
Operating Manual

Control SM5-9



Luigs & Neumann GmbH
Boschstrasse 19 * D-40880 Ratingen * Germany
Tel. : +49 2102 947000 * Fax.: +49 2102 442036
info@luigs-neumann.com * www.luigs-neumann.com

Control SM5-9

The control SM5 is very versatile and configurable.
Depending on equipment one to nine motor-driven LN-axes can be attached.
The control SM5 is also compatible with the control systems SM5, SM5-8 and SM6.

The SM-9 control features 3 operating modes:

- A. The control is used in combination with one key panel.
- B. The control is used in combination with two key panels.
- C. The SM5-9 gets integrated into an existing SM5 system.

* Options A & C only in combination with a SM5 key panel.

Contents

Security advice.....	Page 3
Overview.....	Page 4
Control SM5-9.....	Page 5..6
A: Operation with one key panel.....	Page 7
B: Operation with two key panels.....	Page 8
C: Operation as slope-control.....	Page 9
Appendix A, Change addressing.....	Page 11...15
Technical data.....	Page 16

1 Security advice

1.1 General advice

The manipulators and moving-tables are designated for the positioning of repositories, microscopes or tools. (e.g.: capillaries, measuring electrodes, stimulating electrodes... etc.)
For a safe function of the manipulators regard the operating and assembly manuals.
Our service team will assist you, if additional information is required.
Especially comply with the security advices of this manual.
The intended protection can be endangered if the device is not used accordingly to the operating manual of the producer.

1.2 User advice

Do not touch the motor-driven manipulators during the positioning process in order to avoid injuries and bruises, and to avoid damaging the intended functionality of the device.

As a result of the modular, individually by the customer created arrangement it is possible that miscellaneous areas with increased risk of injury (especially bruises) exist.

Avoid bringing your face to close to the moving devices, as the cramped arrangement in combination with faulty operation of the manipulators can lead to breakage of glass. This can lead to severe injuries (e.g.: splinters of glass in the eye)

The provided protective covering has to be assembled accordingly to the operation manual.

1.3 Transport and backhaul advice

The manipulators and moving tables are transported in a special packing in order to avoid damages and inaccuracies of the adjustment. Retain this special packing for the purpose of return transport or maintenance.
The sender will be charged for all damages caused by insufficient packing during return transport.

1.4 Service and maintenance advice

The manipulators and moving tables are maintenance-free.

For the maintenance of the operation of the devices, protect them from humidity and excessive heat.
Fierce crushes can compromise the correct adjustment, which lowers the functionality of the devices.

No internal interferences are allowed, with exception of the activities mentioned in the operating manual or if instructed by our service team.

1.5 Installation location advice

Install the devices at locations with adequate air supply for aeration of the equipment.

The main control switch of the device has to be easily accessible at all time.

1.6 Disposal advice

Broken or no longer required devices do not belong in the household garbage!
Dispose of them accordingly to the local legal regulations.
In case of doubt ask the service team of Luigs & Neumann for help.

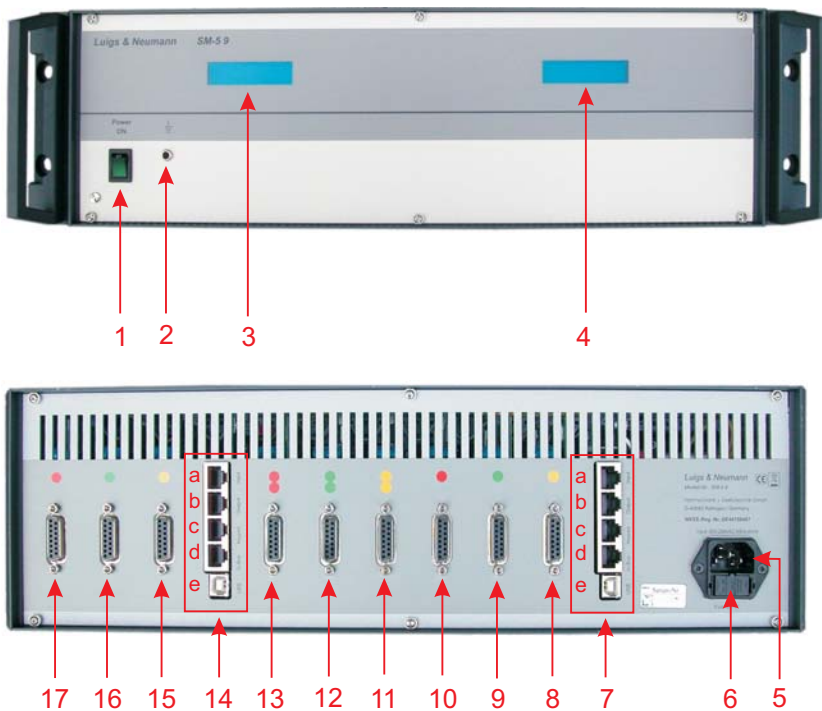
1.7 Guarantee advice

The producers are not liable for damages caused by not authorized interferences.
Unauthorized interferences terminates all warranty claims.

1.8 Repair and readjustment advice

The devices have to be packed according to the adequate regulations.
Contaminated devices have to be cleaned if possible.
If this is not possible, please provide a user declaration which describes the substance and affirms the harmlessness for humans.

Overview: Control SM5-9



- 1 Power switch.....On / off switch of the control
- 2 Earthing plug socket.....Earth the control
- 3 Display 1.....Display 1
- 4 Display 2.....Display 2

- 5 Power input.....90-240VAC
- 6 Fuse insertion.....Fuses: 2x T2A

IFC -1 (SSK -1)

- 7a Input SM5/6.....Link SM5 with other control
- 7b Output SM5/6.....Link SM5 with other control
- 7c Keypad..... Plug for key panel SM5, SM6 or trackball
- 7d I²C-BUS.....Add-on for additional device
- 7e USB.....Configuration of the interfacecard 1 (IFC1 = SSK1), Update of control and key panel

- 8 Motor connection X1.....Connection for motor-driven LN-axis
- 9 Motor connection Y1.....Connection for motor-driven LN-axis
- 10 Motor connection Z1.....Connection for motor-driven LN-axis
- 11 Motor connection X2.....Connection for motor-driven LN-axis
- 12 Motor connection Y2.....Connection for motor-driven LN-axis
- 13 Motor connection Z2.....Connection for motor-driven LN-axis

IFC -2 (SSK -2)

- 14a Input SM5/6.....Link SM5 with other control
- 14b Output SM5/6.....Link SM5 with other control
- 14c Keypad..... Plug for key panel SM5, SM6 or trackball
- 14d I²C-BUS.....Add-on for additional devices
- 14e USB.....Configuration of the interfacecard 2 (IFC2 / SSK2), Update of control and key panel

- 15 Motor connection X3.....Connection for motor-driven LN-axis
- 16 Motor connection Y3.....Connection for motor-driven LN-axis
- 17 Motor connection Z3.....Connection for motor-driven LN-axis

Control SM5-9

The control SM5-9 is equipped with 2 independent interfacecards (IFC=SSK).
Two controls (SM5-6 and SM5-3) are in housed in one chassis.

