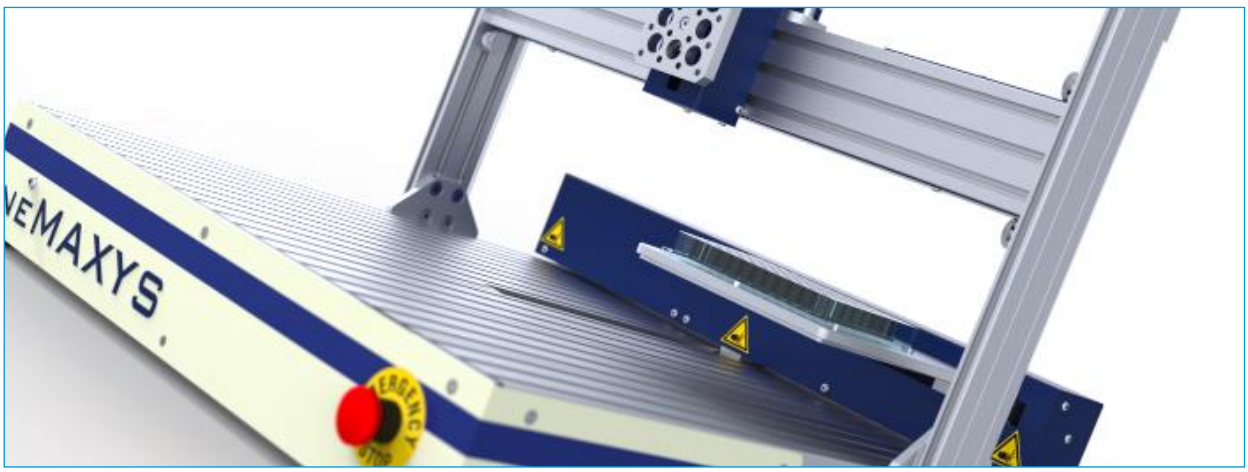
CETONI

CE neMAXYS 200

Hardware Manual



ORIGINAL INSTRUCTIONS 1.05 – APRIL 2020

CETONI GmbH
Wiesenring 6
07554 Korbussen
Germany

T +49 (0) 36602 338-0
F +49 (0) 36602 338-11
E info@cetoni.de

www.cetoni.de

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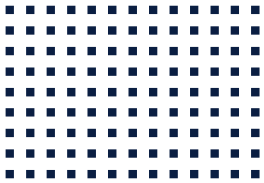


1 Overviews & Directories

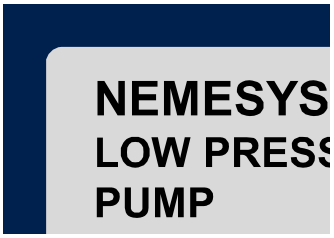
1.1 Table of Contents

Revision History

REV	DATE	CHANGE	VALID FOR
1.00	22.10.2008	Creation	Type SAS-B020-01 A
1.01	11.02.2009	Section Software – Default I/O Channel Assignment (J1) added	
1.02	09.07.2012	• new Design • Update for new Hardware version • Section on software installation deleted (moved to QmixElements software manual)	Type SAS-B020-01 B
1.03	20.02.2014	• Update for new hardware version	Type SAS-B020-01 C Type SAS-B020-01 D
1.04	24.08.2017	• Some typos fixed • Added missing translations	
1.05	01.04.2020	• Layout revised completely	

IMPORTANT. In its current revision, this manual applies only to the product types listed in the last line. Should you require a manual from a previous revision, please do not hesitate to contact us. Please let us know your device type and email address and we will send you the appropriate manual as a pdf file.

The type of your product can be found on the label behind "Type:", according to the marked number in the following example:



2 Introduction

2.1 Preface

Thank you for purchasing a product from CETONI. With this user manual we would like to support you as well as possible when handling the device. If you have any questions or suggestions, please do not hesitate to contact us.

WICHTIG. The neMAXYS positioning system may only be taken in operation after carefully reading and understanding this manual.

2.2 Symbols and Keywords Used

The following symbols are used throughout this manual to help you navigate through this document:

HINT. Indicates application tips and useful hints to facilitate operation.

IMPORTANT. Indicates important information and other particularly useful information that does not describe dangerous or harmful situations.

ATTENTION. Indicates a potentially harmful situation. If it is not avoided, the product or something in its environment may be damaged.

CAUTION. Indicates a potentially dangerous situation. If it is not avoided, slight or minor injuries and property damage may result.

2.3 Norms and directives

CETONI GmbH declares under its sole responsibility, that the neMAXYS 200 complies with the health and safety requirements of the relevant European directives.

2.4 Application Purpose

The neMAXYS positioning system has been designed for precise and fast positioning of small and light parts like cannulas and tubes across the specified XY-area. Consequently it can be used for getting, putting an analyzing of samples in well plates. Its regular use is inside of laboratories.

The optional available Z-axis expand the system with a software-controlled height adjustment of the mounted tools. A maximum of 4 z-axis can be mounted at the same time.

2.4.1 Intended Use

The neMAXYS positioning system has to be used in biotechnological and chemical laboratories. Its intended use is the positioning of pipettes in the installed XYZ area. Application and dosing of the used substances is not included in neMAXYS.

The operators of neMAXYS have to be knowledgeable about the control of the system and the risk that is issued from the used substances.

Local safety instructions have to be observed.

2.4.2 Reasonably predictable Faulty Application

The use of neMAXYS for other purposes than described in chapter 2.4.1 may lead to dangerous situations and it is required to cease and desist it.

CAUTION. The device must not be used as a medical product or for medical purposes.

2.4.3 Safety measures

CAUTION. The device must not be used within areas with potentially explosive atmosphere.

CAUTION. The device must not be used as a medical product or for medical purposes.

IMPORTANT. During operation of the device all relevant laws and regulations applicable at the operating location must be observed. In the interest of safe work processes the operator and user is responsible for observing all relevant regulations.

Safety for the operator and a trouble-free operation of the device are only guaranteed if original equipment is used. There are no warranty claims in the case of damage caused by the use of external accessories or external consumables.

The device has been designed and constructed in such a way that hazards due to its intended use are largely excluded. However, you should observe the following safety precautions to prevent residual hazards.

- The operator must be familiar how to control the unit.
- The cable must be laid so that there is no danger of stumbling!

2.4.3.1 REDUCING OF ELECTROMAGNETIC EMISSIONS

The neMAXYS positioning system may be used in any type of facility, including living quarters, as well as those that are connected to the public utilities network that also supplies buildings used for living purposes.

2.4.3.2 PREVENT FROM ELECTROSTATIC DISCHARGE

Floor materials should be wood, concrete or ceramic tiles. If the flooring is made of a synthetic material, the relative humidity must be at least 30%.

2.4.3.3 REDUCING OF ELECTRIC DISTURBANCES

The quality of the supplied voltage should be to the standard of a typical business or hospital environment.

2.4.3.4 REDUCING OF MAGNETIC DISTURBANCES

Do not place power connector cables, including those of other appliances, in close proximity of the device and its cables. Portable and mobile communication devices may not be used in closer proximity of the unit or its cables than the recommended safety distance.

2.4.3.5 EMERGENCY STOP

In case of emergency or irregular situations of neMAXYS, the device can be switched off with the main switch at the rear of neMAXYS base module or by disconnecting the power cord at any time.

The movement of all axes may be interrupted at any time while in operation by pressing the emergency stop button on the front of the device.

CAUTION. By pressing the emergency stop button only the axes are stopped and locked. Mains supply voltage is still remaining inside the device.

2.4.3.6 VISUAL INSPECTION PRIOR TO OPERATION

Irrespective of the faultless manufacture of the unit, damage may occur whilst the unit is in operation. With this in mind, the user must always carry out a visual check of the device and any attached or co-operated components prior to use. Particular attention must be paid to crushed power cables and deformed plugs. The device has not to be used if any damage is noticed. Inform CETONI GmbH to ensure that operational conditions are reestablished within a reasonable time.

CAUTION. Do not use neMAXYS if visible damages are present on mechanical or electrical components of the system.

You must not attempt to repair the unit yourself.

2.5 Warranty and Liability

The devices left our company in perfect condition.

The duration of the warranty is 1 year of technical equipment (expect wear parts) from the day of delivery. It is not extended or renewed due to work carried out under warranty.

CETONI GmbH considers itself responsible for the devices with regard to safety, reliability and function only if assembly, new settings, changes, extensions and repairs are carried out by CETONI GmbH or an authorised centre, and if the devices have been used in accordance with the instruction manual.

Only the manufacturer is permitted to open the devices. All warranty and liability entitlements, particularly damage entitlements due to personal injuries, are void if the devices are opened by an unauthorised person.

The product conforms to the basic safety regulation standards. Industrial property rights are reserved on the circuits, methods, names, software programs, and units.

