

Kemro
SM 250/A
SSI interface module
Project engineering manual V1.04

Translation of the original instructions

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1.00	11-2007		newly created	meis
1.01	03-2008		several changes	meis
1.02	06-2008	Front view, setting the address	Information on electronic type plate	meis
1.03	08-2010	EC directives and standards, Safety notes, Declaration of conformity	update to EN 61131-2:2007	hasl
1.04	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 SM 250/A (SSI 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 SM 250/A was developed for control applications in industrial machines. The typical applications areas include injection molding machines, robots, presses, machine tools and similar.

The SM 250/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 SM 250/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 SM 250/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

3.1 Front view

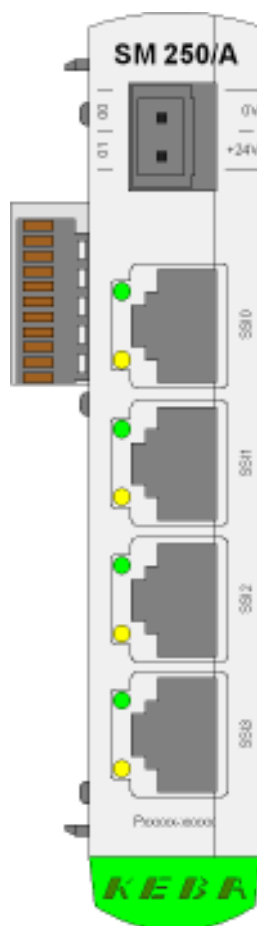


Fig.3-1: SM 250/A Front view

Information

The type plate is stored on the module in an EEPROM and can be read out by the application.

3.2 Accessories

3.2.1 Front panel connectors

Voltage supply: standard male connectors with grid dimension 5.08 mm

The following female connector is required for the SM 250/A.

Socket board	SM 250/A	Ord. no. Weidmüller
2-pole	1	BLZF 5.08/2 SN SW - 170769

Technical data of the socket boards: See manufacturer-specific data sheet of the used front panel connectors

The appropriate female connectors are not included in the delivery of KEBA but can be purchased from KEBA.

For further information: See System manual.

4 Operating elements and displays

4.1 SSI status LEDs

To the left of each respective SSI interface socket (RJ-45) there is one supply LED (green) and one data status LED (yellow).

Designation	Color	Description
Supply LED	Green	Lights up as soon as the power supply is present.
Data status LED	Yellow	Lights up when receiving data.

5 Connection and wiring

5.1 Power supply



WARNING!

Danger of personal injury due to electric shock!

- Supply the device exclusively from power sources that have an extra low voltage (e.g. SELV or PELV according to EN 61131-2)
- Connect only voltages and power circuits to connections, terminals and interfaces up to 50 V rated voltage that have a secure disconnect for hazardous voltages (e.g. with sufficient isolation).



CAUTION!

Fire hazard during module failure!

- Provide suitable fuses for the 24 V DC power supply for the final application. Only fuses with a maximum nominal disconnecting current of 10 A may be used.

Section

Refer to the manufacturer-specific data sheet of the of the female connectors used for type, cross-section and material. For further information: See chapter Accessories.

The actual permissible wire cross-section is specified by the electrical conditions of the connected equipment an the female connectors used:

- Max. load current and required heat dissipation through the connected wire at maximum ambient temperature.
- Permissible voltage drop for error-free operation of the connected equipment.

5.1.1 Example of connecting

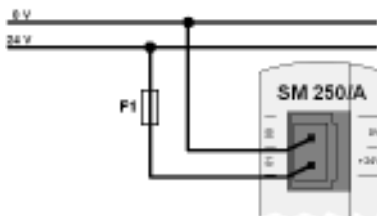


Fig.5-1: Power supply

The power consumption of the transducers amounts to 24 W when all 4 SSI interfaces are operated at a full load of 250 mA.

Fuse F1

The rated current for fuse F1 is dependent on the number of SSI interfaces used and their power consumption. Each interface has its own internal resettable fuse with a rated current of 300 mA.

5.2 SSI interface

The synchronous serial interface (SSI) is an interface for absolute stroke measuring systems.