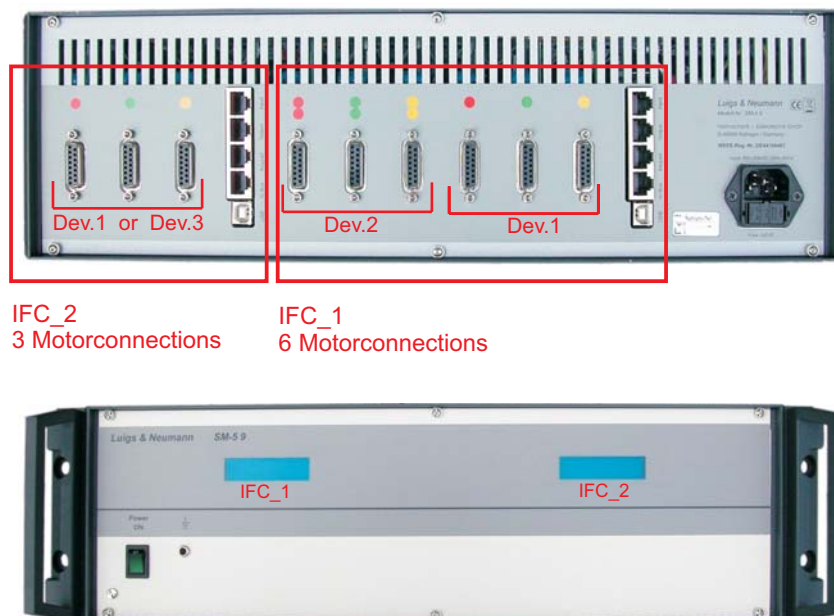
Depending on equipment one to nine motoric LN-axis can be attached.

The first 6 motor connections are assigned to the first IFC, the last three are assigned to the second IFC. Both IFC are independent from each other. This allows the attachment of up to two SM 5 key panels. The front side features two displays. The left display relates to the IFC 1 and the right display relates to the IFC 2.

Each IFC has an individual addressing. The IFC with the attached SM5 key panel has to be set to address 10 and is the so-called the master-IFC.

The IFC with the address 20 is the so-called slave-IFC. It is not possible to attach a key panel to a slave-IFC.

Each IFC has two devices, each with three motor connections.



IFC_2
3 Motorconnections

IFC_1
6 Motorconnections

The SM5-9 control features 3 operating modes:

A. It is used in combination with one key panel.

* See page 7

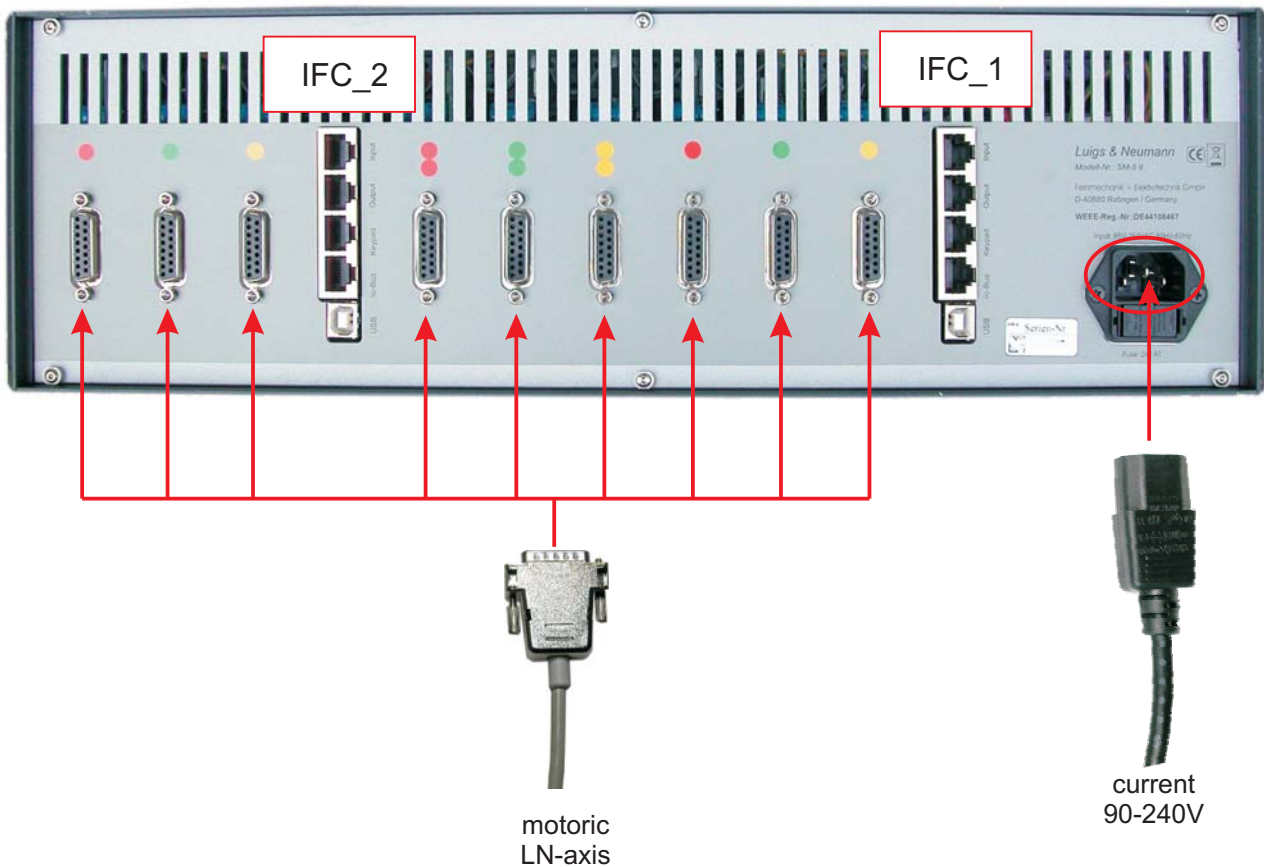
B. It is used in combination with two key panels.

