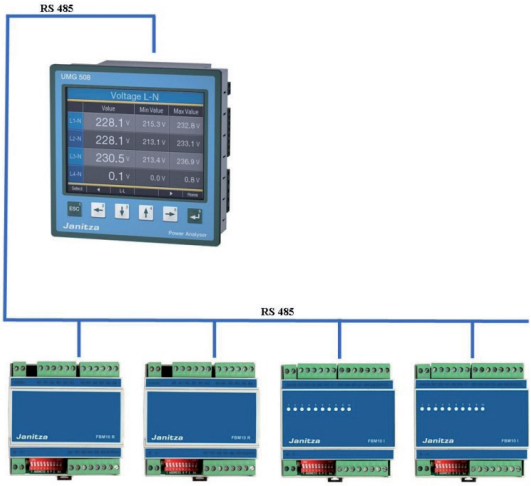
Art. Nr. 33.03.154

FBM series
I/O modules

Functional description

UMG604 - UMG605 - UMG508 - UMG511

Item no.: 15.06.075 / 15.06.076 / 15.06.077
15.06.078 / 15.06.079



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General

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Comments on the operating manual

We welcome your comments. In the event that anything in this operating manual seems unclear, please let us know and send us an EMAIL at: info@janitza.de.

Meaning of the symbols

The following pictograms are used in the operating manual at hand:

Dangerous voltage!
Danger to life or risk of serious injury. Disconnect system and device from power supply before beginning work.

Attention!
Please follow the documentation. This symbol warns of possible dangers that can arise during installation, commissioning and use.

Note!

Instructions for use

Please read the operating manual at hand as well as all other publications that must be drawn from for working with this product (in particular for the installation, operation or maintenance).

Follow all safety regulations and warning information. If you do not follow the information, it can result in bodily injury and/or damage to the product.

Any unauthorized changes or use of this device, which transcend the mechanical, electrical or otherwise stated operating limitations, can result in bodily injury or/and damage to the product.

Any of such unauthorized changes constitute „misuse“ and/or „negligence“ in terms of the warranty for the product and therefore eliminates the warranty for covering any potential damages resulting from this.

This device is to be operated and maintained exclusively by specialized personnel.

Specialized personnel are persons, that based on their respective training and experience, are qualified to recognize risks and prevent potential dangers that can be caused by the operation or maintenance of the device.

Additional legal and safety regulations required for the respective application are to be following during the use of the device.

Dangerous voltage!
Disconnect system and device from power supply before beginning work.

If the device is not operated according to the operating manual, protection is no longer ensured and danger can come from the device.

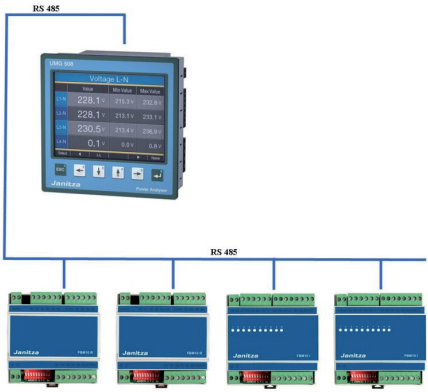
local I/O modules of the FBM10 series

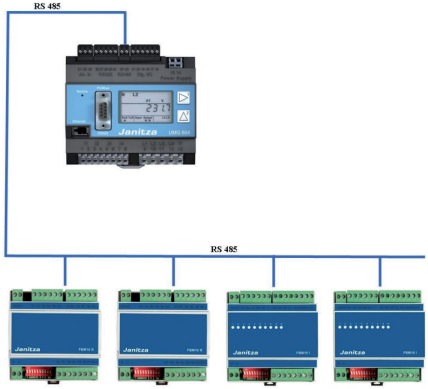
General

With the local I/O modules of the FBM series, the inputs and outputs of device types UMG604 / UMG605 / UMG508 and UMG511 can be expanded inexpensively. The fieldbus module has no intelligence, rather it simply directs the various input and output signals together in order to distribute them to the respective subscribers

The devices of the UMG104 and UMG507 series are not useable as masters for the FBM modules. There are four I/O modules available:

- The fieldbus module FBM 10R (item no.: 15.06.075) has 10 relay outputs
- The FBM 10I module (item no.: 15.06.076) has 10 digital inputs.
- The fieldbus module FBM P10PT1000 (item no.: 15.06.077) has 10 temperature inputs.
- The module FBM DI8-AI8 (item no.: 15.06.079) has 8 digital and 8 analog inputs





The I/O modules of the FBM series are connected to the RS485 interface of the power analyzer. The analyzer works in Modbus Master Mode in doing so. The maximum stitch length (cable length) between the master and the module may not exceed 1000m.

Up to 12 I/O modules in total (6x 10 outputs / 6x 10 inputs) can be controlled via the „Jasic“ graphic programming in conjunction with the Emax App. However, with the standard PT1000/PT100 APP (temperature module) and with the standard AI8-DI8 APP (fieldbus module) only one module can be controlled. The I/O‘s (channels) are permanently assigned and are automatically addressed to the Emax program.

Establishing communication to the measurement device

In order to set the Emax parameters, the first step is establishing the communication between the measurement device and a computer. We recommend installing the configuration and evaluation software „GridVis“. The measurement device should be assigned an IP address, the entry of the IP address is different for display devices and mounting rail devices. The IP address helps identify the measurement device in an ethernet network.

