

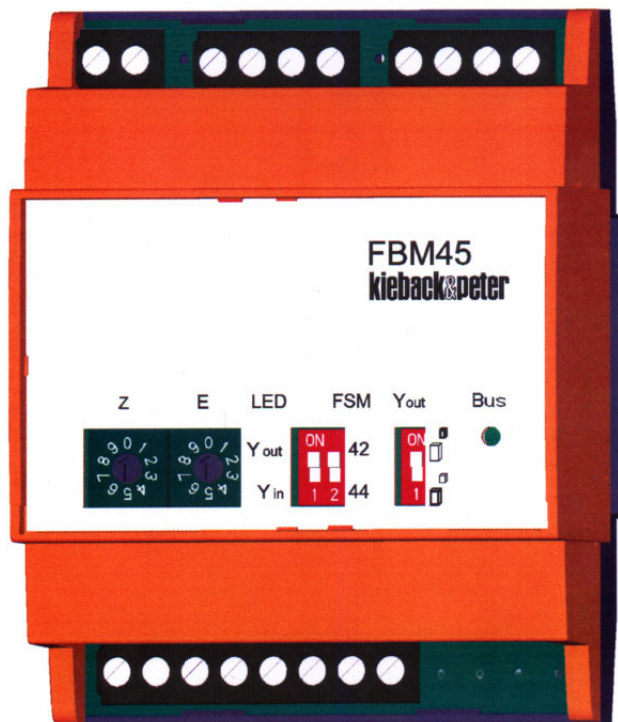
Device description

FBM45 Field Bus Modul

with 4 analog inputs and outputs as well as a connection to a FSM42 or FSM44

FieldBusModule FBM45

with four analog inputs and outputs as well as a connection to a FrontSwitchingModule FSM42 or FSM44 for manual operation



Änderungen vorbehalten

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Notice about the device description

The description contains information on the fields of application and mounting instructions for the field bus module FBM26.

Should there be questions that cannot be answered with the help of the device description, additional information should be obtained from the supplier or manufacturer.

The quoted regulations/guidelines for installation and mounting are valid for the Federal Republic of Germany. If the region of application of the devices is another country, then the plant builder or operator is obliged to ensure that the national regulations are observed.

The operating personnel should be trained using the information in these technical data sheets.

Security notice

For the mounting and the implementation of these devices, the currently valid work protection, accident safety as well as the VDE regulations must be observed.

Mounting, installation and commissioning work on the devices may only be carried out by qualified expert personnel, see section "Qualified expert personnel".

Everyone involved with these devices must have read and understood the description in the technical data sheet.

Symbol meanings within the technical data sheet:



Danger

Warning of dangerous electric voltage



Warning

General warning, notice must be heeded



Notice

Additional Notices of interest

Danger means that if ignored, there is a danger to life, massive bodily hurt or considerable damage to machines.

Warning means that if ignored, injury or damage to machines might occur.

Notice means that information is being presented that should be particularly noted.

Qualified expert personnel

Qualified expert personnel in the sense used in the technical data sheet are individuals who are familiar with the devices described and who have adequate qualifications for their job.

Examples of what might belong to this description:

- authorization to make the device connection according to the VDE legal provisions and the local EVU regulations as well as a local plant authorization to turn ON, OFF and the clearing of devices.
- Knowledge of the safety precautions.
- Knowledge of the range of applications and functions of the devices within the plant systems.

Etc.

Device description

FBM45 Field Bus Modul

with 4 analog inputs and outputs as well as a connection to a FSM42 or FSM44

Application

In the digital regulating system DDC3000; the field bus module FBM25, with its four analog outputs, has the function of switching the remote devices in the plant technical system (ITS).

Four additional analog inputs permit the acceptance of digital data points from the ITS.

