

## Instruction Manual Modbus Extension Module

### Supplement for the Instruction Manual Measurement Transmitter NivuFlow Energy Saver



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## 1 General



### **Important Note**

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- for missing or incorrect measurement values or resulting consequential damages due to **improper installation**.

## 2 Preconditions

### **WARNING**



#### **Instruction Manual for Extension Module not valid all by itself**

*This supplement cannot be considered as a **fully adequate** instruction manual by itself and needs to be read and used **always together** with the NivuFlow Energy Saver transmitter instruction manual.*

This instruction manual is a **supplement** to the instruction manual for the NivuFlow Energy Saver.

The following requirements shall be adhered to always and necessarily:

- Content-related knowledge of the NivuFlow Energy Saver instruction manual and the according safety information.
- Experience in the operation of NIVUS NivuFlow transmitters.
- The sole purpose of this instruction manual is the installation of the Modbus Extension Module (**ZUB0 MOD AIN8**) certified by NIVUS; components not verified and authorised by NIVUS may cause damage to the entire measurement system NIVUS cannot be held responsible for.

### 3 Use in accordance with the requirements

The Type *ZUB0 MOD AIN8* Modbus Extension Module is for the connection of external current signals to transmit current consumption and frequency to the NivuFlow Energy Saver transmitter. The Extension Module is used for all pumps and frequency converters which cannot be connected directly via Modbus.

### 4 Specifications

Article number	ZUB0 MOD AIN8
Protection	IP20
Storage temperature	-40...+85 °C
Operating temperature	0...+55 °C
Max. humidity	95 % (non condensing)
Mounting	On metal carrier (DIN rail), 35 mm
Dimensions (hxwxd)	100x86.5x71.1 mm; Depth measured from top edge of carrier rail: 63.9 mm
Power supply	24 V DC (-25 % / +30 %), min. 500 mA
Modbus	1x RS485 using the accompanying pre-configured connection cable
Inputs	8x 0/4...20 mA DC, passive, not galvanically isolated, internal resistance (20 mA) < 100 Ω
Connection	Cage clamp terminal, 0.08...2.5 mm <sup>2</sup>
Altitude	0...2000 m above MSL

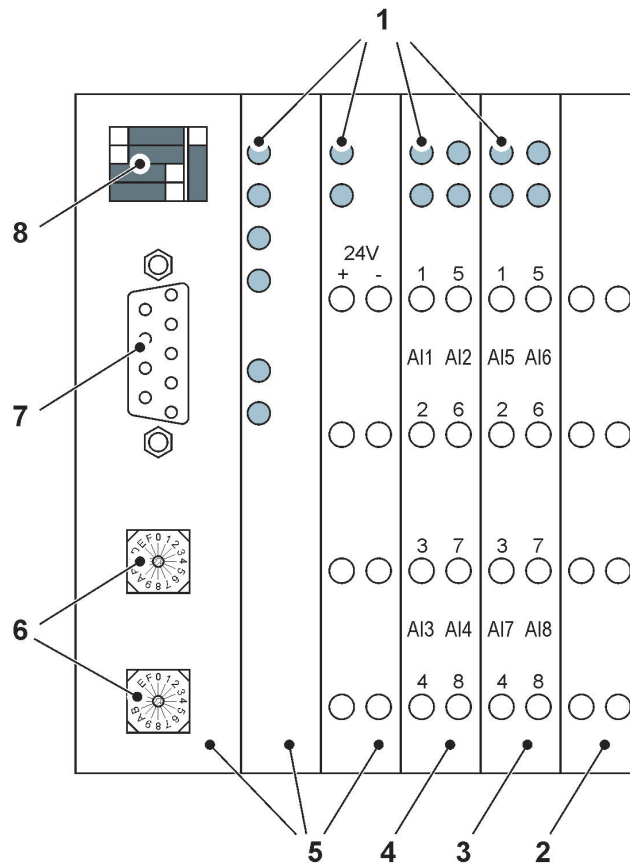
**Table 1      Specifications**

## 5 Functional Description

### 5.1 General

The Modbus Extension Module is suitable for the connection of 0/4...20 mA signals to the NivuFlow Energy Saver transmitter.  
The Modbus Extension Module is shipped in completed and configured condition and needs to be installed and connected only.

