

Kemro

FM 265/A

**PROFIBUS interface slave module
Project engineering manual V1.08**

Translation of the original instructions

KEBA[®]

Automation by innovation.

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1.01	08-2006	Creation of cfg-file	Various changes.	meis
1.02	08-2007		New structuring of the project engineering manual.	meis
1.03	11-2007	Technical data	detailed power ratings.	meis
1.05	09-2008	Pin assignments	Correction of pin assignments	hasl
1.06	11-2009	Watchdog, Technical Data	added watchdog functionality	hasl
1.07	08-2010	EC directives and standards, Declaration of conformity	updated to EN 61131-2:2007	hasl
1.08	08-2011	Introduction	Hint "not for end customers" added, various minor updates.	fstl

Table of Contents

1	Introduction	7
1.1	Purpose of the document.....	7
1.2	Preconditions.....	7
1.3	Intended use.....	8
1.4	Notes on this document.....	8
1.4.1	Contents of the document.....	8
1.5	Documentation for further reading.....	8
2	Safety notes	10
2.1	Representation.....	10
2.2	General safety instructions.....	10
3	Description of the module	12
3.1	Front view.....	12
4	Operating elements and displays	13
4.1	Status-LED (STATUS).....	13
4.2	Bus error LED (BUS FAULT).....	13
4.3	DIP-switch for PROFIBUS-address.....	13
5	Connections and wiring	14
5.1	PROFIBUS interface.....	14
5.2	EMC and wiring guidelines.....	15
6	Configuration	16
6.1	Setting the K-Bus address.....	16
7	Operating behavior	17
7.1	Start-up after Power-On.....	17
7.2	Error response.....	17
7.3	Watchdog.....	17
8	Diagnosis	18
8.1	Possible error at the module:.....	18
9	Disposal	19
9.1	Disposal of the module.....	19
10	Technical data	20
10.1	In general.....	20
10.2	Environmental conditions.....	20
10.3	PROFIBUS-DP interface.....	20
10.4	Dimensions.....	20
11	EC directives and standards	21
11.1	EC directives.....	21
11.2	Standards.....	21

11.2.1	General procedures and safety principles.....	21
11.2.2	EMC guideline.....	21
11.2.3	Electrical safety and fire protection.....	21
11.2.4	Environmental and surrounding conditions.....	21
11.3	Standards for the American market.....	21
11.3.1	UL test for industrial control equipment.....	21
12	Declaration of conformity.....	22

1 Introduction

1.1 Purpose of the document

This document describes the structure of the FM 265/A (PROFIBUS Slave interface module).

Information

This manual is not addressed to end costumers! Necessary safety notes for the end costumer have to be taken into the costumer manual in the respective national language by the machine builders and system providers.

1.2 Preconditions

This document contains information for persons with the following skills:

Target group	Knowledge and skills pre-requirement
Project engineer	Basic technical training (University of Applied Science/University level, engineering degree or corresponding professional experience). Knowledge in: <ul style="list-style-type: none"> • working mode of a PLC, • safety regulations, • the application.
Operator	Basic technical training (Vocational high school, engineering degree or corresponding professional experience). Knowledge in: <ul style="list-style-type: none"> • safety regulations, • working mode of machine or plant, • principal functions of the application, • system analysis and troubleshooting, • setting options at the operating installations.
Service technician	Basic technical training (Vocational high school, engineering degree or corresponding professional experience). Knowledge in: <ul style="list-style-type: none"> • working mode of a PLC, • safety regulations, • working mode of machine or plant, • diagnosis possibilities, • systematic error analysis and rectification.

1.3 Intended use

The FM 265/A was developed for control applications in industrial machines. The typical applications areas include injection molding machines, robots, presses, machine tools and similar.

The FM 265/A may only be used for the types of use described in the technical descriptions and only in conjunction with recommended/approved third-party equipment/installations.

The FM 265/A has been developed, manufactured, tested and documented in accordance with the appropriate safety standards. Therefore, the products do not pose any danger to the health of persons or a risk of damage to other property or equipment under normal circumstances, provided that the instructions and safety precautions relating to the intended use are properly observed.

1.4 Notes on this document

This manual is integral part of the product. It is to be retained over the entire life cycle of the product and should be forwarded to any subsequent owners or users of the product.

