the features of the module, the function of the module can be set in two isolator and independent modes, in the isolator mode, the input signal is converted into an equivalent signal and appears in the output, and in the independent mode, the value of the output analog signal will be independent of the input analog signal. It is determined through the Madbas register.
This module has the ability to connect to a computer and control equipment such as (HMI and PLC).

3.2 Module Uses

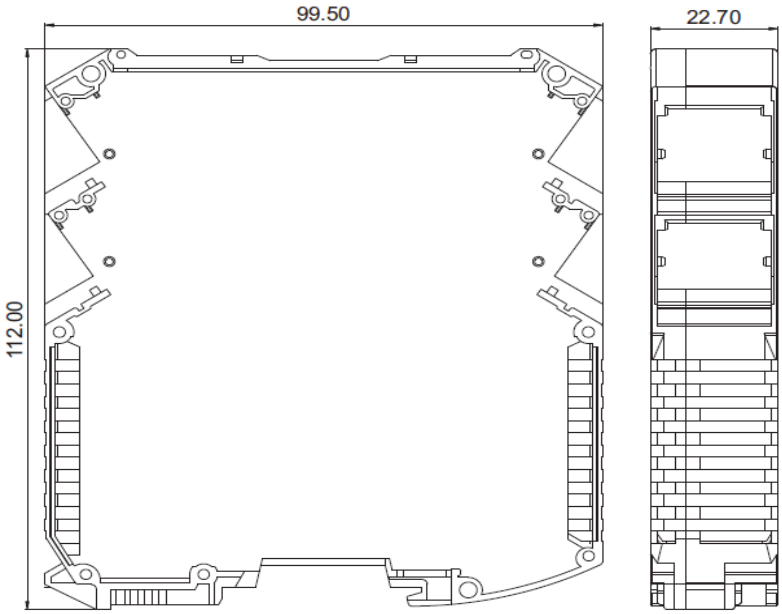
This module is used for analog signal isolation and applications such as:

- Industrial automation
- Measuring and laboratory machines and devices

3.3 Technical Specifications

- Has a display
- 24-bit analog to digital converter
- One analog input channel
- An analog output channel
- The working temperature range is +30 ~ +75 degrees Celsius
- RS485 serial communication with MODBUS protocol support

3.4 Module Dimension



4 Installation

4.1 Observe EMC items

This product is designed and manufactured to work in industrial environments. However, for proper operation, you should check and eliminate the issues that cause the module to malfunction.

4.2 Cases that cause system malfunctions

- Electromagnetic field
- Telecommunication cables
- Power circuit cable

4.3 Things to consider

4.3.1 Convenient ground connection

- When installing the module on the panel body, make sure that the panel body is connected to the ground.
- All ineffective metal parts are (firmly) grounded.
- When connecting varnished wires to ground connection, remove the varnish from that part.

4.3.2 Appropriate wiring method

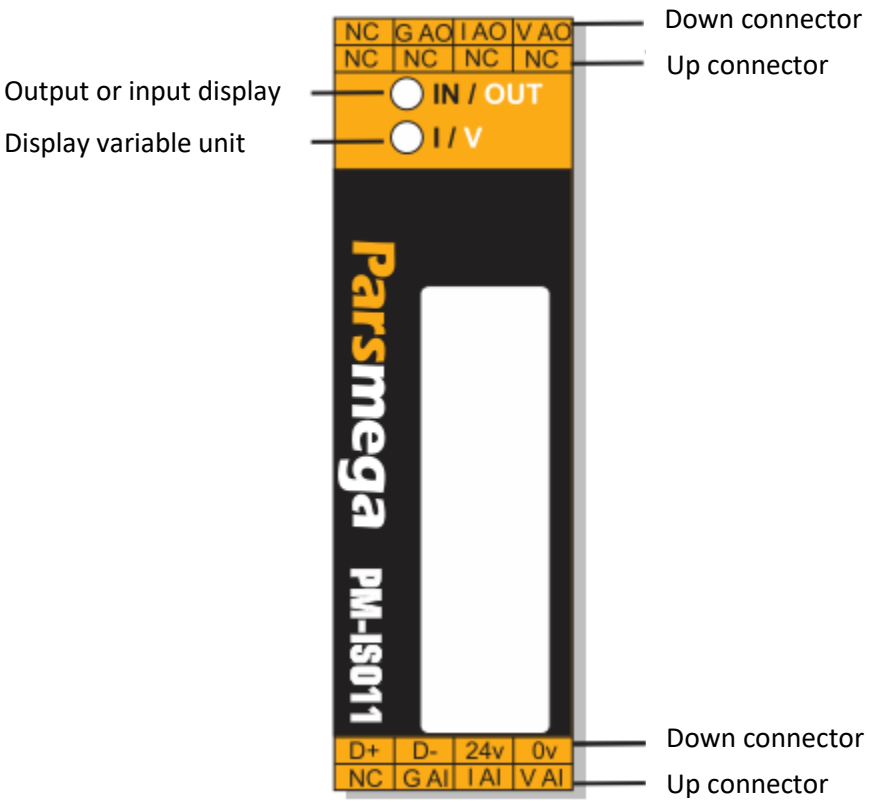
- Divide your system cables into different groups (high voltage, power supply, and signal, analog).
- Always transfer the power cable from another duct.
- Always place your analog cables close to the body of the panel and rails (which are grounded).

