M0007979

SANMOTION

MOTION CONTROLLER

C

SM 210/A , SM 230/A

Serial Interface Module

Project Engineering Manual

SANYO DENKI

E

ENGLISH

Notes on This Manual

At various points in this manual you will see notes and precautionary warnings regarding possible hazards. The meaning of the symbols used is explained below.

⚠ DANGER

- **DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.**

⚠ WARNING

- **WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

⚠ CAUTION

- **CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**

CAUTION

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



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

Note

Notes on use of equipment and useful practical tips are identified by the "Notice" symbol. Notices do not contain any information that draws attention to potentially dangerous or harmful functions.

History

Modification from / to	Date	Modified pages	Description	Author
V1.0	070606		New	meis

Contents

1 Brief description 7

2 General safety instructions 8

3 Configuration 9

General information 9
Configuration via SANMOTION C manager 9
Creation of cfg-files 10
Setting the K-Bus address 11

4 Interface of the SM 210/A (RS-232) 12

Pin assignment 12

5 Interface of the SM 230/A (RS-422/485) 13

Pin assignment 13
Line terminating board 14
Example for connecting 15

6 Operation and displays 16

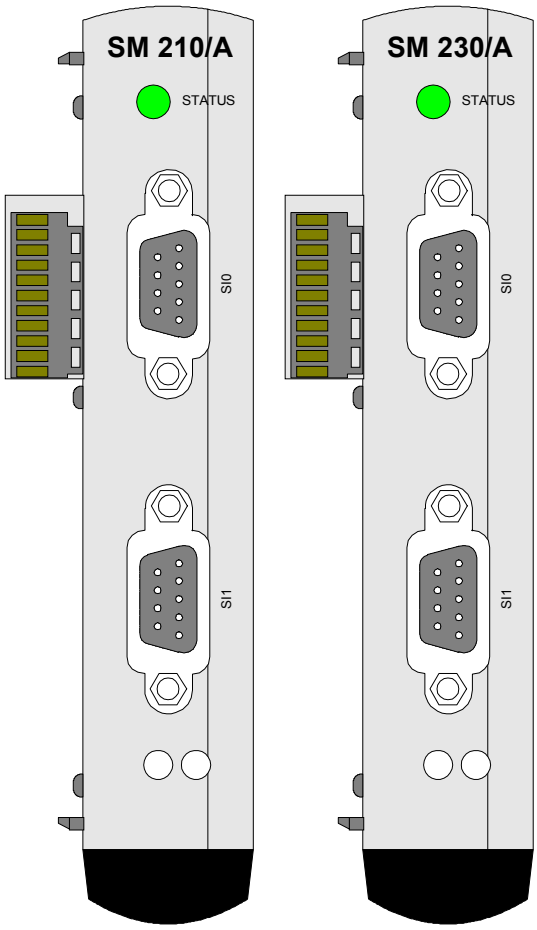
Status display 16

7 Wiring and shielding 17

8 Technical data 18

1 Brief description

SM 210/A: Interface module with 2 RS-232 interfaces
according to PC-standard, up to 115200 Baud
SM 230/A: Interface module with 2 RS-485/422 interfaces,
up to 115200 Baud



SM 210/A, SM 230/A front view

2 General safety instructions

- The device is defined as an "open type equipment" so that it must be installed in a control cabinet.
- The safety instructions in the project engineering handbook " SANMOTION C automation system" are to be complied with.