* See page 8

C. The SM5-9 gets integrated into an existing SM5 System

* See page 9

Control SM5-9

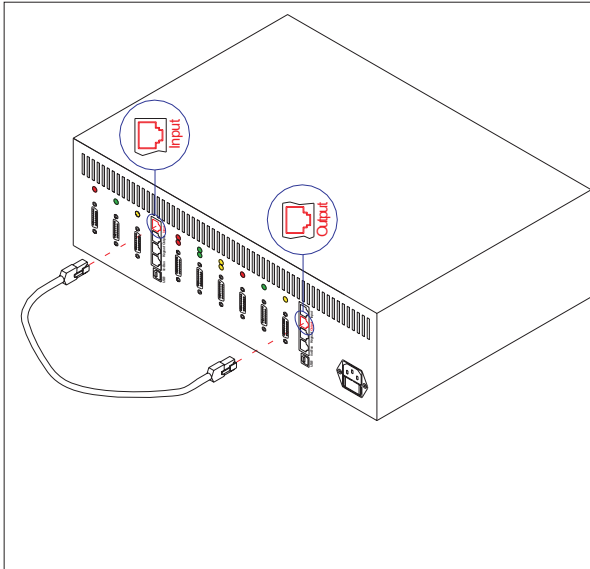


- Only wire up the control SM5 while it is off-state
 - Connect the control SM5 with the mains supply with the mains cable and the power input. [5]
 - Connect the motoric LN-axes with the corresponding motor connections [8..13 + 15..17] of the SM5 control. The motor connections and the LN-axes are color-coded.
 - Connect the key panel according to mode of operation [A, B or C] with the key panel cable to the key panel plug [7c / 14c] of the IFC-master.
- * See page 7..9

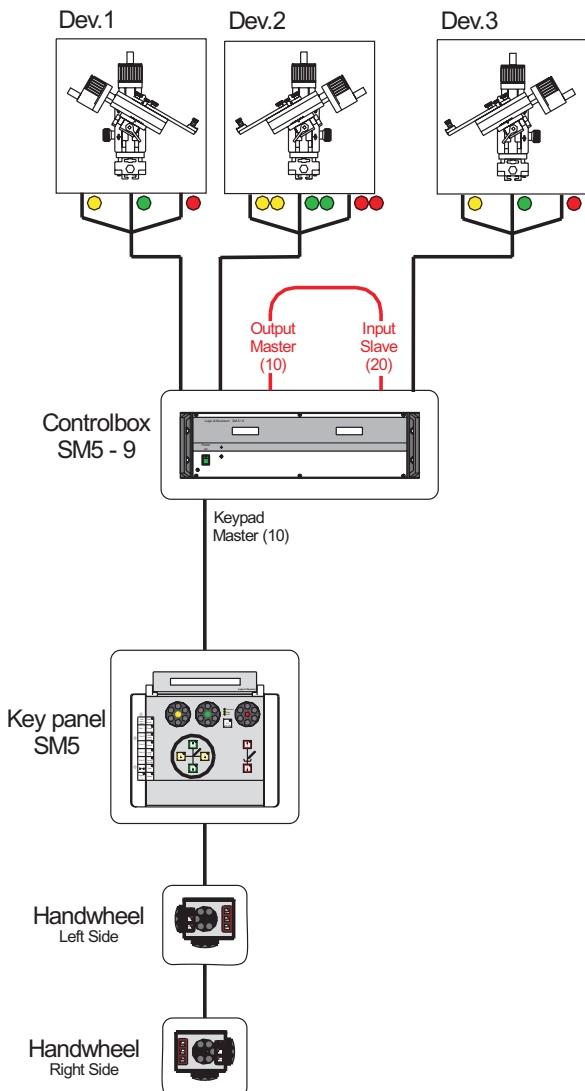
A. Operation with one key panel

The operation of the control SM5-9 with only one key panel SM5 requires the connection of IFC-Master(10) and IFC-slave(20).

*The master/slave configuration is accomplished with the „micromanipulator controlcenter“ program. See Appendix A



- * The control SM5-9 has to be off-state
 - * One IFC has to be configured as master (10), while the other IFC is configured as slave (20).
 - * Use the provided connection cable to connect the IFC master(output) with the IFC slave (input).
-
- * Connect the key panel SM5 with the key panel plug of the IFC master.



Color-code of the motor connections:

M A S T E R	Dev.1	X1=	Y1=	Z1=
	Dev.2	X2=	Y2=	Z2=
S L A V E	Dev.3	X3=	Y3=	Z3=
	Dev.4	-----	-----	-----

IFC1 = 10 (Master) or IFC1 = 20 (Slave)
IFC2 = 20 (Slave) IFC2 = 10 (Master)