3 Scope of Delivery

The following items should be included:

NEMAXYS BASE MODULE

1 – 4 Z-Axis (optional)

Worktable (customizable)

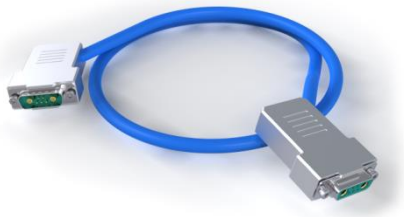
POWER SUPPLY CORD

USB CABLE

double-shielded, 3 m

CONNECTING CABLE FOR Z-AXIS

0.8 m (if Z-axis is part of delivery)



TERMINATOR PLUG

TERMINATOR SOCKET

CD-ROM QMIXELEMENTS WITH:

- USB device drivers
- QmixELEMENTS software
- Qmix SDK
- neMAXYS device configuration files

4 Technical Data

4.1 Environment

TEMPERATURE (OPERATION)	0°C – 45°C / 32 – 113 F
TEMPERATURE (STORAGE)	-40°C – 75°C / -40 – 167 F
HUMIDITY (OPERATION, STORAGE)	20% - 80%, non-condensing

4.2 Mechanical Data

DIMENSIONS (L X W X H)	544 x 494 x 506 mm (with Z-axis attached)
WEIGHT	20 kg (with one Z-axis and work table)

4.3 Electrical Data

POWER SUPPLY VOLTAGE	85 – 264 V (AC)
POWER SUPPLY FREQUENCY	47 - 63 Hz
MAXIMUM POWER USE	120 W
TYPICAL CURRENT (CONTINUOUS USE, SUM OVER ALL AXES)	1.7 A
SHORT-TERM MAXIMUM CURRENT (SUM OVER ALL AXES)	5.2 A
FUSE	4A time-delay, glass 5 x 20 mm DIN 41.662 / EN 60127-2-3 / CN 8536 1010

4.4 Interfaces

USB	versions 1.1 and 2.0
CAN	max. 1 Mbit/s
RS232	max. 115200 bit/s
TTL TRIGGER INTERFACE	2 Analog IN, 3 Digital IN, 4 Digital OUTS

4.5 Positioning Unit

POSITIONING DRIVES / CONTROL	EC servomotors / closed loop PID motion control
POSITIONING AREA (X/Y/Z)	200 / 200 / 50 mm
MINIMUM POSITIONING SPEED (X/Y/Z)	70 / 70 / 17 µm/s
MAXIMUM POSITIONING SPEED (X/Y/Z)	200 / 200 / 25 mm/s
SUPPORTED WEIGHT (X/Y/Z)	0.5 / 0.5 / 1 kg (1.102 / 1,102 / 2.205 lbs.)

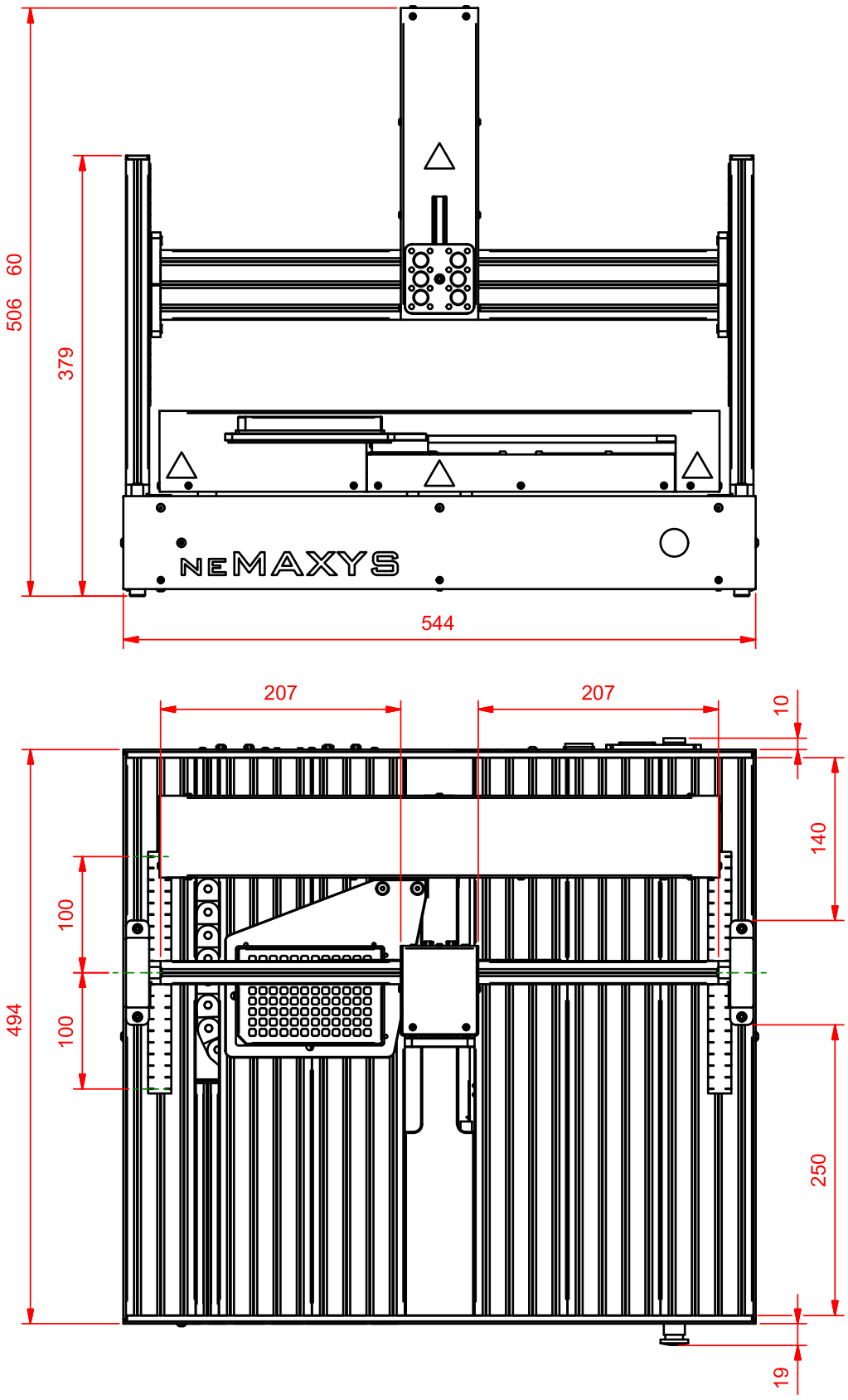
4.6 Positioning Accuracy

ABSOLUTE POSITIONING ACCURACY (X/Y/Z)	8 / 8 / 7 µm
REPEATABILITY (X/Y/Z)	3 / 3 / 0.6 µm

4.7 Configuration Options

Other tables are available on request.

4.8 Dimensional Drawing



5 Transport and Storage

Please do not lift and transport the neMAXYS completely plugged-together

ATTENTION. Risk of injury and damage of neMAXYS. Do not transport the neMAXYS at the gantry bar. Always carry neMAXYS at the Base Module.

It is recommended to use the original packaging for any returns as this ensures optimal protection of the equipment during transport. If this is no longer available, please ensure that the equipment is safely stored within a stable box. Please also take care of enough filling material to protect the equipment against mechanical shocks.

Observe the specifications in chapter "Technical data" for storage.

6 Initial Start-up

IMPORTANT. Carefully read both this manual as well as the software manual before setting up and operating the neMAXYS device.

6.1 Software Installation

All software and drivers must be installed before the neMAXYS device is set up and used the first time. The software installation procedure is described in detail in the software manual that can be found on the DVD or USB stick delivered with your neMAXYS.

IMPORTANT. QmixElements plus device drivers must be installed BEFORE connecting the USB cable to your computer.

6.2 Deployment of neMAXYS

- The neMAXYS device should be placed on a flat and even horizontal surface. Use the device's adjustable feet for optimal levelling of the working plate.
- Make sure that there is enough space for movement of the X/Y/Z axis.
- Keep the Top Side of neMAXYS base module free within the Working Area of X/Y/Z axis.

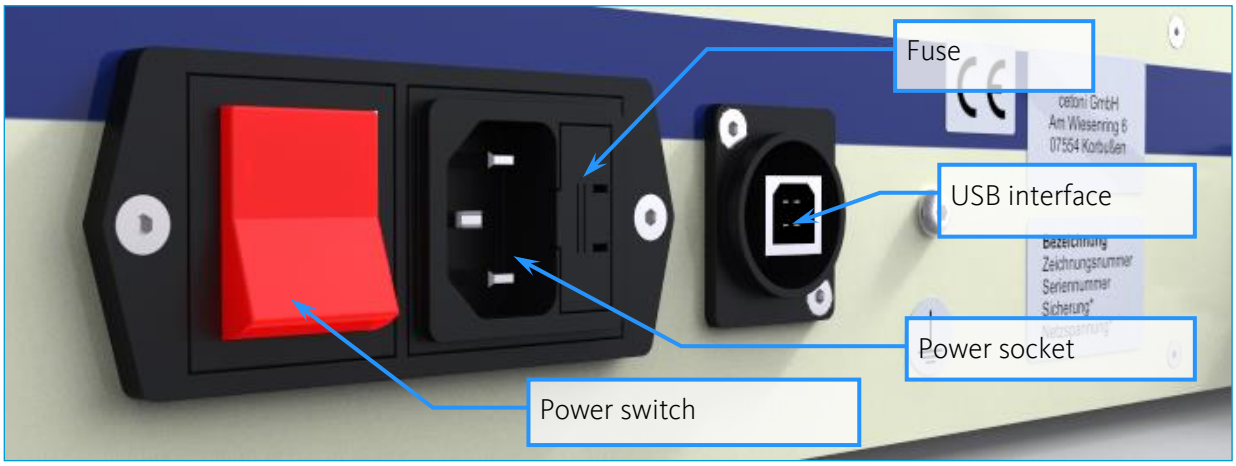
6.3 Connecting neMAXYS

Use the power cable to connect the power interface with mains (see figure below). Use the USB cable to connect neMAXYS (USB - type B) with a free USB port on your computer (USB – type A).

CAUTION. Risk of injury from damaged cables, plugs and sockets. Inspect the unit and connections for damage before starting it. Never operate the unit with damaged connections and plugging devices.

CAUTION. *Danger of tripping over the power and connection cables.* When installing cables, ensure that any risk of stumbling is avoided.