CAUTION
• **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 Configuration

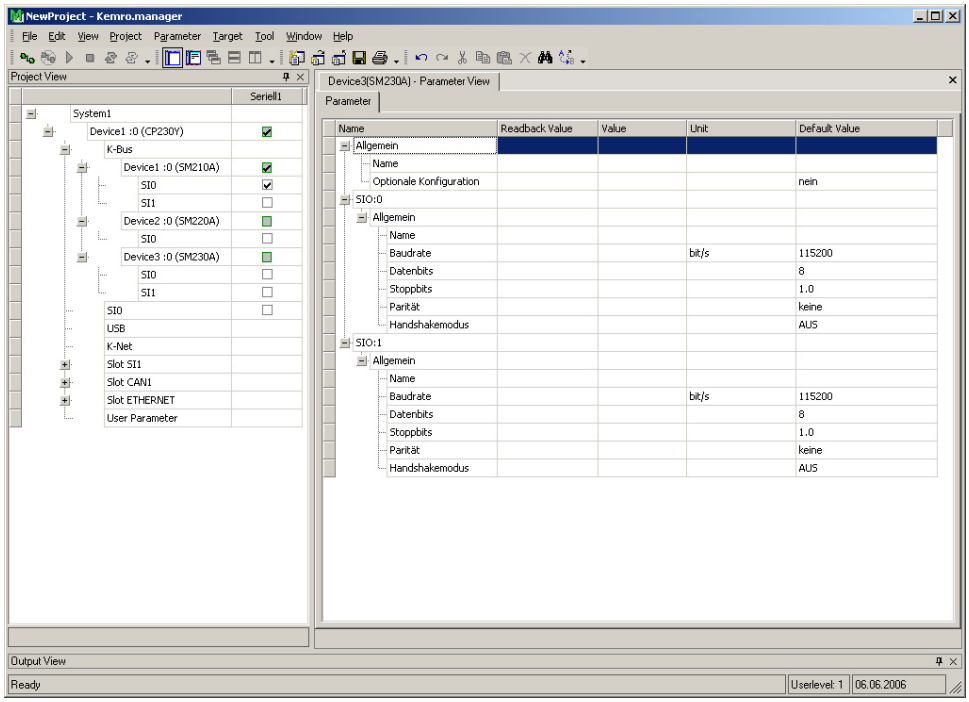
General information

For configuration, the SANMOTION C system requires data that are read out from the configuration data (*.cfg) during the start-up of a master module.
There are 2 possibilities how to configure the SM 2x0/A:

- Via SANMOTION C manager
- Through creation of cfg-files

Configuration via SANMOTION C manager

All modules of a system can be configured with the help of the SANMOTION C manager.
The example configuration has a SM 230/A added on to a CP 230/Y.
The right side lists the details of the respective parameter, which in this case are the details of the SM 230/A. The communication parameter can be specified here, the interface on the RS-422 or RS-485 can be configured under "Handshake mode".



Screenshot SANMOTION C manager with an example configuration

Once all modules have been specified in the system and after all parameters have been adjusted the SANMOTION C manager creates the necessary cfg-files.

Creation of cfg-files

All .cfg-files must be located in the directory “\\application\control\config" and are read-in during the start-up of the control-CPU.

Example:

Configuration of the K-Bus:

```
[IO.ONBOARD.KBUS:0]
name="KBUS"
cycleTime=0.001
```

Configuration of the SM 230/A (serial interface SI0):

```
[IO.ONBOARD.KBUS:0.SM230A:0]
name="SM230A"
optional=0              // optional Configuration:
                        // 0 ... if the module does not exist
                        // an "Error" is output.
                        // 1 ... if the module does not exist
                        // a "Warning" is output.
[IO.ONBOARD.KBUS:0.SM230A:0.SIO:0]
name="SI0"
baudrate=115200         // possible Baud rates:
                        // 1200, 2400, 4800, 9600, 19200
                        // 38400, 57600, 115200
dataBits=8              // possible specifications: 5, 6, 7, 8
stopBits=1.0            // possible specifications: 1.0, 2.0
parity="no"             // Parity:
                        // "no"      no parity
                        // "even"    even parity
                        // "odd"     odd parity
handshakeMode=3         // Handshake mode:
                        // 0 ... off
                        // 1 ... XON/XOFF
                        // 2 ... RTS/CTS
                        // 3 ... RS485
```

Configuration of the SM 230/A (serial interface SI1):

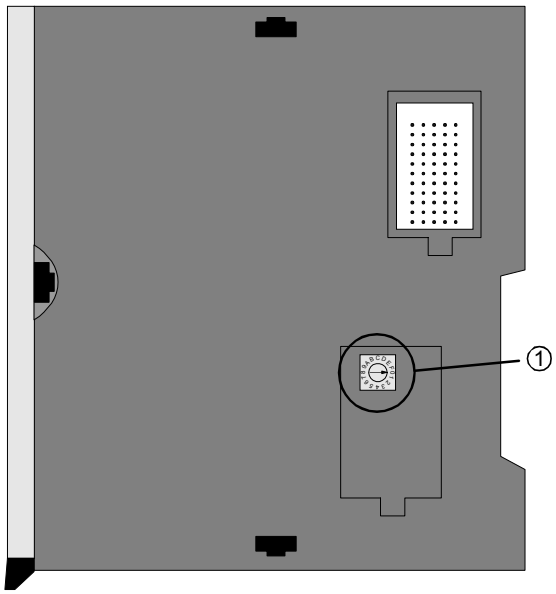
```
[IO.ONBOARD.KBUS:0.SM230A:0.SIO:1]
name="SI1"
baudrate=115200
dataBits=8
stopBits=1.0
parity="no"
handshakeMode=0
```

IEC and teachtalk provide write/read functions for the data exchange. The assignment between the interface and the firmware function is created via the bus name ("SI0").