Setting the IP address on a UMG604 / UMG605

1. Simultaneously press key 1 and key 2 one second

2. You are now in the parameter menu.
   The letters PRG identify this menu.

Note!
Key 1: Change segment selection
Key 2: Change value (long - / short +)

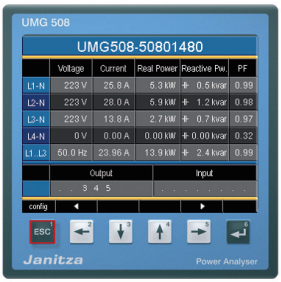
The following parameters must be parameterized for the Emax function on the device:

Parameter	Designation	Parameter recommendation	Settings
205	TCP mode	0	Fixed IP
203	RS485 mode	1	Master
202	RS485 baud rate	2	38,4 kbit/s
200	Device ID	>33	>32
300	IP Adresse XXX --- --- ---	192	*
301	IP address --- XXX --- ---	168	*
302	IP address --- --- XXX ---	001	*
303	IP address ---.--- --- XXX	010	*
304	IP mask XXX --- --- ---	255	*
305	IP mask --- XXX --- ---	255	*
306	IP mask --- --- XXX ---	255	*
307	IP address ---.--- --- XXX	000	*

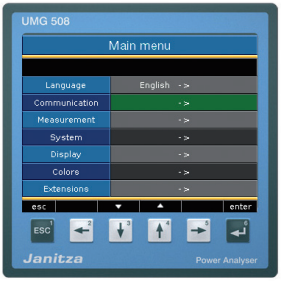
*Parameters can be freely selected or parameterized according to recommendations

Setting the IP address on a UMG508 / UMG511

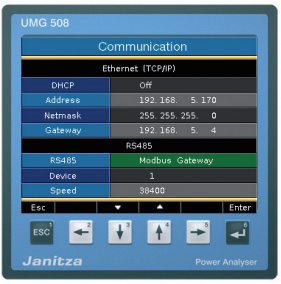
1. Press the „ESC“ key in order to access the configuration menu



2. Go into the communication menu



3. Set the parameters from the following list (recommendation):



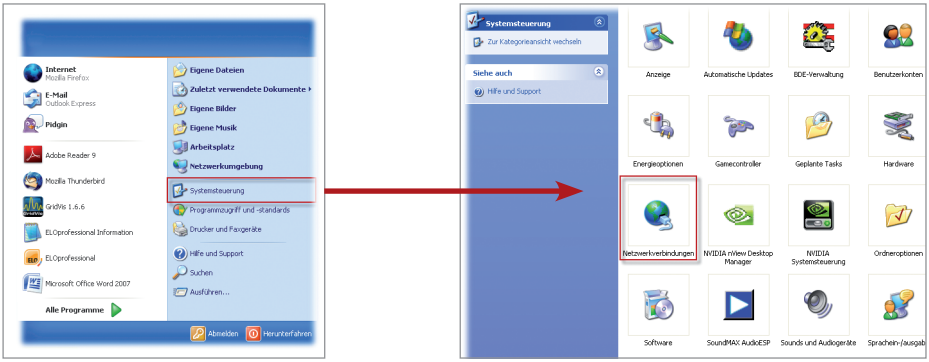
Proposal:

DHCP	Off
Address	192.168.1.10
Net mask	255.255.255.0
Gateway	--
Protocol	Modbus Gateway
Address	>33
Baud rate	38400

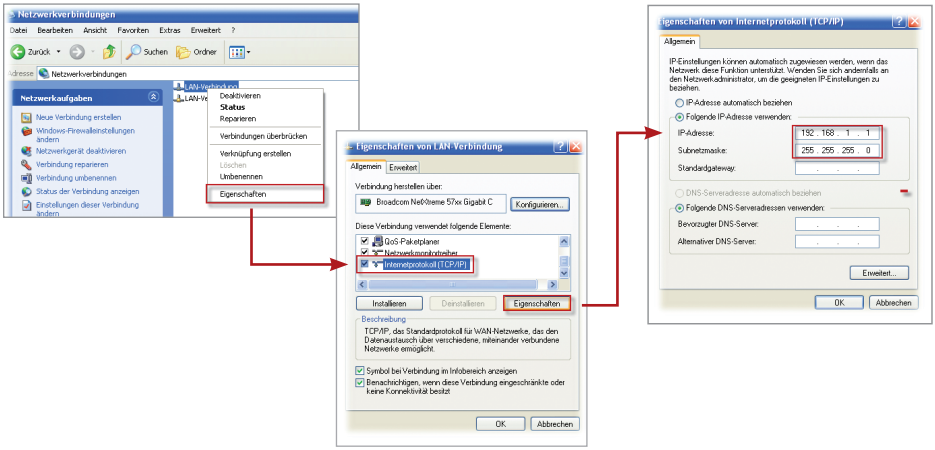
Setting the IP address of the computer

The following setting example was made in Windows XP, the example shows a point-to-point connection with an ethernet cable (cross patch). Settings in a company network can vary!

The IP settings are shown here with the Windows XP operating system as an example. It should be noted here that for a point to point connection, the first three segments of the IP should be the same. The Subnet mask should be exactly the same for the PC and the measurement device.



Give your computer the IP 192.168.1.1 (recommendation) and the subnet mask 255.255.255.0. Confirm with OK.