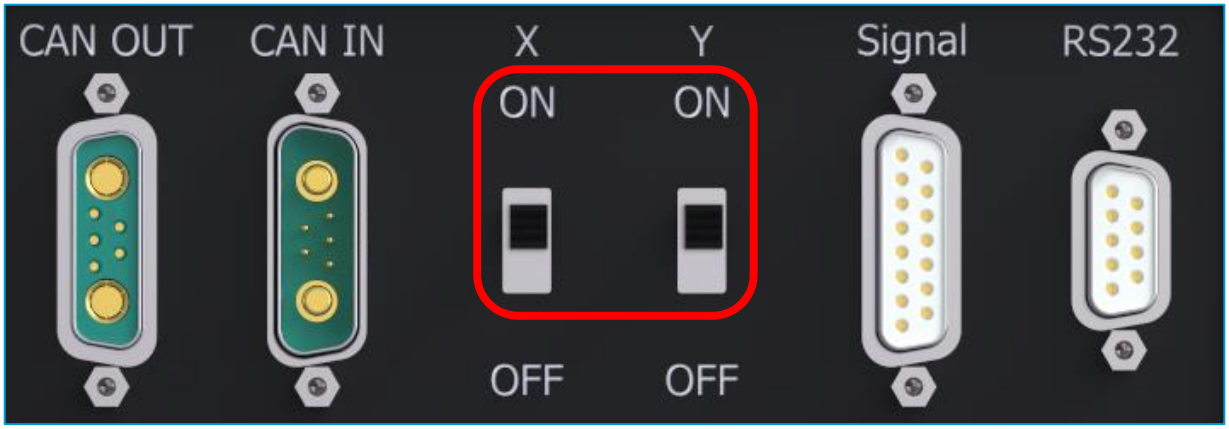
IMPORTANT. Use only the supplied cables to connect to neMAXYS.



To switch the device on, use the power switch on the rear panel. The device start operation, when the power switch lights up.

6.4 Check Service Switches

Check the correct position of the two service switches *X* and *Y* at the back side of the device. Ensure that both switches are in the ON position.



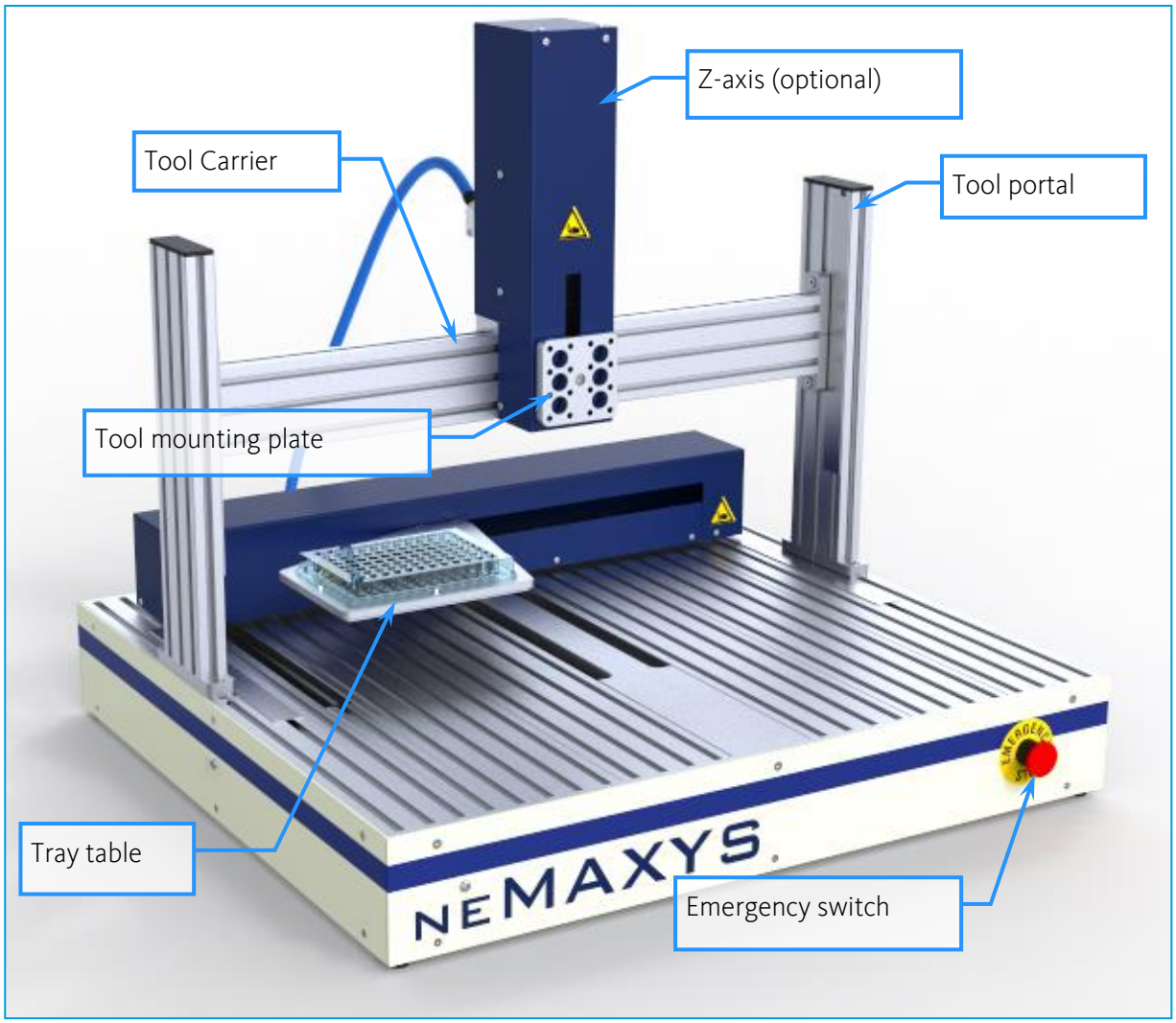
6.5 Check of the Emergency Stop Button

Check the position of the Emergency Stop switch. Ensure that it is in its off position – maybe you have to turn it counter-clockwise to release it.

7 Hardware

7.1 Overview

The figure below shows the main components for operating and configuring the neMAXYS positioning system.



neMAXYS features the following components:

- *Tool carrier* – is to mount tools (Z-axes, modules, etc.) above the tray table. The height of the carrier (Z direction) and the horizontal position (X direction) of the individual components are pre-adjustable.

- *Z-axis (optional)* – allows the software-controlled height adjustment of tools. The position is adjustable on the tool carrier in X direction. Maximum 4 Z-axes can be used simultaneously.
- *Tool portal* – holds the tool carrier and allows positioning in depth (Y direction).
- *Tool mounting plate* – is for the user to fix the tool(s) of choice. The standard plate has 4 x 4 M5 threaded screw-in points, each separated by 16 mm. Custom plates are available on request.
- *Tray table* – fixes the sample or sample carrier(s) and allows the software-controlled movement in both X and Y directions. Tables may be readily interchanged and customized versions are available on request.
- *Emergency Stop switch* – if pressed immediately stops all axes and deactivates all drive units.

CAUTION. *Risk of injury due to moving parts.* Stay clear of the traversing range during device operation. Do not mount tools or carry out adjustments during device operation.

HINT. The use of up to four Z-axes at the same time is possible.

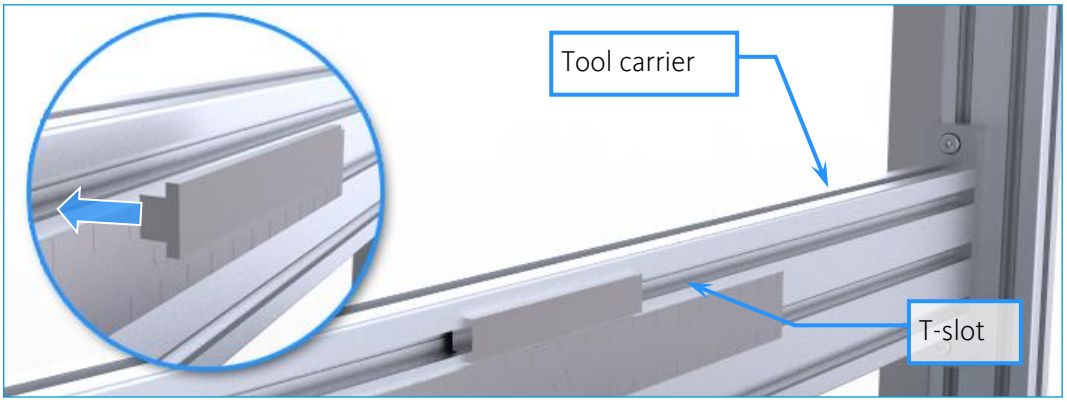
7.2 Base module

For standalone operation of the neMAXYS base module both Terminators have to be connected at the rear panel. Refer to figure below.

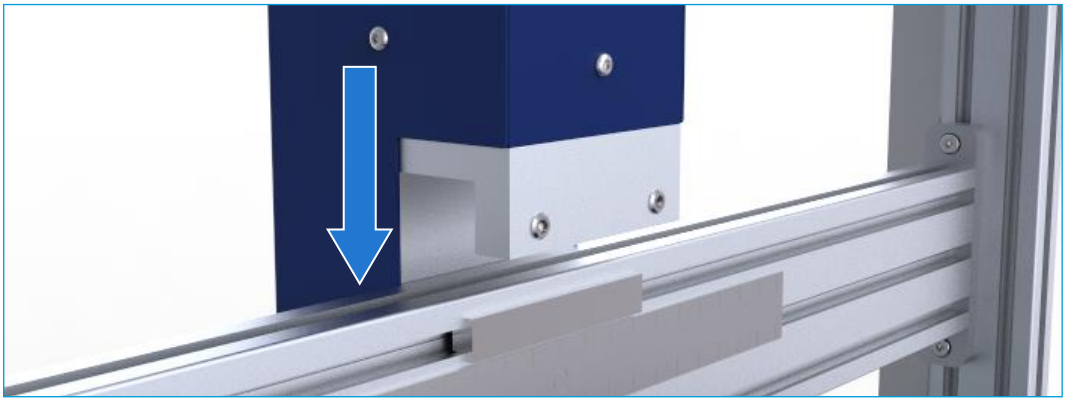
7.3 Z-axis Installation

7.3.1 Z-axis Attachment

To attach the Z-axis to the portal, insert the spacer from the Z-axis to the desired position into the top groove of the tool carrier on the gantry bar. (see figure below).