1.4.1 Contents of the document

- Description of the FM 265/A
- Description of wiring (including EMC guidelines)
- Technical data

1.5 Documentation for further reading

The following documents are to be observed depending on the system solution used:

If you are using the KeStudio U2 tool suite:

Doc.No.	Name	Target group
DE: 65352 EN: 65353	K2-200 automation system manual	<ul style="list-style-type: none"> • Project engineer • Electrician • Programmer • Commissioning foreman • Service technician

If you are using the KeStudio U3 tool suite:

Doc.No.	Name	Target group
DE: 1000868 EN: 1000869	System manual Kemro automation system	<ul style="list-style-type: none">• Project engineer• Electrician• Programmer• Commissioning foreman• Service technician

2 Safety notes

2.1 Representation

At various points in this manual you will see notes and precautionary warnings regarding possible hazards. The symbols used have the following meaning:



DANGER!

- indicates an imminently hazardous situation which will result in death or serious bodily injury if the corresponding precautions are not taken.
-



WARNING!

- indicates a potentially hazardous situation which can result in death or serious bodily injury if the corresponding precautions are not taken.
-



CAUTION!

- means that if the corresponding safety measures are not taken, a potentially hazardous situation can occur that may result in property injury or slight bodily injury.
-

CAUTION

- CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in damage to property.
-



- This symbol reminds you of the possible consequences of touching electrostatically sensitive components.
-

Information

Useful practical tips and information on the use of equipment are identified by the "Information" symbol. They do not contain any information that warns about potentially dangerous or harmful functions.

2.2 General safety instructions



WARNING!

- It is absolutely essential to observe the safety instructions in the system manual.
 - The module is defined as "open type equipment" (UL508) or as "offenes Betriebsmittel" (EN 61131-2) and must therefore be installed in a control cabinet.
-

CAUTION

Improper use of the assembly or the control system leads to irreparable damage!

- Turn off the power supply before inserting or removing the module. Otherwise, the module can be destroyed or undefined signal states can lead to damage of the control system.
-

3 Description of the module

The FM 265/A module is used to connect the control system to a PROFIBUS-DP as slave participant.

3.1 Front view

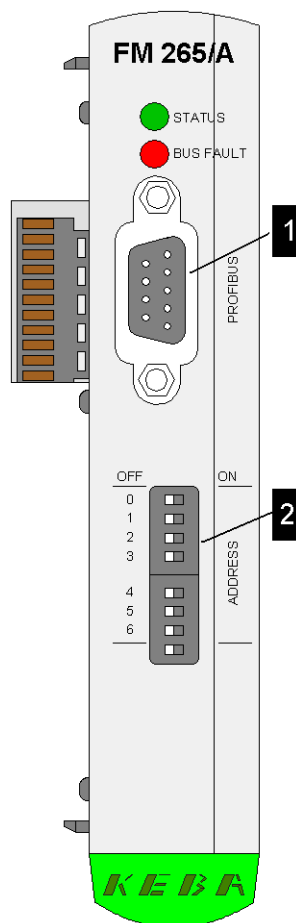


Fig.3-1: Front view FM 265/A

1	... Bus connection
2	... Address switch for PROFIBUS-address

4 Operating elements and displays

4.1 Status-LED (STATUS)

Color	Function
orange	Start-up
Green	Firmware is in status "RUN"
Flashing red	Fatal error
Flashing green (approx. 2 Hz)	The superior system (Profibus Master) has signaled a Reset and is still in Reset status.
Flashing green (approx. 4 Hz)	The set address is invalid (> 125).

4.2 Bus error LED (BUS FAULT)

Color	Function
Dark	Device is exchanging data with the DP-master (Data-Exchange status)
Red	No Baud rate or no master identified
Flashing red (approx. 4 Hz)	Device has identified the Baud rate, but is not addressed by the master. The device was not or wrongly projected by the master.

4.3 DIP-switch for PROFIBUS-address

The PROFIBUS-station address is set via the DIP-switch on the front of the module. PROFIBUS supports the address range 3 ... 125. A change of the PROFIBUS-station address via the DIP-switch cannot occur during running operation. Only after the CPU has been restarted will the changed station address become effective.

