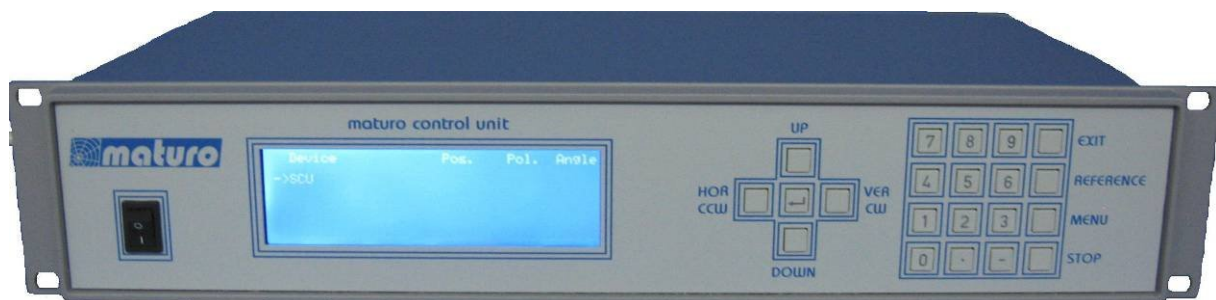


# Manual

## for

# Controller SCU



## For the operation of a Cable Guide Rail

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## 1) General Instructions and Precautions

### **Before this device is applied with power:**

Ground it properly through the protective conductor of the power cable to a power source provided with protective earth contact. Any interruption of the protective (grounding) conductor, inside or outside the device, or disconnection of the protective earth terminal could result in personal injury.

**The electrical installation** of this product must be accomplished by an individual who is authorized to so do by the appropriate local authority. The installation must be in compliance with local electrical safety codes.

**Only qualified personnel** are allowed to operate or service this equipment.

### **Before making service, contact maturO GmbH**

Service or modifications of the device by yourself may void your warranty.

If you attempt to service the unit by yourself, disconnect all electrical power before starting. There are voltages at many points in the components which could, if contacted, cause personal injury. Only trained service personnel are allowed to perform adjustments and/or service procedures upon this device. Capacitors inside this instrument may still be charged even when instrument is disconnected from its power source.

**Stay clear** of moving components during the operation of the device.

Do not operate the device while somebody is close to moving parts.

The protection of the **area of risk** at site is part of the operator.

**Read this manual** completely before starting installation. This equipment must be installed and operated only by qualified personnel.

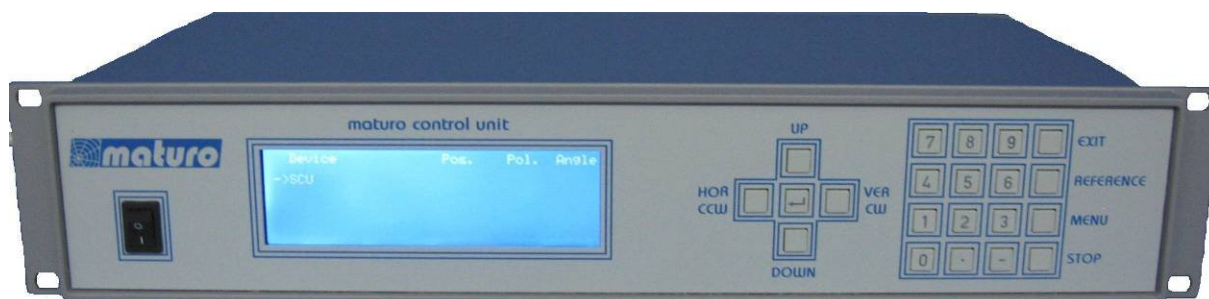
**Regularly inspect** all equipment and conduct scheduled maintenance in accordance with the factory recommendations provided. Only use replacement parts and fasteners ordered directly from the factory.

Information presented enclosed is subject to change as product enhancements are made regularly. Every effort has been made to ensure that the information in this manual is accurate. However, no liability or guarantee is assumed for the up-to-dateness, correctness and completeness of the information provided herein.

Pictures included are for illustration purposes only and do not represent all possible configurations.

## 2) Technical Data of Controller SCU

The **Single Control Unit SCU** is suited for the operation of one device with one axis of motion. Those devices are usually used for the operation of turntables, cable guide rails or any other positioning equipment. This controller SCU permits the operation in manual, semi-automatic and remote control mode via IEEE 488.2 (GPIB bus) of multiple devices simultaneously.