4.3.3 Cable shield connection

- Make sure the shields are properly grounded.
- Try to keep a small part of the cable without a shield.

5 Connections and Display Panel

All connections of this module are screws.



Connection view of the display transmitter

5.1 Connections Group

The connections of this module include 4 main groups:

- Power
- RS485 Serial
- Analog Output
- Analog Input

5.2 Power Supply Connection

The suitable power supply for this module is 24VDC. Observe safety precautions when connecting and using the module.

Terminal: 0V
Terminal: 24V

5.3 Analog input connection

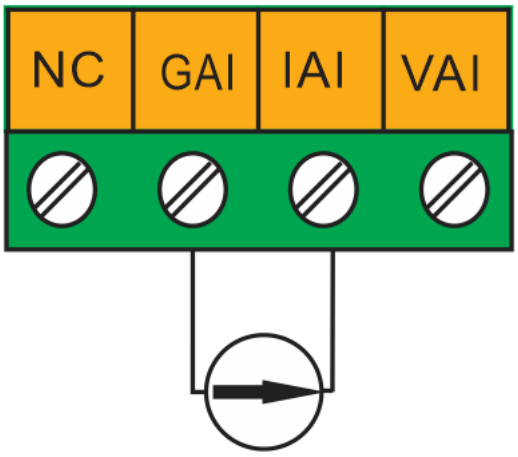
PM-ISO11 module has the ability to connect to an input analog signal. The labels of the terminals as well as the function corresponding to each terminal are as follows:

Lable	Function
V AI	Input analog voltage
I AI	Input analog current
G AI	Input analog ground connection
NC	

The type of analog input signal can be a current signal or a voltage signal, according to the type of signal, the method of connecting to the analog inputs is as follows:

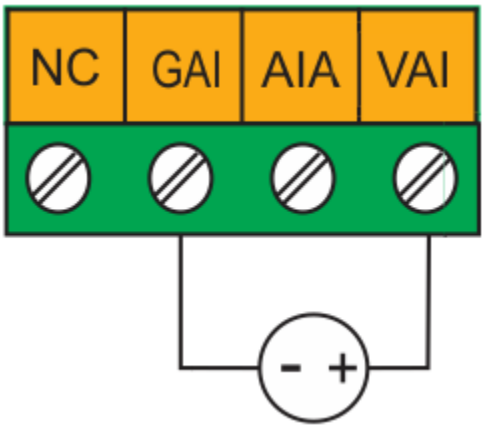
5.3.1 Connecting the analog current signal:

To connect the analog current signal to the input of the analog input channel of the device, we connect the negative part of the input current signal to the terminal GAI of the corresponding channel and the positive part of the input analog current signal to the input analog current terminal IAI of the corresponding channel, for example in The following figure shows how to connect the input analog current signal:



5.3.2 Voltage analog signal connection:

for voltage analog signal connection; We connect the negative part of the input voltage signal to the GAI terminal of the corresponding channel and the positive part of the input analog voltage signal to the VAI input analog voltage terminal of the device. For example, the following figure shows how to connect the input analog voltage signal:



5.4 Analog Output Connection

⚠ Notice

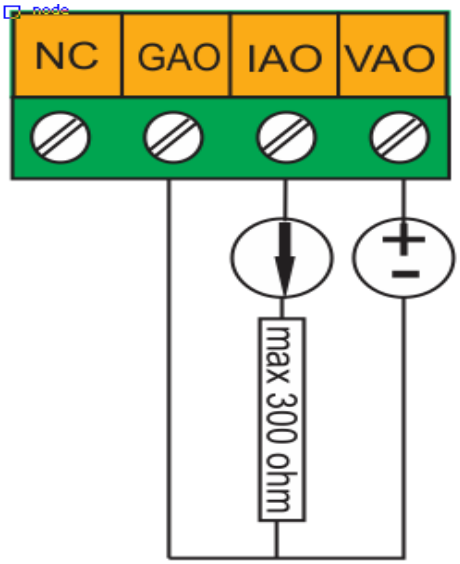
Be sure to know the status of the analog output before connecting it. At the time of initial setup, the analog output may have a value.

