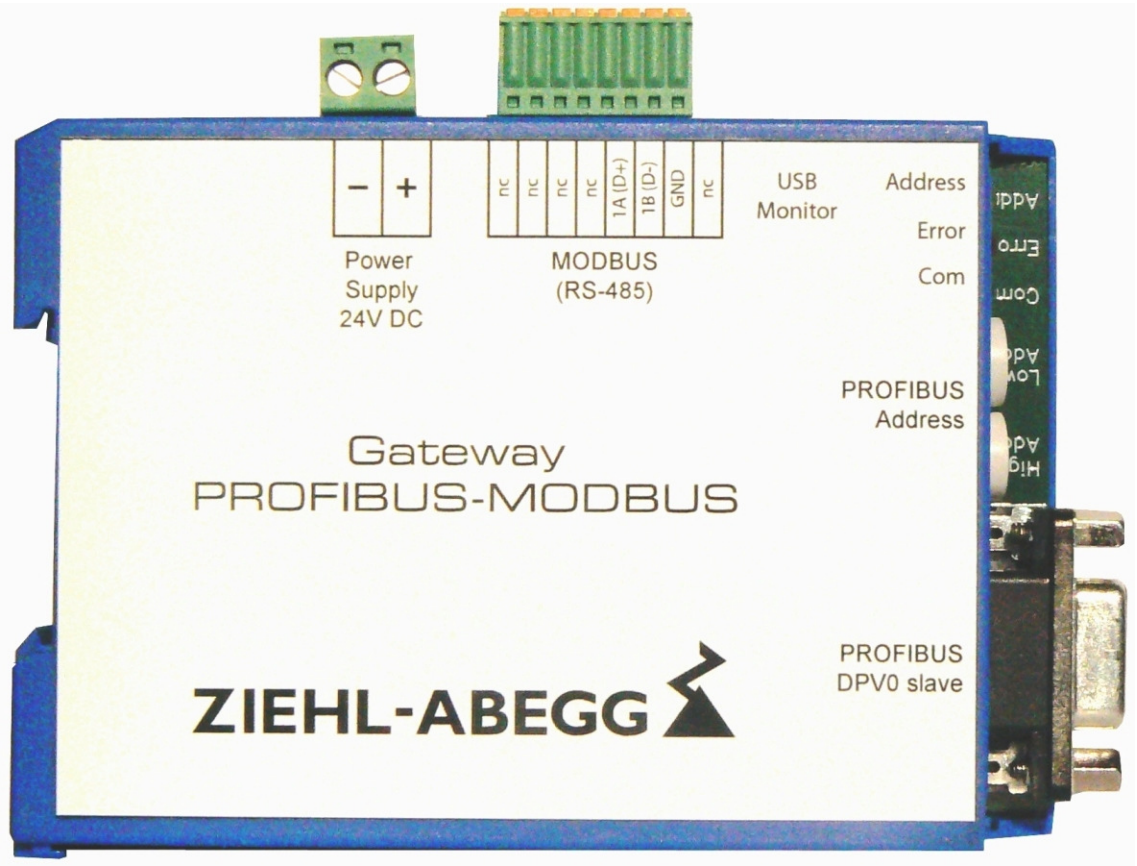
NETcon

D-G-64NE

Part.-No. 380094

Gateway PROFIBUS-MODBUS

Operating Instructions



Content

1 General notes

1.1 Structure of the operating instructions

Before installation and start-up, read this manual carefully to ensure correct use!
We emphasize that these operating instructions apply to specific units only, and are in no way valid for the complete system!

Use these operating instructions to work safely with and on the device. They contain safety instructions that must be complied with as well as information that is required for failure-free operation of the device.
Keep these operating insturctions together with the device. It must be ensured that all persons that are to work on the device can refer to the operating instructions at any time.
Keep the operating instructions for continued use. They must be passed-on to all successive owners, users and final customers.

1.2 Target group

The operating instructions address persons entrusted with planning, installation, commissioning and maintenance and servicing and who have the corresponding qualifications and skills for their job.

1.3 Exclusion of liability

Concurrence between the contents of these operating instructions and the described hardware and software in the device has been examined. It is still possible that non-compliances exist; no guarantee is assumed for complete conformity. To allow for future developments, construction methods and technical data given are subject to alteration. We do not accept any liability for possible errors or omissions in the information contained in data, illustrations or drawings provided.
ZIEHL-ABEGG SE is not liable for damage due to misuse, incorrect use, improper use or as a consequence of unauthorized repairs or modifications.

1.4 Copyright

2 Safety instructions

This chapter contains instructions to prevent personal injury and property damage. These instructions do not lay claim to completeness. In case of questions and problems, please consult our company technicians.

2.1 Intended use

The equipment is to be used solely for the purposes specified and confirmed in the order. Other uses which do not coincide with, or which exceed those specified will be deemed unauthorised unless contractually agreed. Damages resulting from such unauthorised uses will not be the liability of the manufacturer. The user will assume sole liability.
Reading these operating instructions and complying with all contained instructions - especially the safety notifications contained therein - are considered part of intended use. To consider is also the manual of attached components. Not the manufacturer, rather the operator of the device is liable for any personal harm or material damage arising from non-intended use!

2.2 Explanations of symbols

Safety instructions are highlighted with warning triangles and are depicted according to the degree of hazard as follows.

	**Attention!** General hazardous area. Death or severe injury or significant property damage can occur if the corresponding precautions are not taken!
	**Danger due to electric current** Danger by dangerous, electric voltage! Death or severe injury can occur if the corresponding precautions are not taken!
	**Information** Important additional information and advice for user.

2.3 Product safety

The device conforms to the state of the art at the time of delivery and is fundamentally considered to be reliable. The device and its accessories must only be used in a flawless condition and installed and operated in compliance with the operating instructions. Operating outside the device's technical specifications (☞ technical data) can lead to a defect in the device and additional damage!