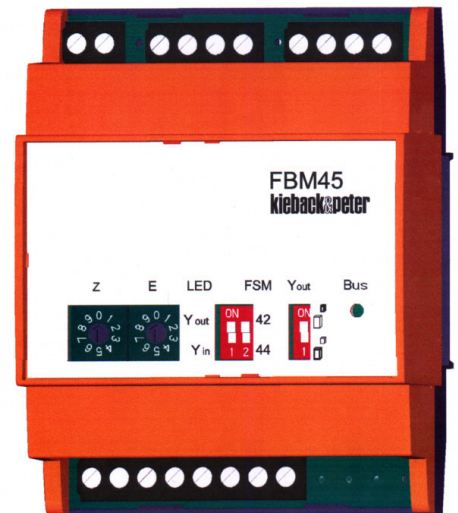
For stand-alone manual operation, the field bus module FBM45 possesses a QBS interface to the connection of a FrontSwitchingModule FSM.

The FBM45 can function in two different types of operation.

Remote operation: drive of the four analog outputs Yout1..4 with the field bus of the DDC3000 Central Control Unit.

Local operation: direct drive of the four analog outputs Yout1..4 with the four analog inputs Yin1..4.

For both types of operation, the manual control of the four analog outputs Yout1..4 has priority over a connected FrontSwitchingModule FSM42 or FSM44.



Type

FBM45 Field bus module with four analog outputs 0..10 V DC and four analog inputs 0..10 V DC as well as a connection to a FrontSwitchingModule FSM42 or FSM44 for manual operation

Technical data

Operating voltage 12 V DC +20%/-5%, 200 mA, 2.4 VA

Outputs Four analog outputs Yout1..4, 0..10 V DC, 5 mA

Inputs Four analog inputs Yin1..4, 0..10 V DC, Ri 22.6 kΩ / 0.44 mA

Field bus connection Four conductor, max. 2000 m

Interface QBS Four conductor, max. 30 m to the connection of a FSM42 or FSM44

Address switch Field bus addressing 01..63 with 2 rotary switches Z and E
Switch Z: setting of the tens place 0x..6x, switch E: setting of the ones place x1..x9

Switch LED Selection of the outputs Yout or the inputs Yin for LED bar graph display in the FSM

Switch FSM Setting of the connected FSM type FSM42 or FSM44

Switch Yout Drive select for outputs Yout1..4

Setting (upper Pos.): type of operation remote: drive on the field bus in FSM setting Auto. inputs Yin1..4 are available for arbitrary logic operations in the DDC System

Setting (lower Pos.): local operation: drive of the inputs Yin1..4 in FSM setting Auto

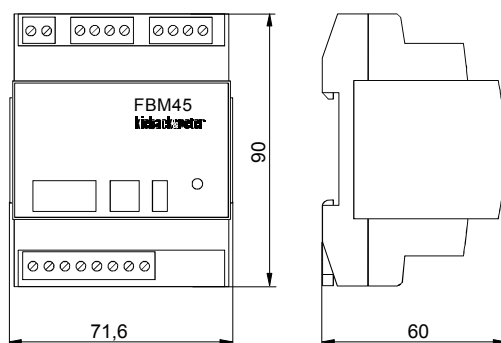
LED Bus Display of field bus communication

Degree of enclosure protection IP20

Environmental temp. 0..45°C, not condensing

Weight 120 g

Measurements



FBM45 Field Bus Modul

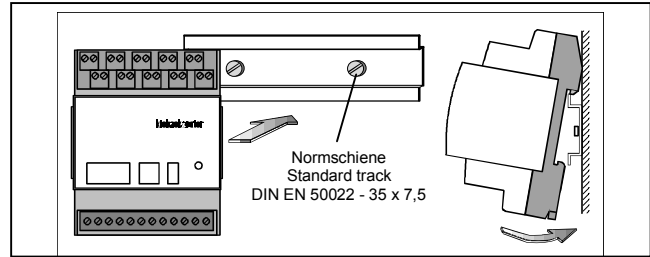
with 4 analog inputs and outputs as well as a connection to a FSM42 or FSM44

Device description

Mounting

The mounting of the FBM45 may only be carried out by qualified expert personnel in a voltage-free control panel!

The FBM26 are snapped onto a hat rail DIN EN 50022 - 35 x 7,5.



Installation

Mains voltage 230 V on the relay outputs is possible!

The electrical installation of the devices connection may only be carried out by qualified expert personnel, e.g. by a trained electrical technician.