Lable	Function
VAO	Analog voltage output
IAO	Analog current output
GAO	Output analog return path

Analog output has several modes:

0-10 V and +10 V and 0-5 V and +5 V and 0-20 mA and 4-20 mA

Note: In current mode, the **maximum** resistance in series with the ring is 300 ohms, and in voltage mode, the **minimum** resistance of the load is 10 kilohms.



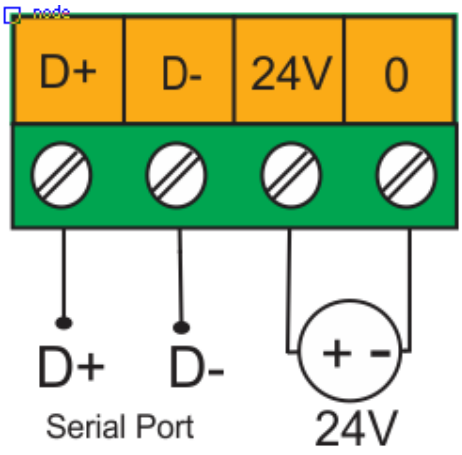
5.5 RS485 Serial connection

This module is equipped with an RS485 serial port on which the MODBUS (RTU, ASCII) protocol is implemented.

Isolation specification of RS485 port:

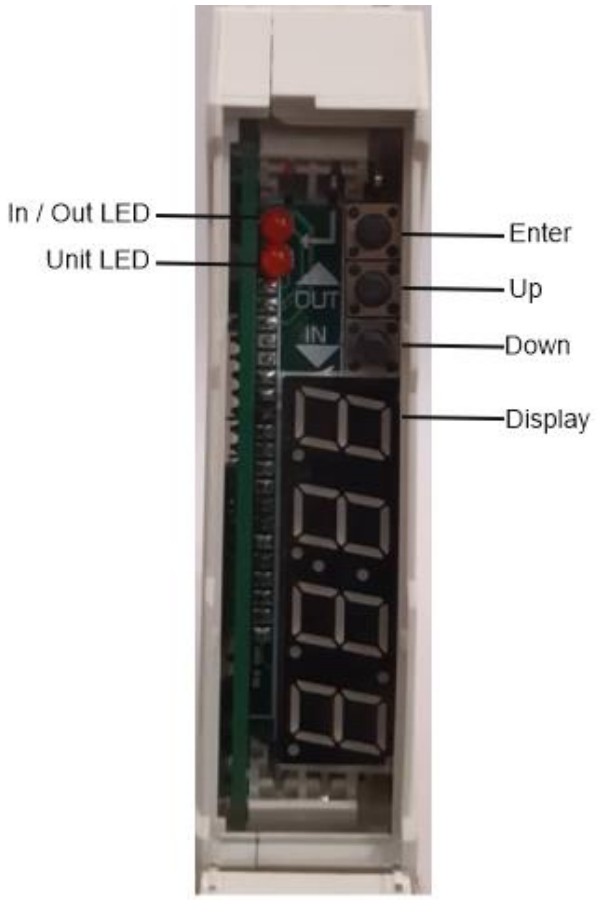
±10 kV ESD protection

Lable	Function
+ D RS485	Positive data
- D RS485	Negative data



5.6 Display Panel

This display module has three push buttons and two LEDs.The keys have different and adjustable functions in different situations, and LEDs can also show different states.



Enter Key

Down Key (or display the input parameter)

Up Key (or display the output parameter)

Uint LED is on if the type of parameter being displayed is voltage type and off if it is current.

In / Out LED turns on when the output parameter is displayed and turns off when the input parameter is displayed.

The following table shows the functions of the keys in different menus and situations