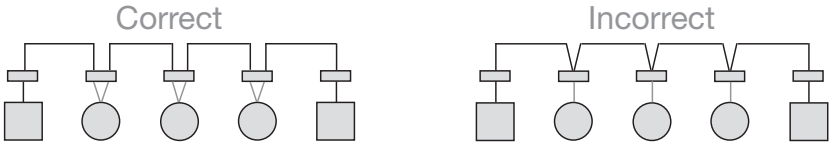


Connection to the RS485

The fieldbus modules are connected in a bus structure (in a line). A terminating resistor (120Ohm 1/4W) is to be set at the end of the bus line.

Note!
A Profibus cable or a cable of the type Li2YCY(TP) 2x2x0.22 are be used as the cable type. The cable must be shielded and drilled!

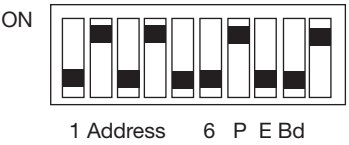
Example connection UMG604/605:
UMG604 terminal 23 (A) FBM 10R / FBM 10I / FBM 10PT1000 / FBM DI8-AI8 on terminal (A)
UMG604 terminal 22 (B) FBM 10R / FBM 10I / FBM 10PT1000 / FBM DI8-AI8 on terminal (B)



DIP switch

For serial communication, several default settings must be implemented. These settings are carried out on the fieldbus device using the ten available DIP switches.

The DIP switches have the following functions



Bus address (DIP switches 1 to 6)

Each I/O module must be assigned a bus address. The I/O modules are all addressed as slaves. There are a total of 64 bus addresses available (slave ID „1“ to slave ID „63“).

Setting occurs as with a binary number.

W	1	2	4	8	16	32	
DIP	1	2	3	4	5	6	Address
	ON	OFF	OFF	OFF	OFF	OFF	1
	OFF	ON	OFF	OFF	OFF	OFF	2
	ON	OFF	OFF	ON	OFF	ON	41
	OFF	ON	OFF	ON	OFF	ON	42
	ON	ON	ON	ON	ON	ON	63

Parity

The parity must be established with serial communication. The following assignments are possible with the fieldbus device:

DIP	7	8	Parity
	OFF	OFF	NONE
	ON	OFF	ODD
	ON	ON	EVEN

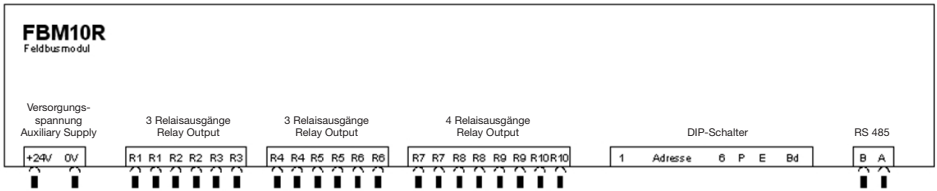
Baud rate (DIP switches 9 and 10)

The speed for the data transmission (baud rate) must also be established. There are four different settings available for the baud rate:

DIP	9	10	SPEED
	OFF	OFF	4800
	ON	OFF	9600
	OFF	ON	19200
	ON	ON	38400

Connection diagram FBM10R

Relay outputs NO contact 250V / 3A AC1 / 2A AC3

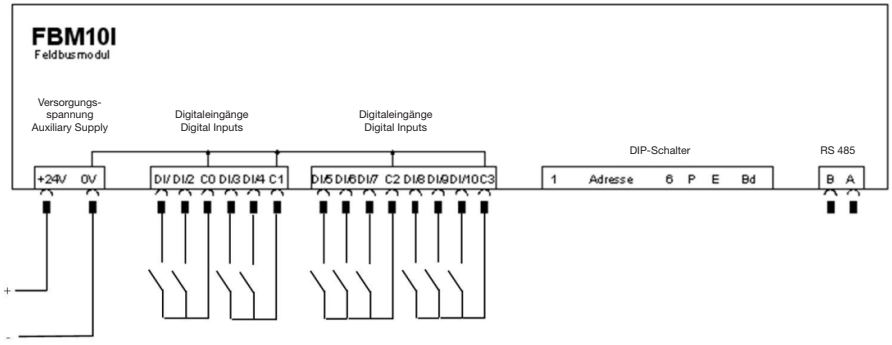


Connection of the device may only occur in de-energized state and if it must be connected under voltage, the GND must first be connected.

Bus polarization necessary!