5.2.1 Example of connecting

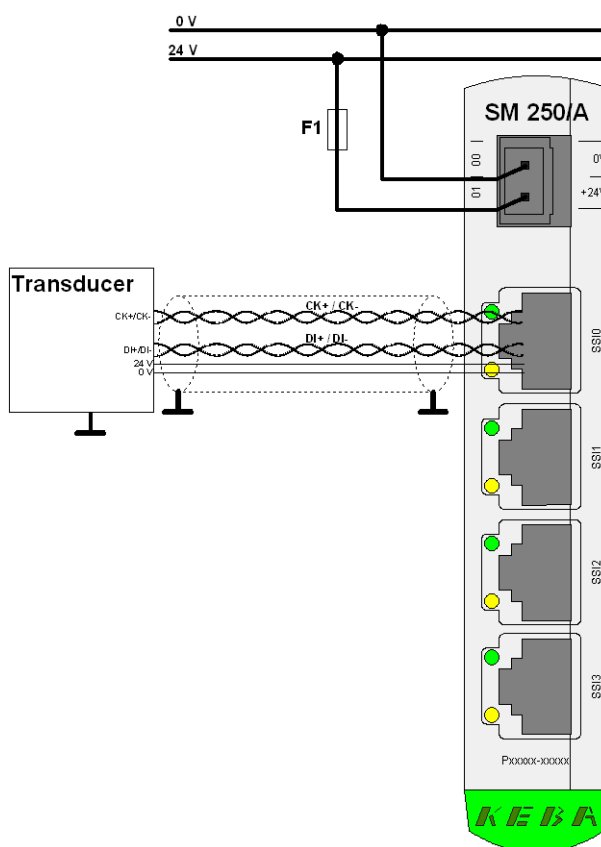
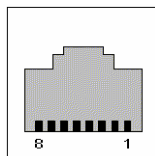


Fig.5-2: Connection example for transducer

Information

The potential difference between the power input socket and the power output at the SSI interface is 1 V at 250 mA.

5.2.2 Pin assignment



Pin-No.	Designation	
01	n.c.	
02	n.c.	
03	DI+	Data input +
04	CK-	Clock input -
05	CK+	Clock input +
06	DI-	Data input -
07	24 V	Transducer supply output
08	0 V	Transducer supply output

5.2.3 Cable and plug specification

Further information: See system manual.

5.2.4 Baud rate / maximum cable length

Further information: See system manual.

5.3 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

The module is addressed via the address switch. A maximum of 12 modules of the same type can be distinguished on one line.

The address switch is located on the right side underneath the lower cover (the K-Bus plug is located underneath the upper cover).

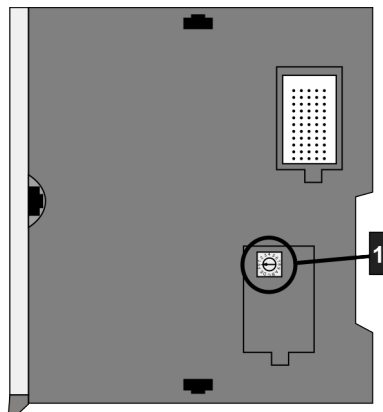


Fig.6-1: Position of the address switch

1 ... Address switch

On leaving the factory all modules are set to address 0 and both covers are closed.

Information

Modules of the same type that are installed within the same line must have different address switch positions. Different modules (e.g. analog and digital modules) may have the same address switch positions.

The two covers for the K-Bus plug and the address switch must remain locked at the last module in the line (to protect against dirt and damage through electrostatic discharge on contact).

7 Operating behavior

7.1 Operating mode of the module

7.1.1 Failure of supply voltage

If the supply voltage fails, a sensor failure is signaled to the application.

7.1.2 Response to sensor failure

In the event of a sensor failure 2 messages are issued:

- 1) "disconnected"
- 2) "Sensor failure"

When the fault is corrected the following messages are issued:

- 1) "connected"
- 2) "Sensor failure cleared"

A fault on the sensor itself is only signaled with "Sensor failure".

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 General information

Power supply voltage:	24 V DC from the front (19.2 V to 30 V, acc. to EN 61131-2)
	24 V DC from K Bus
	5 V DC from K Bus
Addressing at K-Bus:	Via 16-digit address switch, on the side
Maximum power consumption:	24 W when all 4 SSI interfaces are operated at a full load of 250 mA. (power supply: 24 V DC from the front)
Power consumption of 24 V K-Bus:	0 W
Power consumption of 5 V K-Bus:	0,65 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 SSI interfaces

Number of interfaces:	4
Output voltage for transducer supply:	+24 V DC
Maximum current for transducer supply:	250 mA (per channel)
Baud rate:	125 kBit/s, 250 kBit/s, 500 kBit/s, 1 MBit/s
Galvanic isolation:	No
Sensor failure detection:	Yes

9.4 Casing, dimensions

Dimensions:	
• Module height:	120 mm
• Mounting depth:	100 mm
• Module width:	22,5 mm
• Module width (incl. K-Bus plug):	32,5 mm
Weight:	140 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
Gewerbepark Urfahr
4041 Linz
AUSTRIA

Document No.: 69252/CE

We declare that the following product(s)

Name of product: **SM 2xx**

Variants: **SM 210/A, SM 220/A, SM 230/A, SM 250/A**

From: **revision 02 (Mat.Nr. 75194), revision 02 (Mat.Nr. 74203)
revision 02 (Mat.Nr. 76790), revision 02 (Mat.Nr. 76791)
revision 02 (Mat.Nr. 76792), revision 01 (Mat.Nr. 81639)
revision 03 (Mat.Nr. 69251), revision 03 (Mat.Nr. 69252)
revision 03 (Mat.Nr. 69253), revision 02 (Mat.Nr. 73550)
revision 03 (Mat.Nr. 71251), revision 03 (Mat.Nr. 71252)**

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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