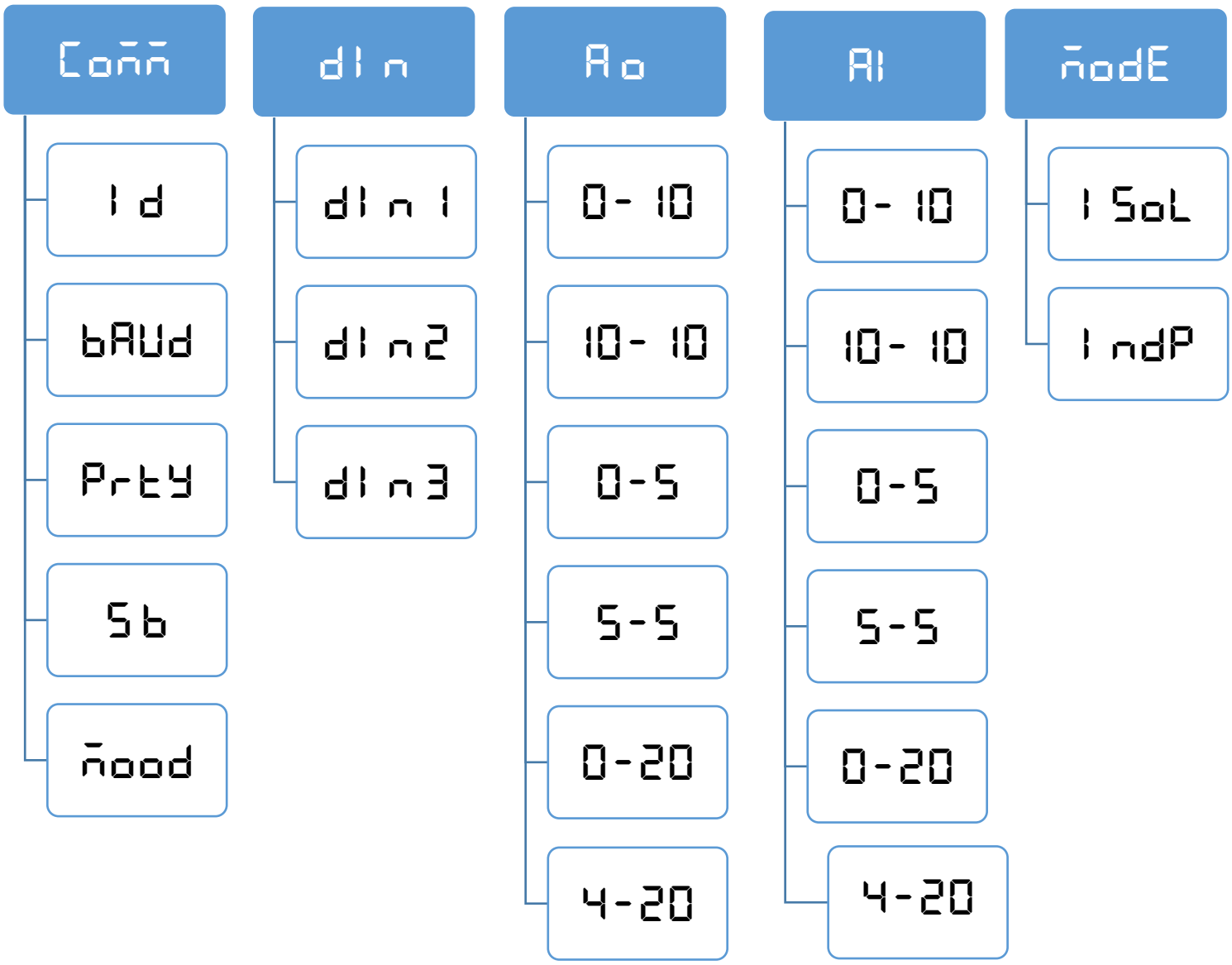
Keys	When setting parameter		Inside the settings menu		Out of the settings menu	
	to keep	push	to keep	push	to keep	push
Enter	Confirm parameter changes	Cancel parameter change	Enter the selection menu	Back to the previous menu	Enter the settings menu	
▲ Up / Out	Continuous increase of the parameter	Increase the parameter	----	Go to the upper menu	---	Display output
▼ Down In	Continuous reduction of the parameter	Parameter reduction	---	Go to the lower menu	---	Display input

The duration of holding the key to confirm the function is 3 seconds.

6 Display parameters and menus

- All parameters are set with default values at the time of purchase.
- You can also do this with the reset command.
- The length of all variables is word
- Some parameters require a reboot to take effect.
- The parameters and menus of the device have different categories for settings, which we will explain below. In the next table, we see the general structure of the menus.

6.1 Menu structure table



6.2 How to work with menus

1- To enter the settings, you must hold the EntEr key for 3 seconds. After entering the settings, the word Conn is displayed on the top line, which is the first category of settings and related to the communication settings of the device.
2- Now you can select other setting category with ▲/▼ key.
3- After selecting the setting category, you can enter the parameters of that setting category by holding the EntEr key.
4- If you select and enter the Conn settings category, the term Id will be displayed. Which represents the value of the ID parameter of the device's Modbus connection.
5- Now you can select other parameters with the ▲/▼ key.
6- After selecting the parameter, you can edit the value of that parameter by holding the EntEr key.
7- If you select and enter to edit the parameter Id, the value of the parameter will start flashing.
8- Now you can change the value of the parameter with the ▲/▼ key.
9- After setting the appropriate value, you can save the parameter by holding the EntEr key. The word "SAvEd" is also displayed to confirm the operation.