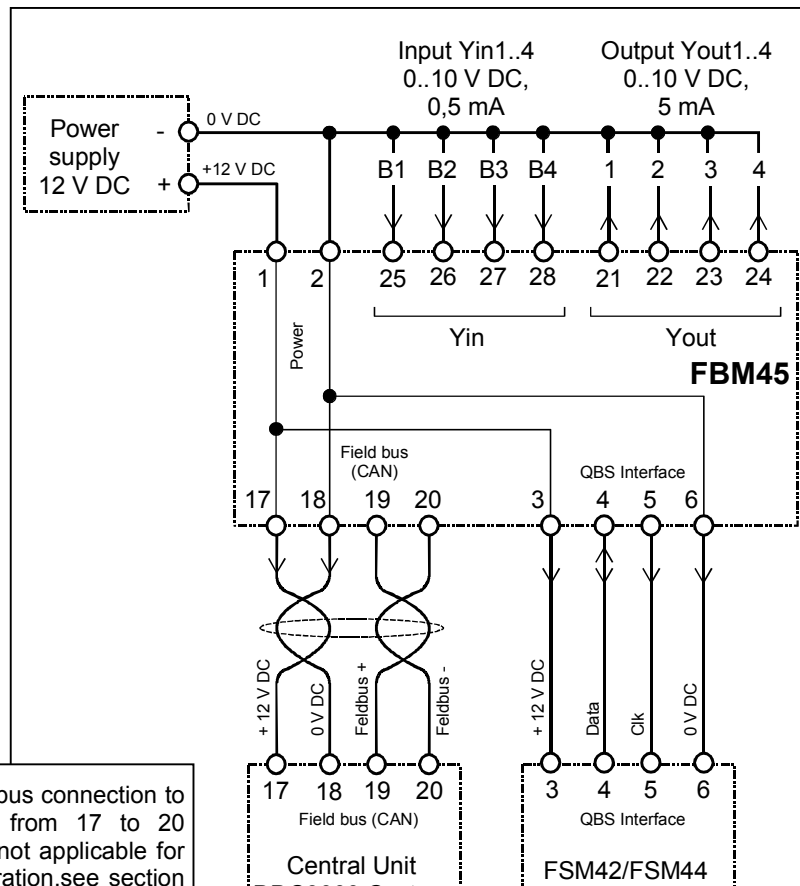
The VDE regulations as well as all the local ordinances must be observed.

- lines for the field bus (terminal n 19, 20) and the voltage supply 12 V DC (terminal n 17, 18) should be run together in a shielded cable, cable type is at a minimum: JY(St)Y 2x2x0.8 Lg.

Lines for power supply must in the form of twisted pairs.

Lines for field bus must in the form of twisted pairs.

- At the end of the field bus (most distant point from the Central Unit, max. 2000 m) a terminating resistance of ca. 180 Ω must be connected between the lines of the field bus (a terminating resistor is a part of the Central Unit accessory kit).
- The four conductor control line QBS for the FrontSwitchingModule FSM20/22/24/26 can have a maximum length of 30 m. Twisted pairs are not required.



The field bus connection to terminals from 17 to 20 could be not applicable for local operation, see section on types of operation.

Notice
When connecting positioner devices on the outputs Yout1..4, the connection example in the device description of the Front switching module FSM42 / FSM44 should be noted.



Warning

Switch on mains only after devices have been set by the commissioning technician!

Device description**FBM45 Field Bus Modul**

with 4 analog inputs and outputs as well as a connection to a FSM42 or FSM44

Types of operation (Setting and function)

The field bus module FBM45 can be run in two different modes of operation. The type of operation is selected with the switch Yout on the FBM45.

1. Remote operation: Drive of the FBM45 with the field bus of the DDC Central Control Unit with/without FrontSwitchingModule FSM42 or FSM44 for automatic/manual control .

- Switch Yout  to Set (upper position).

- Without FrontSwitchingModule FSM

The four analog outputs Yout1..4 (0..10 V DC) of the field bus module FBM45 are controlled with the field bus of the DDC Central Control Unit.

The analog inputs Yin1..4 (0..10 V DC) are made available for arbitrary logic operations in the DDC Central Control Unit.