Place the Z-axis unit onto the tool carrier and align it with the T-nut (see figure below).



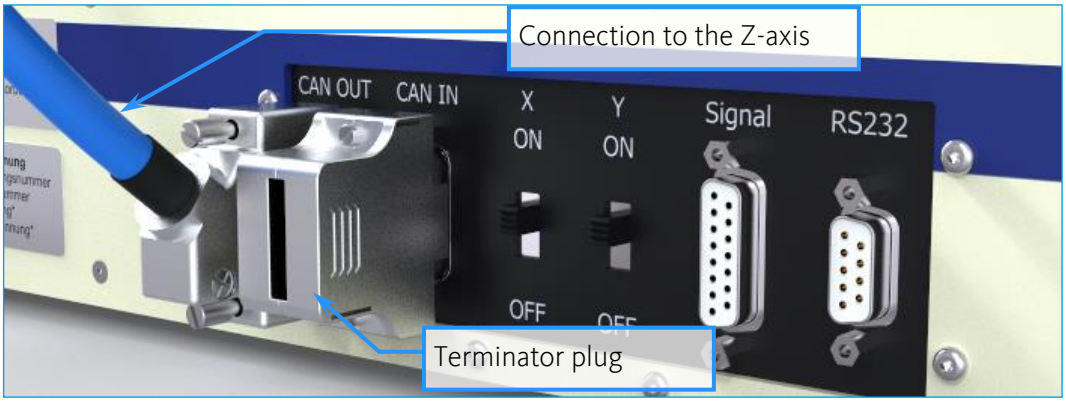
Tighten both M6 Allen screws with an Allen wrench to fix the Z-axis to the tool carrier (see figure below).

7.3.2 Connecting the Z-Axis

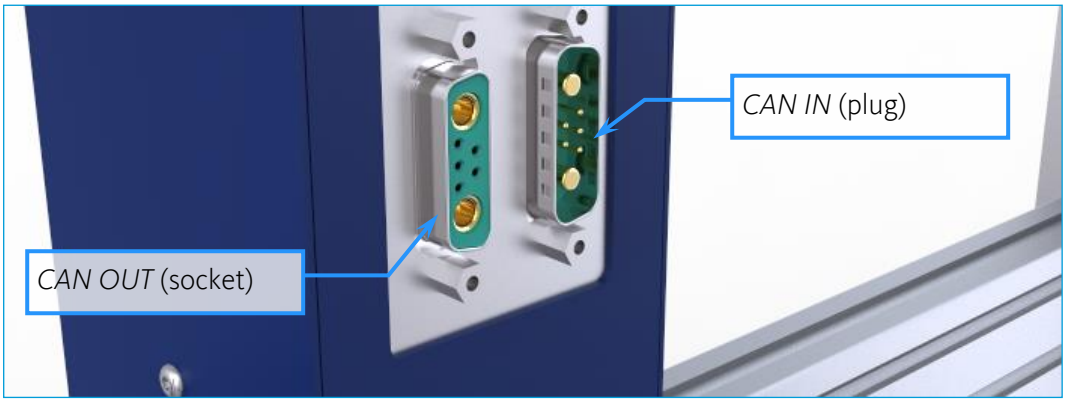
ATTENTION. Please ensure that the neMAXYS is switched off before connecting or disconnecting any power or data connections to avoid damage to the device.

IMPORTANT. Connect the Z-axis with the neMAXYS base unit using the supplied Z-Axis connection cable only. Do not use an CETONI Interconnect-cable for connecting the z-axis to the base module Do not use the cable for the Z-axis as an Interconnect-cable to other CETONI equipment.

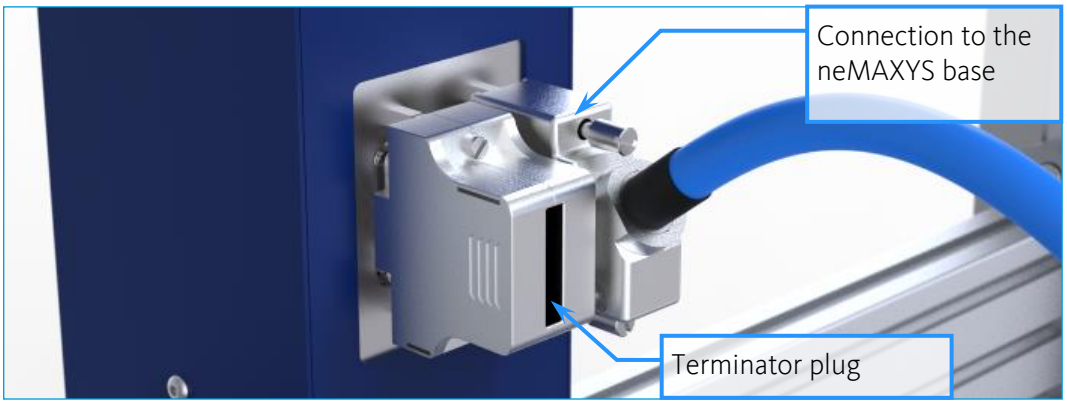
Attach the Z-axis cable to *CAN OUT* and the Terminator plug to *CAN IN* (see figure below).



Each Z-axis module features both a *CAN OUT (socket)* and a *CAN IN (plug)* interface at its back (see figure below).

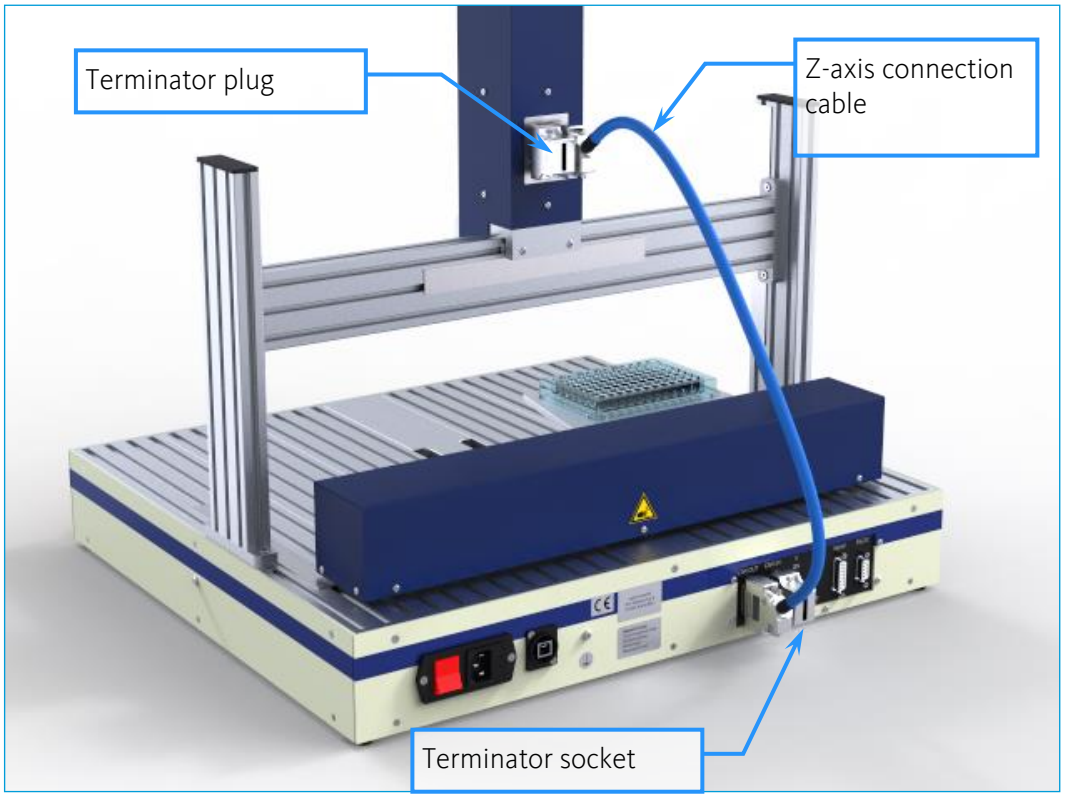


To finish the setup, connect the Z-axis cable to the *CAN IN* and the Terminator plug to the *CAN OUT* of the Z-axis unit as shown below.



The Z-axis is fully connected now and you can use your neMAXYS positioning system.

IMPORTANT. Secure the connections of the cable and the terminators with the screws in the housing of the connectors to prevent loss of control in communication.

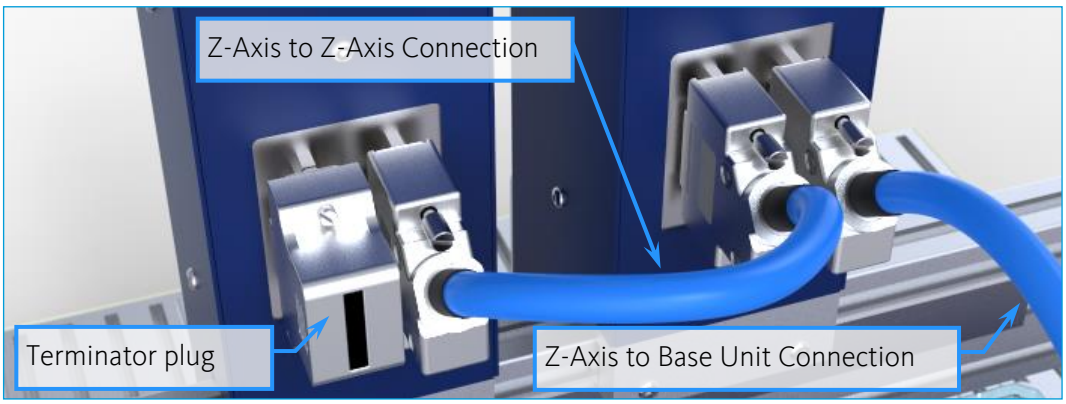


7.3.3 Connecting additional Z-Axes

HINT. Attach additional Z-axis from operator viewing to the right of existing axis. This leads to more simple connection between axis.

