



# DOCUMENTATION ISG-kernel

## Manual SERCOS device

Short Description:  
SERC-S3

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# Preface

## Legal information

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This documentation was produced with utmost care. The products and scope of functions described are under continuous development. We reserve the right to revise and amend the documentation at any time and without prior notice.

No claims may be made for products which have already been delivered if such claims are based on the specifications, figures and descriptions contained in this documentation.

## Personnel qualifications

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This description is solely intended for skilled technicians who were trained in control, automation and drive systems and who are familiar with the applicable standards, the relevant documentation and the machining application.

It is absolutely vital to refer to this documentation, the instructions below and the explanations to carry out installation and commissioning work. Skilled technicians are under the obligation to use the documentation duly published for every installation and commissioning operation.

Skilled technicians must ensure that the application or use of the products described fulfil all safety requirements including all applicable laws, regulations, provisions and standards.

## Further information

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Links below (DE)

<https://www.isg-stuttgart.de/produkte/softwareprodukte/isg-kernel/dokumente-und-downloads>

or (EN)

<https://www.isg-stuttgart.de/en/products/softwareproducts/isg-kernel/documents-and-downloads>

contains further information on messages generated in the NC kernel, online help, PLC libraries, tools, etc. in addition to the current documentation.

## Disclaimer

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It is forbidden to make any changes to the software configuration which are not contained in the options described in this documentation.

## Trade marks and patents

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# General and safety instructions

## Icons used and their meanings

This documentation uses the following icons next to the safety instruction and the associated text. Please read the (safety) instructions carefully and comply with them at all times.

## Icons in explanatory text

➤ Indicates an action.

⇒ Indicates an action statement.



### **DANGER**

#### **Acute danger to life!**

If you fail to comply with the safety instruction next to this icon, there is immediate danger to human life and health.



### **CAUTION**

#### **Personal injury and damage to machines!**

If you fail to comply with the safety instruction next to this icon, it may result in personal injury or damage to machines.



### **Attention**

#### **Restriction or error**

This icon describes restrictions or warns of errors.



### **Notice**

#### **Tips and other notes**

This icon indicates information to assist in general understanding or to provide additional information.



### **Example**

#### **General example**

Example that clarifies the text.



### **Programming Example**

#### **NC programming example**

Programming example (complete NC program or program sequence) of the described function or NC command.



### **Release Note**

#### **Specific version information**

Optional or restricted function. The availability of this function depends on the configuration and the scope of the version.

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# 1 SERCOS Device

This chapter describes the parameters for the configuration of the connected SERCOS devices.