### Technical Data

Data interface		IEEE 488.2 (GPIB-Bus)
Device interface		CAN-Bus via fibre optic cable
Transfer rate		100 baud
Display		4 x 40 characters
Voltage		110-240 VAC, 50/60 Hz, single phase
Current consumption	approx.	20W
Fuse		T 125mA, 250V
Size (W X D)		19" Rack mount (427 x 300 mm)
Height		2 HE (87 mm)
Temperature range		5°C - 40°C
Total weight		5 kg
Accessories		1.5 m power supply cable Service manual

**The multiple control unit SCU works with HP, R&S, and etc. software. The IEEE 488 (GPIB) is available as an interface device.**

### 3) Connecting to SCU with fibre optic cables

1. Power of the device and SCU.
2. Connect "IN" at SCU with "OUT" of the device, prefer the red line. Connect "OUT" at SCU with "IN" of the device, prefer the black line. If your device is prepared for a HCU (Hand Control Unit), you have to connect the SCU to the port named "SCU".
3. Power on the device and wait for 30 seconds.
4. Connect the power cable and switch on the power  
Attention: Power Consumption: 110-240V, 50/60 Hz, 16A
5. Power on the SCU. While booting the following is shown:

```
PLEASE WAIT.....INITIALIZING!  
Version: 1.20      IEEE-Addr1: 7
```

6. When the SCU is ready for working the following MAINSCREEN is shown:

```
Device          Pos.   Pol.  Angle  
->SCU  
  GuideRail     not referenced
```

In this example the main screen shows the SCU itself and a not referenced Cable Guide Rail CGR.

7. With "UP" and "DOWN" you can navigate the arrow "->" between the devices.

#### 4) Menu of SCU

1. Navigate the arrow “->” to the SCU and press “ENTER”. Now there is a double arrow “=>” in front of the SCU. The double arrow “=>” always marks the chosen device (here SCU).

```
Device          Pos.   Pol.  Angle
=>SCU
=>GuideRail     2.50m
```

2. Press “MENU”. The menu screen opens.

```
----- CONTROLLER MENU -----
information
-> display contrast
IEEE addresses
```

With “UP” and “DOWN” you can navigate the arrow.

3. If you want to change the display contrast, go to “display contrast” with the arrow and press “ENTER”.
4. Change the contrast by pressing “UP” or “DOWN”. When finished press “ENTER” to confirm, then “EXIT”. You are back in the MAINSCREEN again.
5. For changing the IEEE-address repeat steps 3.1, 3.2 and 3.3, but choose “IEEE-address”.
6. Change the address with “UP” or “DOWN” and confirm with “ENTER”. Quit with “EXIT”, the MAINSCREEN is shown again

### 5) Moving a Cable Guide Rail

1. Navigate the arrow in the MAINSCREEN with “UP” or “DOWN” to the Gable Guide Rail and press “ENTER”. The double arrow marks him now as chosen device.
2. Press “REFERENCE”,

```
Device          Pos.   Pol.  Angle
SCU
=>GuideRail    2.50m
```

Then “ENTER”. The Guide Rail is now slowly moving to his reference point, 0.00 m.

```
Device          Pos.   Pol.  Angle
SCU
=>GuideRail    4.99m
new value      referencing...
```

3. When referencing is finished you will be able to move the Guide Rail manually with the “UP” and “DOWN” buttons or by entering a new position.  
Note: You must make a reference process if the Guide Rail shows “not referenced”, Referencing is also possible when the Guide Rail is at a defined position.
4. Press “UP” and hold it, the Guide Rail will move, but only up to the maximum limit of 5.40 m. Press “DOWN” and hold it, the Guide Rail will move, but only up to the minimum limit of 0.00 m.
5. To move to a defined position press “ENTER”,

```
Device          Pos.   Pol.  Angle
SCU
=>GuideRail   -0.00m
new value     -0.00m
```

Input the new position, e.g. 2.50.

```
Device      Pos.   Pol.  Angle
SCU
=>GuideRail -0.00m

new value   2.5m
```

Press “ENTER” again. The Guide Rail will move to the new position.

```
Device      Pos.   Pol.  Angle
SCU
=>GuideRail  2.23m

new value   2.50m
```

```
Device      Pos.   Pol.  Angle
SCU
=>GuideRail  2.50m
```

- By pressing the “STOP” button while the Guide Rail is moving, the movement can be stopped.