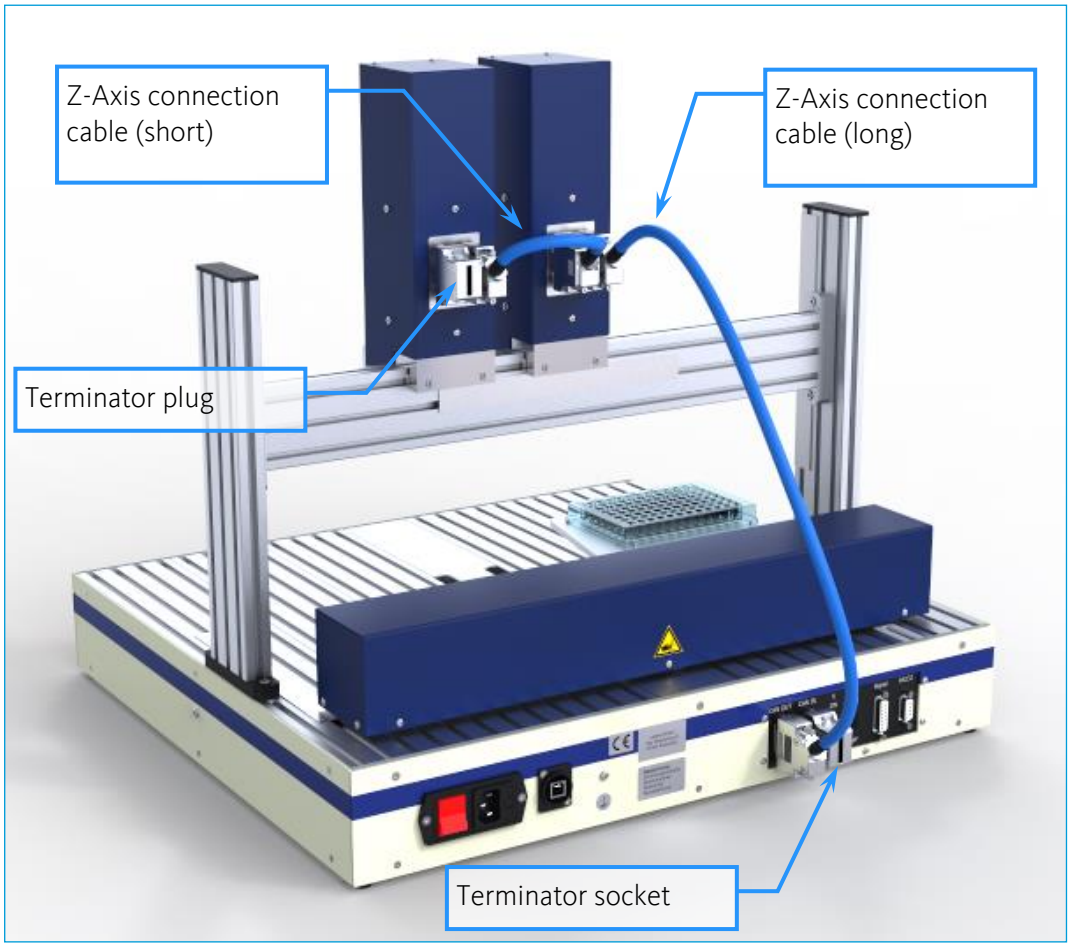
For attachment of additional Z-axis refer to chapter 7.3.1.

For installation of an additional Z-axis replace the Terminator plug from CAN OUT connector of the installed axis. Use a short Z-axis Connection cable. Connect it to the CAN OUT of the installed Z-axis and the CAN IN of the following axis. Terminate the CAN bus by attaching the Terminator plug into the CAN OUT of the final Z-axis (see figure below).



The installation of the axes is finished and you can use your neMAXYS positioning system now.

IMPORTANT. Secure the connections of the cable and the terminators with the screws in the housing of the connectors to prevent loss of control in communication.



7.4 Adjustment of the gantry bar

The gantry bar is fixed via two Allen screws on the right and on the left-hand side on the base unit. To adjust the position of the gantry bar in the Y direction, please follow these steps:

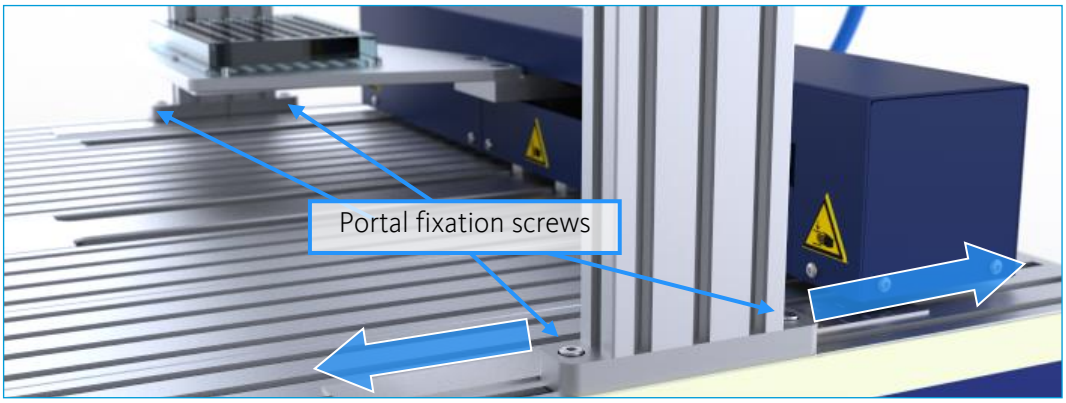
CAUTION. Danger of injury in case of moving parts. Adjust the gantry bar only in disconnected condition. Avoid collision between your tools and Sample set.

(1) Lightly unfasten all four screws at the stand of the gantry bar so that the clamping to the base module is unthreaded.

ATTENTION. Do not remove the screws completely.

(2) Moving the gantry bar along the Y-axis is now possible see figure below.

ATTENTION. Move the gantry bar on both sides close to the surface of the base module while pulling or pushing it to the desired position. Avoid to cant or overbalance the gantry bar.



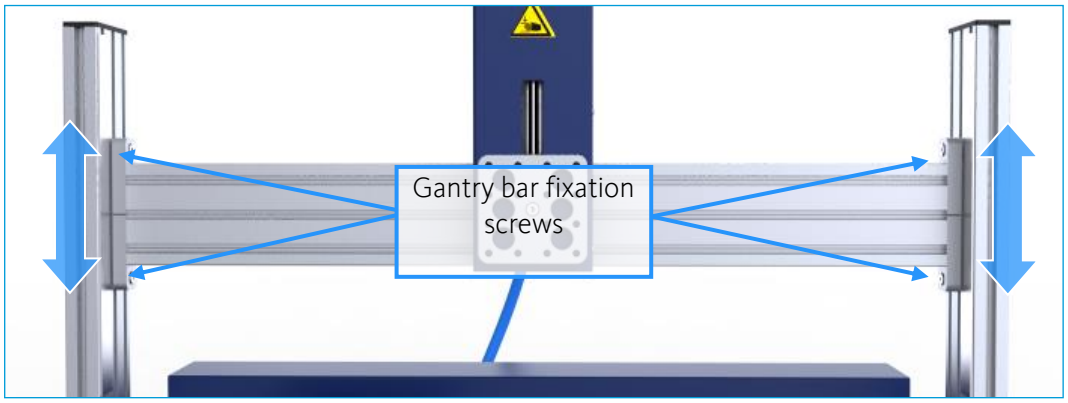
The scales on the base module top side aid you to align the gantry bar into the correct or previous saved position.

IMPORTANT. Make sure that the values to the left and to the right are identical to get parallel movement over the working area.

(3) Tighten all four screws when the gantry bar is at its final position.

7.5 Height Adjustment of gantry bar

The gantry bar is fixed vertically via two Allen screws on each side. Use these screws to adjust the height of the gantry bar carrier above the worktable.



CAUTION. Danger of injury in case of moving parts. Adjust the gantry bar only in disconnected condition. Avoid collision between your tools and sample set.

CAUTION. The gantry bar has to be secured during the adjustment by a second person to prevent uncontrolled dropping down.

To adjust the height of the tool carrier, please follow these steps:

(1) Loosen the four Allen screws.

(2) Hold the tool carrier with one hand on each side and move the tool carrier to its desired position. Moving both sides in parallel will help to prevent canting. The scales on the left and the right portal stand aid you to align the gantry bar into the correct or a previous saved position.

IMPORTANT. Make sure that the values to the left and to the right are identical to get parallel movement over the working area.

(3) Tighten all four screws.

7.6 Z-Axis Positioning

The Z-axis is fixed to the gantry bar carrier via two M6 Allen screws. These allow the repositioning of the Z-axis in the X direction.

To adjust the position of a Z-axis unit on the tool carrier, please follow these steps:

CAUTION. Danger of injury in case of moving parts. Adjust the gantry bar only in disconnected condition. Avoid collision between your tools and sample set.

(1) Loosen both Allen screws.

(2) Drag the Z-axis together with the t-nut to the left or right on the gantry bar to the desired position. The scale aid you to find a specific position. Make sure to move the T-nut and properly align it with the axis unit.

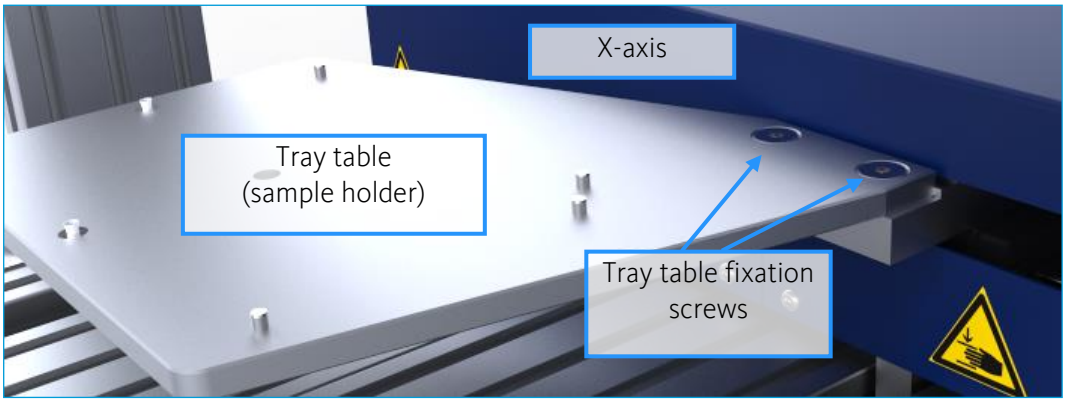
(3) Tighten the screws to fix the Z-axis in its position.