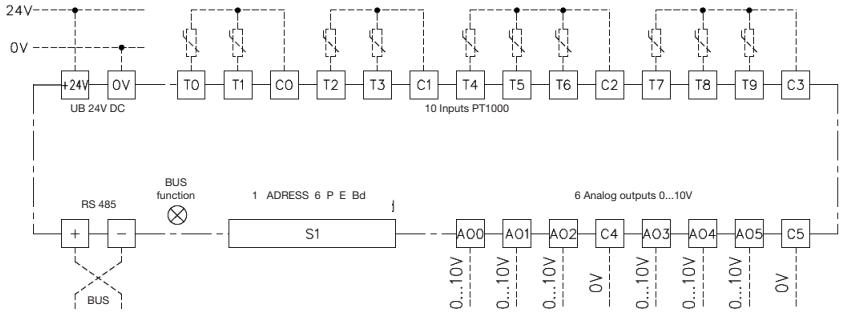
Connection diagram FBM10I

Digital inputs 24 V DC / 5mA inputs

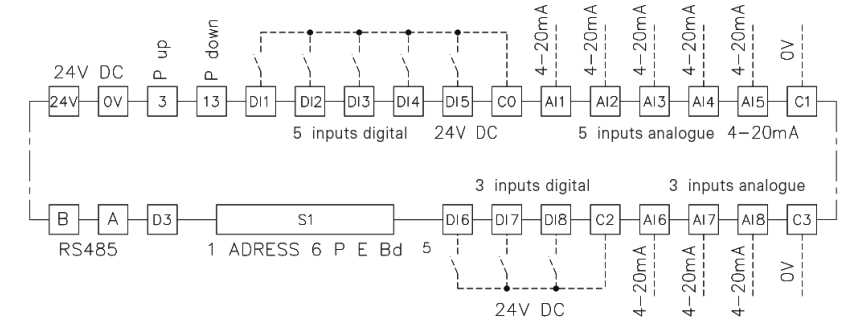


Connection diagram FBM10PT1000/PT100

Temperature input 2-wire



Connection diagram FBM DI8AI8



Note: The 10V analog outputs are in preparation and are not yet integrated in the current version (FBM10PT1000/100).

0 volt terminals are internally connected and must only be connected once. Connection terminals for the potential-free contacts are implemented separately. With analog inputs and outputs, it is recommended to connect the 0 voltage line (C...) for accuracy reasons.
Connection terminals for the potential-free contacts are implemented separately.

Bus polarization necessary!

Connection of the device may only occur in de-energized state and if it must be connected under voltage, the GND must first be connected.

LED display

LED	Information	Cause
Green LED (flashing)	Slave device OK	--
Red LED (flashing)	No bus present Communication error	• Incorrect baud rate • Incorrect parity • +/- on bus reversed • Bus fault due to 2 identical slave addresses in the network
Red and green LED (flashing)	Access error	Access on incorrect register address

Register assignment FBM10R

Connection terminal	Type (I/O module)	Type Modbus RTU
R1	Relay output 1	Coil 0
R2	Relay output 2	Coil 1
R3	Relay output 3	Coil 2
R4	Relay output 4	Coil 3
R5	Relay output 5	Coil 4
R6	Relay output 6	Coil 5
R7	Relay output 7	Coil 6
R8	Relay output 8	Coil 7
R9	Relay output 9	Coil 8
R10	Relay output 10	Coil 9

Word addressing	R1-R10	Holding register 0
Info	Hardware version	Input register 1000
Info	Software version	Input register 1001

Note:
MOD coils <fc = 1, 5, 15>
MOD holding register (coils) <fc = 3, 6, 16>
MOD input register <fc = 4>

Register assignment FBM10I

Connection terminal	Type (I/O module)	Type Modbus RTU
DI1	Digital input 1	Input status 0
DI2	Digital input 2	Input status 1
DI3	Digital input 3	Input status 2
DI4	Digital input 4	Input status 3
DI5	Digital input 5	Input status 4
DI6	Digital input 6	Input status 5
DI7	Digital input 7	Input status 6
DI8	Digital input 8	Input status 7
DI9	Digital input 9	Input status 8
DI10	Digital input 10	Input status 9

Word addressing	DI1 - DI10	Input register 0
Info	Hardware version	Input register 1000
Info	Software version	Input register 1001

Note:
MOD Input status <fc = 2>
MOD Input register <fc = 4>

Register assignment FBM10PT1000/PT100

Connection terminal	Type (I/O module)	Type Modbus RTU
T0	Analog input 0	Input register T0
T1	Analog input 1	Input register T1
T2	Analog input 2	Input register T2
T3	Analog input 3	Input register T3
T4	Analog input 4	Input register T4
T5	Analog input 5	Input register T5
T6	Analog input 6	Input register T6
T7	Analog input 7	Input register T7
T8	Analog input 8	Input register T8
T9	Analog input 9	Input register T9

Info	Hardware version	Input register 1000
Info	Software version	Input register 1001

Note:

MOD Input register <fc = 4>

Note: The 10V analog outputs are in preparation and are not yet integrated in the current version

Register assignment FBM DI8AI8

Connection terminal	Type (I/O module)	Type Modbus RTU
DI1	Digital input 1	Input status 0
DI2	Digital input 2	Input status 1
DI3	Digital input 3	Input status 2
DI4	Digital input 4	Input status 3
DI5	Digital input 5	Input status 4
DI6	Digital input 6	Input status 5
DI7	Digital input 7	Input status 6
DI8	Digital input 8	Input status 7
AI1 (4..20mA)	Analog input 1	Input register 1
AI2 (4..20mA)	Analog input 2	Input register 2
AI3 (4..20mA)	Analog input 3	Input register 3
AI4 (4..20mA)	Analog input 4	Input register 4
AI5 (4..20mA)	Analog input 5	Input register 5
AI6 (4..20mA)	Analog input 6	Input register 6
AI7 (4..20mA)	Analog input 7	Input register 7
AI8 (4..20mA)	Analog input 8	Input register 8
Word addressing	DI1 - DI8	Input register 0
Info	Hardware version	Input register 1000
Info	Software version	Input register 1001

Note:
MOD Input status <fc = 2>
MOD Input register <fc = 4>

Example control of the FBM10R module with JASIC

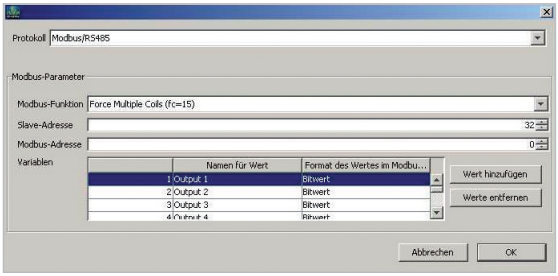
The I/O modules can be controlled via the graphic programming. The following programs show examples for read-write access to the modules.