### 5.2 Overview



1. Status-LED
2. Bus terminal clamp
3. Module 2 (AI5...AI8)
4. Module 1 (AI1...AI4)
5. Fieldbus coupler with power supply
6. Rotary encoding switch
7. Fieldbus connection RS485
8. Switch for RS485

**Fig. 5-1 Overview Modbus Extension Module**

### 5.3 Connection of Analog Inputs

The analog inputs 1...4 are permanently assigned to module AI1, analog inputs 5...8 are permanently assigned to module AI2.

The analog inputs are used exclusively for the power and frequency inputs of pumps 1...4. Other functions are not available.

The assignment of the analog inputs to the terminal clamps on the modules is fixed and cannot be changed.

The following assignments apply:

- Module AI1
  - AI1 (1)            Input Power Pump 1
  - AI2 (2)            Input Frequency Pump 1
  - AI3 (3)            Input Power Pump 2
  - AI4 (4)            Input Frequency Pump 2
- Module AI2
  - AI1 (5)            Input Power Pump 3
  - AI2 (6)            Input Frequency Pump 3
  - AI3 (7)            Input Power Pump 4
  - AI4 (8)            Input Frequency Pump 4

### 5.4 Parameter setting / Operation

Once cables and power supply are connected correctly the parameters of the Extension Module are set via the NivuFlow Energy Saver. Therefore, the Extension Module does not require any operation elements of its own.

## 6 Electric Installation

### 6.1 General

The Modbus Extension Module is shipped in completed and **configured** condition.



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***Do not change default settings of switches on the Modbus Extension Module***

*Changing the settings of the RS485 switches (Fig. 5-1 n° 8) or the rotary encoding switches (Fig. 5-1 n° 6) may lead to communication failure between the module and the transmitter.*

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Connect the Modbus Extension Module to the transmitter only by using the accompanying/shipped **Modbus-RTU connection cable** (length approx. 1.3 m). One side of the Modbus Extension Module is equipped with a RS485 plug, the other side is open for connection to the transmitter.

Connect only 1 conductor on each **cage clamp terminal** of the Modbus Extension Module.

The module's metal **carrier rail** (DIN rail, 35 mm) must be earthed **prior to initial operation**.

### 6.2 Connection and wiring diagram of the Modbus Extension Module

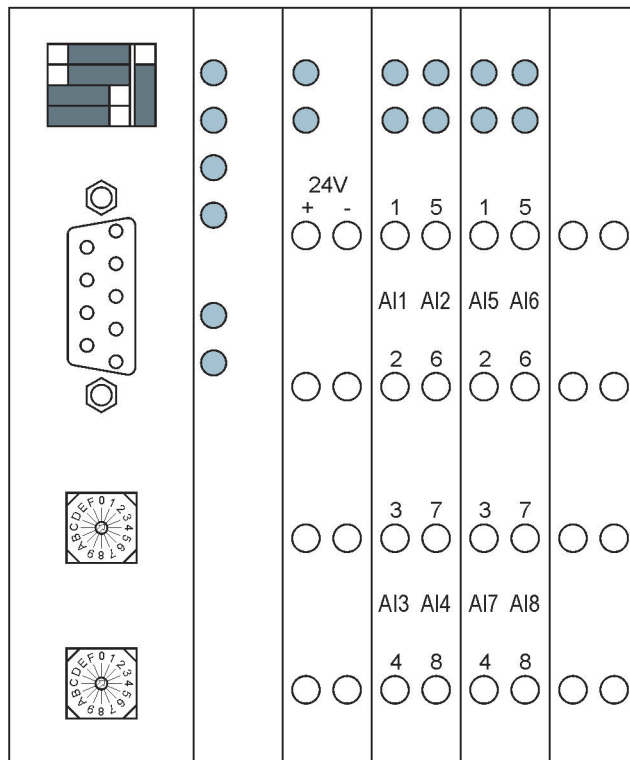


Fig. 6-1 Connection and wiring diagram

### 6.3 Power Connection



**No power supply via the transmitter**

The Modbus Extension Module cannot be supplied via the transmitter directly due to its high energy consumption.

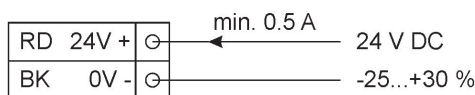


Fig. 6-2 Power supply Modbus Extension Module

### 6.4 Connection to measurement transmitter NivuFlow Energy Saver

Connect the Modbus Extension Module to the transmitter only by using the accompanying Modbus-RTU connection cable (length approx. 1.3 m).