7.7 Replacing the Worktable

The sample tray table of your neMAXYS may be re-configured freely based on the specific task to handle.

CAUTION. Danger of injury in case of moving parts. Adjust the gantry bar only in disconnected condition. Avoid collision between your tools and sample set.

To change between different tray tables, simply remove the two Allen screws (see figure below) that connect the tray table to the X-axis drive unit. Attach and fix the new table.


X-axis
Tray table
(sample holder)
Tray table fixation
screws

8 Electrical Interfaces

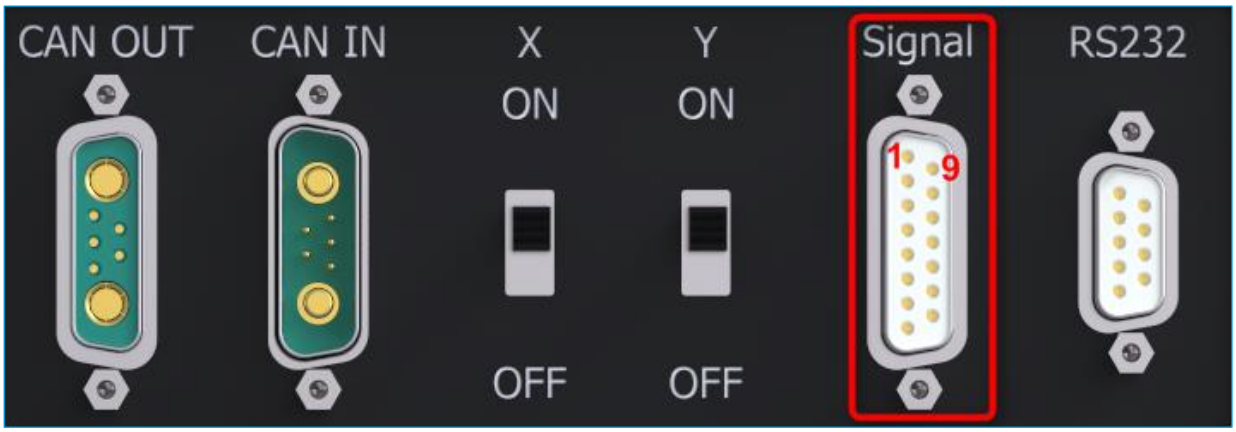
8.1 Overview

On the back of the neMAXYS device, there are a number of different interfaces for connecting the device to mains, the computer, or an external controller (see figure below).

neMAXYS is equipped with the following interfaces:

- J1 – Signal — Signal Interface - CETONI I/O Trigger Interface
- J2 – RS232 — RS-232 Connector
- J3 – CAN IN — CAN IN Connector
- J4 – CAN OUT — CAN OUT Connector
- J5 – USB — USB Interface Type B

8.2 Signal Interface (J1)



"Multipurpose" digital Input/output as well as analogue Input connections are available.

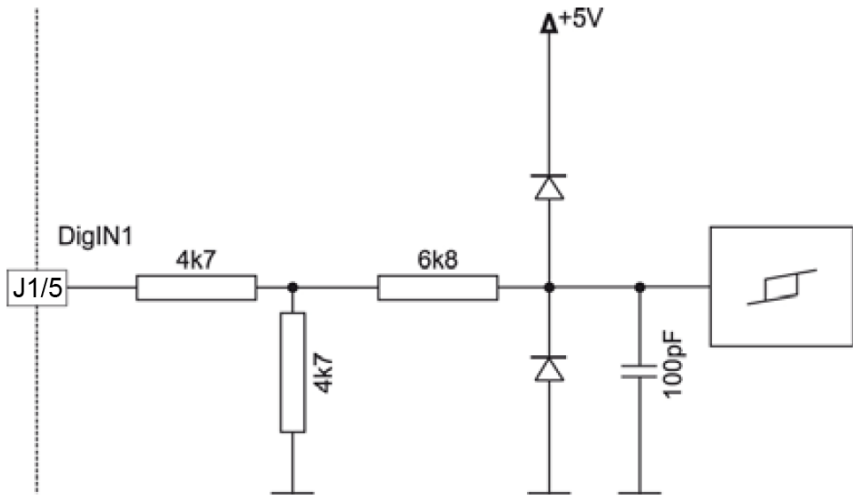
8.2.1 Pin Assignment

PIN NO.	SIGNAL	DESCRIPTION
1	Y-axis A_GND / D_GND	ground (analogue/digital)
2	Y-axis AIN 1	analogue input 1
3	Y-axis AIN 2	analogue in 2
5	Y-axis DigIN 2	digital input 2 "general purpose"
6	Y-axis DigIN 3	digital input 3 "general purpose"
7	Y-axis DigIN 4	digital input 4 "general purpose"
8	Y-axis DigOUT 1	digital output 1 "general purpose"
9	Y-axis DigOUT 2	digital output 2 "general purpose"
12	Y-axis DigOUT 3	digital output 3 "general purpose"
13	Y-axis DigOUT 4	digital output 4 "general purpose"
15	Y-axis $+V_{out}$	additional power out (24 V max. 1 A)

8.2.2 Digital Inputs 2 und 3

"General purpose" inputs may be freely configured by the user

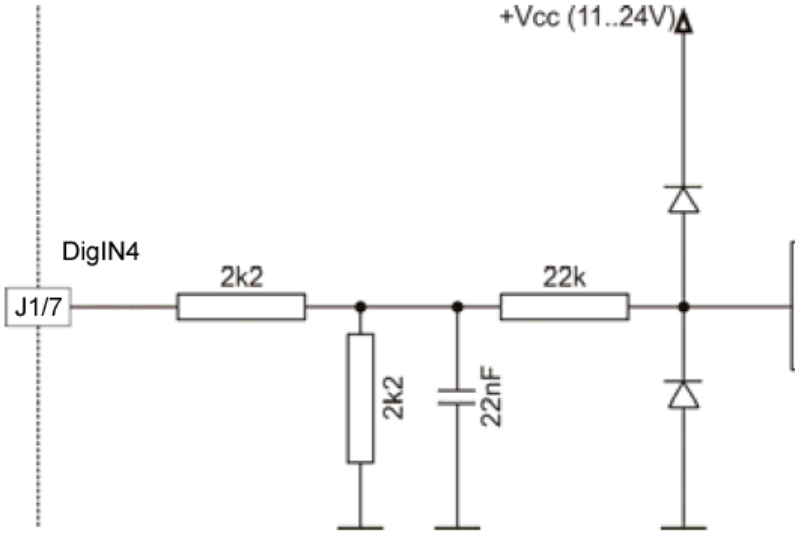
DigIN2 DigIN3 Digital Ground	signal port [J1] Pin [5] signal port [J1] Pin [6] signal port [J1] Pin [1]
Nominal supply voltage	0 – 24 V DC
Max. supply voltage	-30 to +30 V DC
Typical Input voltage @ Level 0	< 1.5 V DC
Typical Input voltage @ Level 1	> 3.0 V DC
Typical Input resistance	8 kΩ
Typical Input current @ Supply voltage at level 1	3 mA @ 24 V DC
Switching delay	< 2 µs @ 5 V DC



8.2.3 Digital Input 4

"General purpose" inputs may be freely configured by the user.

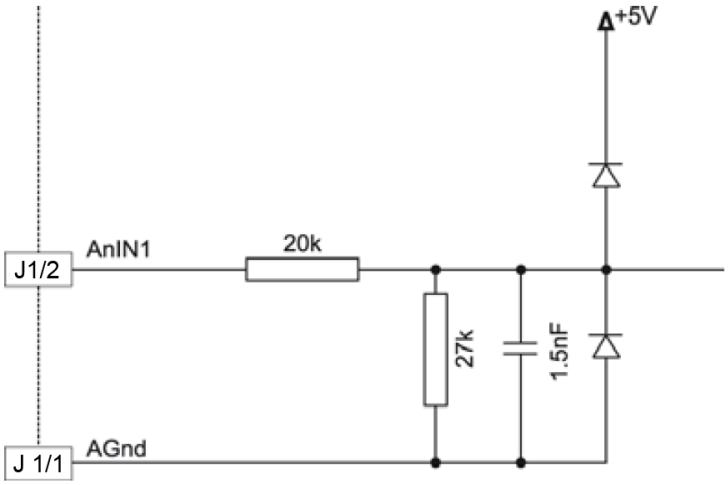
DigIN4 Digital ground	signal port [J1] pin [7] signal port [J1] pin [1]
Nominal supply voltage	0 – 24 V DC
Max. supply voltage	-30 – +30 V DC
Typical voltage Level 0	< 5.0 V DC
Typical voltage Level 1	> 9.0 V DC
Typical Supply resistance	4 kΩ
Typical current @Supply voltage = Level 1	6 mA @ 24 V DC
Switching delay	< 50 µs @ 11 – 24 V DC



8.2.4 Analog Inputs 1 and 2

"General purpose" inputs may be freely configured by the user.