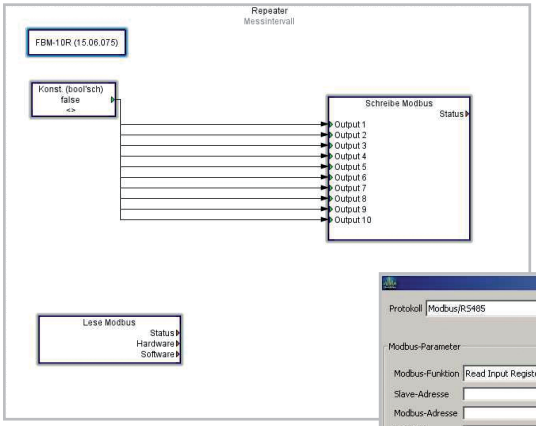
Information on the graphic programming can be found in the functional description „Graphic programming“ from Janitzaelectronics GmbH

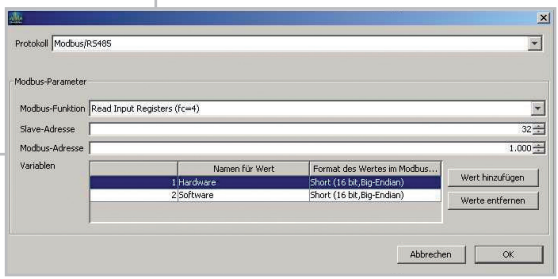
Attention: For the function Write/Read Modbus is at least the license of GridVis Enterprise (Art.Nr.: 51.00.170) required.

Example:

The digital outputs of the FBM10R are controlled using a write Modbus function module.

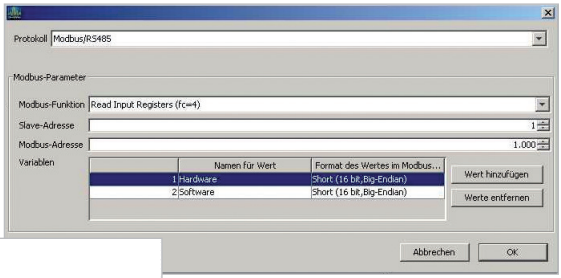


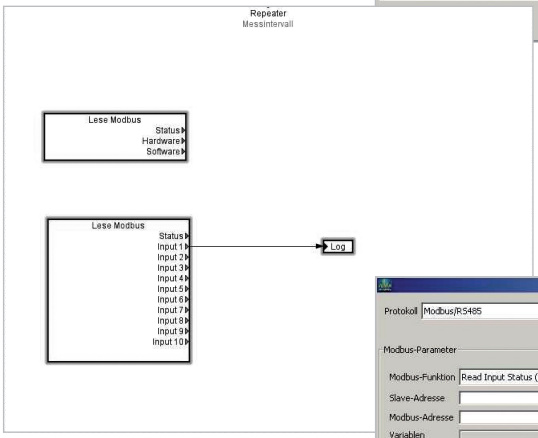


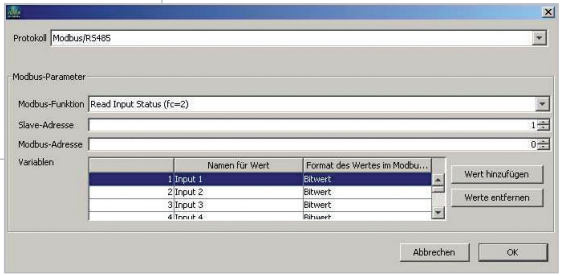


Example:

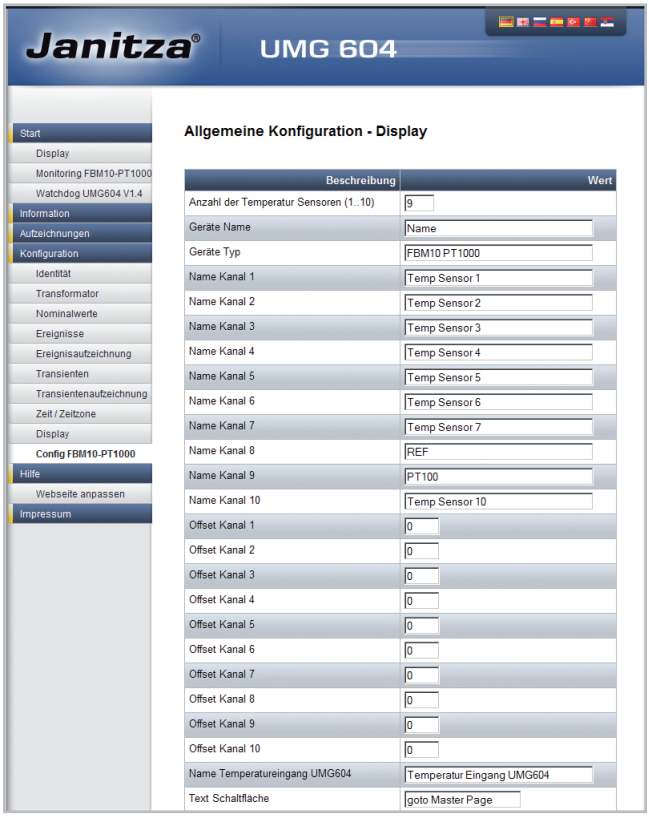
The digital inputs of the FBM10I are read out using a read Modbus function module.