The function stated of the field bus module FBM45 are sent back as internal contacts on the field bus to the DDC Central Control Unit and are available there for further processing and logic operations.

The switch LED and FSM have no function without the FSM connection.

- With FrontSwitchingModule FSM42 or FSM44

The four analog outputs Yout1..4 (0..10 V DC) of the Field bus module FBM45 in FSM automatic operation are controlled with the field bus by the DDC Central Control Unit.

The analog inputs Yin1..4 (0..10 V DC) are made available for arbitrary logic operations (parameter B1..B4) in the DDC Central Control Unit.

The connected FSM type FSM42 or FSM44 type is selected with the double switch FSM on field bus modules FBM45.

With the FrontSwitchingModule FSM, the analog outputs Yout1..4 K4 can be switched for manual operation.

The manual operation set by the FrontSwitchingModule FSM.. has priority over the field bus control.

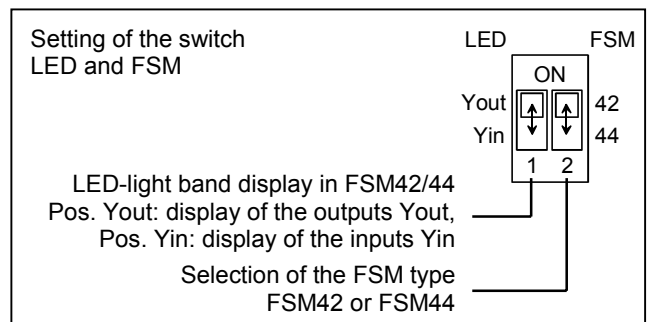
The manual operation works in stand-alone mode so that switching of the relay outputs on the connected FrontSwitchingModule FSM.. is possible at any time even when field bus transmission is interrupted.

If not all of the relay outputs are addressed by the FrontSwitchingModule FSM.. (FSM42), then the rest of the outputs remain switched over the field bus control.

Switch and function states of the field bus modules FBM26 as well as of the FSM.. are returned as internal contacts on the field bus to the DDC Central Control Unit and are made available for further processing and logic operations.

The FSM42 and FSM44 have an eight place light bar display where the analog inputs Yin or the analog outputs Yout are displayed.

The selection for the display of the inputs or outputs is done with the switch LED.



2. Local operation : Independent functional unit with/without FrontSwitchingModule FSM42 or FSM44 for automatic/manual control .

- Switch Yout to Set (lower Position).

- Without FrontSwitchingModule FSM

The four analog outputs Yout1..4 are driven directly by the four analog inputs Yin1..4.
Input Yin1 switches output Yout1, Yin2 switches Yout2, Yin3 switches Yout3 and Yin4 switches Yout4.

In this type of operation, the FBM45 serves as a signal amplifier, e.g.. for signals 0..10 V DC from remote systems (connection on FBM inputs Yin1..4).

The FBM outputs Yout1..4 are connected to the positioning facilities in the plant.

If there is a field bus connection with a setting for the field bus address, the FBM45 acts like a gateway to the remote system.

In this case, the digital signal of the remote system as well as the signals of the FBM relay outputs are returned as internal contacts to the DDC Central Control Unit and are therefore made available in the DDC System and in the building management system BMS.

The switch LED and FSM have no effect without a FSM connection.

- With FrontSwitchingModule FSM

In FSM automatic operation, the four analog outputs Yout1..4 are directly controlled by the four analog inputs Yin1..4.

Input Yin1 switches output Yout1, Yin2 switches Yout2, Yin3 switches Yout3 and Yin4 switches Yout4.

The connected FSM type is set with the switch FSM on the Field bus module FBM45.

With the FrontSwitchingModule FSM, the analog outputs Yout1..4 can be controlled by manual operation.

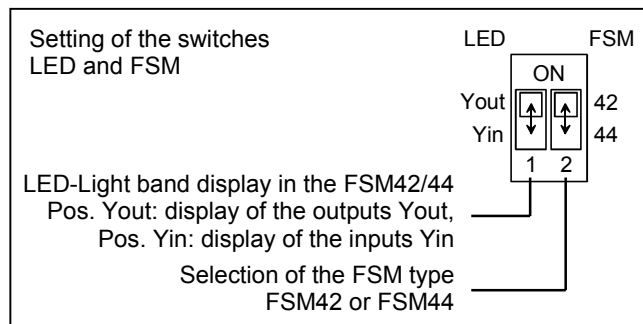
The manual operation with the FrontSwitchingModule FSM has priority over control by the analog inputs Yin1..4.