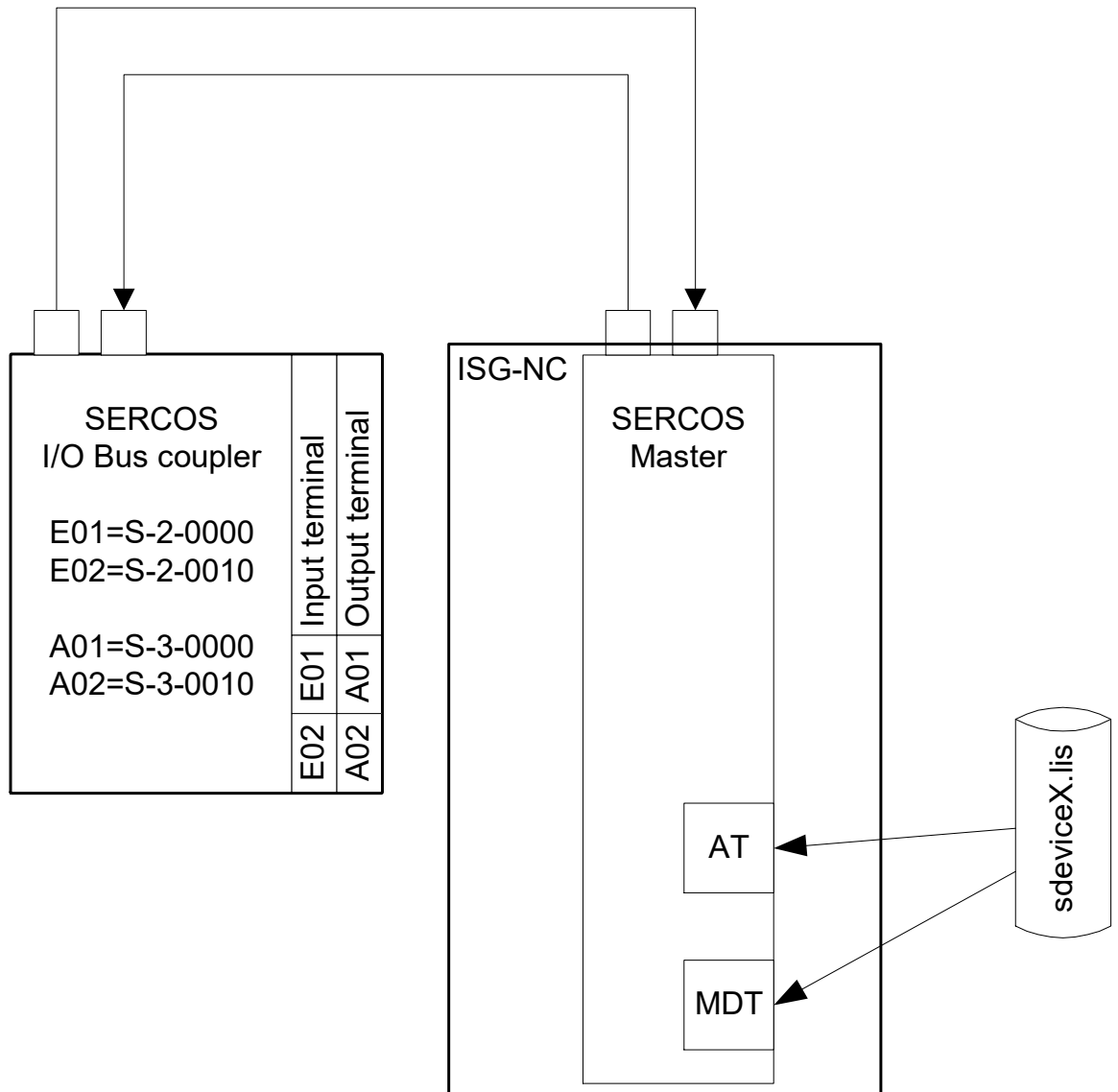


Fig. 1: Example of SERCOS device schematic

## 1.1 Device type (type)

The type of SERCOS device is specified here.



### Notice

SERCOS device types are described in greater detail in [SERC-S2].

Variable name	Type	Permitted range	Axis type	Dimension
type	UNS16	0 - Drive 1 - I/O station 2 - Combined station	T	----
			R	----

## 1.2 Telegram type (telegramm\_typ)

The communication telegram type of the SERCOS device is specified here.  
Communication telegram 7 is assumed for I/O stations.



### Notice

SERCOS communication telegram types are described in greater detail in [SERC-S2].

Variable name	Type	permitted range	Axis type	Dimension
telegramm_typ	UNS16	$0 < \text{telegramm\_typ} \leq 7$	T	----
			R	----

## 1.3 Ring number (ring\_nr)

The SERCOS ring number is entered here to denote the axis to which it is connected. This value must currently be set to 0 since no multi-ring operation is possible.

Variable name	Type	permitted range	Axis type	Dimension
ring_nr	UNS16	0	T	----
			R	----

## 1.4 Device address (antr\_adr)

The device address must correspond to the set value in the SERCOS slave or on the SERCOS device.

Variable name	Type	permitted range	Axis type	Dimension
antr_adr	UNS16	$1 < \text{antr\_adr} \leq 254$	T	----
			R	----

## 1.5 Master data telegram MDT (mdt[i].\*)

The configurable master data telegram to the drive is defined here.



### Notice

The SERCOS master data telegram is described in greater detail in [SERC-S2].

### 1.5.1 MDT data (ident\_nr)

SERCOS ID number.

Variable name	Type	permitted range	Axis type	Dimension
mdt[i].ident_nr	UNS16	$0 \leq \text{ident\_nr} \leq \text{MAX}(\text{UNS16})$	T	----
			R	----
i	UNS16	$0 \dots [\text{MAX\_ID\_ANZ} - 1]$		

Value MAX_ID_ANZ	Meaning
8	Maximum size of SERCOS telegrams

### 1.5.2 MDT length (ident\_len)

Length of the data item transmitted.

Variable name	Type	permitted range	Axis type	Dimension
mdt[i].ident_len	UNS16	$0 \leq \text{ident\_len} \leq \text{MAX}(\text{UNS16})$	T	----
			R	----
i	UNS16	$0 \dots [\text{MAX\_ID\_ANZ} - 1]$		

Value MAX_ID_ANZ	Meaning
8	Maximum size of SERCOS telegrams



### 1.5.3 MDT data type (nc\_ref)

This specifies which output data type the ident (ID) refers to.



#### Notice

The exact position of the datum on the PLC I/O interface is described in more detail in [SERC-S4// Mapping rules for SERCOS I/O data].