2.4 Requirements placed on the personnel / due diligence

Persons entrusted with the planning, installation, commissioning and maintenance and servicing in connection with the frequency inverter must have the corresponding qualifications and skills for these jobs.
In addition, they must be knowledgeable about the safety regulations, EU directives, rules for the prevention of accidents and the corresponding national as well as regional and in-house regulations.
Personnel to be trained or instructed and apprentices are only permitted to work on the device under the supervision of an experienced person. This also applies to personnel undergoing general training.
Comply with the legal minimum age.
This device is not intended to be used by people (including children) who have restricted mental, sensory or intellectual abilities or who have a lack of experience and/or knowledge.

2.5 Start-up and during operation

Attention!

- During commissioning, unexpected and hazardous conditions can arise in the entire installation due to defective adjustments, defective components or incorrect electrical connections. Remove all persons and objects from the hazardous area.
- During operation, the device must be closed or installed in a control cabinet. Fuses may only be replaced by new ones and must not be repaired or bypassed. The data for the maximum line fuse are to be considered absolutely (☞Technical data). Use only fuses specified in schematic diagrams.
- Any faults detected in the electric system/modules/operating equipment must be corrected immediately. If these faults are not corrected, the device/system is potentially very dangerous. The device/system must therefore not be operated when it is faulty.
- Pay attention to smooth, low vibration running of the motor/fan, the appropriate instructions in the drive documentation must be observed!

2.6 Work on the device

Information

Mounting, electrical connection, and start-up operation may only be carried out by an electrical specialist in accordance with electrotechnical regulations (e.g. EN 50110 or EN 60204)!

Danger due to electric current

It is generally forbidden to carry out work on electrical live parts. Protection class of the device when open is IP00! It is possible to touch hazardous voltages directly.
The safe isolation from the supply must be checked using a **two-pole** voltage detector.

Attention!
Automatically restart after a power failure or mains disconnection!

2.7 Modifications / interventions in the device

Attention!
For reasons of safety, no unauthorized interventions or modifications may be made on the device. All planned modifications must be authorized by the manufacturer in writing.

Use only genuine spare parts / genuine wearing parts / genuine accessories from ZIEHL-ABEGG.These parts were specifically designed for the device. There is no guarantee that parts from non-original sources are designed and manufactured in correspondence with load and safety requirements.
Parts and optional equipment not supplied by ZIEHL-ABEGG are not approved by ZIEHL-ABEGG for use.

2.8 Operator's obligation of diligence

- The contractor or owner must also ensure that the electric systems and equipment are operated and maintained in accordance with electro-technical regulations.
- The owner is obliged to ensure that the device is operated in perfect working order only.
- The device may only be used as intended (☞ "Application").
- You must periodically examine the safety equipment for their properly functioning condition.
- The assembly instructions and/or operating instructions are always readily available at the location where the device is being used, are complete and are in legible condition.
- These persons are regularly instructed in all applicable questions regarding occupational safety and environmental protection and are knowledgeable regarding the assembly instructions and/or operating instructions and, especially, are familiar with the safety instructions contained therein.
- All safety and warning notices attached to the device are never removed and remain legible.

2.9 Employment of external personnel

Maintenance and service work are frequently carried out by external employees who often do not recognize the specific situations and the thus resulting dangers.These persons must be comprehensively informed about the hazards in their area of activity.
You must monitor their working methods in order to intervene in good time if necessary.

3 Product overview

3.1 Operational area

With this Gateway (distributed periphery) a MODBUS system with up to 64 members can be linked to an existing PROFIBUS system.

3.2 Function

The D-G-64NE acts as a MODBUS master, including autoaddressing of the slaves, which is controlled by a PROFIBUS network. Up to 64 MODBUS members can be connected to the Gateway.
The Gateway also has a USB interface which serves for bus monitoring by a PC / laptop.

Information
Detail information to the topic "auto addressing" (R-TIL10_17) can be requested over our support department for control systems - ventilation engineering (V-STE).

3.3 Maintenance

The device must be checked for soiling and, if necessary, cleaned in periodic intervals.

3.4 Transport

- The device is packed ex factory to suit the transport method previously agreed.
- Always use the original packaging materials when transporting the device.
- Avoid shocks and impacts to the device during the transport.
- During manual handling the human lifting and carrying restrictions must be observed and adhered to.

3.5 Storage

- The device must be stored in its original packaging in a dry and weather-proof room.
- Avoid exposure to extreme heat and cold.
- Avoid over-long storage periods (we recommend a maximum of one year).

3.6 Disposal / recycling

Disposal must be carried out professionally and environmentally friendly in accordance with the legal stipulations.

4 Mounting

4.1 General notes

Attention!
The following points must be complied with during the mechanical installation to avoid causing a defect in the device due to assembly errors or environmental influences:

- Before installation remove the device from the packing and check for any possible shipping damage!
- The installation in a switch cabinet or in a adequate plastic housing will be made through a snap-up on a 35 mm top-hat-rail (EN 50 022) or through screw fastening.
- Do not allow drilling chips, screws and other foreign bodies to reach the device interior!
- Do not mount equipment on vibrating base!
- Care must be taken to avoid direct radiation from the sun!

4.2 Temperature influences during commissioning

Avoid condensation in the controller and functional faults attributable to condensation by storing the controller at room temperature!