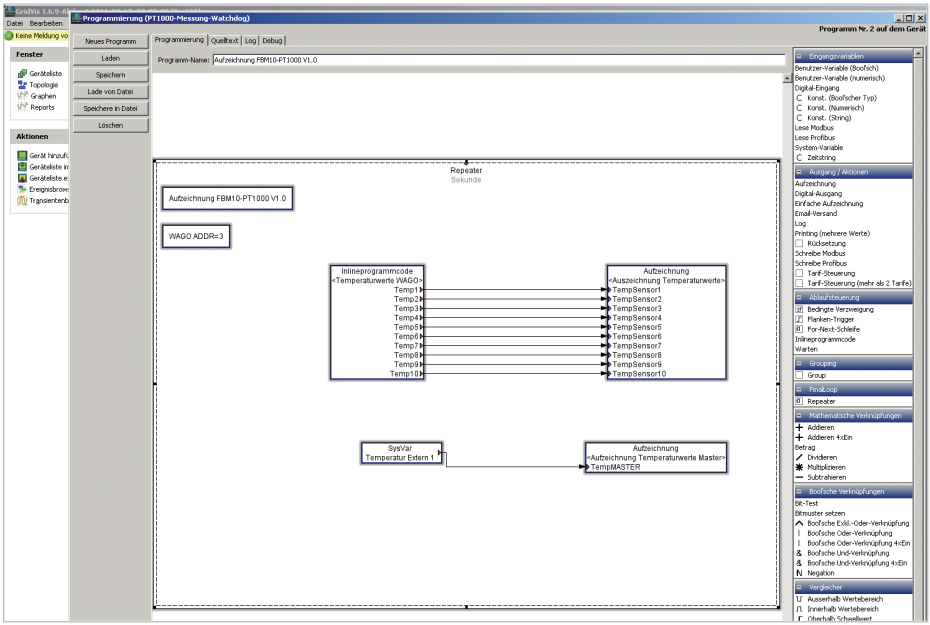




Temperature measurement APP for module FBM10PT1000



After APP installation, the values can also be saved. The programming occurs graphically.

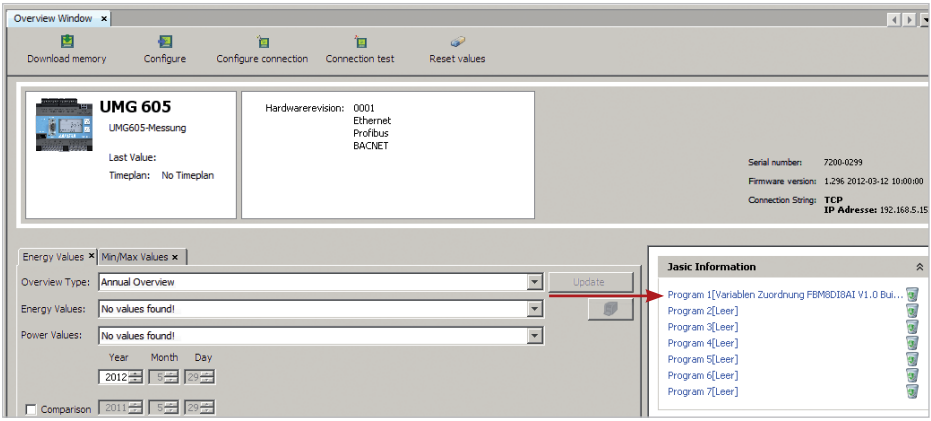


JASIC programs for module DI8AI8

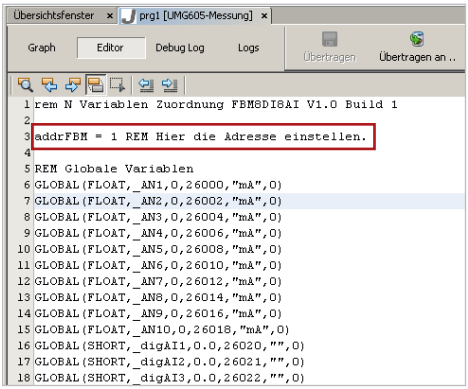
JASIC-FBM-DI8AI8-globale-Variablen.jas
JASIC-FBM-DI8AI8-Aufzeichnung.jas

These Jasic programs read out the FBM modules and place the values in global variables.
The program „JASIC-FBM-DI8AI8-Aufzeichnung.jas“ stores the analogue measurement values in the UMG.

