4-axis-controller

iMC-S8

Operating Instruction

About this operating instruction

Used shortcuts

MRL   *machine directive 2006/42/EC*
ERL   *EMC directive 2004/108/EC*
NRL   *low voltage directive 73/23/EWC*

Used symbols

You will find different symbols in this manual that signalizes important information/ facts and danger.

Warning!
This symbol indicates dangers that cause damages for person's health, physical injury or death.

Warning! Dangerous voltage!
Warning of danger from electricity. Ignoring can lead to serious injury or death.

Attention!
This Symbol indicates important notes. Ignoring this symbol leads to damages and malfunctions of the machinery

Information:
This symbol indicates important information and notes.

Observe the safety instructions

Before you take the 4-axis-controller iMC-S8 in operation, working with the controller or make additions or changes to the wiring of the, make sure to read carefully the safety instructions in this manual. (Chapter 1.2 **Safety instructions***).*

isel controllers are concurrent with CE norms and marked accordingly. Commissioning of all other parts or components, for which CE safety regulations apply, is prohibited until all respective requests are met.

isel Germany AG as the manufacturer cannot take over guarantee if you change the controller in any way.

The EMC test is valid only for the controller's original configuration ex works, i.e. the delivery state.

Latest operating instructions and manuals for download, visit:

www.isel-data.de/manuals

Table of contents

1 Introduction

The stepper-motor-controller iMC-S8 is a freely programmable compact control up to four linear or rotational units with 2-phase stepper motors. The controller integrates maximum four motor power amplifiers with step/direction interface, a processor core with flash memory to interpret the user programs and generating step/direction signals for the power amplifiers, power supply units, security circuit module and a table housing with net input filter and control elements.

1.1 Intended use

The processors operating system (firmware) provides following operation modes:

- DNC-mode:
  The controller is permanent connected with a PC/laptop via serial interface.

- CNC-mode:
  The controller works „Stand Alone" after a user program is downloaded to the processors flash memory.

The controller is able to drive stepper-motors in micro stepping mode. The power amplifiers generates up to 128 micro-steps per full-step. This allows a smoothly run of the connected motors. An automatic current reduction reduces the power loss in the amplifier and motor.

The peak current amounts 7,8A and is adjustable via DIP-switches.

With the impulse input it's possible to control the most important functions (start, stop). Thereby it's also possible to connect an external control console or a higher ranked control (e.g. PLC).

All axis of the controller have to be used only with the compatible motor type.

Please read this operation instruction manual carefully before first use of the controller therewith you can:

- Work safely, fast and effective
- Keep away danger from persons
- Use all the power and features of the controller.

1.2   Safety instructions

- The stepper-motor-controller iMC-S8 is designed in conformability to current technical and recognized rules.

- The device may only be used if it is in correct condition. Any faults have to be eliminated immediately. Neither children nor non-authorized persons are allowed to put the device into operation.

- The device may only be used for the intended purpose: control of 2 up to 4 linear or rotational axes with 2-phase stepper motors.

- All work with the controller iMC-S8, especially initial operation, installation as well as external wiring must be executed by authorized personal regarding electrical industry rules and accident prevention regulations.

- Assembly and use of operating material has to be according to EMC directive 2004/108/EC and Low voltage directive 73/23/EWC. In case of in proper use even the observation of the respective rules and standards does not protect against physical damages and damage to property.

- Do not expose the device to high humidity or high vibrations.

- Please take care of the instruction manual. Be sure that all users know the instructions.

- Ignoring the instruction manual can lead to damage, heavy physical damage or to death.

2 Scope of delivery

The stepper motor controller iMC-S8 is available in the following variants:

<u>**iMC-S8**</u> (Part.-No. 383320 200x) as desk controller

- stepper motor controller iMC-S8 with Core module as desk device with max. four stepper motor power amplifiers MD28
- main cable (protection contact plug, IEC-60320 power connector)
- RS232-communication cable, 9-pin Sub-D (socket) to 9-pin Sub-D (plug)
- Operating instruction
- Programming software PALPC 2.1 (software version 2.1.5.1 or higher)

<u>**iMC-S8**</u> (Part.-No. 383320 100x) as 19 inch plug-in controller

- stepper motor controller iMC-S8 with Core module as 19 inch device with max. four stepper motor power amplifiers MD28
- main cable (protection contact plug, IEC-60320 power connector)
- RS232-communication cable, 9-pin Sub-D (socket) to 9-pin Sub-D (plug)
- Operating instruction
- Programming software PALPC 2.1(software version 2.1.5.1 or higher)

3 Technical data

General data:	
dimensions (W x H x D):	475 x 187,5 x 324 mm
weight:	15 kg
maximum number of axis :	4
motors:	2-phase stepper motors (1,8°)
safety class:	IP20
stop category:	1
ambient temperature:	0°C - +50°C
storage temperature:	-20°C - +65°C
humidity:	maximum 95% not condensing
Embedded controller data:	
controller core:	32Bit-RISC processor (embedded controller)
program memory:	128 Kbyte flash total, 350 commands storable
communication via RS232:	RS232 (19200 baud, 8 data bit, 1 stop bit, no parity)
stepper motor amplifier:	stepper motor driver MD28
max. step input frequency:	40 kHz (full step)

Electrical data:	
power supply voltage:	100-230VAC 50…60 Hz
power consumption:	ca. 120 W (3 axis)
fuses:	*2 x 6,3 A/250V time lag*
Stepper motor control:	
peak current per amplifier:	2,8 A - 7,8 A
rated current per amplifier:	2,0 A - 5,6 A
voltage of the amplifiers:	48 VDC
automatic current reduction:	to 50%
digital inputs:	8 x inputs
digital outputs:	8 x transistor outputs 24VDC/300 mA 1 x relay output 230V/6A
analog outputs:	1 x analog output 0…10V for speed control setting to a frequency inverter
cover/door control:	Yes
motor brake on Z-axis:	Yes
safety category:	3
stop category:	0
Software:	
CNC mode:	*PALPC 2.1* (software version 2.1.5.1 or higher)
DNC mode:	*Remote* (software version 1.46.2.1 or higher), *optional: ProNC)*