5 Electrical installation

5.1 Safety precautions

Danger due to electric current

- Work on electric components may only be carried out by trained electricians or by persons instructed in electricity under the supervision of an electrician in accordance with electrical engineering regulations.
- The 5 electrical safety rules must be observed!
- **It is forbidden to carry out work on electrically live parts.**
- Other measures may be necessary to achieve safe electrical isolation.
- A second person must always be present when working on energized parts or lines who disconnects in case of emergency.
- Inspect electrical equipment periodically: retighten loose connections – immediately replace damaged lines and cables.
- Always keep switch cabinets and all electrical supply facilities locked. Access is only allowed for authorized persons using a key or special tool.
- Operating the device with the housing cover removed is prohibited because energized, exposed parts are present inside the device. Disregarding this regulation can lead to severe personal injury.
- The required protective earth connection is established using screws between the housing parts in metal terminal space covers and housing casings. Commissioning is only permissible after these screws have been properly attached!
- The device owner is responsible for the EMC of the entire plant according to the locally applicable standards.
- Metal screwed-connections are not permitted in plastic housing parts because there is no potential equalization.
- Never clean electrical equipment with water or similar liquids.

Information

The respective connections are represented in the enclosure of this manual (☞ Connection diagram)!

5.2 Supply voltage

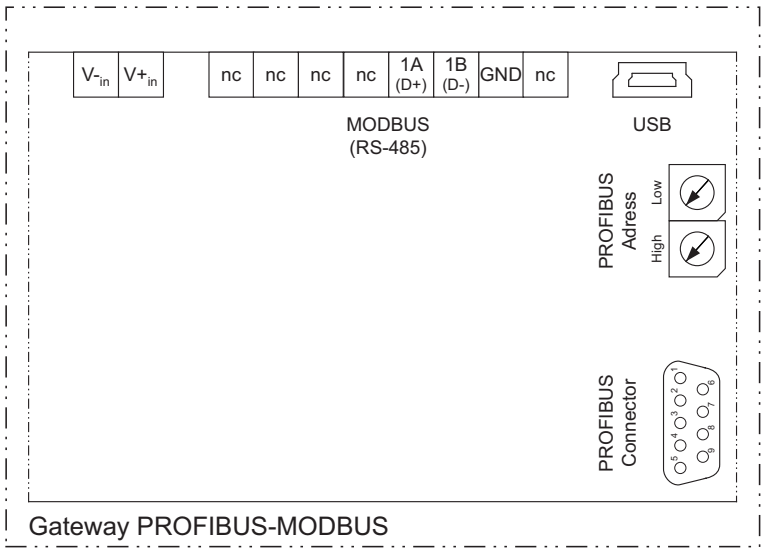
The supply voltage (☞ Technical Data) is connected at the terminals “V+in” and “V-in” by a 2-pole "MSTB 2.5/2-ST" jumper from Phoenix Contact.

Make sure that the supply voltage lies within the allowable tolerance specifications (☞ Technical data and the nameplate is fixed to the side of the device).

Option: Power supply for switch cabinet mounting
Type STEP-PS/1AC/24DC/1.75
Part.-No. 380067
Primary: 1 ~ 100...240 V +/-10 % / 50/60 Hz (600 mA)
Secondary: 24 V DC (1.75 A / 42 W)
for top hat rail mounting

5.3 Connections

The device has a SUB-D plug for connecting to the PROFIBUS network, an 8 pole plug for connecting to the MODBUS network and a Mini-USB plug for connecting to the PC.



V- / V+ Voltage supply 24 V_{DC}
1A MODBUS D+
1B MODBUS D-
GND Ground
PB Adress Low Rotary switch for setting the PROFIBUS address (bits 0:3)
PB Adress High Rotary switch for setting the PROFIBUS address (bits 4:7)
PB Connector 3 PROFIBUS B
PB Connector 5 PROFIBUS DGND
PB Connector 6 PROFIBUS VP/+5 V
PB Connector 8 PROFIBUS A

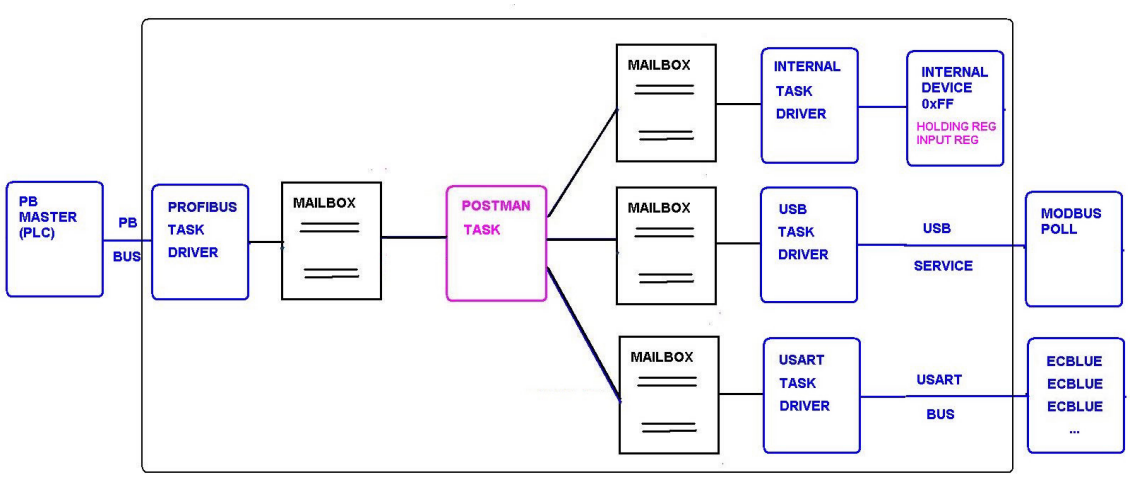
6 Communication

6.1 Firmware schema

This firmware is based on a real-time operating system, which allows for great flexibility and ensures the response time on the profibus side. Tasks run independently and parallel to each other. The common points are mailboxes in which the messages are temporarily stored.