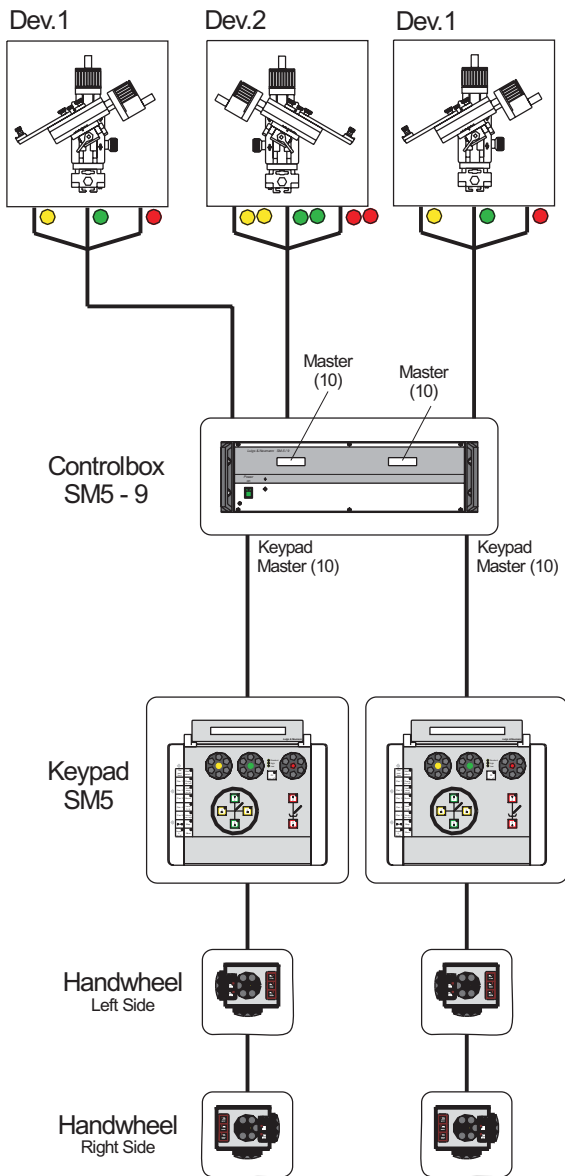
* The operation of the control SM5-9 with only one key panel requires the connection of master and slave

Master = The first IFC in the network-chain and the address 10, which is connected with the key panel SM5.










Slave = All additional IFC in the network-chain, starting with address 20. Up to eight IFC can be networked. It is not possible to connect a key panel with a slave IFC.




B. Operation with two key panels

During operation with two SM5 key panels, both IFC of the control SM5-9 have to be set to address 10. Both IFCs are masters and one key panel can be connected with each of them.



Color-code of the motor-connections

M A S T E R	Dev.1	X1= 	Y1= 	Z1= 
	Dev.2	X2=  	Y2=  	Z2=  

M A S T E R	Dev.1	X1= 	Y1= 	Z1= 
	Dev.2	-----	-----	-----

IFC1=10 (Master)

IFC2=10 (Master)

C. Implement control SM5-9 into an existing SM5-System

The control SM5 can be networked with other controls (SM5 or SM6).

Up to eight IFC can be networked in line and operated with one key panel SM5.

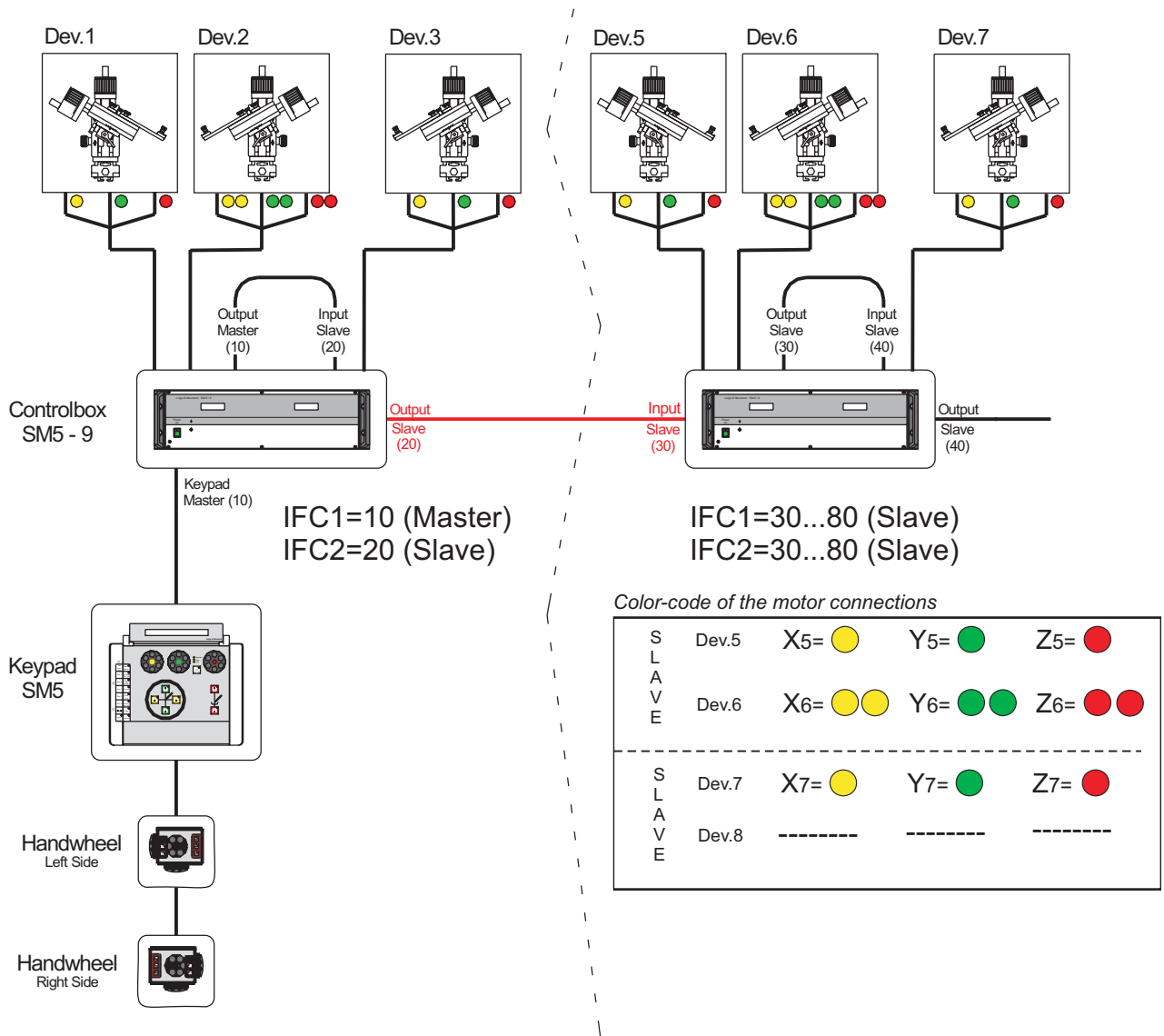
The first IFC which is connected with the key panel SM5 has to be set to address 10 and is labeled as master-IFC. All subsequent additional IFCs have address 20, 30...80 and are

labeled as slave-IFC. Each IFC has to have an individual address (No multiple usage of addresses)

The master/slave configuration is accomplished with the „micromanipulator controlcenter” program.