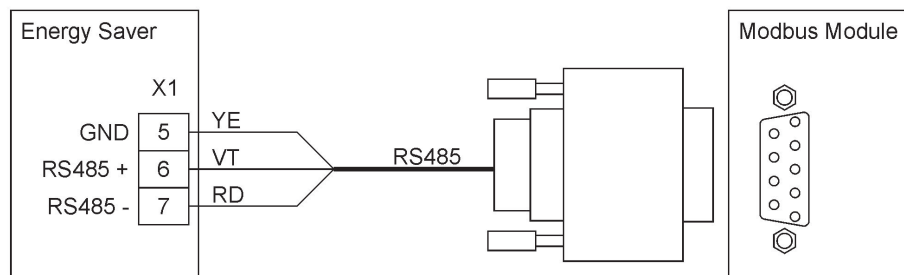
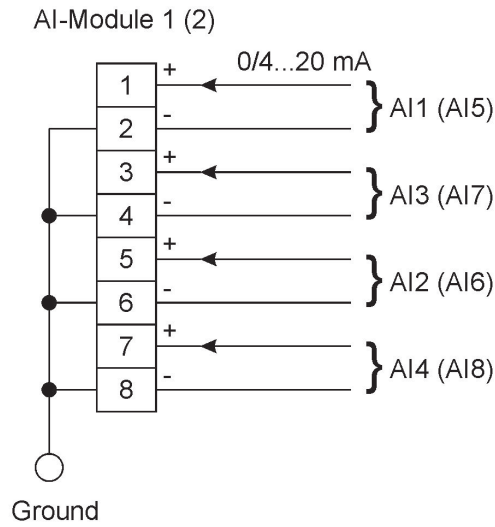


Fig. 6-3 Connection Extension Module – transmitter

### 6.5 Connection of external Analog Inputs to the Modbus Extension Module

Connect only 1 conductor on each cage clamp terminal of the Modbus Extension Module.



**Fig. 6-4** Connection external analog inputs – Extension Modules

## 7 Parameter Setting

Set the parameters of the Modbus Extension Module by using the menu of the NivuFlow Energy Saver.

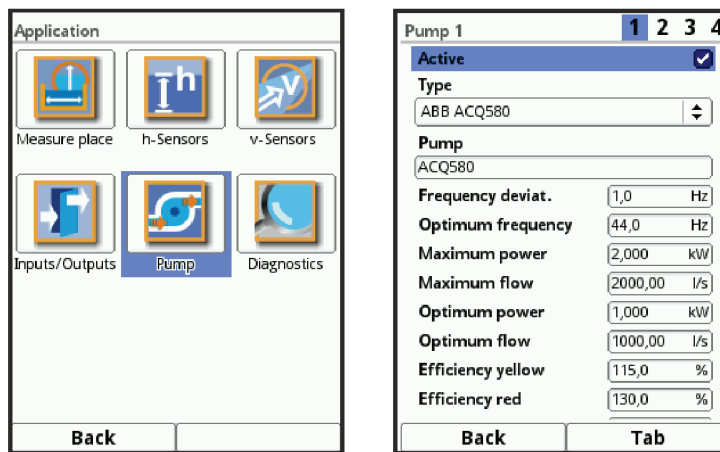
### Preconditions

- The Modbus Extension Module is correctly connected to the transmitter.
- The Modbus Extension Module is connected to the power supply module.
- The metal carrier rail is earthed.