Setting the K-Bus address

The modules are addressed via the address switch. A maximum of 4 similar modules (switch position 0 – 3) can be differentiated within one line, the switch position 4 – F is invalid. In case of an invalid address switch, the module will not log-on at the K-Bus, which means that it cannot be configured either.

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



① Address switch

Position of the address switch

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

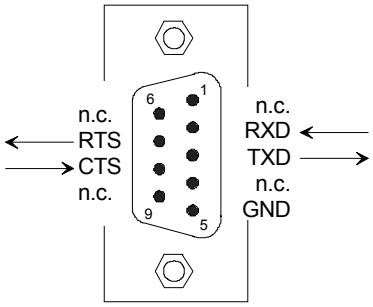
***Note**:*
Modules of the same type that are installed within the same line must have different address switch positions. Different modules (e.g. SM 210/A and DM 260/A) may have the same address switch positions.

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

4 Interface of the SM 210/A (RS-232)

Pin assignment

The module is connected to the bus with a 9-pole DSUP male connector.



Assignment RS-232 interface, DSUB-plug connection seen from front

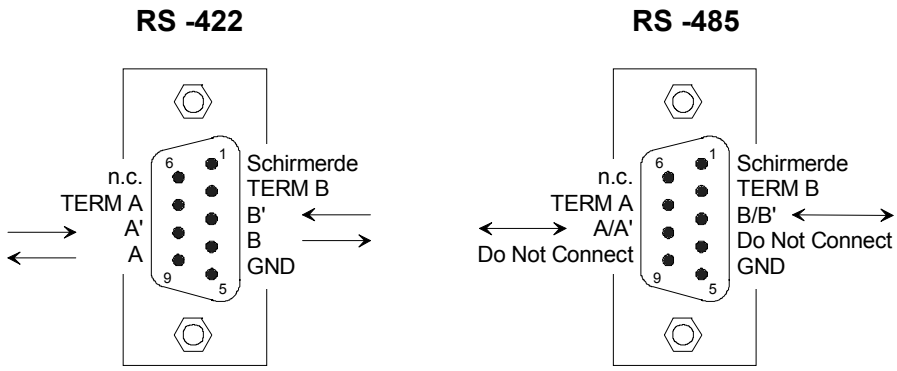
	Signal designation	PIN-No.	Input / Output
RXD	Receive Data	2	Input
TXD	Transmit Data	3	Output
SGND	Signal Ground	5	---
RTS	Request To Send	7	Output
CTS	Clear To Send	8	Input

5 Interface of the SM 230/A (RS-422/485)

This module can be configured via software on to the RS-422 or RS-485. (For further information see chapter "Configuration via SANMOTION C manager" and "Creation of cfg-files")

Pin assignment

The module is connected to the bus with a 9-pole DSUP male connector.



n.c.: not connected

Assignment RS-422/RS-485, DSUB-plug connection seen from front

RS -422	Signal designation	PIN-No.	Input / Output
A	Transmit -	9	Output
A'	Receive -	8	Input
B	Transmit +	4	Output
B'	Receive +	3	Input
GND	Ground	5	---

To activate the terminating resistor the pins 2 and 7 (TERM A, TERM B) must always be connected.
For further information: See chapter "Line termination" and "Connection example"

RS -485	Signal designation	PIN-No.	Input / Output
A / A'	Transmit / Receive -	8	Input or Output
B / B'	Transmit / Receive +	3	Input or Output
GND	Ground	5	---

To activate the terminating resistor the pins 2 and 7 (TERM A, TERM B) must always be connected.