If only one part of the relay outputs is being controlled by the FrontSwitchingModule (FSM42), then the rest of the outputs remain controlled by the digital inputs Yin3..Yin4.

The FSM42/FSM44 has eight place LED light band displays for displaying the analog inputs Yin or the analog outputs Yout.

Selection for the display of the input or output signals is done with the switch LED on the FBM45.

With a field bus connection and with a setting of the field bus address, the FSM/FBM functions are sent back to the DDC Central Control Unit and are here made available to the DDC System and to the building management system BMS.



Device description

FBM45 Field Bus Modul

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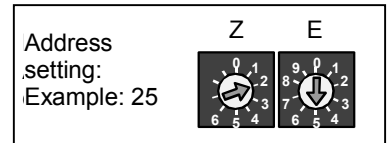
Commissioning



Danger

Commissioning may only be carried out by expert qualified personnel, e.g. by the commissioning-technician/engineer.

1. Check that mounting, installation and device connection are carried out in a voltage-free state.
2. Set type of operation (see section types of operation).
3. For remote operation (relay control K1..4 on the field bus), set the field bus address. Address range: 01 to 63.
Switch Z for tens place / switch E for ones place.



For local operation (Yout drive with inputs Yin) and without field bus connection, leave the address switching setting to the initial setting 00.

For field bus connection for the acceptance of signals from the DDC System, the field bus address 01 to 63 should be set.



Notice

With the address switch setting 00 (initial setting), the field bus is switched to passive.

4. Turn on power supply and test functions including the FSM drive.

- **Test function**

An automatic test function is available for the FBM45 The LEDs and drives of the Manual/Auto switch in the connected FSM as well as the drives of the analog outputs Yout of the FBM45 can be checked.



Warning

Before activating the test function, make certain that during the cyclical process of the tests and the switching of the relay outputs, no functional damage is done to the connected devices or other plant components. If necessary, the connection lines of the relay outputs should be made voltage-free or disconnected.

- The test function are activated when the address switch is set to 99. After an initialization phase of about 5 sec., the function test can be started by changing the switch K. The test process can be terminated at any time by leaving the address switch setting 99.

- **Function test of the connected FSM42 or FSM44**

Switch Yout  to Set (upper Position).

In the first test section, all LEDs (LED Test) in the FSM light up for about 3 sec.

In the second test section, the switch controls in the FSM are tested. increasing chain of lights on the LED light bar display signal the beginning of the Manual/Auto switch test.

The Manual/Auto switches must now sequentially be turned to the setting 70 %.

If the respective correct switch setting is recognized, then the accompanying LED light bar display turns off. The setting test 70 % is completed, when all LED light bar displays are turned off.

Then the Manual/Auto switches must be sequentially turned to the setting 30 %. If the respective correct switch setting is recognized, then this is notified by the blinking of the accompanying LED light band display. The setting test 10 % is completed when all LED light bar displays are blinking.

The switch test is automatically terminated when, in the third test step, all Manual/Auto switches are turned to the automatic symbol and all LED displays including the LED ERROR are off.

After 10 seconds, a new test cycle is automatically started.

The FSM function test is terminated when the switch LED on the FBM45 is switched from Yin to the FBM45 function test, or the address switch is changed from the setting 99.

FBM45 Field Bus Modul

with 4 analog inputs and outputs as well as a connection to a FSM42 or FSM44

Device description

- **Functions test of the FBM45**

Switch Yout to set (lower position).

The function test state is displayed by the continuous lighting of the LED BUS.

In the following automatic test run, the analog outputs Yout1..4 are set.

In sequential order, all four outputs are set to the voltage steps 0 V, 5 V, 10 V, 5 V and 0 V.

After setting the output of Yout4, the test run starts again with Yout1.

The test run is ended when the address switch setting 99 is changed.