4 iMC-S8 hardware description

4.1 front side
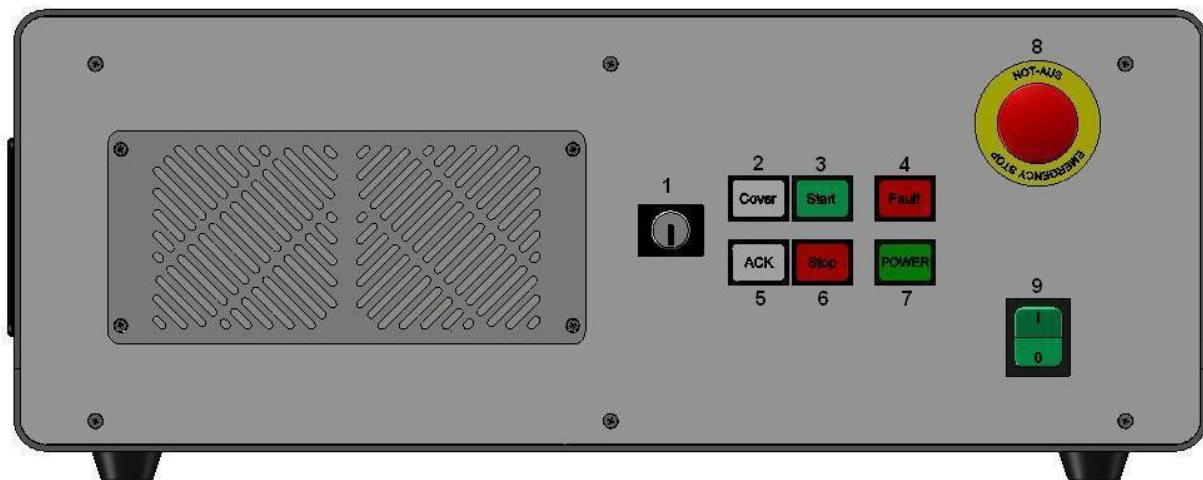
1 - operation mode switch (key switch)
Use this switch to choose between automatic- and setup-mode.

In **automatic-mode** you can **only open** the **cover or safety door** of the machine if **no axis is in motion** and the mounted **working spindle** is **switched off** (means that spindle does not turn).

In **the setup-mode** you can **only open** the **cover or safety door** of the machine if the mounted **working spindle** is **switched off** (means that spindle does not turn). You can just **move the axes at opened cover or safety door** if you **press** the **ACK button**.

Ensure that in setup-mode (key switch on TEST) only authorized personal operates on the machine.

2 - cover-button

Use this button to open the machines cover or safety door. This is possible only if the conditions from point "4 – operation mode switch" are complied. An enable for opening of the cover or safety door is signalized by a white lighted cover button.

3 - start-button

If you press the start button in CNC mode (see chapter: **Fehler! Verweisquelle konnte nicht gefunden werden.**) a saved user program in the flash memory will be executed.

You cannot use the start switch in DNC mode.

4 - fault-lamp

The fault lamp indicates an error within the safety circuit.

5 - ACK

This button has no function on 4-axis-Controller iMC-S8.

6 - stop-button

If you press the stop button in CNC mode an active user program / axis motion will be stopped. You can continue the execution of the user program by pressing the start button.
If you press the stop button in DNC mode an active user program / axis motion will be stopped. To continue the execution of the user program you have to use the controller software (ProNC, Remote).

7 - power-button

Use this button to switch on motor power supply voltage for the motor power amplifiers.

Conditions for switch on:
- Main power switch on the controller back side is switched on
- Emergency stop button is pulled out

Be sure that the contacts for external emergency stop switch on the remote connector are bridged!

If power supply voltage is successfully switched on the power button is lighted green.

8 - emergency stop switch

Turns off the power supply for the motor power amplifiers and the working spindle in case of any danger. This means dangers for the users health or machine safety. The integrated security circuit is applicable till safety category 3 (DIN EN945-1).

If you push the emergency stop switch the motor power supply will be switched off immediately (DIN EN 60204-1, stop category 0) and any axes motion will be stopped.
The main power supply voltage of 115/230VAC lies still on the device, only the motor power supply voltage for the amplifiers is switched off.

9- Main switch (je nach Ausführung)
Einschalten der Netzeingangsspannungsversorgung des Controllers. Im eingeschalteten Zustand ist der Schalter grün beleuchtet.

4.2   Back side
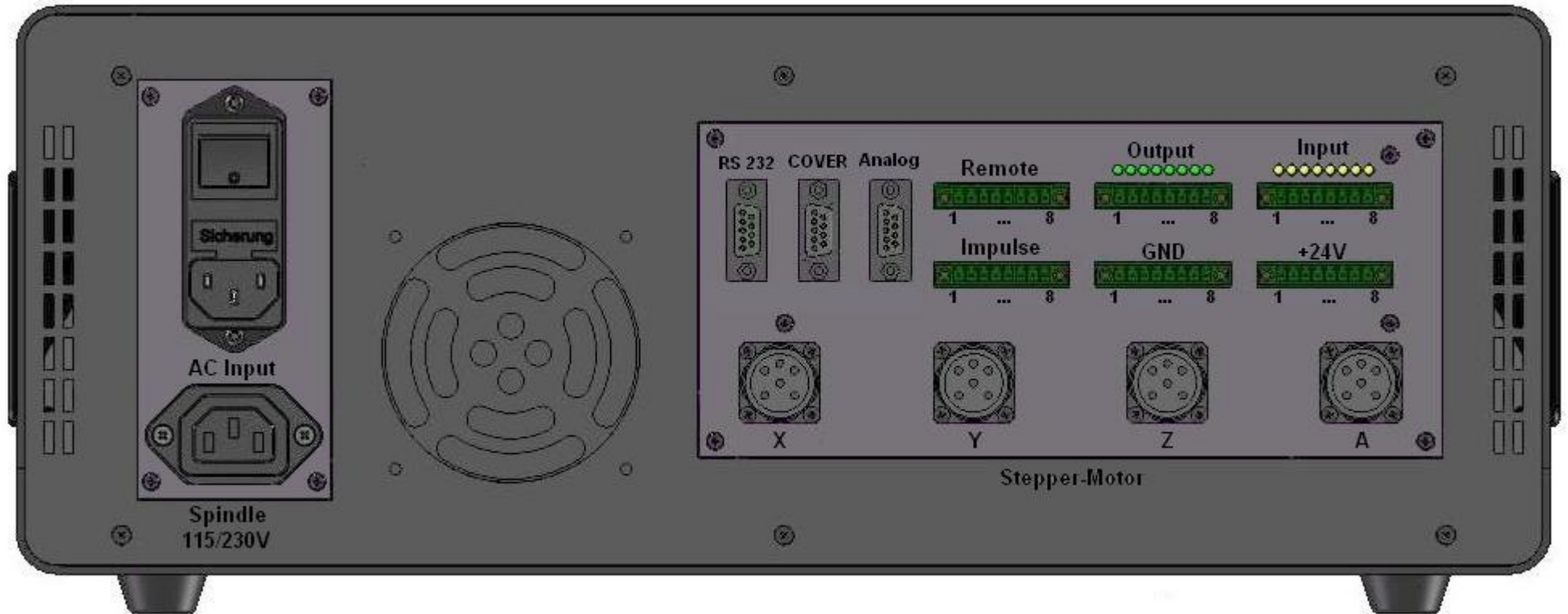
Stepper-Motor – *motor connector X-, Y-, Z-, A-axis, M23 – 12-pin*

Connector for motor modules (CNC axis).