Notes on this device:

- In a normal state, the data exchange is fast enough. The operating profibus master of the ECblue usually waits for a response or ends with a timeout. There are of course certain limitations.
  - Each message is valid up to 2000 ms only.
  - A mailbox has a limit of no more than 4 messages.
  - In an extreme situation, not all packages are sent. This is due to the fact that the profibus is generally faster than the MODBUS.
- It is also possible to monitor the communication via USB. Alternatively, the USB can be used for settings and / or communication with an ECblue. For these debugging purposes, we recommend using one of the special gateway operating modes. There are three modes available here. For more details, refer to the chapter “Gateway Operating Mode”
  - Normal
  - Profibus restricted
  - Switch
- Access to the internal MODBUS device (IMBD) is required to adjust the mode or speed. This internal MODBUS device has the MODBUS address 255, which is not normally used by an ECblue. Access is possible from profibus and / or USB. The gateway operating mode selection is temporary and resetting the device switches it back to the normal mode.
- Every change of the MODBUS baud rate is automatically saved into the flash and used after the next boot-up. It is possible to get access to the standard settings without software. In this case, use the production address and a device Reset (see the chapter on addressing for details ☞).



6.2 Speed

6.2.1 Profibus (PB)

The baud rate is in the range of 9.6 kbit/ s - 12 Mbit / and is automatically recognised. The following table lists in full the limitations of cable length and baud rates.

The D-G-64NE supports the following baudrates at the corresponding cable lengths.

9.6 kBit/s / 1000 m	500 kBit/s / 400 m
19.2 kBit/s / 1000 m	1,500 kBit/s / 200 m
45.45 kBit/s / 1000 m	3,000 kBit/s / 200 m
93.75 kBit/s / 1000 m	6,000 kBit/s / 200 m
187.5 kBit/s / 1000 m	12,000 kBit/s / 100 m

Please see the official PROFIBUS directives for further settings to the PROFIBUS, such as recommended cable type, termination, etc.

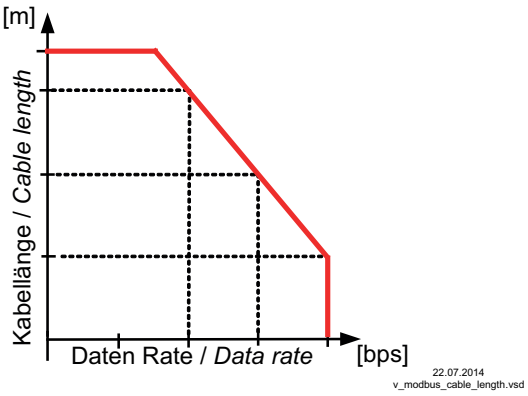
Device master data (GSD file)

The device master data file also known as device data sheet serves for simple integration of devices of different manufacturers into a PROFIBUS network.
The GSD file describes characteristics of a device such as the possible baudrates, I/Os or other features in a fixed format.
If there is any doubt about the use or procurement of the GSD file for this gateway, our V-STE support department will be very glad to help.

6.2.2 MODBUS (MB)

- The standard baud rate is 19,200 and parity 8E1
- It is possible to change the communication parameters (for details ☞ chapter IMBD)
- If you forget the settings, it is possible to reset them via Profibus or USB. Alternatively, you can use "production mode" and "device Reset" (details ☞ chapter addressing).
- The possible baud rate lies in the range of 4,800 bit/s - 115,200 bit/s. The following tables show the full list:

4,800 Bit/s	38,400 Bit/s
9,600 Bit/s	
19,200 Bit/s	115,200 Bit/s (1.6 %)



The maximum length for a RS-485 cable is calculated as follows:
Length [m] = 1200 / (1 + (baud-rate [kBaud] / 250)^2)$^{0.5}$

6.2.3 USB

The baud rate is determined automatically, although it is recommended to use the same settings as those for MODBUS.

6.3 Address

6.3.1 Addressing PROFIBUS

There are basically two possible ways to set the member's address.

There are three possible addressing groups:

- 0: reserved for the production
- 1 - 126: Hardware-Addressing
- 127: Software-Addressing

Hardware-Addressing

The hardware is addressed at two rotary switches.
After setting the address, a voltage reset* must be performed on the module because otherwise the new address cannot be accepted.

The following table contains some examples for configuration of the PROFIBUS address.
The addresses "1" to "126" (0x01 to 0x7E) are basically available.

	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L
Setting (Hex)	0	0	0	1	0	2	0	3	0	4	0	5	0	6	0	7	0	8	0	9	0	A	0	B	0	C	0	D	0	E	0	F
Address (dec)	x		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15	
...	...																															
Setting (Hex)	4	0	4	1	4	2	4	3	4	4	4	5	4	6	4	7	4	8	4	9	4	A	4	B	4	C	4	D	4	E	4	F
Address (dec)	64		65		66		67		68		69		70		71		72		73		74		75		76		77		78		79	
...	...																															
Setting (Hex)	7	0	7	1	7	2	7	3	7	4	7	5	7	6	7	7	7	8	7	9	7	A	7	B	7	C	7	D	7	E	7	F
Address (dec)	112		113		114		115		116		117		118		119		120		121		122		123		124		125		126		x	

H Rotary switch "High Addr"
L Rotary switch "Low Addr"
x not available

Software-Addressing
The following order must be followed for the software addressing:
- The address must be set to the decimal value 127 before inserting the module in the device. This corresponds to 0x7F or 0xFF at the rotary switches.
- Then a voltage reset* must be performed.
- The module then automatically has the address 126.
- Set the desired address by PROFIBUS.
- Possible addresses are 1 - 126.
- The new address is written automatically into the Flash memory after addressing.
- The Gateway module then works with the new address.

Restoring the standard software address
If you have forgotten the member address of the Gateway module, the following procedure applies:
- To reset the software address, both rotary switches must be turned to the "0" position and a voltage reset* performed.
- The following steps correspond to those for software addressing.

*** Voltage reset**
A power reset must be carried out on the complete unit! The module must not be connected or disconnected under voltage.