Notes:

- In each step, by pressing the EntEr key, you can go back to the previous step, exit the settings menu, or cancel saving the parameter value.
- Parameter values have a predefined limit, for example, the value of the Conn->Id parameter can be selected between 1 and 247.

6.3 Communication settings menu and parameters (**CoMM**)

In the CoMM menu, it is related to serial communication settings, in which there are the following sub-menus:

- Id (Device ID): In Modbus communication, every device connected to the bus has a unique ID.
- bAUd (Baud Rate): RS485 serial data transmission speed can be set in this menu.
- PrtY (Parity Bit): In this menu, the parity bit of RS485 serial communication can be set.
- Sb (Stop Bit): In this menu, the number of RS485 serial communication stop bits can be set.
- nodE (RTU/ASCII): In this menu, RTU or ASCII type of Modbus communication is selected.

Note that the system must be reset once to apply the above parameters.

Communication parameters menu table

Menu Title	Menu Parameter	Default
Id	1-247	1
bAUd	24 48 96 144 192 288 384 576 768 1152 2304	9600
PrtY	none = nonE odd = odd even = EvEn	even
Sb	1stop bit = 1bit 2 stop bit = 2bit	1 bit
nodE	RTU = rtU ASCII 8 = ASC8 ASCII 7 = ASC7	RTU

Address table of communication parameters

Title	Variable Type	Length	Reading Writing	Address	Description	Default
ID	Unsigned int	1	RW	40001 0 d 0 h	1~247	1
Baud Rate	Unsigned int	1	RW	40002 1 d 1 h	0~10 0=2400 1=4800 2=9600 3=14400 4=19200 5=28800 6=38400 7=57600 8=76800 9=115200 10=230400	2
parity	Unsigned int	1	RW	40003 2 d 2 h	0=none 1=odd 2=even	2
Stop bit	Unsigned int	1	RW	40004 3 d 3 h	0=1 bit 1=2 bit	0
Mode	Unsigned int	1	RW	40005 4 d 4 h	0=RTU 1=ASCII (8bit)	0

6.4 Menu and parameter analog output (Ao)

In this menu, the type of analog output signal is specified:

Menu Title	Parameter Menu	Default
Ao Output signal type	0- 10 =0-10 V 10 10 = +-10 V 0-5 =0-5 V 5-5 =+-5 V 0-20 = 0-20 mA 4-20 =4-20 mA	0- 10

Address table of analog output parameters

Title	Variable Title	Length	Address	Writing Ability	Description	Default
Output signal type	unsigned int	1	40057 56 d 38 h	RW	0=0~10v 1=-10~ +10 2=0~5 3=-5~+5 4=0~20mA 5=4~20mA	0
Output analog register	unsigned int	1	40060 59 d 3b h	RW	Where to enter the output analog digital value 65535 to 0	--

6.5 Menu and parameter analog output (AI)

In this menu, the type of analog input signal is specified:

Menu Title	Menu Parameter	Default
AI Input signal type	0- 10 =0–10 V 10 10 = +-10 V 0-5 =0-5 V 5-5 =+-5 V 0-20 = 0-20 mA 4-20 =4-20 mA	0- 10

Address table of analog input parameters

Title	The Length	Writing Ability	Address	Address	Description	Default
Input signal type	unsigned int	1	RW	40033 32 d 20 h	0=0~10v 1=-10~ +10 2=0~5 3=-5~+5 4=0-20mA 5=4~20mA	0
Analog input register	int	1	R	40058 57 d 39 h	Display the digital value of the analog input 32767-32767	--

6.6 menu and function mode parameters(nodE)

The device has a performance mode. The ISOL module acts as a signal isolator and an equivalent signal appears in the output for the input signal, and the Indp module acts as an analog-to-digital signal converter and a digital-to-analog converter and displays the equivalent of the input signal digitally in a register. It is equivalent to the output analog signal in a register that can be adjusted by the user.

Menu table of digital input parameters

Menu Title	Parameter Munu	Default
nodE Performance mode	ISoL = It acts as a signal isolator Indp = It acts as an independent face. It places the corresponding values of the input and output signals in the corresponding register of the modbus or reads from the corresponding register .	ISoL

Address table of digital input parameters

Title	Variable type	The Length	Writing ability	Address	Description	Default
Function mode	Unsigned int	1	RW	40061 60 d 3c h	isolator signal=0 independent converter=1	0