> ⚠️ *Connect / disconnect the Sub-D plug only if the controller is switched off. Ignoring this instruction can lead to damage the motor cable or stepper motor amplifier.*

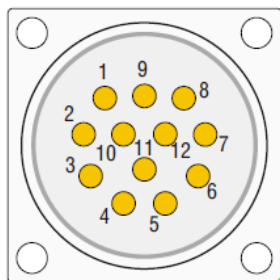| pin	description
1	motor phase 2B
2	motor phase 2A
3	motor phase 1B
4	motor phase 1A
5	+24VDC (switches)
6	motor brake (+24VDC/1,8A)
7	GND (switches)
8	GND (motor brake)
9	limit switch 1 - Öffner (NC)
10	limit switch 2 - Öffner (NC)
11	n.u.
12	n.u.
case	cable shield

> ⚠️ *The connection of a stepper motor with brake is only on the connector of the Z-axis possible. At this jack the switching signal (+24 V to pin 6) for the motor brake is provided*

Remote - - *security circuit interface, 8-pin socket*

Use this connector to include the controller into a higher ranked security circuit system. Please note that the external power input is only useable if the power button from the controller front is switched off.
That will be realized by bridging the pins 1 and 2.

Pin	Beschreibung
1	power button select
2	power button select
3	external power (make contact)
4	external power (make contact)
5	external emergency stop channel 1 (brake contact, 11)
6	external emergency stop channel 1 (brake contact, 12)
7	external emergency stop channel 2 (brake contact, 21)
8	external emergency stop channel 2 (brake contact, 22)

Use external emergency stop:
→pin 5 and 6 bridged
→pin 7 and 8 bridged

**The length of the connection cable for the external emergency stop button must not more than 5m.**

Use external power button:
→pin 1 and 2 bridged
→connect external power button (make contact) on pin 3 and 4

Impulse - interface impulse control, 8-pin connector

Use this connector to integrate the function keys start button, stop button and reset from the controller front side as external signal inputs.

pin	description
1	input external START button
2	+24VDC
3	input external STOP button
4	output lamp START button
5	GND
6	output lamp STOP button
7	input length measure switch
8	+24VDC
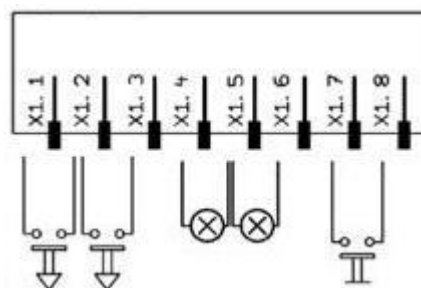
If the external STOP button is not used pins 2 and 3 must be bridged.

Input - digital inputs, 8-pin connector
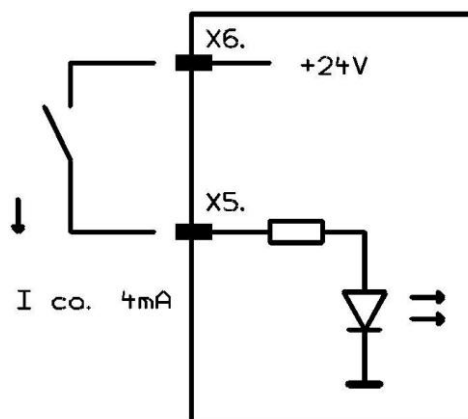
The controller has 8 digital user inputs. Use these inputs to connect external devices like sensors, switches or outputs from other devices. All inputs are opto-decoupled. If +24VDC lies on the input a logical HIGH is signalized. Not connected (e.g. switch open) a logical LOW is signalized.

Do not short 24VDC reference potential of the controller with GND or case ground.

The binary user inputs 1 – 8 must be wired as shown opposite.

The load of the controller internal 24V power supply unit amounts on 1-active state 4 mA per input.

Output - digital outputs, 8-pin connector

The controller has 8 digital user outputs. Use these outputs to connect external devices like relays, or inputs from other devices. The maximum load of each relay output is 24 VDC/300 mA

> **!** ***Do not short 24VDC reference potential of the controller with GND or case ground.***

> ⚠ ***If you have pushed the emergency stop switch all states of the binary user outputs will be maintained and not reset!***

The binary user output 1 – output 8 must be wired as shown opposite.

The transistor outputs (output 1 – 8) can be rated with 300 mA per output.

If all outputs are switched (1-active) the maximum load of the internal 24VDC power supply unit is 1, 5 A (ca. 180mA per output).
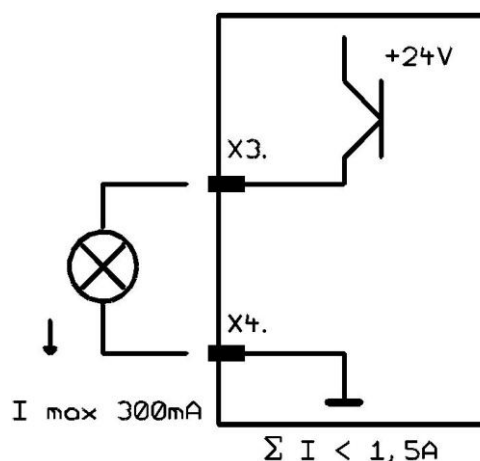
Analog - Out, *Sub-D9-pin connector*

Use this connector to drive an external frequency inverter with the corresponding working spindle via a 0 – 10 V analog output.

pin	description
1	+24VDC
2	n.u.
3	n.u.
4	make contact 1(potential free contact)
5	analog 0 ...10V
6	GND
7	n.u.
8	make contact 1(potential free contact)
9	GND

Cover - *Sub-D9-pin connector*

This connector is used to integrate a door lock switch to the security circuit of the controller.

| pin	description
1	+ coil break contact
2	switch 1.1 (bridge to pin 3 if no safety door is used)
3	switch 1.2 (bridge to pin 2 if no safety door is used
4	switch 2.1 (bridge to pin 5 if no safety door is used
5	switch 2 .2 (bridge to pin 4 if no safety door is used
6	- coil break contact
7 - 9	n.u.

If no cover or safety door is used the pins 2, 3 and 4, 5 must be bridged. Therefore use the enclosed Sub-D 9-pin plug.

RS232 (PC) – programming interface

Communication between iMC-M / iMC and control PC is realized via a serial interface (RS232). Use the delivered communication (null modem) cable for connection.

A software protocol realizes the faultless transmission of the ASCII characters. Therefore it's necessary that both systems respect the communication protocol:

- The connected control PC sends a command which ends with a line end character [CR, char (13)].