6.3.2 Address of the ECblue fan
- Valid range is 1-247
- 0 is reserved for broadcast
- 248-255* is reserved for internal purposes
  *) MODBUS ZIEHL-ABEGG specifiction 2.0

6.3.3 Address of the internal device
- It has the address 254 (0xFE)

6.4 Gateway-Operation mode

6.4.1 Mode 0 - normal

Mode 0 is the "normal operating mode" normally used for communication between the profibus and MODBUS. Communication can be monitored via USB.
Profibus (PB)
- Incoming packages are sent to: USB, MB, IMBD

MODBUS (MB)
- Incoming packages are sent to: PB, USB

USB
- Incoming packages are sent to: IMBD (only monitoring and settings possible)

Internal MODBUS Device (IMBD)
- Incoming packages are sent to: PB, USB

6.4.2 Mode 1 - Profibus restricted
Mode 1, "Profibus limited" enables shut-down of the profibus via the software without the need to interrupt the cable connection. This is typically used for maintenance and configuration of ECblue fans. In this case, the requesting profibus master never receives a response and ends every request with a timeout.

Profibus (PB)
- Incoming packages are sent to: IMBD (only settings possible)

MODBUS (MB)
- Incoming packages are sent to: USB

USB
- Incoming packages are sent to: MB, IMBD

Internal MODBUS Device (IMBD)
- Incoming packages are sent to: Profibus or USB (depending on request origin)

6.4.3 Mode 2 - Switch Function

Mode 2, "2-switch function", allows the profibus and USB to be used at the same time. The change-over switch recognises the origin of the request and provides it with the correct response.

Profibus (PB)
- Incoming packages are sent to: MB, IMBD

MODBUS (MB)
- Incoming packages are set to profibus or USB (depending on request origin)

USB
- Incoming packages are sent to: MB, IMBD

Internal MODBUS Device (IMBD)
- Incoming packages are set to profibus or USB (depending on request origin)

Information

As mentioned previously, all packages sent to the MODBUS address 255 are excluded. This applies to all operating modes.

6.5 Supported commands

6.5.1 overview

▷ 1 Read Coils
▷ 3 Read Holiding Register
▷ 4 Read Input Registers
▷ 5 Write Single Coils
▷ 6 Write Single Holding Registers
▷ 15 Write Multiple Coils
▷ 16 Write Multiple Holding Registers
▷ 43 Read Device Idendification
▷ 66 Wite Double Holding Registers
▷ 67 Read Production Registers
▷ 68 Write Productin Registers
▷ 71 Flash Command
▷ 72 Device Reboot
▷ 103 Auto-Addressing

Profibus (PB)
- Always 10 bytes input, 10 bytes output
- Supported function: all functions to 10 bytes, i.e. 1, 3, 4, 5, 6, 15, 66, 67, 68, 71, 72, 103

MODBUS (MB)
- Buffer limit 110 bytes
- Supported function: compatibility with ECblue fans is required for all with gateway. In practice, this means 1, 3, 4, 5, 6, 15, 16, 43, 103

USB
- Buffer limit 110 bytes
- Supported function: all with gateway. In practice however, this is dependent on the target IMBD or ECblue

Internal MODBUS Device (IMBD)
- Buffer limit 110 bytes
- Supported address range only 254
- Supported function: 3. 4, 6, 66, 67, 68, 71, 72

Information

Only the most interesting functions are listed, the list may not include all functions. Please contact our technical support if you have any further questions.

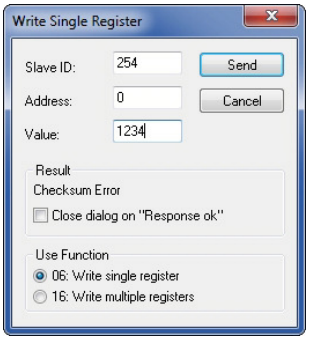
6.6 Internal MODBUS Device (IMBD)

This device behaves like a MODBUS device with the address 254. It is a virtual device that is no different to a real one. It has “holding” and “input” registers. The holding registers can be used for gateway settings, the input register to read out statistics. Follow this chapter for more details.

6.6.1 Holding register

- Holding Register 0 - Gateway Operation mode

Value	Mode	Alias	Comments
Any other	Mode 0	Normal (PB data, USB monitoring)	-
1234 (dec)	Mode 1	Profibus disabled (only USB data)	Requieres PIN 1234
5678 (dec)	Mode 2	Switch (PB and USB data)	Requieres PIN 5678

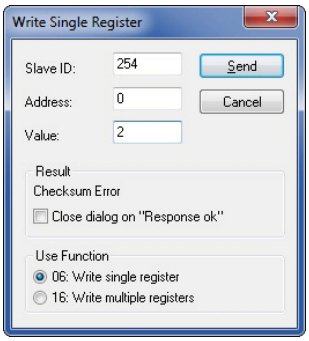


Example of change to operating mode

- Holding Register 1 - Baudrate für MODBUS
  - After a change, it is saved in the flash drive and the settings are used after the next device reset.
  - In order to use this register, always use the correct index as per the following table.

Index	Baudrate [Bit/s]
0	4.800
1	9.600
2	19.200
3	38.400
4	115.300

List of baud rates

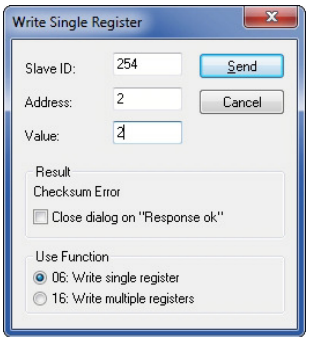


Example for change to baud rate

- Holding Register 2 - parity for MODBUS
  – After a change, it is saved in the flash drive and the settings are used after the next device reset.
  – In order to use this register, always use the correct index as per the following table.