AnIN1 AnIN2 Analogue ground	signal port [J1] pin [2] signal port [J1] pin [3] signal port [J1] pin [1]
Nominal supply voltage	0 – 5 V DC
Max. supply voltage	-30 – +30 V DC
Typical Input resistance	47k @ A_GND [1]
A/D converter	12 bits
Resolution	0.0012 V
Band width	5 kHz

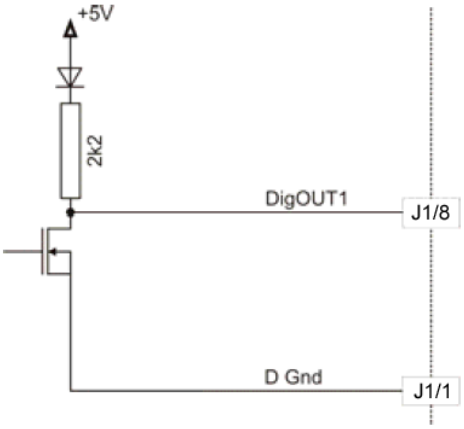


8.2.5 Digital Output 1, 2 and 3

8.2.5.1 SPECIFICATION

“General purpose” outputs may be freely configured by the user.

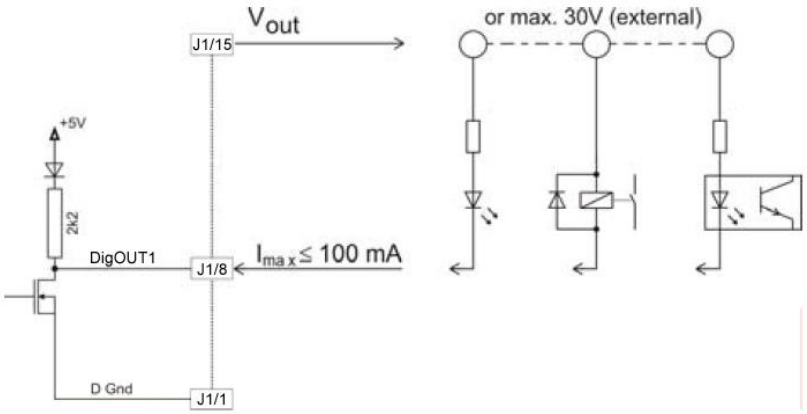
DigOUT1 DigOUT2 DigOUT3 Digital ground	signal port [J1] Pin [8] signal port [J1] Pin [9] signal port [J1] Pin [12] signal port [J1] Pin [1]
Circuit	Open drain (internal Pull-up resistor 2k2 und diode at +5 VDC)
Polarity	High Active 0 - inactive = low level 1 - active = high level



8.2.5.2 WIRING EXAMPLES

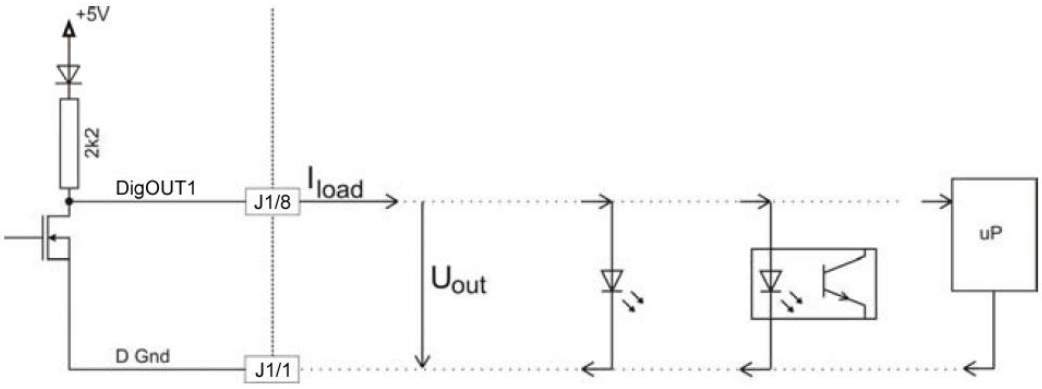
DIGITAL OUT „DRAIN“

Max. supply voltage	+30 VDC
Max. load current	100 mA
Max. voltage drop	0.5 V @ 100 mA



DIGITAL OUT "SOURCE"

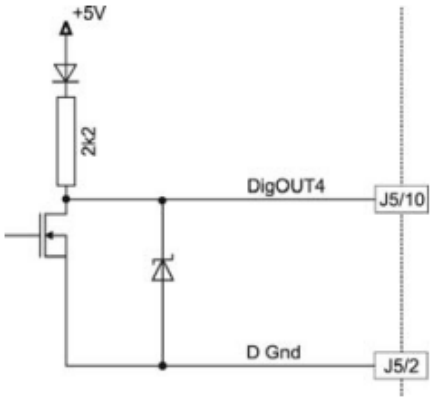
Output Voltage	$U_{out} \approx 5V - 0.75V - (I_{load} \times 2200\ \Omega)$
Max. load current	$I_{load} \leq 2$ mA



8.2.6 Digital Output 4

8.2.6.1 SPECIFICATION

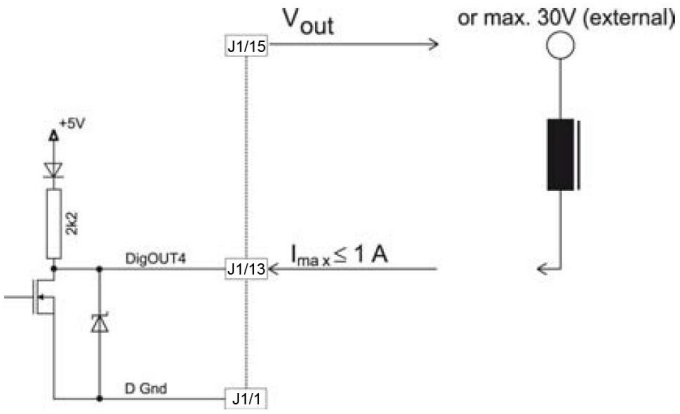
DigOUT4 Digital ground	signal port [J1] Pin [13] signal port [J1] Pin [1]
Circuit	Open drain (internal pull-up resistor 2k2 und diode at +5 VDC)
Polarity	High Active 0 - inactive = low level 1 - active = high level



8.2.6.2 WIRING EXAMPLES

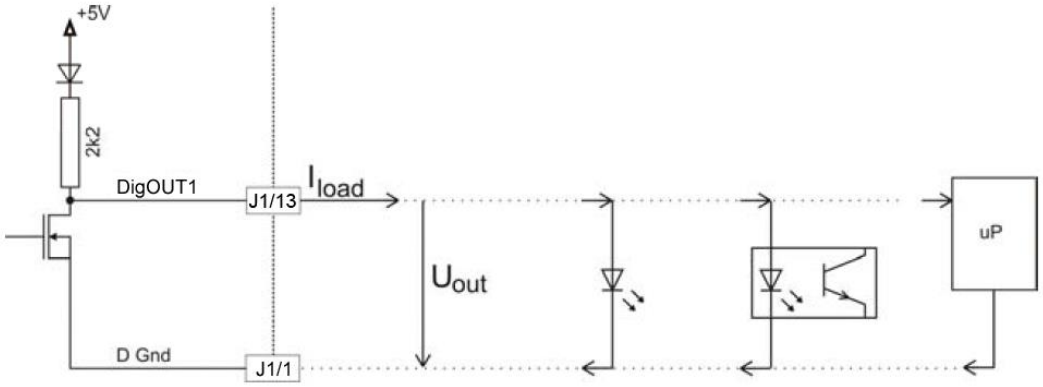
DIGITAL OUT „DRAIN"

Max. supply voltage	+30 VDC
Max. load current	1 A
Max. voltage drop	0.3 V @ 1 A



DIGITAL OUT "SOURCE"

Output voltage	$U_{out} \approx 5V - 0.75V - (I_{load} \times 2200\ \Omega)$
Max. load current	$I_{load} \leq 2$ mA

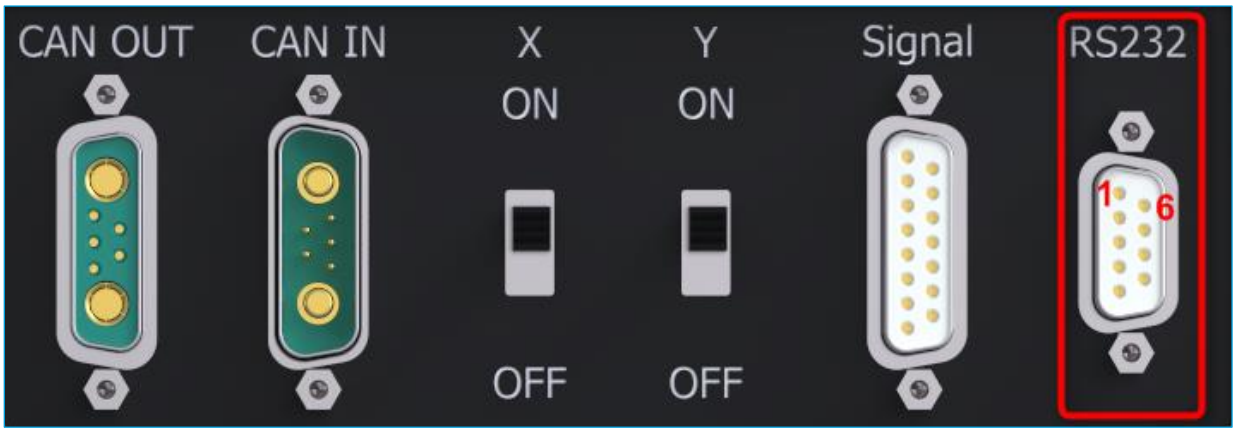


8.2.7 Supply Voltage Output V_{out}

Output may be used as supply voltage for external consumer loads.