* See Appendix A

Each newly implemented IFC has to be connected with the previous IFC-Slave (Output).



Master = The first IFC in the network-chain and the address 10, which is connected with the key panel SM5.

Slave = All additional IFC in the network-chain, starting with address 20.
Up to eight IFC can be networked.
It is not possible to connect a key panel with a slave IFC.

Initiation of control SM5-9

* Activate the control SM5-9 by pressing the main switch. [1]

Both Displays show:

```

i n i t i a l i z i n g
P l a s e   w a i t
  
```

```

L u i g s   &   N e u m a n n
   G e r m a n y
  
```

```

T e l + 4 9 2 1 0 2 9 4 7 0 0 0
F a x + 4 9 2 1 0 2 4 4 2 0 3 6
  
```

```

S S K   V 2 . 8 . 3
o w n   a d d r e s s   1 0
  
```

The program version of the IFC* and the currently set address is shown (10 = master, 20 and higher = slave)

*IFC = SSK = Interfacecard

```

L o a d e r   V 1 . 2 . 0
  
```

The current bootloader version for updates is shown

```

K e y b o a r d   f o u n d
  
```

Indicates a connected key panel.

```

N u m b e r   o f   C u b e s
d e t e c t e d : 0
  
```

Indicates how many cubes are connected

```

T r a c k b a l l   f o u n d :
n o n e . . .
  
```

Indicates a connected trackball.

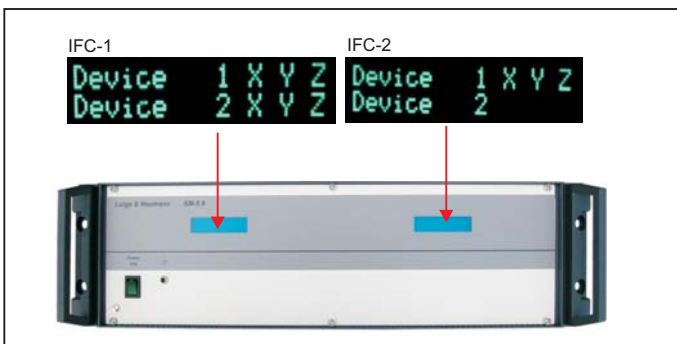
```

P l e a s e   w a i t . . .
  
```

```

D e v i c e   1   X   Y   Z
D e v i c e   2   X   Y   Z
  
```

Indicates equipment and state of readiness of the control.



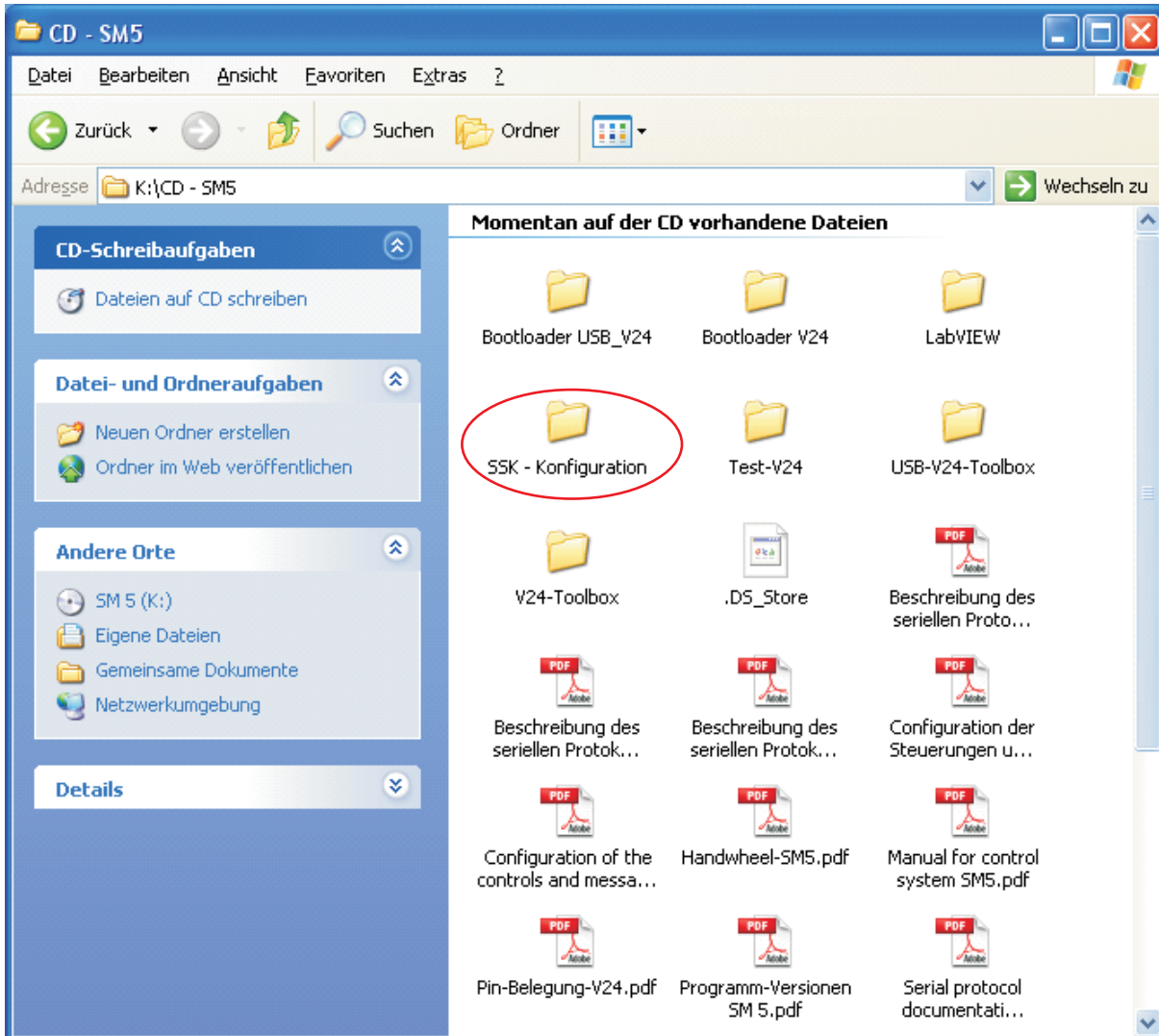
* The displays only show Device 1 and Device 2, Independent from the number of networked Slave-IFCs. The display of the key panel shows the correct device number.