## 6) Menu of Guide Rail

1. When a Guide Rail is chosen (double arrow =>) by pressing “MENU” you will enter the Guide Rail menu. With “UP” and “DOWN” you can navigate to the individual points.

```
----- DEVICE MENU -----  
  
information  
-> movement limits  
Positioning speed
```

2. Navigate to “information” and press “ENTER”. The device type, the serial number and the firmware version will be shown.

```
----- DEVICE INFORMATION -----  
  
device type           0x4000  
serial number         1851107  
firmware version      11.10
```

It is not possible to make any changes there.  
Press “EXIT” and you will be back in the MAINSCREEN.

3. Go to the Guide Rail menu again as explained in D1; navigate to “movement limits” and press, “ENTER”. The first two lines are the hardware limits of 5.40 m and 0.00 m. It is not possible to change these hardware limits.
4. Standard for the user limits is “no”.

```
----- LIMITS SETUP -----  
  
hardware limit maximum      5.30m  
hardware limit minimum      0.00m  
  
user limit maximum          no  
user limit minimum          no
```

You can type in user limits and confirm with “ENTER”. With “UP” and “DOWN” you can navigate between user limit maximum and minimum.

5. To delete a user limit navigate to the according, input a higher (or lower) limit and confirm with “ENTER”. Repeat this with the second user limit. Press “EXIT” to go back to the MAINSCREEN.

6. Go to the Guide Rail menu again as explained in 6.1; navigate to “positioning speed” and press, “ENTER”. You will see the possible minimal and maximal speed.

A screenshot of a terminal window showing the "SPEED SETUP" menu. The text is displayed in a monospaced font on a dark blue background. The menu shows the current speed settings for "Position / m/s", including minimum, maximum, and actual values.

	min.	max.	act.
Position / m/s	0.030	0.413	0.413

You can change the actual speed by type in a value and confirm with “ENTER”. Press “EXIT” to go back to the MAINSCREEN.

## **7) Trouble Shooting for Controller SCU**

If there are problems with the controller, please always carry out the following first:

1. Check power supply – must be between 110V and 240V
2. Check both fuses at the backside of the controller
3. Check user limits and remove the limits, if not in use (see manual for controller)
4. Check fibre optic cables and connections (if possible change cables from a different device and check)
5. Use a short cable for connection directly to the device in the chamber
6. Disconnect the power supply of the device and the controller for approx. 1 minute; reconnect the power supply and carry out referencing

<b>Fault</b>	<b>Probable Cause</b>	<b>Suggested Remedy</b>
Display does not light up	<ul style="list-style-type: none"> <li>• LCD display not connected properly or display has malfunction</li> </ul>	<ul style="list-style-type: none"> <li>• Check all connectors of the display</li> </ul>
Display lights up but no text is shown	<ul style="list-style-type: none"> <li>• Wrong adjustment of the display contrast</li> </ul>	<ul style="list-style-type: none"> <li>• Check display contrast in the menu</li> </ul>
Problems with IEEE interface to software	<ul style="list-style-type: none"> <li>• Wrong software installed</li> <li>• Malfunction at the connector</li> </ul>	<ul style="list-style-type: none"> <li>• Update of software</li> <li>• Change of IEEE-connector</li> </ul>

Please contact our service department by:

Phone: +49 9606 9239130

Or by

Email: [service@maturO-gmbh.de](mailto:service@maturO-gmbh.de)

When contacting maturO, please always provide the serial number of the products.

## Warranty Statement

Maturo GmbH, hereinafter referred as maturo, warrants that our standard products are free from defect in materials and workmanship for a period of one year from date of shipment, if maintenance is done regularly. Standard maturo products include the following:

- Antenna Mast and Stands
- Turntables and Turn Devices
- Cable guide rails
- Controllers
- Dynamometers for the automotive industry

If the Buyer notifies the Seller of a defect within the warranty period, the Seller will, at the Seller's option, either repair and/or replace those products that prove to be defective.

There will be no charge for warranty services performed at the location maturo designates. The customer must, however, prepay inbound shipping costs and any duties or taxes. Maturo will pay outbound shipping cost for a carrier of maturo's choice, exclusive of any duties or taxes. If maturo determines that warranty service can only be performed at the customer's location, the customer will not be charged for maturo's travel related costs.