- The processor unit quits the execution or storing of a command with the quitting signal 0[char (48)] or returns an occurred error with an ASCII character unequal 0.
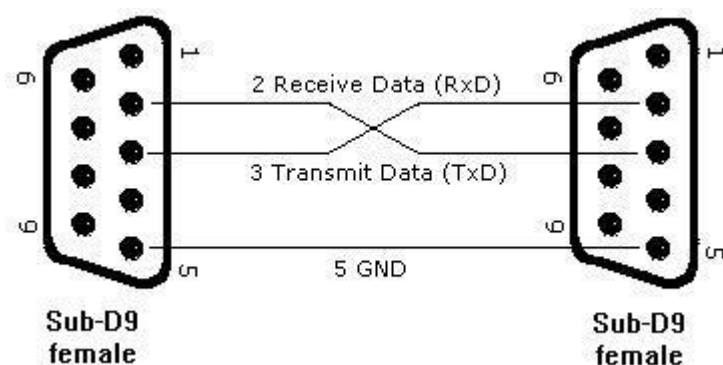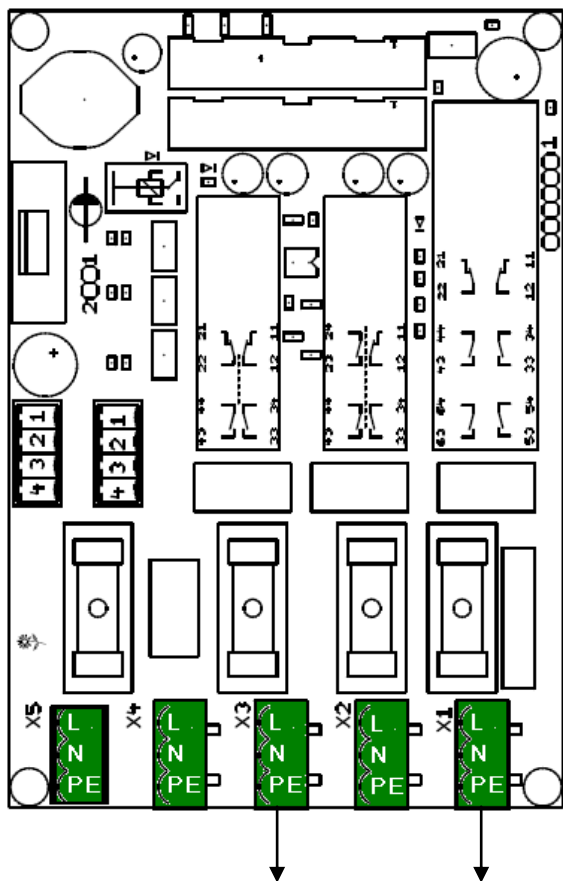

Data transfer parameters:
- 19200 baud
- 8 data bits
- 1 stop bit
- no parity

AC-Input - net input module 100 - 230 VAC, 50 - 60 Hz

The net input module consists of net input socket, net filter, fuse holder and net main switch. Connect the controller via delivered net cable to a free receptacle. After that you can switch on the controller with the net main switch.

Spindle - 100 - 230V output, three-pin-plug

Use this output connector to directly plug a working spindle or a frequency inverter with a speed controlled working spindle (e.g. iSA750). According to the working spindle type you have to change the internal power supply connection on the security circuit module either for the working spindle without speed control or for the frequency inverter with a working spindle with speed control.

Remove the controller cover by loosen the screws on the right and left side of the controller (only on desk controller type). After that remove the cover plate by loosen the screws all around on the top of the controller case.

Connect the 3-pin wire from connector „Spindle 230V" inside the controller with the for you necessary connector on the security circuit module.

Ex factory the controller is delivered with the connection to X1 (that means for a working spindle without speed control).

Connector **X3** for <u>frequency inverter with working spindle with speed control</u>, max. switching capacity 100-230V / 6A

connector **X1** for <u>working spindle without speed control</u>, max. switching capacity 100-230V / 6A

Please note that in case of an emergency stop the power supply voltage on connector X3 will switched off time delayed according to stop category 1.

Power supply voltage on connector X 1 will switched off immediately in emergency stop case according to stop category 0.

4.3   Assembly iMC-S8

base board with embedded controller und relays

net input module with net filter, main switch and fuses

power supply unit input 100-230 VAC output 48VDC, 500W

max. 4 x stepper motor power amplifier MD28

power supply unit input 115/230 VAC output 24VDC, 60W

security circuit board with safety relays

function keys module for operating elements (buttons, switches) in front side of the controller

case vans

4.3.1 DIP-switch settings

The controller iMC-S8 has four stepper motor power amplifiers MD28. Settings for rated current, step resolution and current reduction takes place by the DIP-switch on the top side of the <u>amplifiers case</u>.

> ⚠️ *Configuration of the controller should be done before first start-up so that a connected motor will not be damaged because of an incorrect power setting.*

To configure the step resolution and motor current open the cover and set the jumper on each amplifier as follows (more information /1/ Microstepping Driver MD24/MD28):

DIP Switch - MD28 in iMC-S8
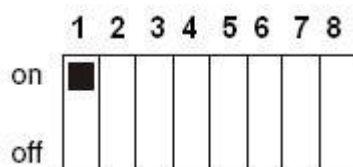
1:	current setting 1
2:	current setting 2
3:	current setting 3
4:	current reduction
5:	step resolution 1
6:	step resolution 2
7:	step resolution 3
8:	step resolution 4

Current setting (DIP-switch 1, 2, 3)
Use the DIP switches 1, 2 and 3 to set the current of the motor. The following table shows the motor current (RMS) setting for the different switch positions:

Spitzenstrom[A]	Nennstrom[A]	SW1	SW2	SW3
2,80	2,00	ON	ON	ON
3,50	2,50	OFF	ON	ON
4,20	3,00	ON	OFF	ON
4,90	3,50	OFF	OFF	ON
5,70	4,10	ON	ON	OFF
6,40	4,53	OFF	ON	OFF
7,00	5,00	ON	OFF	OFF
7,80	5,57	OFF	OFF	OFF

> ℹ️ *The factory set of the motor current is 3,00 A (RMS)on all motor power amplifiers.*

Current reduction (DIP-switch 4)

Use the DIP switch 4 to set the automatic current reduction. If the DIP switch is set to ON the automatic current reduction is deactivated. DIP switch in state OFF means that the current is set to 50% of the motor current if the motor standstill.

DIP 4	Stromabsenkung
ON	0% reduction (deactivated)
OFF	50% reduction

If the holding torque is sufficient, the activated automatic current reduction is recommended.

The factory set of the current reduction is active (DIP 4 = OFF).