Appendix - A

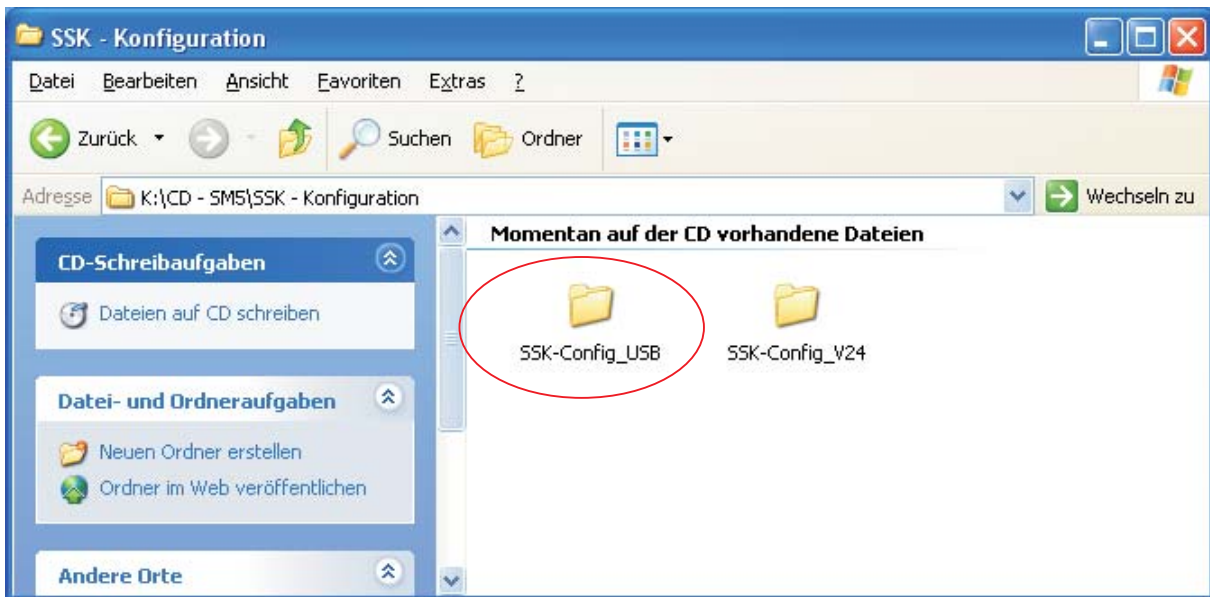
Control configuration

* with the “Micromanipulator Controlcenter V1.1.1 Beta” program

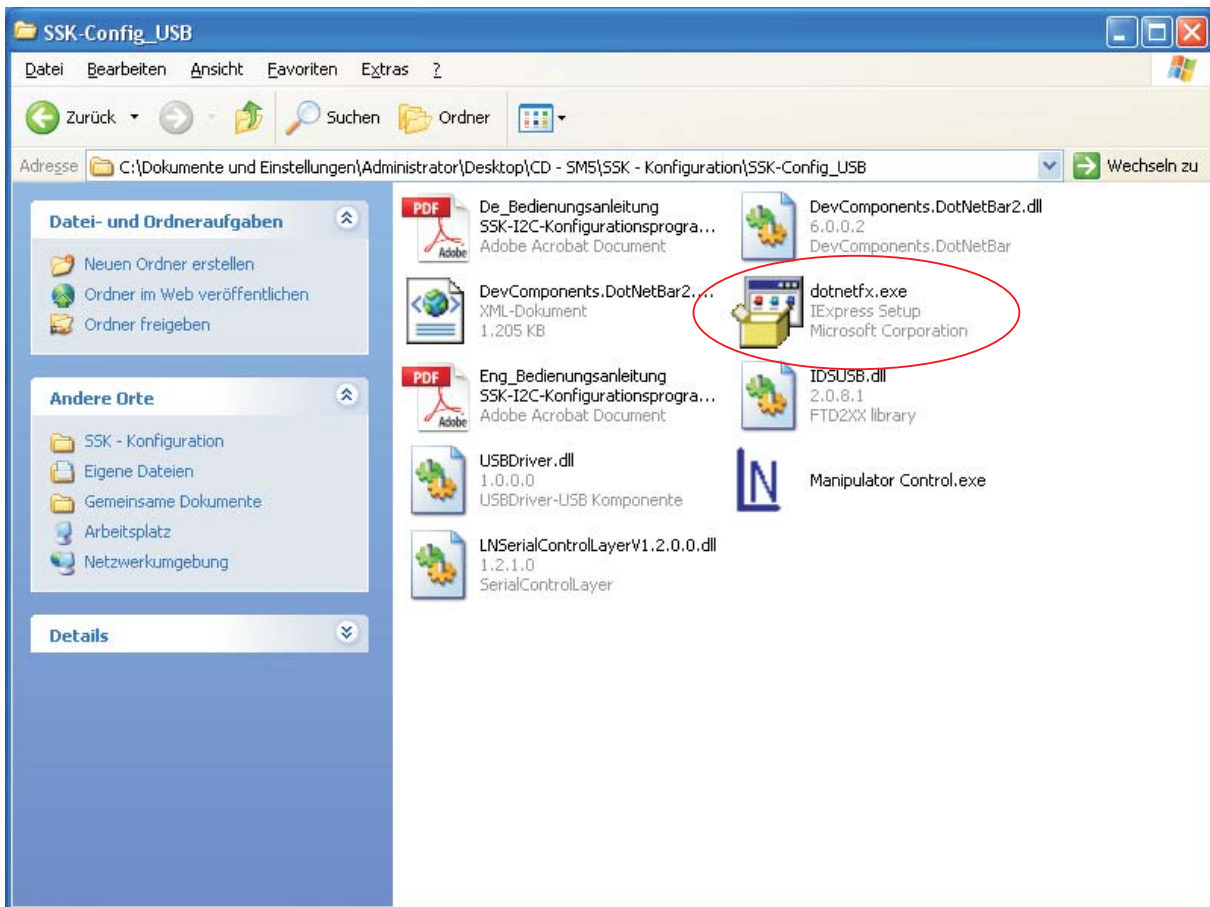
Copy the „SSK – Config_USB“ folder from the SM5/SSK directory on the SM5 CD to your computer.