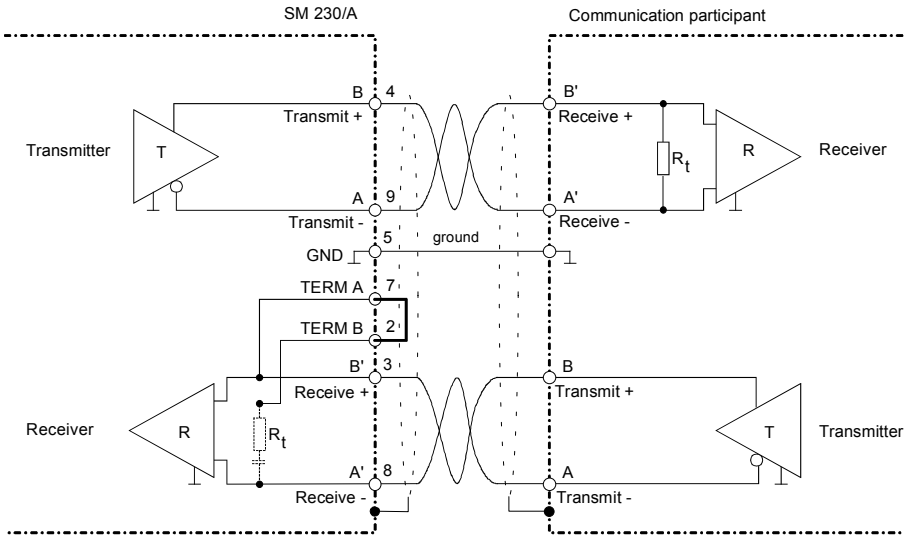
Line terminating board

If the modules are located at the end of the line, the line terminating board must be activated (see connection example). This way the line is closed with the line terminating board (=characteristic impedance).

Example for connecting

The following connection examples show two possible configurations of the interface module SM 230/A.

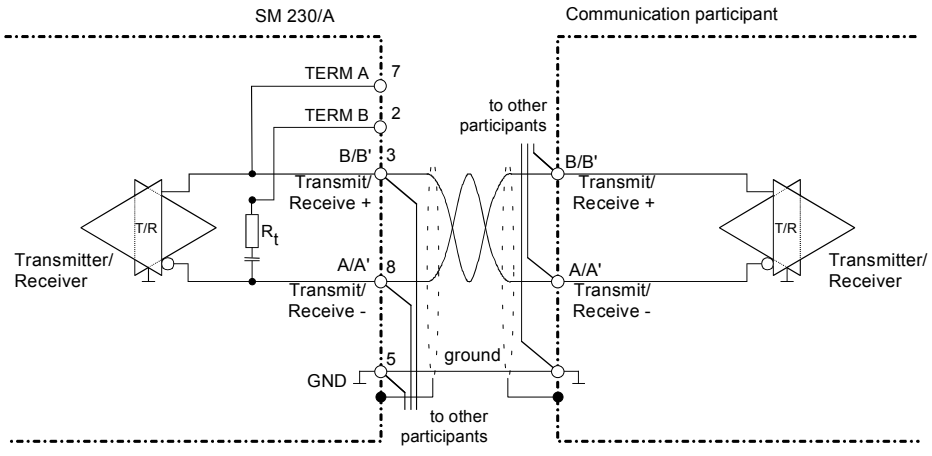
Example 1: RS-422 wiring connection at SM 230/A



T .... Transmitter R .... Receiver Rt .... Terminating resistor

Example 1: RS-422 interface

Example 2: RS-485 wiring connection at SM 230/A



T .... Transmitter R .... Receiver Rt .... Terminating resistor (if required)

Example 2: RS-485 interface

The maximum number of participants when operated as RS-485 is limited to 32.

6 Operation and displays

Status display

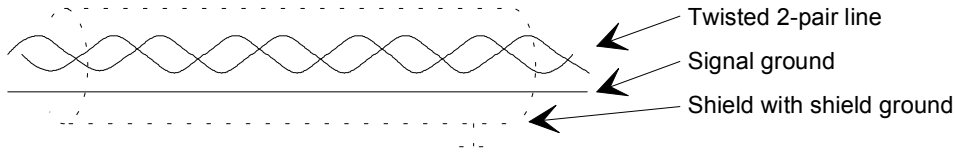
Designation	Color	Meaning	Comment ON: LED is lit)	
STATUS	green	OK	ON:	Ready for operation
	orange	Initialization	ON:	Firmware start-up
	red	Switch-on	ON:	Switch on
		module error	ON:	Wrong address switch (0x04 0x0F)

7 Wiring and shielding

This section covers issues that concern in particular the serial interface connections.