Index	Parität
0	8N1
1	8O1
2	8E1
3	8N2

List of parities



Example for change to parities

6.6.2 Input register

- Input register 0 - PB RX packages
- Input register 1 - MB RX packages
- Input register 2 - USB RX packages
- Input register 3 - IMBD RX packages

6.7 Communication with ECblue fans

Information

- The figures given in the tables are usually decimal and the hexadecimal numbers have the prefix 0x. e.g. 0x100 means 100 hexadecimal.
- All examples in this chapter were handled with the MODBUS address 1

6.7.1 read data

Request data:
Format for a character string from the PROFIBUS to the MODBUS:

Head	0x01	Meter	Runs automatically continuously from 0x01...0xFF
	0x06	Length	Always "6" for reading data
MODBUS	0x01	Device address (MODBUS)	MODBUS address of slave
	0x04	Command	3 or 4 stands for READ DATA
	0x0002	Index	Register-Index (possible: 0 ... 49)
	0x0001	Data	Counts the requested data

Received reply:
Format for a character string from the MODBUS to the PROFIBUS:

Head	0x02	Meter	Increased automatically after receiving a packet
	0x05	Length	Packet length
MODBUS	0x01	Device address (MODBUS)	MODBUS address of slave
	0x04	Command	3 or 4 stands for READ DATA
	0x02	Data meter	Data meter (number of bytes received)
	0x0010	Data	Here: 2 data bytes received

6.7.2 Write data

Request data:
Format for a character string as reply from the MODBUS back to the PROFIBUS:

Head	0x01	Meter	Runs automatically continuously from 0x01...0xFF
	0x06	Length	Always "6" for writing data
MODBUS	0x01	Device address (MODBUS)	MODBUS address of slave
	0x06	Command	6 stands for WRITE DATA
	0x0002	Index	Index of holding register
	0x0010	Data	Data of requested register

Received reply:
Format for a character string from the MODBUS to the PROFIBUS:

Head	0x02	Meter	Increased automatically after receiving a packet
	0x06	Length	Packet length
MODBUS	0x01	Device address (MODBUS)	MODBUS address of slave
	0x06	Command	6 stands for WRITE DATA
	0x0002	Index	Index of holding register
	0x0010	Data	Data of requested register

6.7.3 Example for setting of an ECblue

The following example shows the setting of an ECblue. It should be set accordingly so that it turns with 20% of its rated speed.
The ECblue has the MODBUS address 1.

First the function of "D1" is set to "OFF" (Register h14, value 0)

Meter	Length	Device address	Command	Register	Value
0x01	0x06	0x01	0x06	0x000E	0x0000

Then we set the mode to "0-100%" (Register h04, value 3)

Meter	Length	Device address	Command	Register	Value
0x02	0x06	0x01	0x06	0x0004	0x0003

Finally we set the desired percentage (Register h02, value 20)

Meter	Length	Device address	Command	Register	Value
0x03	0x06	0x01	0x06	0x0002	0x0014

The ECblue with the MODBUS address 1 now turns with a speed of 20% of its rated speed.

6.7.4 Manual addressing of the MODBUS slave

The individual MODBUS addresses are parameterised directly at the respective slaves.

6.7.5 Autoaddressing of the MODBUS-Slaves

There are three pre-defined commands to the MODBUS slaves for the autoaddressing.

Information
The autoaddressing is only possible with ZIEHL-ABEGG ECblue motors and frequency converters with built-in AM-MODBUS modules.

1st phase – initialise addressing mode

Head	0x01	Meter	Increased automatically after sending a packet
	0x08	Length	Always use 8 for autoaddressing
MODBUS	0x00	Device address (MODBUS)	00 = Broadcast
	0x67	Function	Special MODBUS function (103)
	0x0040	Sub-function	MODBUS sub-function
	0x0001	ID Option	Phase 1
	0x0000	Data	Data

2nd phase – change address

Head	0x02	Meter	Increased automatically after sending a packet
	0x08	Length	Always use 8 for autoaddressing
MODBUS	0x01	Device address (MODBUS)	Address the devices in order
	0x67	Function	Special MODBUS function (103)
	0x0040	Sub-function	MODBUS sub-function
	0x0002	ID Option	Phase 2
	0x0001	Data	Assign new slave address

Head	0x03	Meter	Increased automatically after sending a packet
	0x08	Length	Always use 8 for autoaddressing
MODBUS	0x02	Device address (MODBUS)	Address the devices in order
	0x67	Function	Special MODBUS function (103)
	0x0040	Sub-function	MODBUS sub-function
	0x0002	ID Option	Phase 2
	0x0002	Data	Assign new slave address

Head	0x04	Meter	Increased automatically after sending a packet
	0x08	Length	Always use 8 for autoaddressing
MODBUS	0x03	Device address (MODBUS)	Address the devices in order
	0x67	Function	Special MODBUS function (103)
	0x0040	Sub-function	MODBUS sub-function
	0x0002	ID Option	Phase 2
	0x0003	Data	Assign new slave address

Information
The addressing runs until the last device (max. number of devices is 64) is re-addressed.

The byte fort he device address (to address the device, byte no. 3) is consecutive and is assigned fixed by the command in phase 1.
The new slave address (byte no. 7) on the other hand is freely selectable providing that it is between 1 and 247.