Open the SSK-Config_USB folder



Start Dotnextfx.exe in order to start the installation



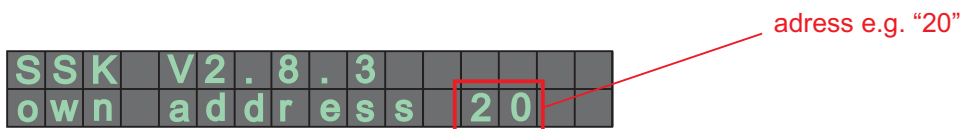
If you own multiple connected control, please keep in mind that address adjustment is not possible beyond multiple units.

Disconnect the network connection (input/output) with the other controls.

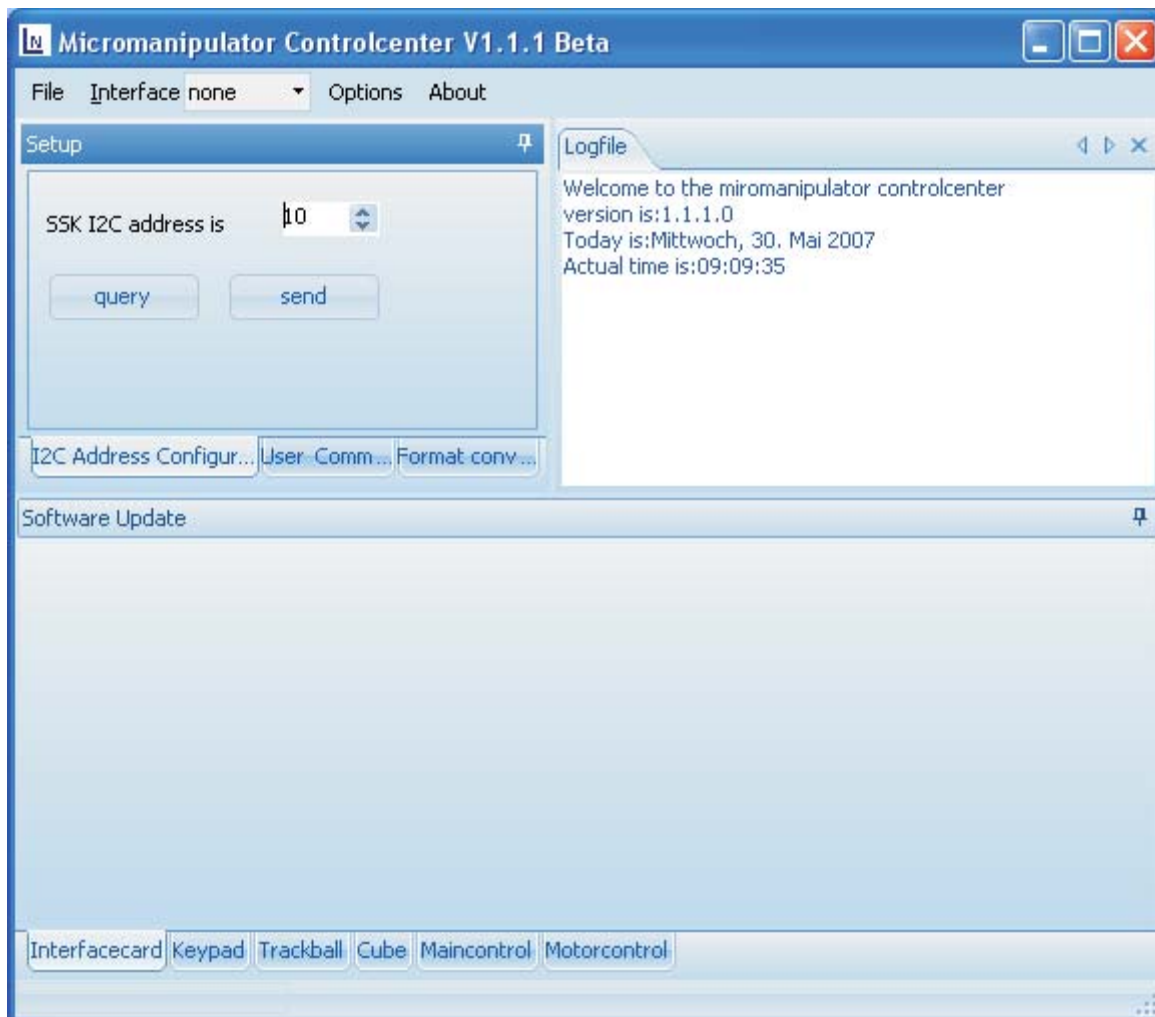
It is necessary to connect the PC with that control directly in order to change the address.

Establish a connection between PC and control with a USB-cable or a V24-cable.