Step resolution (DIP-switch 5, 6, 7, 8)

Use the DIP switches 5, 6, 7 and 8 to set the step resolution. Setting the factor to a higher value causes a smooth motion of the motor but the maximum reachable velocity will taking down. Also the motor torque will be reduced to 75% in microstep mode. The following table shows the DIP switch settings for the different step resolutions:

micro steps	steps/ rev. (1,8 ° motor)	SW5	SW6	SW7	SW8
2	400	ON	ON	ON	ON
4	800	OFF	ON	ON	ON
8	1600	OFF	OFF	ON	ON
16	3200	ON	OFF	ON	ON
32	6400	ON	ON	OFF	ON
64	12800	OFF	ON	OFF	ON
128	25600	OFF	OFF	OFF	ON
256	51200	ON	OFF	OFF	ON
5	1000	ON	ON	ON	OFF
10	2000	OFF	ON	ON	OFF
20	4000	OFF	OFF	ON	OFF
25	5000	ON	OFF	ON	OFF
40	8000	ON	ON	OFF	OFF
50	10000	OFF	ON	OFF	OFF
100	20000	ON	OFF	OFF	OFF
200	40000	OFF	OFF	OFF	OFF

The Factory set of the step resolution is 800 steps/rev. for all motor power amplifiers.

5 Operation modes and operation

The processors operating system (firmware processor core) provides the following operation modes:

- DNC-mode:
    - PC/Laptop is permanent connected to the 4-axis-controller via serial interface
    - Software Remote/ProNC is used to drive the controller

- CNC-mode:
    - 4-axis-controller executes user programs stand alone without a connected PC/Laptop
    - Software PALPC 2.1 is used for programming and download of user programs into the flash memory of the controller

5.1 Controller preparation

Before first startup of the controller please check the scope of delivery.
The following parts should be included:

- 4-axis-stepper-motor-controller iMC-S8 as desk or 19" device
- Net power supply cable 115/230VAC
- RS232-communication cable,
  9-pin Sub-D (female) to 9-pin Sub-D (female)
- Bridging connectors
- Operating instruction

If all this parts are included you can begin initial operation.

Provide all electrical connections.

Connectors
- Connect net power supply cable
- Connect axis (motors) on the controller back side

Configuration
- Set DIP-switches / jumper for motor current, step resolution, current reduction, motor brake (see chapter 204.3.1)

Initial operation
- Switch on controller with main power switch on the back side
- Check if emergency switch is pulled out
- Push power button on the front of the controller
  → Power button should be lighted green – controller is ready for work
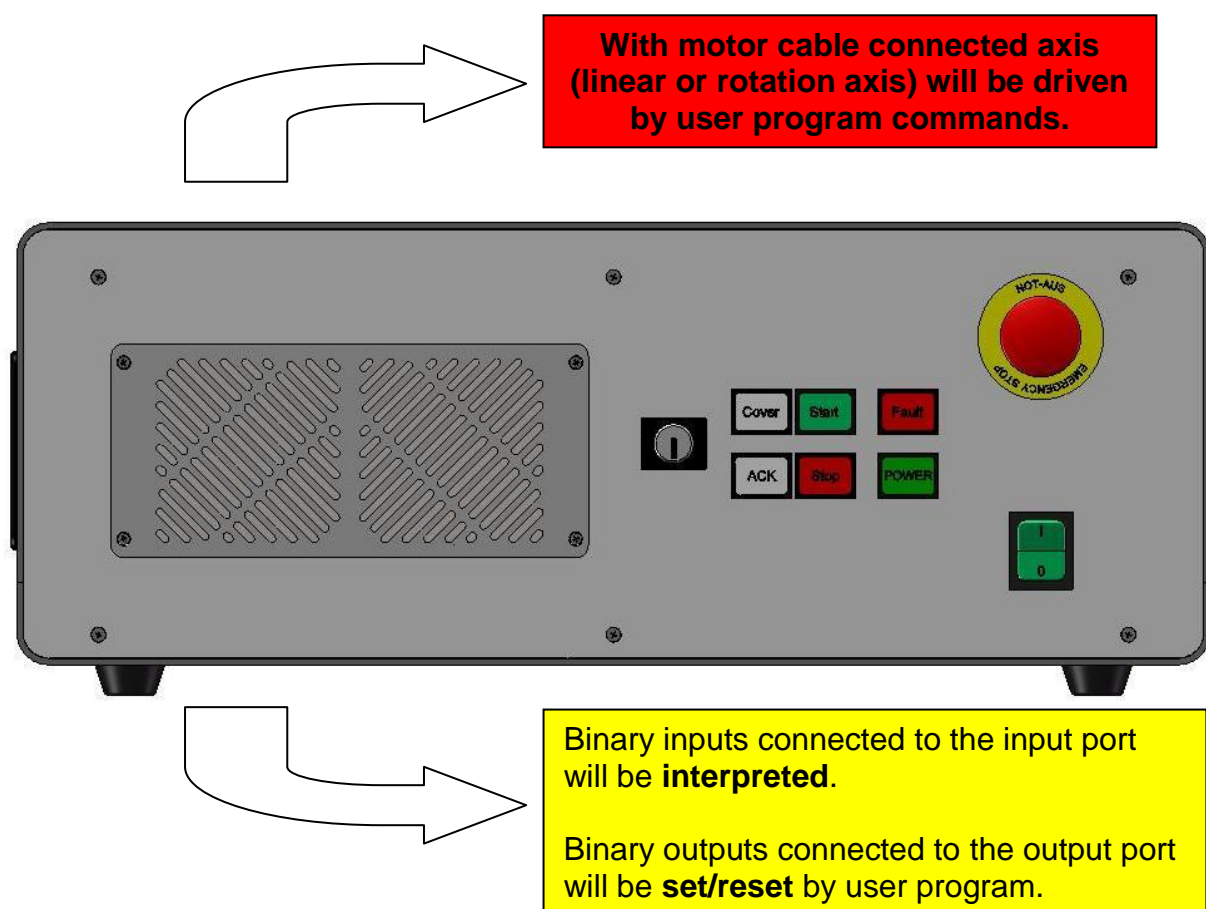
Operation mode
- Use the 4-axis-controller in CNC- or DNC-mode

5.2 CNC-mode

The CNC mode (automatic mode = CNC mode) is the program controlled mode of the 4-axis-stepper-motor-controller iMC-S8.

That means that a user program which is saved in the controller's memory (flash) will be executed till the end.

During the automatic mode (CNC mode) you can stop the execution of the active user program by pressing the STOP-key on front side of the controller or by using the external Stop input. A following operation of the START-key on the front side of the controller or the activation (1-active) of the external start input effects the resumption of the automatic mode.

With motor cable connected axis (linear or rotation axis) will be driven by user program commands.

Binary inputs connected to the input port will be **interpreted**.

Binary outputs connected to the output port will be **set/reset** by user program.

