

Kemro

FM 280/A

**SERCOS II Interface Module
Project engineering manual V1.02**

Translation of the original instructions

KEBA[®]

Automation by innovation.

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1.00	11-2007		newly created.	meis
1.01	08-2010	Declaration of conformity, Safety notes	updated	hasl
1.02	08-2011	Introduction	Hint "not for end customers" added, various minor updates.	fstl

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1 Introduction

1.1 Purpose of the document

This document describes the structure of the FM 280/A (SERCOS II 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	<p>Basic technical training (University of Applied Science/University level, engineering degree or corresponding professional experience).</p> <p>Knowledge in:</p> <ul style="list-style-type: none"> ● working mode of a PLC, ● safety regulations, ● the application.
Operator	<p>Basic technical training (Vocational high school, engineering degree or corresponding professional experience).</p> <p>Knowledge in:</p> <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	<p>Basic technical training (Vocational high school, engineering degree or corresponding professional experience).</p> <p>Knowledge in:</p> <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 280/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 280/A does not conform to the EMC directive with regards to emissions in living areas.

The FM 280/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 280/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 280/A is a field bus master module for the SERCOS II drive bus.

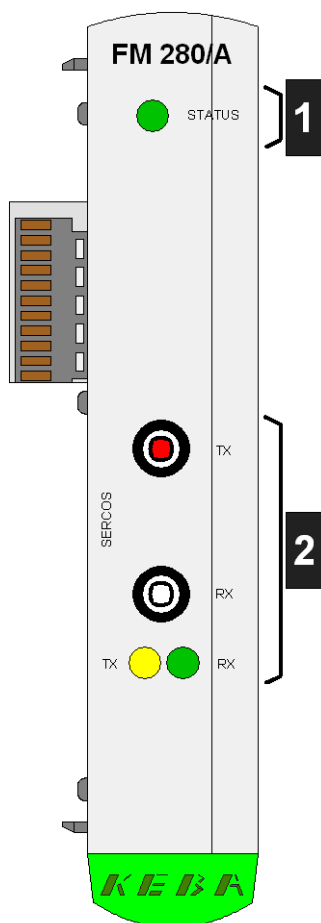


Fig.3-1: FM 280/A Front view

1	... Status LED
2	... SERCOS Interface

Information

*It is only possible to use **one** FM 280/A per K-Bus row. The FM 280/A may only be connected with CP-Modules, not with bus link modules.*

3.1 General functionality of SERCOS

The SERCOS module is activated via K-Bus on the CPU module. The generated SERCOS frames are available for members on the optic waveguide interface (max. members: 254).

Further information: www.sercos.de

SERCOS-circuit:

SERCOS (**SE**rial **R**eal-time **CO**munication **S**ystem) is an international standard that defines the digital interface between drives and controls. This standard allows the flexible, fast and exact control or coordination of machine movements.

Optical waveguide technology:

The data are transmitted via optic waveguide technology (glass or plastic fiber cables), which offers the following advantages:

- Simple wiring
- Interference immune and fast data transfer

Switchable data rate

Two data rates can be set:

- 2 MBit/s
- 4 MBit/s

4 Operating elements and displays

4.1 Status-LED (STAT)

Color	Meaning	Comment
Green	OK	LED is on: Ready
Red	Initialising / Bus error	LED is on: Ring circuit not closed, receiver signal interference or ring not configured

4.2 SERCOS-LEDs (TX and RX)

Color	Meaning	Comment
Yellow	TX: Transmit	LED is on: At transmission activity
Green	RX: Receive	LED is on: On receipt of frames

5 Connections and wiring

5.1 SERCOS Interface

5.1.1 Connection example

The bus-line is made up of optical waveguides and must be laid out as ring circuit. One example would be to establish the connection from the transmitter connection of the FM 280/A to the receiver connection of the next bus-participant. From the transmitter of this bus-participant the optical waveguide will then connect with the receiver of the next bus-participant. The optical waveguide must then close the circuit from the transmitter of the last bus-participant to the receiver of the FM 280/A. See also the following graphic:

