M0007285B

SANMOTION

MOTION CONTROLLER

C

FM 299/A

GA1060 Field Bus Master 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 /	100106			meis
V1.0 / V1.1	030806	10, 11	Changes to chapter "Creation of cfg-file"	meis

Contents

1 Brief description 7

2 General safety instructions 8

3 Configuration 9

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

4 Connections, wiring 12

SDC Bus interface 12
General information 12
Connector 12
Cable 12
Cable routing 13
Bus topology 13
Schematic diagram of the bus topology bus terminating board 14

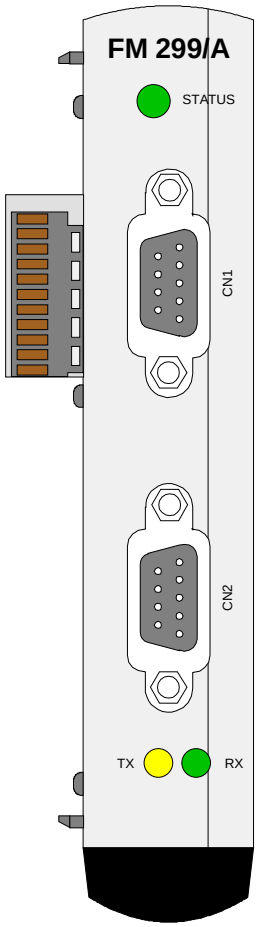
5 Operation and displays 15

Status LED 15
GA1060 Bus Status LEDs 15

6 Technical data 16

1 Brief description

The FM 299/A module is a field bus master module for the Sanyo Denki drive bus.



Front view FM 299/A module

Two FM 299/A modules can be operated on one control CPU.

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

Only a name has to be assigned for the configuration of the FM 299/A. In addition, the GA1060 bus must be configured, also with its name and the cycle time.

The FM 299/A can be configured at the CPU module in two different ways:

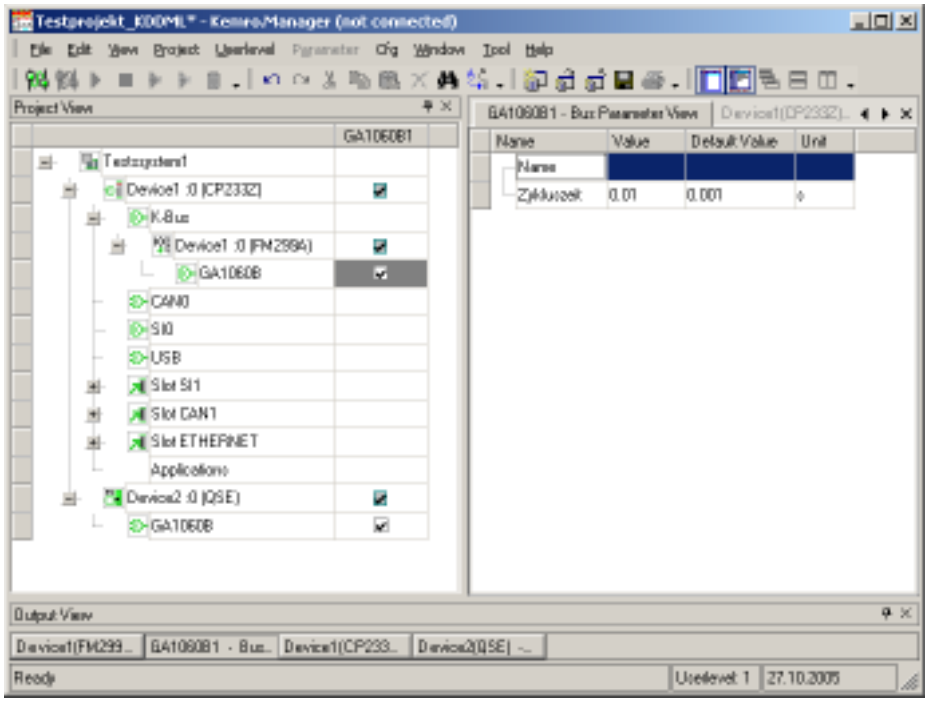
- Via SANMOTION C manager
- through the creation of cfg-files with a text editor

Two FM 299/A modules can be operated on one CPU.

Configuration via SANMOTION C manager

The SANMOTION C manager can be used to configure all modules of a systems as well as the Sanyo Denki converters of the QSE series.

At selection of the FM 299/A one column is automatically created for the bus connection, which is then used to connect the drives.



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-file

The FM 299/A and the GA1060 bus do not have any special parameters except for their name and cycle time.

The configuration file is used to configure also the drives operated at the GA1060 – see the following example.

Example:

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

[IO.ONBOARD.KBUS:0.FM299:0]
name = "FM299_Interface"
traceWord = 0

[IO.ONBOARD.KBUS:0.FM299:0.GA1060B:0]
name = "GA1060B_Bus"
cycleTime = 0.002
traceWord = 0
```

The following information describes the configuration of one of SDC's QSE-drive controller. Please refer to the relevant drive documentation for a description of the parameters and additional information.