5.3   Initial Operation and user programming in CNC-mode

Creating user programs for 4-axis-controller iMC-S8 is realized with the software PALPC.exe. The implementation method is simple and described in "/2/ PAL-PC programming instruction":

Analyze technological problem definition:
- Layout program algorithm (solve problem definition)
- Implementation of the control algorithm into a PALPC source program *.ppc; edit code with text editor
- Compile PALPC source file with PALPC compiler; on faultless translation an output file *.out is created by the compiler
- Download output file *.out into the flash memory of 1-axis-controller MC1
- Start program and check control behavior regarding technological problem definition

5.3.1   Install programming software PALPC.exe

To install PALPC software do the following:

1. Insert PALPC 2.1 installation medium (delivered CD or USB stick) with the control computer.

2. Following Auto-start-window will be shown (when installing from CD):

If Auto-Start-window is not shown start the Windows Explorer and open the root directory of the CD/DVD- or USB-drive. Double click on the file "Autorun.exe".

3. Click on "**Install PAL PC**" and follow the installation instructions.

PALPC installation assistant → installation dialog:

4. Start PALPC.exe via start menu entry or desktop shortcut. On first startup an activation window will be shown. Enter delivered registration data (serial number and activation code) into the dialogs edit fields.
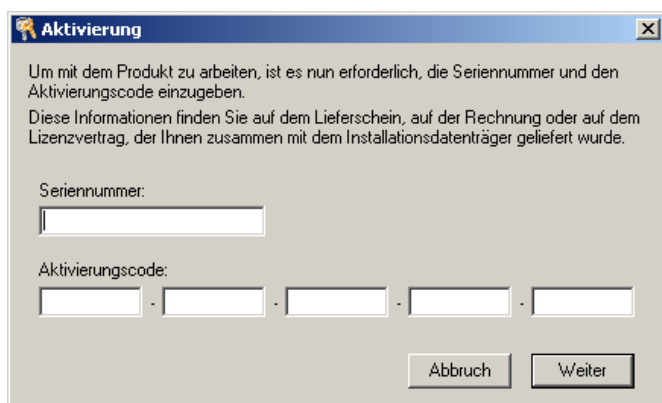
5.3.2 PALPC- operation

The use of PALPC and user programming are described in /1/ PALPC user manual and /2/ PALPC programming instruction.

For 4-axis-controller iMC-S8 note following specialties:

```
PALPC - [SetPortA1.ppc]
Datei  Bearbeiten  Transfer  Ansicht  Einstellungen  Fenster  ?

/ ****************************************************************************
/
/ Datei:        SetPortA1.ppc
/
/ Controller:   4-Achs-Controller iMC-M / iMC-P von isel Germany 2009
/
/ Inhalt:       Testprogramm im CNC-Mode -> Setzen
/               - der binären Ausgänge  A1.1 bis A1.8   (A1=Port 65532)
/               - Analogausgang und Spindel-Start       (A2=Port 65528)
/
/ erstellt:     20/07/2009, isel Germany
/
/ ****************************************************************************

#control IMCMP;        / Festlegung des Ziel-Controllers
                       +-> nur für Offline-Betrieb (ohne Controller) wichtig

#axis   xyza;          / Achsenwahl
#steps  800,800,800,800; / Schrittauflösung: 4 Mikroschritte * 200 Vollschritte/U
#elev   5,5,4,4;       / Steigung der Achsen

#input                 / nachfolgende Anweisungen speichern

/ JG: zum offline-Test:
test_mode on;

reference xyza;        / Referenzfahrt Achsen

repeat                 / Schleifenanfang

  / Hinweis: A1 steht bei der iMC-M/P für die Portsdresse  0 (Binärausgabe)
  set_port 0,1=1        / binären Ausgang A1.1 setzen
  time 1;
  set_port 0,2=1        / binären Ausgang A1.2 setzen
  time 1;
  set_port 0,3=1        / binären Ausgang A1.3 setzen
  time 1;
  set_port 0,4=1        / binären Ausgang A1.4  setzen
  time 1;
  set_port 0,5=1        / binären Ausgang A1.5 setzen
  time 1;
  set_port 0,6=1        / binären Ausgang A1.6 setzen
  time 1;
  set_port 0,7=1        / binären Ausgang A1.7 setzen
  time 1;
  set_port 0,8=1        / binären Ausgang A1.8 setzen
  time 1;
  set_port 0,128=0x00; / Port A1: A1.1 bis A1.8 rücksetzen
  time 1;
  set_port 0,128=0xFF; / Port A1: A1.1 bis A1.8 setzen
  time 10;
  set_port 0,1=0        / binären Ausgang A1.1 rücksetzen
  time 1;
  set_port 0,2=0        / binären Ausgang A1.2 rücksetzen
  time 1;
  set_port 0,3=0        / binären Ausgang A1.3 rücksetzen
  time 1;

Drücken Sie F1, um Hilfe zu erhalten.    ??? / COM1, 9600 Bd    Z:16, S:6    NUM
```

1. The declaration

#control IMCP;
defines target controller as 4-axis-controller iMC-S8 (iMC-M / iMC-P / IMC4 compatible family)

2. The declaration

#axis xyza;
defines the axis that will be used, in this case four axis: x, y, z and a

3. The declaration

#steps 800;
defines the step resolution set by DIP switch
e.g. #steps 800;   /4 micro steps per full step * 200 full steps/motor revolution

4. The declaration
defines the spindle elevation of the connected linear axis,
e.g. #elev 5,5,5,4   /elevation 5mm for xyz-axis, 4mm for a-axis

#elev 360°/ transmission ratio;
defines the transmission ratio of the connected rotary axis,

e.g. ZR20 with transmission ratio 1:20:

$$\frac{360°}{20} = 18 \rightarrow \ \text{#elev 18;}$$

5.4 DNC- mode

In DNC mode the 4-axis-controller controller **iMC-S8** is connected permanently via RS-232 interface with a control PC (IBM compatible PC or Notebook).