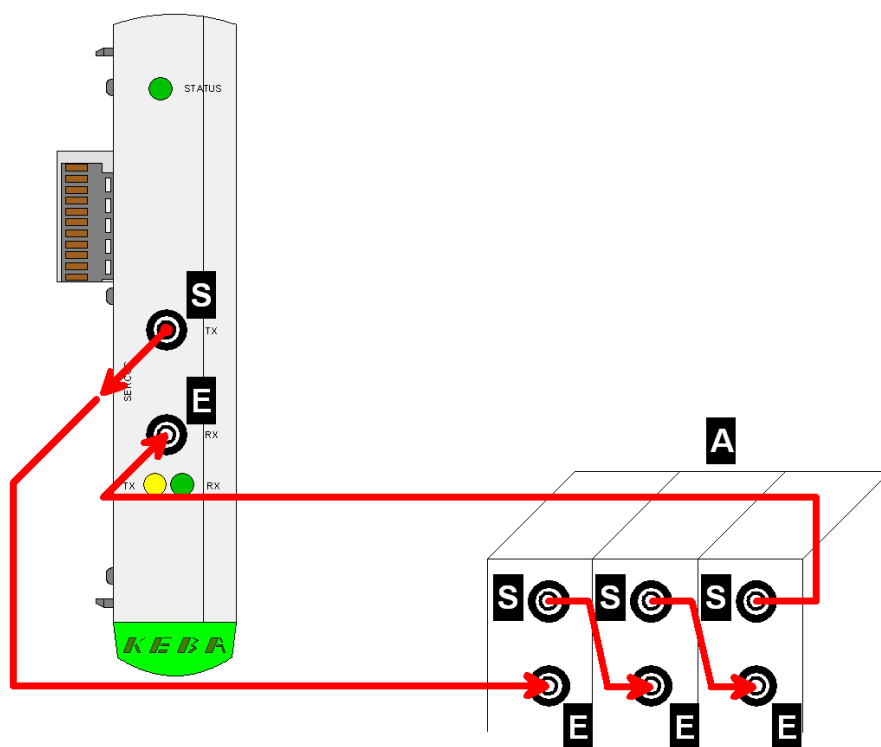


Fig.5-1: Connection example FM 280/A

A ... Drive	E ... Receiver connection
S ... Transmitter connection	

Information

*It is only possible to use **one** FM 280/A per K-Bus row. The FM 280/A may only be connected with CP-Modules, not with bus link modules.*

5.1.2 Cable and connector specification

See system manual.

5.1.3 Cable length

The max. cable length from the transmitter to the first receiver is:

- For plastic fibers 50 m.
- For optical fibers 250 m.

Information

We recommend using finished and standardized optical waveguides from specialist suppliers. Please do not hesitate to ask your KEBA-contact partner for further information.

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.

6.1 Setting the K-Bus address

Since only one FM 280/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.

8 Disposal

8.1 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.

9 Technical data

9.1 In general

Power supply voltage:	24 V DC from K-Bus, 5 V DC from K-Bus.
Equipment class:	III in accordance with IEC 61131-2
Displays on the front panel:	LEDs for transmission and receipt and for the status display
Max. number of FM 280/A that can be operated on a CP module:	1
Max. power consumption K Bus 24 V:	1,4 W
Max. power consumption K Bus 5 V:	0 W

9.2 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

9.3 SERCOS II Interface

Data transmission rate:	2 MBit/s and 4 MBit/s; configurable per software
Max. cable length (optical waveguide):	50 m with plastic fibers; 250 m with glass fiber
Transmitting/Receiving display:	Transmission LED, receipt LED, status LED
Connection:	Optical waveguide module with screw joint
Galvanic isolation:	Yes, signaling lines

9.4 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:	130 g

10 EC directives and standards

10.1 EC directives

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

10.2 Standards

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

10.2.1 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.

10.2.2 EMC guideline

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

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

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

10.3.1 UL test for industrial control equipment

UL 508, 2005	Industrial Control Equipment
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11 Declaration of conformity



EC Declaration of Conformity



KEBA AG
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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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