```
[IO.ONBOARD.KBUS:0.FM299:0.GA1060B:0.QSE:0]
name = "Axis_0"
address = 0
MOCODE = 16#1017
ENCODE = 16#800B
ENTYPE = 16#8300

driverMode = 3
positionMode = 1

maxPositionExponent = 32

positionOffset = 0.0
posUnitsToIncrements = 16.00
velUnitsToRpm = 11.777
torqueUnitsToPercent = 13.66

comBank = 16              // default = 17
resBank = 65              // default = 66

periodNum = 10
periodDenom = 200

traceWord = -1

[IO.ONBOARD.KBUS:0.FM299:0.GA1060B:0.QSE:0.BANK1]
DAT2 = 16#0001
DAT3 = 16#0001
DAT4 = 16#0005
DAT5 = 16#0000
```

```
DAT6 = 16#0032
DAT7 = 16#0090
DAT8 = 16#0000
DAT9 = 16#0000

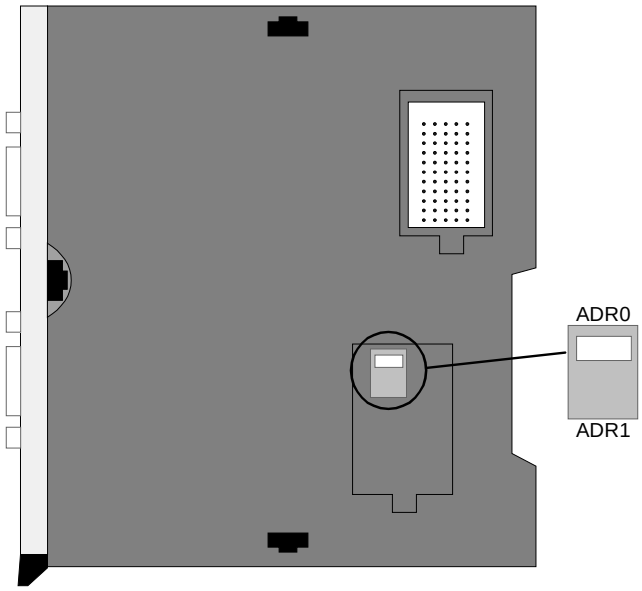
[IO.ONBOARD.KBUS:0.FM299:0.GA1060B:0.QSE:0.BANK8]
DAT2 = 16#0030
DAT3 = 16#1000
DAT4 = 16#0000
DAT5 = 16#0050
DAT6 = 16#0020
DAT7 = 16#0100
DAT8 = 16#0000
DAT9 = 16#0000
```

For user with a higher userlevel the following configuration entry is available:

```
[IO.ONBOARD.KBUS:0.FM299A:0]
optional=0              / optional configuration:
                        / 0 ... when the module is not available
                        / an "Error" occurs
                        / 1 ... when the module is not avialable
                        / a "Warning" occurs
```

Setting the K-Bus address

The modules are addressed via the address switch. A maximum of two FM 299/A modules can be operated on one SANMOTION C control CPU.
The address switch is located on the right side underneath the lower cover.
The K-Bus plug is located underneath the upper cover.



Position of the address switch

On leaving the factory the FM 299/A module is set to address 0 and both covers are closed.

4 Connections, wiring

SDC Bus interface

General information

To ensure adequate stability the GA1060 drive bus must be built as fully shielded interface. Consequently the entire bus periphery must be provided with an uninterrupted shield connection.

Connector

9-pole D-SUB socket connector with completely conductive shell.
The cable shielding must be connected plane with the shield cover of the plug. An additional connection of the shield and the ground is not necessary.

Pin assignment:

Pin	Meaning
Pin1	GA1060 Bus +
Pin2	GA1060 Bus -
Pin3 – 8	GND
Pin9	n.c.

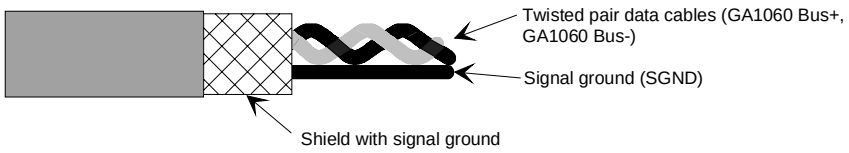
Cable

Cable type

Shielded, twisted pair data cables with a characteristic impedance of 100 – 120 Ω.

Structure

Twisted pair, shielded with signal ground.



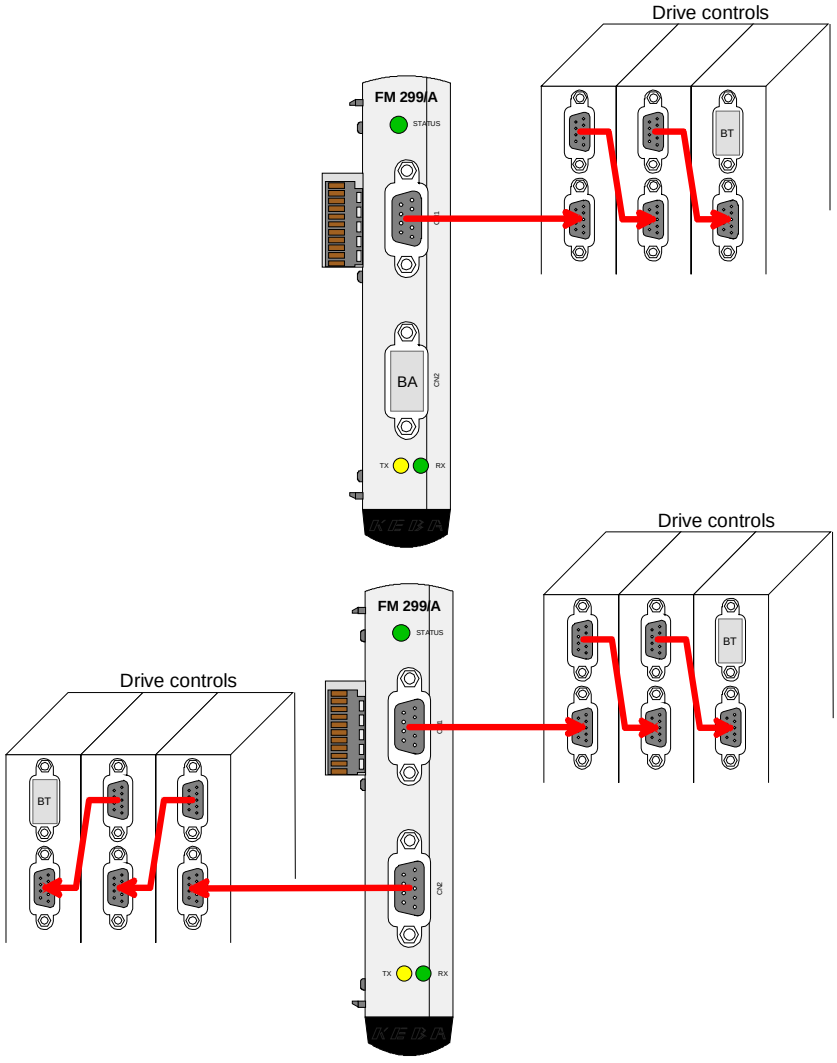
A multi-core twisted cable can also be used. Attention must be paid that the GA1060 Bus+ and the GA1060 bus-lines are guided in a common twisted pair of wires.

Cable routing

Signal and data lines that are foreign to the system and not connected to the SANMOTION C control must not be routed in the same cable as the system's own signal and data lines. All shielded signal, data and low voltage supply lines with contacted shields on either side can be routed parallel to one another and parallel to the energy supply lines.

Bus topology

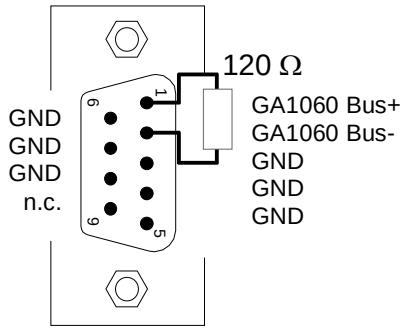
- The GA1060 drive bus is a bus system that must be closed on either end with a bus terminating board.
- The FM 299/A can be operated at the end of the bus line or at any section of the bus line. CN1 and CN2 can be located anywhere
- The total bus length must not exceed 10 meters, whereby the gaps between the individual participants can be freely selected.



BT … bus terminating board

Schematic diagram of the bus topology bus terminating board

If the FM 299/A is connected at one bus terminating board of a GA1060 drive bus, a terminating board must be connected to the free plug. This is done by soldering a resistance with 120 Ω in between the Pins 1 and 2 (GA1060 Bus).



GA1060-Bus interface with activated bus terminating board

5 Operation and displays

Status LED

LED color	Function
orange	System start-up
green	Communication alive, no error
red	After switch-on -> module faulty In cyclical mode -> Communication error, no communication possible

GA1060 Bus Status LEDs

LED color	Labeling	Function
yellow	TX	Indicates transmission activity
green	RX	Indicates receiving activity

6 Technical data

General information

Logic supply	5V via K-Bus
Power consumption:	Max. 1.0 W
Safety class:	III according to EN 61131-2
Displays on the front panel:	LEDs for transmission and receipt and for the status display
Max. number of modules at one CPU module	2

GA1060 Interface

Data transmission rates	10 Mbit/s
Max. cable length	10 m (between first and last participant)

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

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 May.2006
Revision B Feb.2008

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.