This warranty does not apply for:

- Improper storage of our products outside our area of influence,
- Errors during installation, commissioning or operation,
- Wear and tear during normal operations,
- Unqualified maintenance works,
- The application of unsuitable equipment and materials,
- The results of repair works or other activities undertaken on our products, which have not been expressly approved by us.
- Consumable items such as fuses, batteries, etc.
- Products which have been operated outside the specifications

**Note: Please always contact maturo before shipping equipment to us.**



# GPIB commands for the Single Control Unit SCU



## For Cable Guide Rails CGR



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## Chapter 1: GPIB-Bus commands for Cable Guide Rails

### General information

- All outputs through the GPIB-Bus are five characters long, followed by Line Feed (0AH). Missing positions are filled with blanks (20H).
- All values are transferred in CM.
- Negative values are not allowed.
- The commands, values and units must be transferred in capital letters and separated by blanks.
- No more than 32 characters may be sent in one transmission.
- The Line Feed or the EOI can be used as an end character (CR will be ignored).

### Registers

The GPIB-Bus interface of the control device has several registers available. By transmitting the register name, the register is made the current register. If the device is addressed as TALKER, it outputs the contents of the register set.

If a value has been loaded previously with LD, it is accepted into the next following register.

### Input Registers

These registers can be assigned a value with the LD command. They can be readout when the register name is received and the control unit is then addressed as TALKER.

- WL - Wise Limit, cannot be larger than 5.40 (6.00) m.
- CP - Current Position.
- NP - Next Position, set point for the GO command.
- SP - Speed, valid numbers are 1 to 8.

### Output Registers

These registers are only for readout of information.

- CP - Current Position
- BU - Busy Motor status  
0: Motor is off  
1: Motor is on



The BU register indicates if the motor and thereby also the mast is currently moving. For mechanical reasons, the motor cannot start immediately after the receipt of a start command.

Therefore it is necessary to wait until the mast moves (BU = 1), before it is possible to enquire with BU whether the previous command has been completed. If the mast is already located in the desired position when a GO command is received, BU will nevertheless be set on 1 for approx. 0.5 sec.

### **Commands to Load the Registers**

LD nnn CM - Load the value nnn into the register following.

### **Commands to Control Cable Guide Rail**

Note: Device address: 2

- CW - Moves the Guide Rail until the maximum limit is reached or a STOP command (ST) is received.
- CC - Moves the Guide Rail until the minimum limit is reached or a STOP command (ST) is received.
- GO - Moves the Guide Rail to the position in the set point register (NP)
- ST - Stops the movement of the Guide Rail.

## Chapter 2: Error Messages

- E – P            Power is sent after a loss of mains power
- E – S            Syntax is sent when an invalid command is received
- E – V            Value is sent when a value does not lie within the valid limits
- E – D            Device is sent when the device no longer reacts, meaning that the motor does not move in spite of the control. It is also sent if the addressed device does not exist.

### Chapter 3: General programming of the GPIB-BUS at SCU

#### **Speed setting of a device**

You can set speed 1 to 8 with the SP-Register. To change the speed of the turntable, make the following two steps:

Select the Turntable "LD 1 DV"

Write "LD 5 SP" sets the speed to five. The speed depends on the maximum speed of the device.

For example the maximum speed of the turntable is 2.0 U/min  
 $(2.0 \div 8) * 5 = 1.25$  U/min is the new speed

The maximum speed of each device can be readout in the device-menu of the SCU.

#### **Go to a new position**

For setting a new position of the turntable make the following two steps:

Select the Turntable "LD 1 DV"

Write the command "LD 180.0 DG NP GO" (the turntable moves to 180 degree)

With the commands "CC" and "CW" it is possible to move the turntable to minimum and maximum limit.

"CC" – Turntable moves to minimum limit (e.g.: -200 degree)

"CW" – Turntable moves to maximum limit (e.g.: +400 degree)

For stopping the turntable make the following two steps:

Select the turntable "LD 1 DV"

Write the command "ST"

For setting a new position of the cable guide rail follow the same steps:

Except: Select the cable guide rail with writing "LD 2 DV"

Write the command "LD 300.0 CM NP GO" (the cable guide rail moves to 3.0 meter)

#### **Readout the actual position of the device:**

Select the device by writing "LD x DV". (x = 2 => Cable Guide Rail and x = 1 => Turntable)

Write "CP" (set the Pointer to the CP-Register)

Readout of six Bytes (applies to cable guide rail and turntable)

In general all registers can be readout in the same way.

E.g.: WL and the CL Register

Device address	Device
1	Turntable (TT)
2	Cable Guide Rail (CGR)



*Notes*