3rd phase – end addressing mode

Head	05	Meter	Increased automatically after sending a packet
	08	Length	Always use 8 for autoaddressing
MODBUS	00	Device address (MODBUS)	00 = Broadcast
	67	Function	Special MODBUS function
	0040	Sub-function	MODBUS sub-function
	0003	ID Option	Phase 3
	0000	Data	Data

6.7.6 Error byte

When the addressed MODBUS device detects an error, it replies with the appropriate command. This so-called error command results from the requested command added with 0x80. If an error occurs when writing, for example, this would be 0x06 + 0x80 =0x86

6.7.7 LED functions

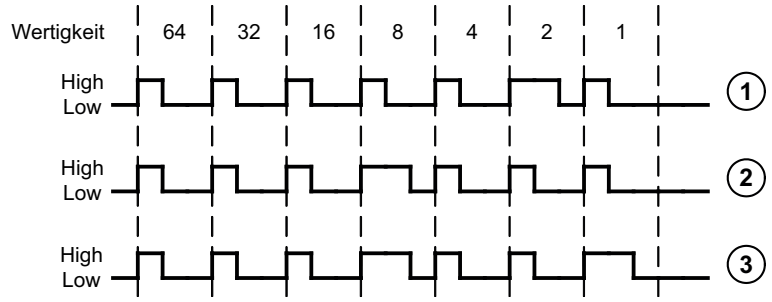
LED "Com" green
This LED signals the status of the connection between PROFIBUS and MODBUS:
- LED on: Communication OK
- LED off: No communication or error

LED "Error" red
The Error-LED signals existing errors in the PROFIBUS configuration by a blink code:
- LED off: No error exists
- LED flashes 1x per cycle: Parameter error exists
- LED flashes 2x per cycle: Configuration error exists
- LED flashes 7x per cycle: Internal communication error exists

See the chapter "Errors" for adjustment of the errors.

LED "Addr" yellow
The Address-LED signals the set PROFIBUS address by a binary blink code:
- LED blinks long: corresponds to logic "1"
- LED blinks short: corresponds to logic "0"
- Sum of the bits: 7

The following picture describes the conversion of the binary blink code into a decimal number based on three examples:



Characteristic 1 symbolises the decimal number 2, corresponding to the PROFIBUS address 2
Characteristic 2 symbolises the decimal number 8, corresponding to the PROFIBUS address 8
Characteristic 3 symbolises the decimal number 9, corresponding to the PROFIBUS address 9

The blink code always consists of 7 bits which corresponds to 7 blinks followed by a short pause.
Long blinking corresponds to logic 1, short blinking to logic 0.
The blink code begins with the most significant bit and ends with the least significant bit.
With seven bits this corresponds to the values of 2^6 bis 2^0.

If the values at which the corresponding bit is logic 1 are then added, you get the PROFIBUS address of the Gateway as a decimal number.

Possible LED codes

LED yellow	LED red	LED green	Description	Validity
General				
Off	Off	Off	not in operation	
- - -	Off	- - -	device ready for operation	
Off	On	Off	Red LED lights after reset	once, for approx. 5 s
On	On	Off	Hardware error, memory error	continuously, in case of error
7x binary	- - -	- - -	Bus address display	continuously, if no board error exists
fast flashing	- - -	Off	Invalid bus address (0 or 127)	continuously, in case of error
1x	- - -	Off	System clock error	continuously, in case of error
2x	- - -	Off	External oscillator error, device runs with internal clock source	continuously, in case of error
3x	- - -	- - -	I^2C-Fehler	as long as connection is faulty
PROFIBUS specific				
7x binary	Off	Off	device ready for operation	
7x binary	Off	On	device in operation	
Off	1x	Off	Parameter error	continuously, in case of error
Off	2x	Off	Configuration error	continuously, in case of error
Off	fast flashing	Off	Internal communication error	continuously, in case of error

fast flashing cycle time = 300 ms corresponds to 150 ms pulse / 150 ms pause
binary blinking cycle time = 600 ms corresponds to 150 ms pulse / 450 ms pause
normal blinking cycle time = 600 ms corresponds to 300 ms pulse / 300 ms pause
- - - These LEDs can be ignored in the named combinations

7 Failure

7.1 Parameter error

The settings of the user parameters in the .gsd file do not match the Gateway configuration.

Adjustment

Check the setting of the following parameters in the .gsd file.

- Max _ User _ Prm _ Data _ Len
- Ext _ User _ Prm _ Data _ Const

7.2 Configuration error

The configuration in the .gsd files does not match the Gateway configuration.

Adjustment

Check configuration, example:

- input - " READ / 10B / IN" 0x40 0x89
- output - " WRITE / 10B / OUT" 0x80 0x89

7.3 Internal communication error

Communication of the two microcontrollers in the Gateway is faulty.

Adjustment

Perform voltage reset at the Gateway.
If the Gateway still displays the error after the reset, adjustment is not possible!
The Gateway is defective.