For all serial interfaces holds true:
- Use shielded cables
- Contact shield directly at metallic interface plug casing

	Required line (must be shielded in all cases)	Take account of line termination
CL	Twisted paired wiring	no
RS -232	Standard line	no
RS-422 unidirectional	Twisted pair, with signal ground	yes
RS-422 bidirectional	2x twisted pair line + 1 signal ground	yes
RS-485	Twisted pair, with signal ground	yes



Structure of a shielded twisted pair line with signal ground

8 Technical data

General information

Supply voltage logic:	+5 V DC K-Bus supply
Power consumption 5V at K-Bus SM 210/A:	0.4 W
Power consumption 5V at K-Bus SM 230/A:	0.5 W
Addressing at K-Bus:	Via 16-position address switch, lateral; max. 4 modules (Address switch position 4-F invalid)

SM 210/A

Interface type	RS-232, 9-pole connector plug
Transmission media	shielded cable
Galvanic isolation	no
RS-232 Baud rates:	To be set via software (from 1200 Baud to 115200 Baud)

SM 230/A

Interface type	RS-485/422, 9-pole connector plug
Transmission media	shielded cable
Galvanic isolation	no
RS-485/422 Baud rates:	To be set via software (from 1200 Baud to 115200 Baud)
Switching between RS-485 and RS-422:	To be set via software

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:	132 g

Standards:

The module conforms to the following standards:

General information	
UL 508	UL – listed
Product standard for programmable controllers:	
IEC 61131-1:2003	General information
IEC 61131-2:2003	Hardware

Release
Revision A Jul.2007

Precautions For Adoption

⚠ Cautions

The possibility of moderate or minor injury
and the occurrence of physical damage are assumed
when the precautions at right column are not observed.
Depending on the situation,
this may cause serious consequences.
Be sure to follow all listed precautions.

⚠ Cautions

- Be sure to read the instruction manual before using this product.
- Take sufficient safety measures and contact us before applying this product to medical equipment that may involve human lives.
- Contact us before adapting this product for use with equipment that could cause serious social or public effects.
- The use of this product in high motion environments where vibration is present, such as in vehicles or shipping vessels, is prohibited.
- Do not convert or modify any equipment components.

* Please contact our Business Division for questions and consultations regarding the above.

http://www.sanyodenki.com

SANYO DENKI CO., LTD.
1-15-1, Kita-Otsuka, Toshima-ku, Tokyo 170-8451, Japan
Phone: +81 3 3917 2223

SANYO DENKI *AMERICA, INC.*
468 Amapola Avenue Torrance, CA 90501 U.S.A.
Phone: +1 310 783 5400

SANYO DENKI *EUROPE SA.*
P.A. Paris Nord II 48 Allee des Erables-VILLEPINTE B P.57286 F-95958 ROISSY CDG Cedex France
Phone: +33 1 48 63 26 61

SANYO DENKI *GERMANY GmbH*
Frankfurter Strasse 63-69 65760 Eschborn Germany
Phone: +49 6196 76113 0

SANYO DENKI *KOREA CO., LTD.*
9F 5-2, Sunwha-dong Jung-gu Seoul, 100-130, Korea
Phone: +82 2 773 5623

SANYO DENKI *SHANGHAI CO., LTD.*
Room 2116, Bldg B, FAR EAST INTERNATIONAL PLAZA, No.317 XianXia Rd., Shanghai 200051 China
Phone: +86 21 6235 1107

SANYO DENKI *TAIWAN CO., LTD.*
Room 1208,12F, No.96 Chung Shan N, Rd., Sec.2, Taipei 104, Taiwan, R.O.C.
Phone: +886 2 2511 3938

SANYO DENKI *(H.K.)CO., LIMITED*
Room 2305, 23/F, South Tower, Concordia Plaza, 1 Science Museum Rd., TST East, Kowloon, Hong Kong
Phone: +852 2312 6250

SANYO DENKI *SINGAPORE PTE. LTD.*
10 Hoe Chiang Road #14-03A/04 Keppel Towers Singapore 089315
Phone: +65 6223 1071

*Remarks : Specifications Are Subject To Change Without Notice.

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