A user program stored in flash memory will not be executed. The commands to execute an action/motion (e.g. reference motion, motion of the axis or I/O actions) will be sent by user software from the PC with the new Remote/ProNC motion control for 4-axis-controller (IMC4 compatibility mode).
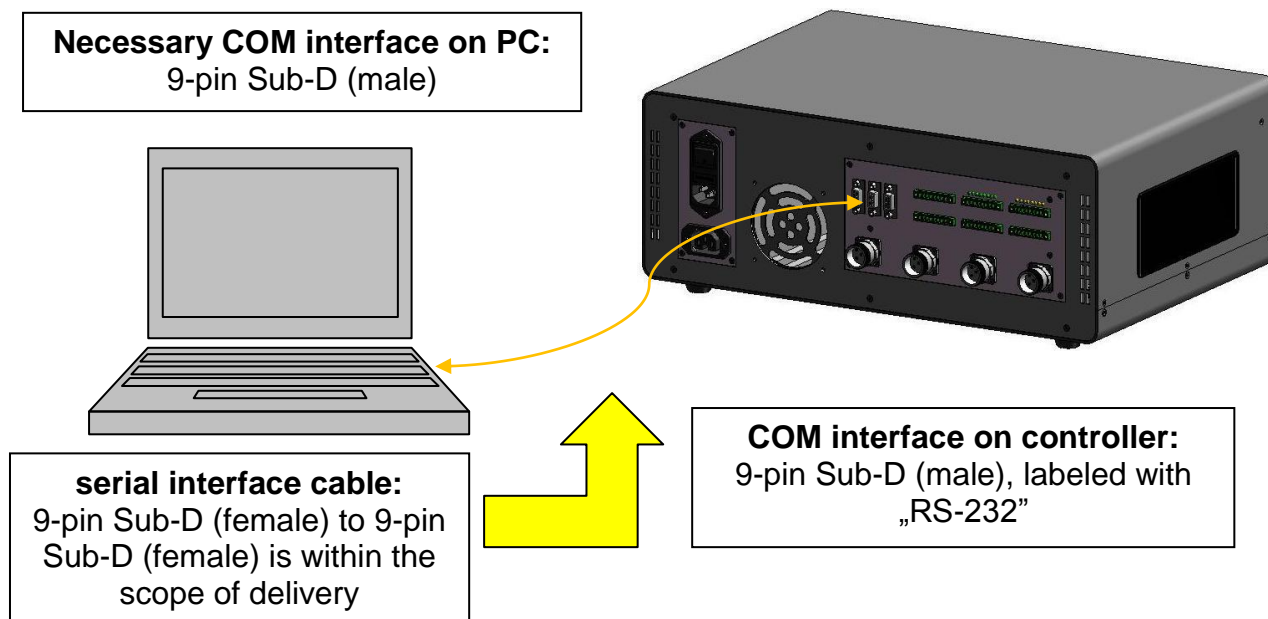

Necessary COM interface on PC:
9-pin Sub-D (male)

serial interface cable:
9-pin Sub-D (female) to 9-pin Sub-D (female) is within the scope of delivery

COM interface on controller:
9-pin Sub-D (male), labeled with „RS-232"

Image: serial connection (RS-232) between PC / Notebook and iMC-S8 via interface cable

Likewise in this configuration can be done:

**PALPC 2.1 user program download into the flash memory of the 4-axis-controller iMC-S8
(COM Interface for PALPC: 19200 Bit/sec, PalPC.exe)**

5.5 Initial operation und user programming in DNC-mode

User programming and control of the 4-axis-controller iMC-S8 in DNC-mode takes place by the programs **Remote** or **ProNC** by binding the corresponding motion-control-DLL file. Commands in the user program will be send to the 4-axis-controller.

Installation of the control software Remote (version 1.46.2.1 or higher)

the following steps to install setup software:

1. Insert Remote (part.-no.: Z12_334500) installation medium (delivered CD or USB stick) with the control computer.

2. An Auto-start-window will be shown (when installing from CD):

> *If Auto-Start-window is not shown start the Windows Explorer and open the root directory of the CD/DVD- or USB-drive. Double click on the file "Autorun.exe".*

3. Click on the entry "**Installation of Remote**".

Choose your language and follow the instructions of the setup assistant.

4. Mark on setup window "Select control" the option "Stepper motor control IMC4" to install the IMC4 stepper motor driver module.
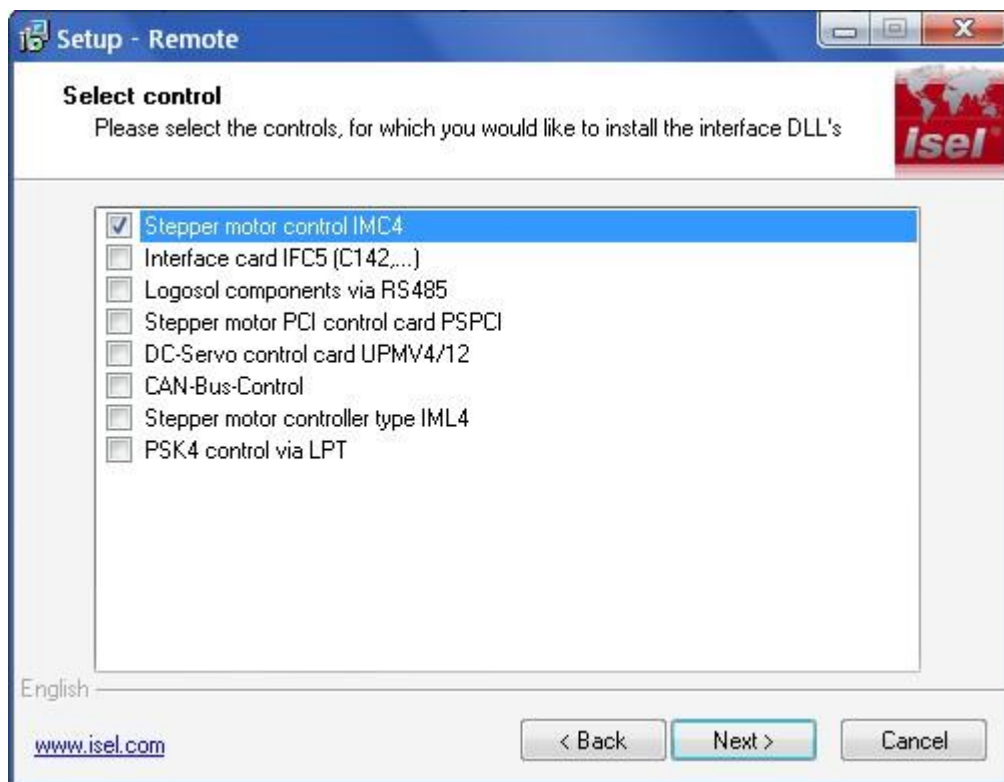
After finishing the installation click on button "Exit" to close the Auto-Start-menu.

5. Open the control software Remote via shortcut on the windows desktop or the start menu entry: Start → Programs → CNCworkbench → Remote

6. On first startup of the software Remote you have to type in a serial number and an activation code. You will find this information on the delivered registration formular.
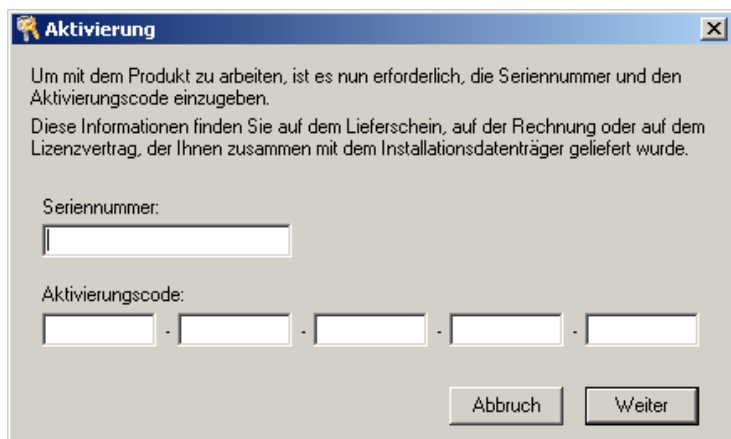
Click on button „Next" to check the registration data. If the data is ok Remote will starting.