Variable name	Type	permissible range	axis type	Dimension
mdt[i].nc_ref	ISG_CHAR	$0 \leq \text{mdt\_id}[i] \leq \text{MAX}(\text{UNS16})$	T	----
			R	----
i	UNS16	0 ... [MAX_ID_ANZ - 1]		

Value MAX_ID_ANZ	Meaning
8	Maximum size of SERCOS telegrams

ANALOG\_OUT Analogue output

DIGITAL\_OUT Digital output

## 1.6 Drive data telegram AT (at[i].\*)

The configurable drive data telegram of the drive is defined here.



### Notice

The SERCOS drive data telegram is described in greater detail in [SERC-S2].

### 1.6.1 AT data (ident)

SERCOS ID number.

Variable name	Type	permitted range	Axis type	Dimension
at[i].ident	UNS16	$0 \leq \text{ident} \leq \text{MAX}(\text{UNS16})$	T	----
			R	----
i	UNS16	$0 \dots [\text{MAX\_ID\_ANZ} - 1]$		

Value MAX_ID_ANZ	Meaning
8	Maximum size of SERCOS telegrams

### 1.6.2 AT length (ident\_len)

Length of the data item transmitted.

Variable name	Type	permitted range	Axis type	Dimension
at[i].ident_len	UNS16	$0 \leq \text{ident\_len} \leq \text{MAX}(\text{UNS16})$	T	----
			R	----
i	UNS16	$0 \dots [\text{MAX\_ID\_ANZ} - 1]$		

Value MAX_ID_ANZ	Meaning
8	Maximum size of SERCOS telegrams

### 1.6.3 AT data type (nc\_ref)

This specifies which input data type the ident (ID) refers to.



#### Notice

The exact position of the datum on the PLC I/O interface is described in more detail in [SERC-S4// Mapping rules for SERCOS I/O data].

Variable name	Type	permissible range	Axis type	Dimension
at[i].nc_ref	ISG_CHAR	----	T	----
			R	----
i	UNS16	0 ... [MAX_ID_ANZ - 1]		

Value MAX_ID_ANZ	Meaning
8	Maximum size of SERCOS telegrams

ANALOG\_IN Analogue input

DIGITAL\_IN Digital input

HANDWHEEL Handwheel parameter

ENCODER Encoder parameter

## 2 Example

```
# *****
#
# SERCOS Device List for ISG SERCOS-I/O
#
# *****
#
# type : device type (1 I/O-station only)
# telegramm_typ : telegram type (7 only)
# ring_nr : ring number (0 only)
# antr_adr : device address
#
# mdt/at[x].ident_nr : SERCOS parameter number
# mdt/at[x].ident_len : SERCOS parameter length (2, 4)
# mdt/at[x].nc_ref : reference (ANALOG_IN, ANALOG_OUT,
# DIGITAL_IN, DIGITAL_OUT,
# HANDWHEEL, ENCODER)
#
# *****
#
type 1
telegramm_typ 7
ring_nr 0
antr_adr 2
#
mdt[0].ident_nr 12288 # S-3-0000
mdt[0].ident_len 2
mdt[0].nc_ref ANALOG_OUT
mdt[1].ident_nr 12298 # S-3-0010
mdt[1].ident_len 2
mdt[1].nc_ref DIGITAL_OUT
#
at[0].ident_nr 8192 # S-2-0000
at[0].ident_len 2
at[0].nc_ref ANALOG_IN
at[1].ident_nr 8202 # S-2-0010
at[1].ident_len 2
at[1].nc_ref DIGITAL_IN
at[2].ident_nr 8212 # S-2-0020
at[2].ident_len 4
at[2].nc_ref HANDWHEEL
#
End
```

## 3 Appendix

### 3.1 Links to other documents

For the sake of clarity, links to other documents and parameters are abbreviated, e.g. [PROG] for the Programming Manual or P-AXIS-00001 for an axis parameter.

For technical reasons these links only function in the Online Help (HTML5, CHM) but not in pdf files since pdfs do not support cross-linking.

### 3.2 References

[SERC-S2] SERCOS Interface Update 9/91

ISG Documentation "Mapping rules for SERCOS I/O data"

### 3.3 Suggestions, corrections and the latest documentation

Did you find any errors? Do you have any suggestions or constructive criticism? Then please contact us at [documentation@isg-stuttgart.de](mailto:documentation@isg-stuttgart.de). The latest documentation is posted in our Online Help (DE/EN):



QR code link: <https://www.isg-stuttgart.de/documentation-kernel/>

The link above forwards you to:

<https://www.isg-stuttgart.de/fileadmin/kernel/kernel-html/index.html>



#### Notice

##### **Change options for favourite links in your browser;**

Technical changes to the website layout concerning folder paths or a change in the HTML framework and therefore the link structure cannot be excluded.

We recommend you to save the above "QR code link" as your primary favourite link.

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