Installation to a free program location:



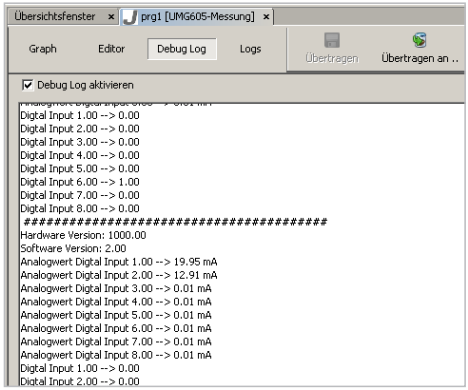
The JASIC program is installed via the button „Load from file“. Once the program has be transferred, a debug output takes place in the „Debug Log“ tab.



The device address for the FBM module is cited directly in the source text.

Default device address: 1

Important: The UMG604 must possess a different device address and must be located on the modbus master. The Baud rate is 38000 Baud.



Control of the communication and status displays must be activated after clicking on the display „*Activate Debug Log*“.

The statuses of the I/O modules are located at the following register addresses:

FBM-DI8-AI8 (15.06.079) with JASIC program “JASIC-FBM-DI8AI8-globale-Variablen.jas”

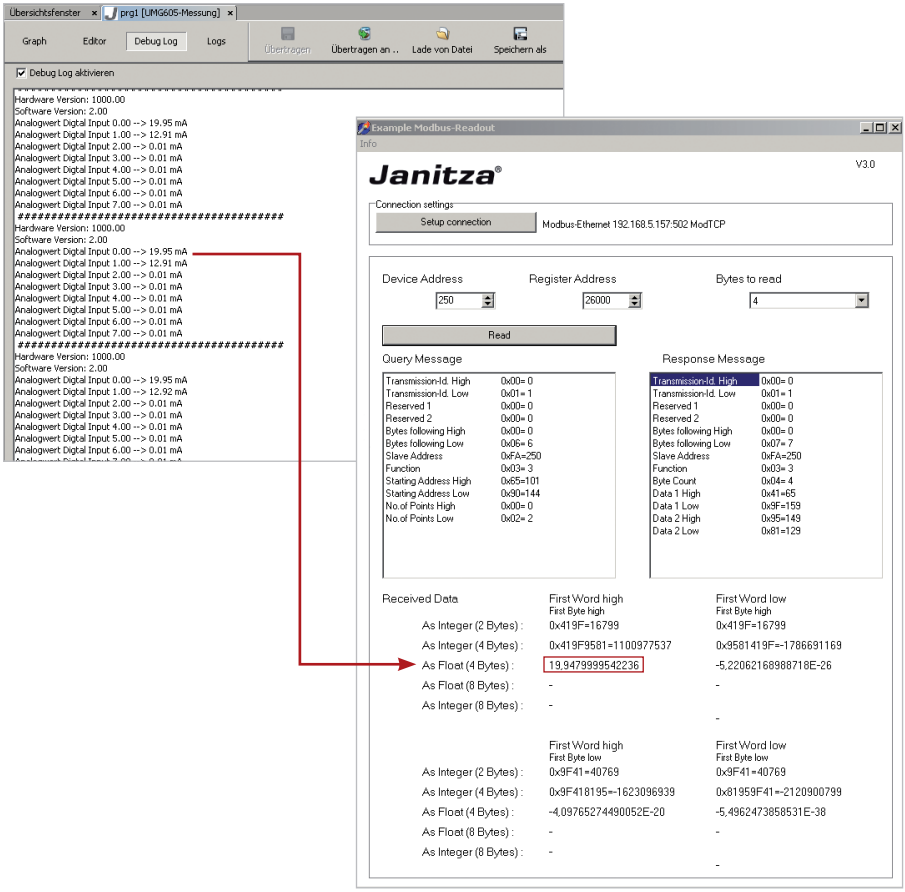
Name	Register	Type
FBM module analog input 1	26000	FLOAT (4 Byte)
FBM module analog input 2	26002	FLOAT (4 Byte)
FBM module analog input 3	26004	FLOAT (4 Byte)
FBM module analog input 4	26006	FLOAT (4 Byte)
FBM module analog input 5	26008	FLOAT (4 Byte)
FBM module analog input 6	26010	FLOAT (4 Byte)
FBM module analog input 7	26012	FLOAT (4 Byte)
FBM module analog input 8	26014	FLOAT (4 Byte)
FBM module digital input 1	26020	SHORT (2 Byte)
FBM module digital input 2	26021	SHORT (2 Byte)
FBM module digital input 3	26022	SHORT (2 Byte)
FBM module digital input 4	26023	SHORT (2 Byte)
FBM module digital input 5	26024	SHORT (2 Byte)
FBM module digital input 6	26025	SHORT (2 Byte)
FBM module digital input 7	26026	SHORT (2 Byte)
FBM module digital input 8	26027	SHORT (2 Byte)
Communication error RS485*	26028	SHORT (2 Byte)

Format: Motorola (First Byte high)