Use of the controller with Remote

Using iMC-S8 with Remote (ProNC) via serial interface:

1. Start control software *Remote.* If you don't have activated *Remote* you have to do it now.

2. After installation of *Remote* for a specific control (in this case IMC4) all module DLL's for the motion control, I/O module, spindle module and security circuit module are set correctly. You only have to set the parameters to your machine configuration.

   Click in the main menu to the entry Settings →Control
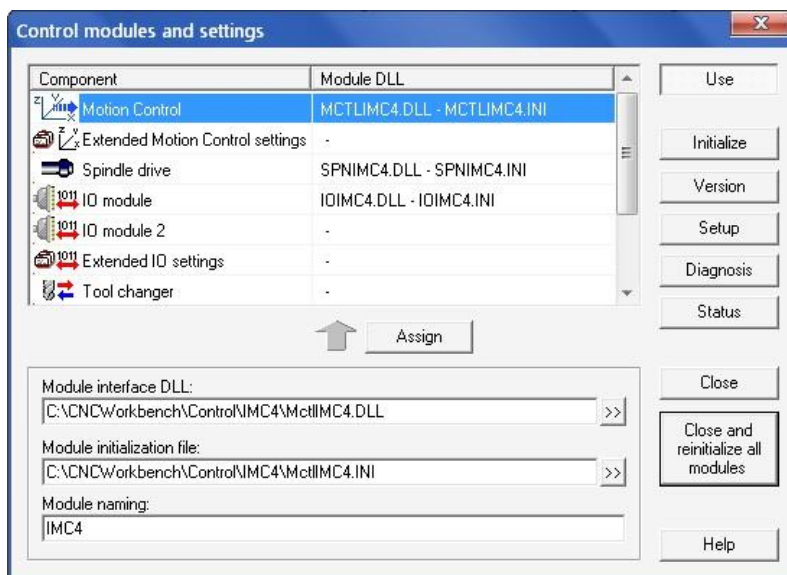
The dialog shows all active and used modules in a list.

Mark the line "Motion Control" and click on button "Setup" on the right side to show the settings for communication and axis kinematics.

Over the different register cards you can change the parameters like axis direction, spindle gradient, gear etc. for each separate axis. Over the register card "Data transmission" you can change the used COM Port of the control computer.
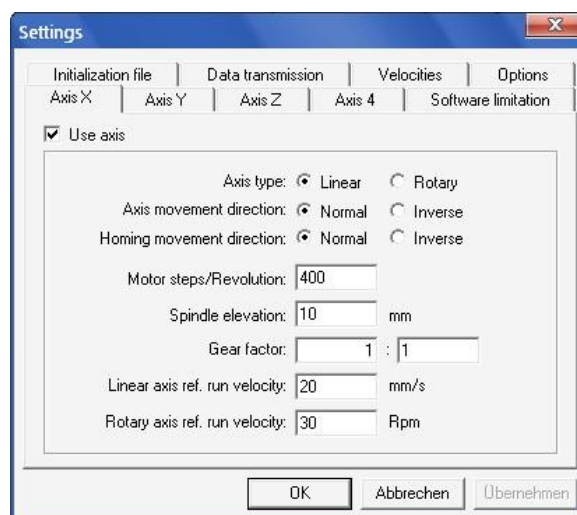
3. If you have set all parameters close the dialog with the button „OK".
   Click on button "Close & Initialize" in the "Control module and settings" dialog to take effect the new settings and reinitialize the control.

4. Perform a software reset and a reference run to check correct behaviour of the machine /system.

6 EC - Declaration of Conformity

Der Hersteller
The manufacturer

> **isel Germany AG**
> **Bürgermeister-Ebert-Str. 40**
> **D-36124 Eichenzell**

erklärt hiermit, dass folgendes Produkt
hereby declares that the following product

Geräteart:	**4-Achs-Schrittmotor-Controller**
Device:	4-axis stepper motor controller
Typ:	**iMC-S8**
Type:	
Art.-Nr.:	383320 x00x
Product - No.:	

mit den Vorschriften folgender Europäischer Richtlinien übereinstimmt:
complies with the requirements of the European Directives:

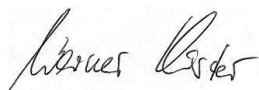EG-Richtlinie 2004/108/EG   EMV Richtlinie
EC-Directive 2004/108/EC   *EMC directive*

EG-Richtlinie 73/23/EWG   Niederspannungsrichtlinie
EC-Directive 73/23/ECC   *low voltage directive*

Folgende harmonisierte Normen wurden angewandt:
Following harmonized standards have been applied:

EN 61000-6-2:2005	EMV - Fachgrundnorm - Störfestigkeit für Industriebereich
	EMC - Generic standards - Immunity for industrial environments
EN 61000-4-2:2007	EMV - Prüf- und Messverfahren - Prüfung der Störfestigkeit gegen Entladung statischer Elektrizität (ESD)
	EMC - Testing and measurement techniques; Electrostatic discharge immunity test
EN 61000-4-4:2004	EMV - Prüf- und Messverfahren - Prüfung der Störfestigkeit gegen schnelle transiente elektrische Störgrößen (Burst)
	EMC - Testing and measurement techniques - Electrical fast transient/burst immunity test
EN 61000-4-5:2006	EMV - Prüf- und Messverfahren - Prüfung der Störfestigkeit gegen energiereiche Impulse (Surge)
	EMC - Testing and measurement techniques - Surge immunity test
EN 61000-4-11:2004	EMV - Prüf- und Messverfahren - Prüfung der Störfestigkeit gegen Spannungseinbrüche / Spannungsunterbrechungen
	EMC - Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests
EN 61000-6-3:2007	EMV - Fachgrundnorm - Störaussendung Wohn- und Geschäftsbereich , Kleinbetriebe
	EMC - emission standard for residential, commercial and light-industrial environments

Dermbach, 15.04.2010

_____
Werner Kister, Vorstand / chairman

7 Bibliography

/ Microstepping Driver MD24/MD28, Hardware Description, 02/2009

/2/ PAL PC 2.0 Operating instruction, status 06/2004

/3/ Remote operating instruction, status 2003

Operating instructions and manuals for download you can find here:

www.isel-data.de/manuals

8 Index