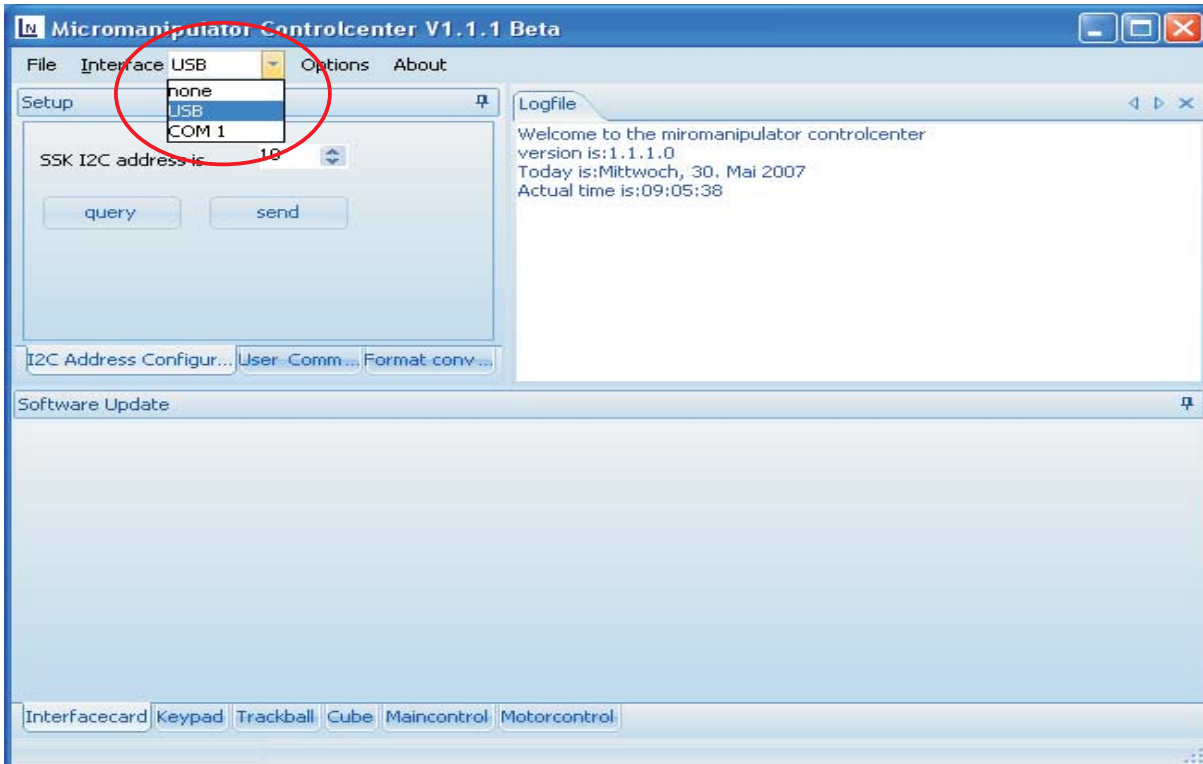
Activate control, after booting up the display shows the message:



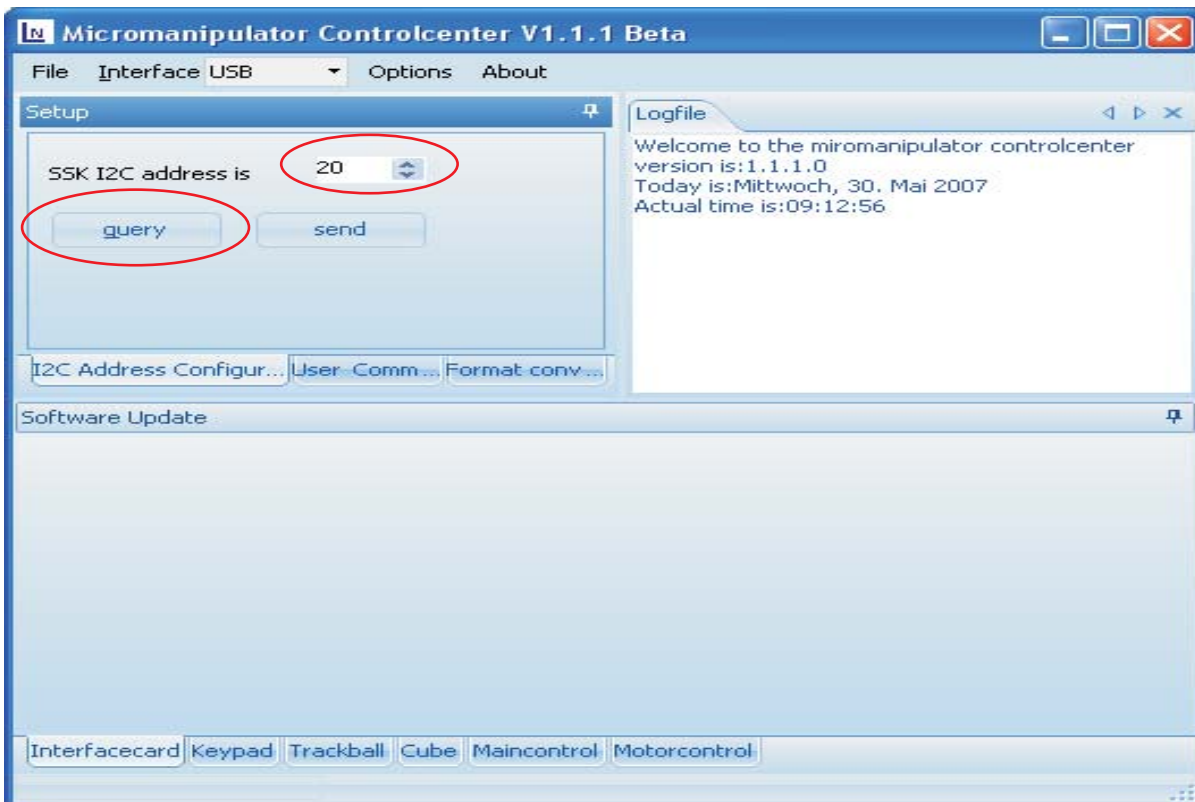
Start „Micromanipulator Controlcenter“ on your pc



Choose **USB** or **Com** for the V24 cable in the **Interface** dropdown menu



Click „**query**“ and the „**SSK I2C address**“ array shows the current address



Change the address value of „SSK I2C address is“ with the **up / down** buttons.
(for master = 10, slave = 20 – 80)
press „**send**“



Deactivate the control and reactivate it hereon. The current address is shown on the display during the booting process.



The control operates as master and a key panel can be attached.

Technical Data

Chassis : 19" / 3HE, 375mm deep

Dimensions in mm : approx. 449mm x 133mm x 375mm

Weight : 8,4kg

Input Voltage : 85V – 264V AC, (47-63Hz)

Fuse : 2x T2A

Performance : 150W

current : max. 1,9A at 100VAC / 0,95A at 200VAC

Inrush current : 14 / 28A

(Inrush Current 100V/200V AC)

Ambient temperature[≤] : 0°C – 40°C

Relative humidity: 90%

Applicable law:

EMV Richtlinien 04/108/EG

Niederspannungsrichtlinie 72/23/EGW

Ergänzt durch 93/68/EWG