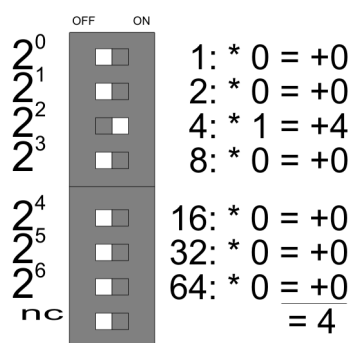


Fig.4-1: Example for the setting of the PROFIBUS-station address

5 Connections and wiring

5.1 PROFIBUS interface

The Profibus gets connected to a 9-pin D-SUB socket at the device. The Cable must have 9-pole D-SUB header

Connecting cable

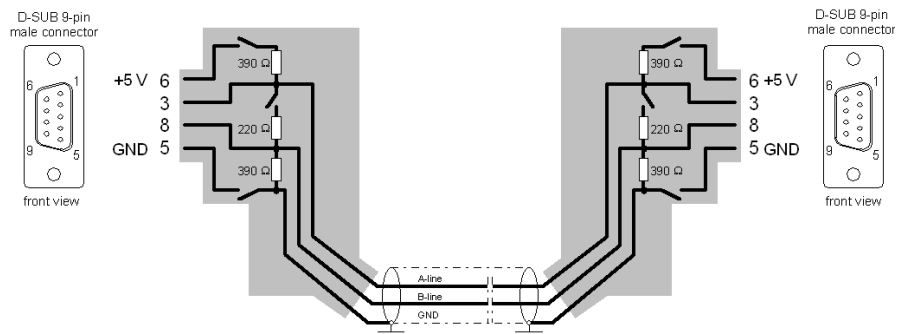


Fig.5-1: Connection cable with connection plug for PROFIBUS-DP

Pin assignment

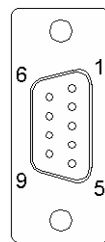


Fig.5-2: PROFIBUS D-SUB male connector, front view

PIN-No.	Designation:	Additional information
3	RS-485-A: B-line	Color: red
5	GND	Galvanic isolation
6	+5 V	Galvanic isolation
8	RS-485-A: A-line	Color: Green

Cable specification

The bus line is specified according to IEC 50170 as cable type A with the following properties:

Type:	Twisted pair cable, shielded
Surge impedance:	135 Ω - 165 Ω
Capacity load:	< 30 pF/m

Loop resistance:	110 Ω /km
Wire dimensions:	0,64 mm
Wire cross section:	> 0,35 mm ²

Plug specification

To establish connection with the plug, the following shielded plug is recommended:

Phönix plug SUBCON-PLUS-PROFIB/AX/SC

Material number: 2744380

Bus termination

To ensure smooth operations, the profibus bus line must be terminated on either end. When using a plug designed for PROFIBUS the termination can be switched on/off via a switch at the connector shell.

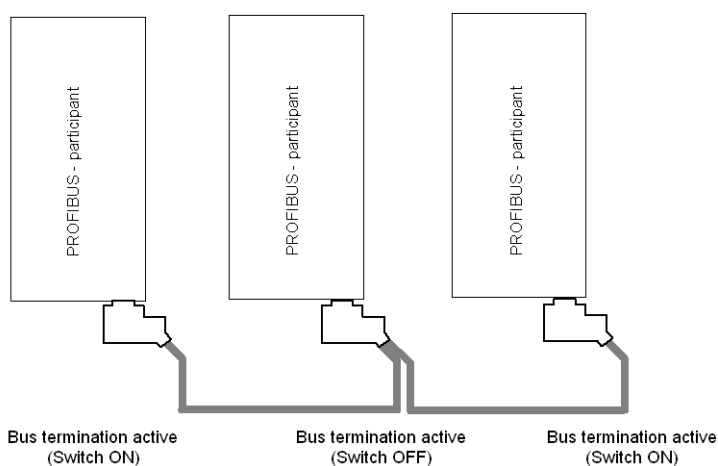


Fig.5-3: PROFIBUS bus termination

Information

Plugs with active bus terminating board must be plugged to modules, because otherwise there would be no 5V-supply for the terminating resistors. The plug must not remain unconnected.

5.2 EMC and wiring guidelines

Pay attention from the outset to careful wiring and shielding.

Further information: See system manual.

6 Configuration

General information

A Kemro system needs data for the configuration of system performance, its I/O-devices and interfaces. The system reads this data during the start-up operation and allocates them to its components and devices.

Configuration data is created by included configuration tools or by editing configuration files.

For further information to the configuration see the documentation of the included configuration tool.

For further information to the configuration see the documentation of the included configuration tool.

6.1 Setting the K-Bus address

Since only one FM 265/A may be added to a CPU module, no address setting of the module address is required.

7 Operating behavior

7.1 Start-up after Power-On

The module is passive and is configured and activated through the HOST.