### Procedure

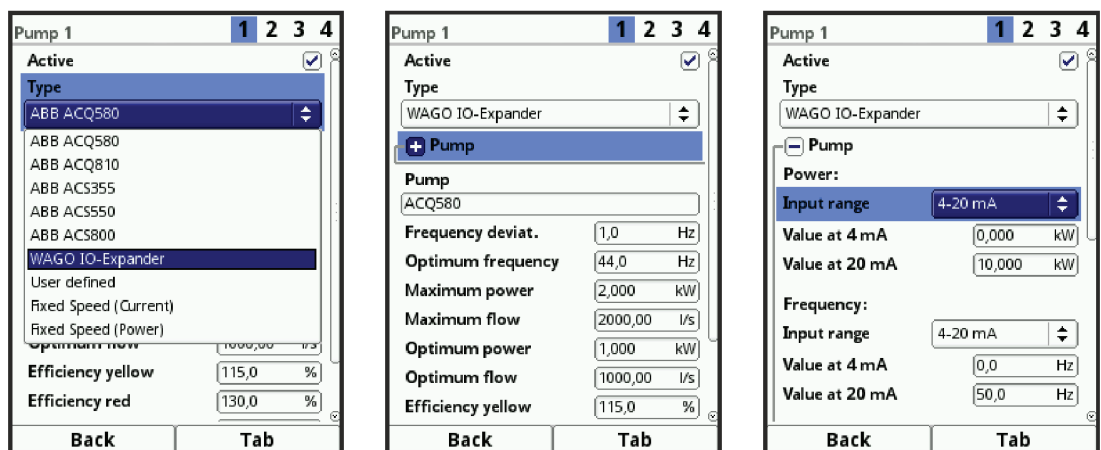
#### ➡ Set Pump(s) Parameters

1. Open the >Application< / >Pump< menu and check the “Active” checkbox for pump 1.  
The other pumps can be selected by clicking “Tab”.



**Fig. 7-1** Open and activate pump

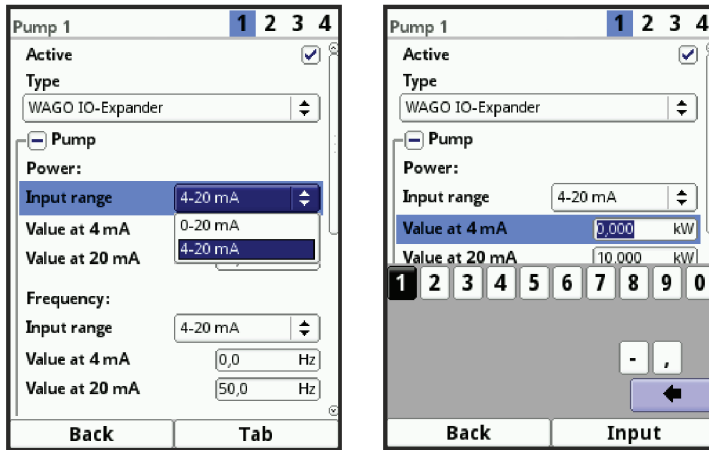
2. In “Type” use the pulldown menu to select the pump type >WAGO I/O-Expander<.



**Fig. 7-2** Select pump type and open the settings

3. Open the settings for the selected pump.  
Select the (current) input range (0-20 mA or 4-20 mA) each for power and frequency (pulldown menu).
4. In power and frequency specify the values for 0 mA or 4 mA and 20 mA.





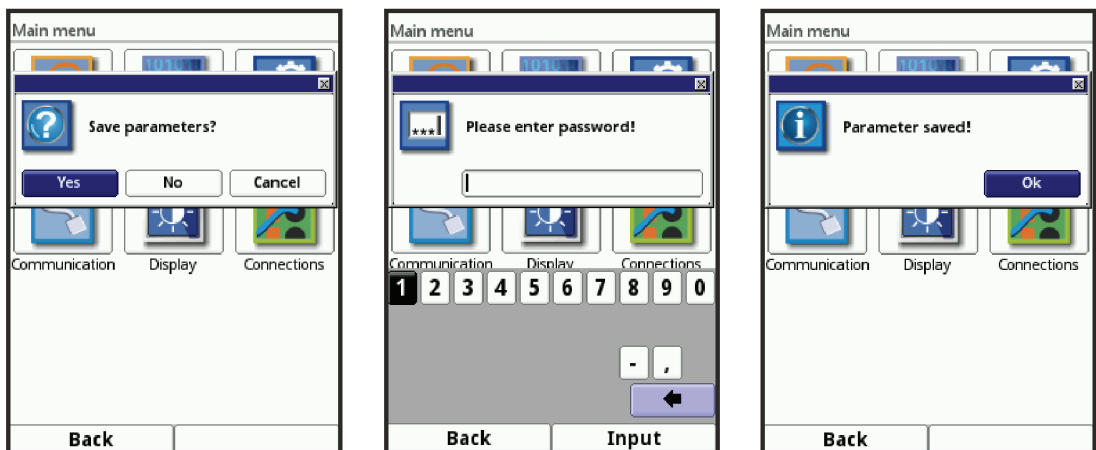
**Fig. 7-3 Value input for power/frequency**

5. After the settings for pump 1 are adjusted use the “Tab” key to proceed to pumps 2/3/4 if required and set the parameters accordingly.



**Fig. 7-4 Activating and setting the parameters for further pumps**

6. After finishing the pump parameter settings close the menu (back 3x) and save the parameters.



**Fig. 7-5 Save parameters**