7.4 Member error message

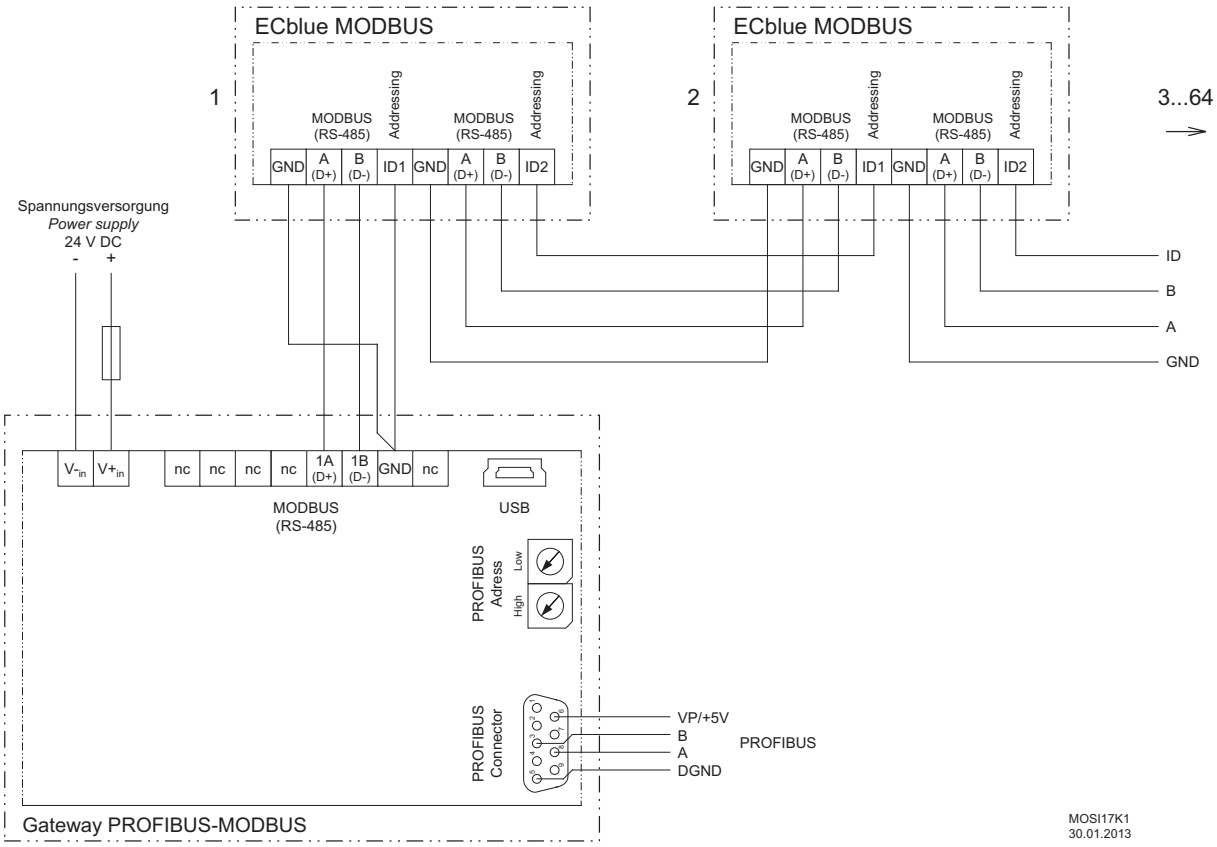
If errors occur on a MODBUS member, these are displayed directly on the affected member.
In this case please consult the appropriate operating instructions of the member.

8 Enclosure

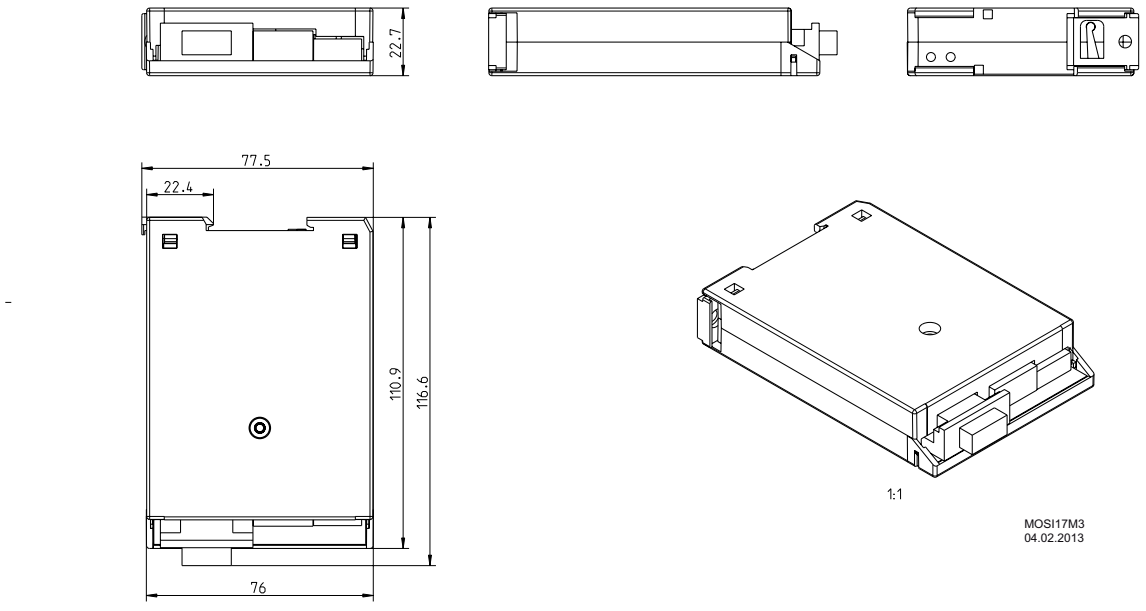
8.1 Technical data

Supply voltage	24 V DC +/- 10 % 35 mA (Phoenix 2 pole)
Interfaces	• PROFIBUS – 1x Sub-D, 9 polig – 1 x Communication Status LED (green) – 1 x Error LED (rot) – 1 x Adress LED (gelb) • MODBUS RTU RS485 – 1 x RS-485 (8-pole jumper, unshielded) – COM Parameter: 19,2kBd, 8E1 – Integrated network and fail safe termination (150 Ω) – up to 64 members • Mini-USB – Virtual serial port
Permissible ambient temperature	0...55 °C
Permissible rel. humidity	85 % no condensation
Electromagnetic compatibility	Interference emission EN 61000-6-3 (domestic household applications) Interference immunity EN 61000-6-2 (industrial applications)
Housing protection	IP20
Weight	80 g

8.2 Connection diagram



8.3 Dimensions [mm]



8.4 Manufacturer reference CE

Our products are manufactured in accordance with the relevant international regulations. If you have any questions concerning the use of our products or plan special uses, please contact:

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info@ziehl-abegg.de
http://www.ziehl-abegg.com

8.5 Service information

If you have any technical questions while commissioning or regarding malfunctions, please contact our technical support for control systems - ventilation technology.
phone: +49 (0) 7940 16-800
Email: electronic4fans@ziehl-abegg.com

Our worldwide contacts are available in our subsidiaries for deliveries outside of Germany. ☞ www.ziehl-abegg.com.
If you make returns for inspections or repairs we need certain information in order to facilitate focused trouble shooting and fast repair. Please use our repair tickets for this. It is provided to you after you have consulted our support department.
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