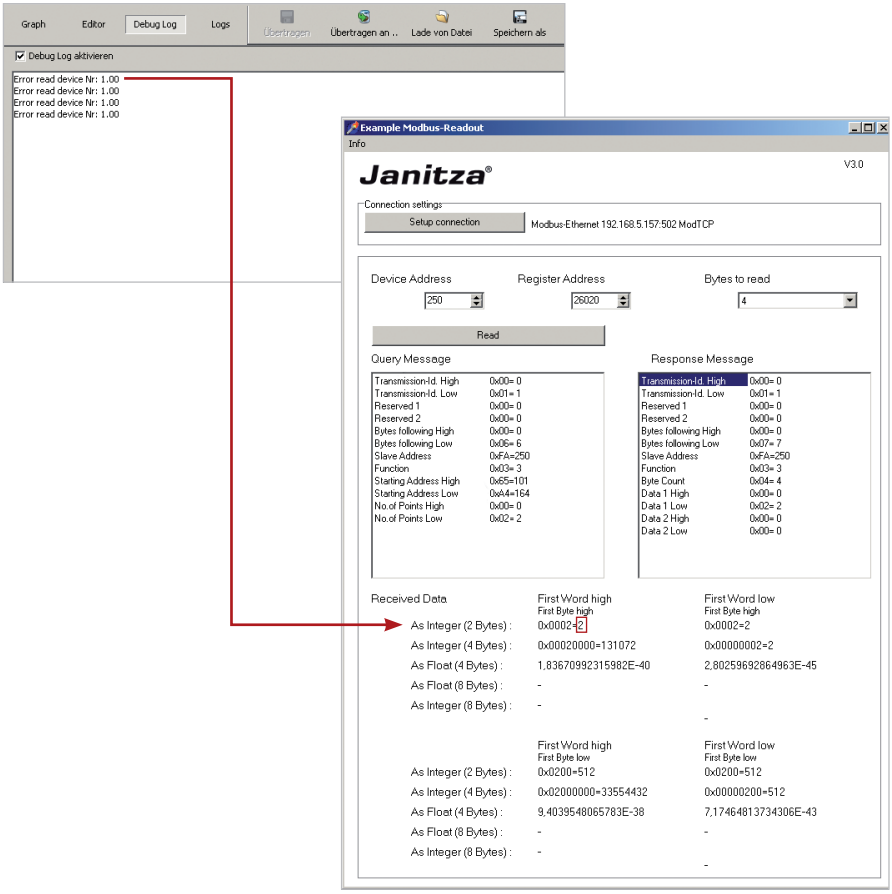
* 1 = no error; 2 = error RS485

Control with modbus diagnostics tool for module DI8AI8

(Download at: http://download.janitza.de/download_direkt/Tools/Modbus-Diagnose.zip)

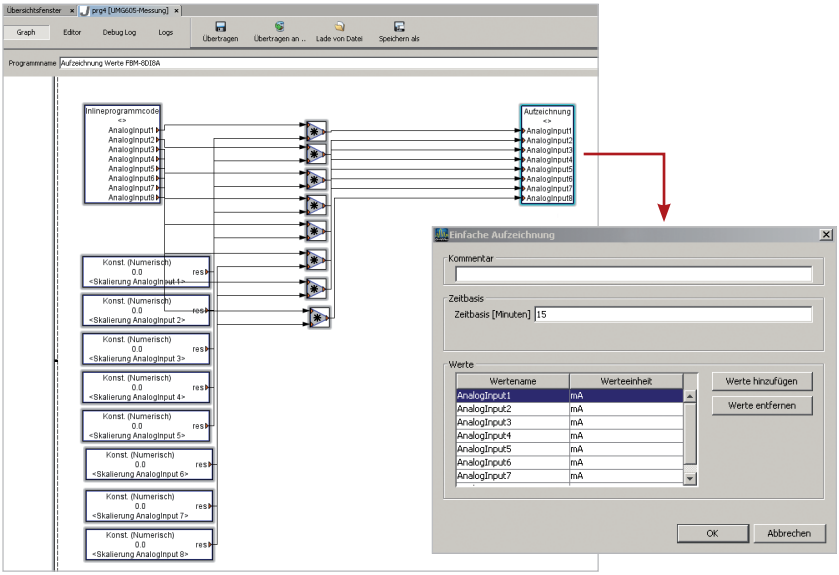


RS485 communication error



Storing the analogue input measurement values from module FBM-DI8AI8

Install the program „JASIC-FBM-DI8AI8-Aufzeichnung.jas“ to a free JASIC program location. It is subsequently possible to change the names in the recording dialogue box. It is also possible to set a scale.



Technical data

Supply voltage:	24V DC +/- 20%
Power consumption	20 mA
Bus protocol	RS 485 Modbus RTU
Configuration possibility	via DIP switch (address number, parity, baud)
Address number	1 to 63 (0 not allowed)
Parity Modbus	no parity, even parity, odd parity
Transmission rate	4800, 9600, 19200, 38400 baud
Digital inputs	Digital inputs 24 V DC / 5mA inputs
Digital outputs	Relay outputs NO contact 250V / 3A AC1 / 2A AC3
Analog inputs	PT100/PT1000 (16 bit resolution / 0…65535) 0...10V (resolution 0 ... 10.000)* 4...20mA (resolution 4.000 ... 20.000)
Environmental temperature	-10°C…+50 °C
Storage temperature	-20°C…+70 °C
Accuracy	<0.1% for temperature measurement PT1000
Temperature coefficient	<0.003% / K for temperature measurement PT1000
Terminal	Screw terminal / plug terminal 0.14 to 1mm² (pursuant to VDE)
Housing	45mm series production system
Dimensions	H x W x D 90 x 88 x 58 mm
Installation	Mounting rail TS35 or direct wall mounting
Humidity	<90% relative humidity non-condensing
EMC directives	pursuant to EN55011 Class B
Standards	CE Conformity
Protection class	IP20

* The 10V analog outputs are in preparation and are not yet integrated in the current version (FBM10PT1000/100).