7.2 Error response

Any module error is indicated by the STATUS-LED. Possible errors: See [chapter 8.1 "Possible error at the module:" on page 18](#).

7.3 Watchdog

The FM 265/A has a internal watchdog. The process data must be collected by the PROFIBUS-master within 50 ms. That implies a maximum cycle time of 50 ms.

8 Diagnosis

8.1 Possible error at the module:

Possible causes	Debugging
After the switching-on: Invalid address switch position.	Check the address switch position. The address set in the configuration and the address set on the module must match.
After the switching-on: Module defective.	Send module to KEBA.
In cyclical mode: Communication error at one of the two channels.	Check cabling and connected participants.

9 Disposal

9.1 Disposal of the module

CAUTION

Please observe the regulations regarding disposal of electric appliances and electronic devices!



- The symbol with the crossed-out waste container means that electrical and electronic devices including their accessories must not be disposed of in the household garbage.
- The materials are recyclable in accordance with their labeling. You can make an important contribution to protecting our environment by reusing, renewing and recycling materials and old appliances.

10 Technical data

10.1 In general

Power supply voltage:	24 V from K-Bus 5 V from K-Bus
Equipment class:	III
Displays on the front panel:	STATUS LED and BUSFAULT LED
Max. number of FM 265/A that can be operated on a CPU module:	1
Max. power consumption K Bus 24 V:	0 W
Max. power consumption K Bus 5 V:	1.4 W
Max. cycle time:	50 ms

10.2 Environmental conditions

Operating temperature:	+5 °C to +55 °C
Storage temperature:	-40 °C to 70 °C
Relative humidity of air:	10 % to 95 % (non condensing)
Vibration resistance:	according to EN 61131-2:2007
Shock resistance:	according to EN 61131-2:2007

10.3 PROFIBUS-DP interface

Data transmission rates:	9.6 kBit/s to 12 Mbit/s
Max. cable length:	100 m (at 12 Mbit/s) up to 1200 m (at 9.6 kBit/s)
Galvanic isolation:	Yes, signaling lines

10.4 Dimensions

Footprint:	
• Module height:	120 mm
• Mounting depth:	100 mm
• Front panel width:	22.5 mm
• Module width: (incl. K-Bus plug)	32.5 mm
Weight:	140 g

11 EC directives and standards

11.1 EC directives

Guideline 2004/108/EG	EC guideline on electromagnetic compatibility
Guideline 2002/95/EG	RoHS guideline

11.2 Standards

To check the conformity of the system with the directives, the following non-binding legal European standards were applied:

11.2.1 General procedures and safety principles

EN 61131-1:2003	Programmable controllers - Part 1
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Information

This product was developed for the use in industrial areas and can cause radio interference when used in residential areas.

11.2.2 EMC guideline

EN 61131-2:2007	Programmable controllers - Part 2
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11.2.3 Electrical safety and fire protection

EN 61131-2:2007	Programmable controllers - Part 2
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11.2.4 Environmental and surrounding conditions

EN 61131-2:2007	Programmable controllers - Part 2
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11.3 Standards for the American market

11.3.1 UL test for industrial control equipment

UL 508, 2005	Industrial Control Equipment
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12 Declaration of conformity



EC Declaration of Conformity



KEBA AG
Gewerbepark Urfahr
4041 Linz
AUSTRIA

Document No.: 75201/CE

We declare that the following product(s)

Name of product: FM 2xx

Variants: FM 200/A, FM 260/A, FM 265/A, FM 265/B, FM 280/A

From: revision 02 (Mat.Nr. 75201)
revision 03 (Mat.Nr. 73984)
revision 02 (Mat.Nr. 77068)
revision 01 (Mat.Nr. 76787)
revision 01 (Mat.Nr. 72581)
revision 01 (Mat.Nr. 75254)
revision 06 (Mat.Nr. 67215)
revision 05 (Mat.Nr. 66675)
revision 03 (Mat.Nr. 68006)

is/are in conformity with the essential requirements of the following European Council Directive(s):

∞ EC-Directive relating to electromagnetic compatibility 2004/108/EC

Conformity to the directive 2004/108/EC is assured by the compliance with the applicable parts of the following harmonized european standards:

∞ EN 61131-2:2007

Important notes:

Any modification on the product(s), that is performed without KEBA's consent will render this declaration invalid.

This declaration certifies the conformity with the directives mentioned, but does not imply any warranty of the features of the product(s).

The safety instructions contained in the documentation supplied with the product(s) must be followed.

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