$+V_{out}$ Ground	signal port [J1] Pin [15] signal port [J1] Pin [1]
Output voltage	+24 V
Output current	max. 1000 mA

8.3 RS-232 Connector (J2)



8.3.1 Pin Assignment

PIN NO.	SIGNAL	DESCRIPTION
2	neMAXYS TxD	neMAXYS RS232 sending
3	neMAXYS RxD	neMAXYS RS232 receiving
5	GND	RS-232 ground

8.3.2 Technical Data

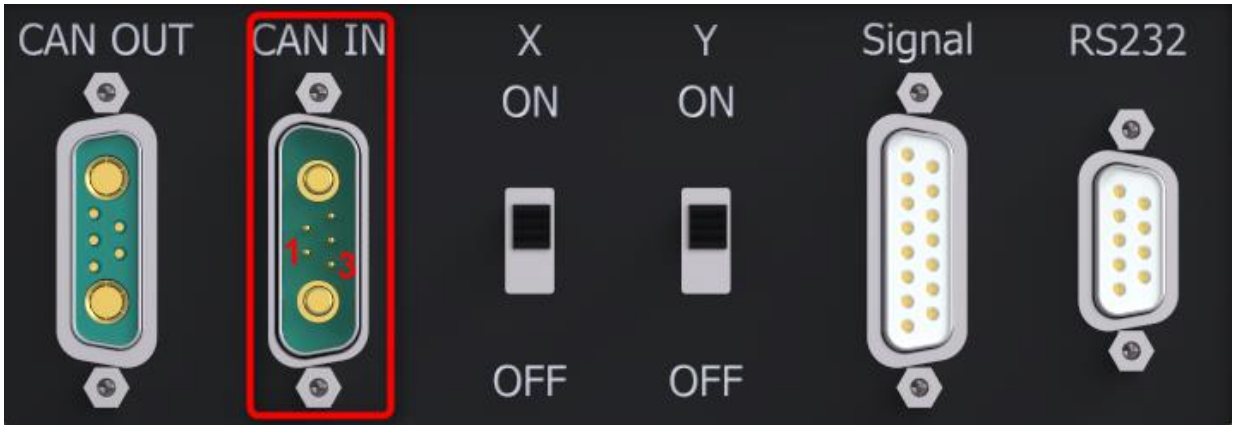
MAX. SUPPLY VOLTAGE	± 30 V
TYPICAL OUTPUT VOLTAGE	± 9 V @ 3k to ground
MAX. BIT RATE	115 200 bit/s (standard 38 400 bit/s)
INTERNAL RS232 DRIVER/RECEIVER	EIA RS232 standard

8.3.3 Connection neMAXYS - PC

NEMAXYS RS-232	PC RS-232
Pin 2 “neMAXYS TxD”	Pin 2 “PC RxD”
Pin 3 “neMAXYS RxD”	Pin 3 “PC TxD”
Pin 5 “GND”	Pin 5 “GND”

IMPORTANT. Please note the RS232’s maximum baud rate of your computer or microcontroller. The standard-baud rate (factory setting) is 115,200 bit/s.

8.4 CAN IN Connector (J3)



8.4.1 Pin Assignment

PIN NO.	SIGNAL	DESCRIPTION
1	NC	not connected
2	NC	not connected
3	CAN high	CAN high bus line
4	CAN low	CAN low bus line
5	CAN GND	CAN Ground

8.4.2 Technical Data

STANDARD TYPE	CAN high-speed, ISO 11898 compatible
MAX. BIT RATE	1 Mbit/s
PROTOCOL	CANopen DS-301, DS-402
NODE ID	Software

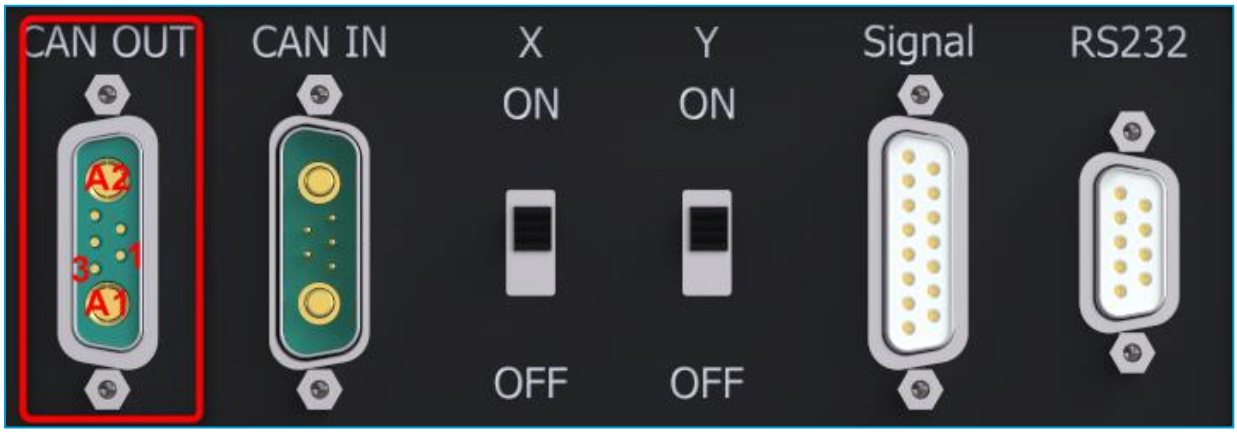
Compatible connector FCT FM-Series Mixed Layout: Case: FM7W2S-K121; High-current pins: FMP007S103

8.4.3 Connection neMAXYS – CAN bus line CiA DS-102

NEMAXYS	CAN 9 PIN D-SUB (DIN41652)
Pin 3 “CAN_H”	Pin 7 “CAN_H” high bus line
Pin 4 “CAN_L”	Pin 2 “CAN_L” low bus line
Pin 5 “CAN_GND”	Pin 3 “CAN_GND” ground
Housing “CAN_Shield”	Pin 5 “CAN_Shield” cable shield

IMPORTANT. Please note the maximum baud rate of your CAN master. The standard baud rate on delivery is 1 Mbit/s. The CAN bus must be terminated with two terminator resistors (see section 7.7-CAN bus Termination)

8.5 CAN OUT Connector (J4)



8.5.1 Pin Assignment

PIN NO.	SIGNAL	DESCRIPTION
1	Emergency-Stop	Emergency-Stop signal for all axes
2	NC	not connected
3	CAN high	CAN high bus line
4	CAN low	CAN low bus line
5	CAN GND	CAN Ground
A1	$+V_{cc}$	Supply voltage +24 V
A2	GND	Supply voltage ground

8.5.2 Technical Data

Standard Type	CAN high-speed, ISO 11898 compatible
Max. bit rate	1 Mbit/s
Protocol	CANopen DS-301, DS-402
Node ID	Software

8.5.3 Connection neMAXYS – CAN bus line CiA DS-102

NEMAXYS	CAN 9 PIN D-SUB (DIN41652)
Pin 3 “CAN_H”	Pin 7 “CAN_H” high bus line
Pin 4 “CAN_L”	Pin 2 “CAN_L” low bus line
Pin 5 “CAN_GND”	Pin 3 “CAN_GND” ground
Housing “CAN_Shield”	Pin 5 “CAN_Shield” cable shield

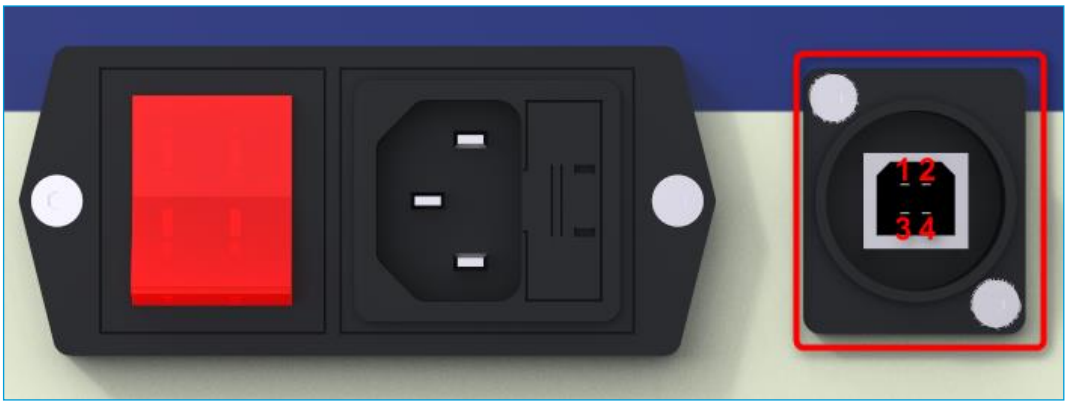
IMPORTANT. Please note the maximum baud rate of your CAN master. The standard baud rate on delivery is 1 Mbit/s. The CAN bus must be terminated with two terminator

resistors (see section 8.7-CAN bus Termination).

Please note the maximum power of the internal power supply when driving external devices via Pins A1 and A2 with 24V.

Compatible plug: FCT FM-Series Mixed Layout FM7W2P-K120
High-current connectors: FCT FM-Series Mixed Layout FMP007P103

8.6 USB Interface Type B (J5)



8.6.1 Pin Assignment

PIN NO.	SIGNAL	DESCRIPTION
1	V_{Bus}	USB BUS Input supply voltage +5 VDC
2	USB D-	USB Data-
3	USB D+	USB Data+
4	GND	USB ground
	Shield	Cable shield

8.6.2 Technical Data

USB STANDARD	2.0 (Full speed)
MAX. BIT RATE	12 Mbit/s
MAX. SUPPLY VOLTAGE BUS	+5.25 V
POWER SUPPLY	via USB Port, ca. 250 mA
TEMPERATURE RANGE	-20 °C ... +80 °C

8.6.3 Connection neMAXYS – PC

NEMAXYS	PC INTERFACE USB2.0
Pin 1 "V_{Bus}"	Pin 1 "V_{Bus}"

Pin 2 “USB D - “	Pin 2 “USB D - “
Pin 3 “USB D+”	Pin 3 “USB D+”
Pin 4 “GND”	Pin 4 “GND”
Housing “Shield”	Housing “Shield”

Supplied Accessory: neMAXYS USB-COM cable
Compatible Connector: Standard USB cable with Type B plug (4 pole)

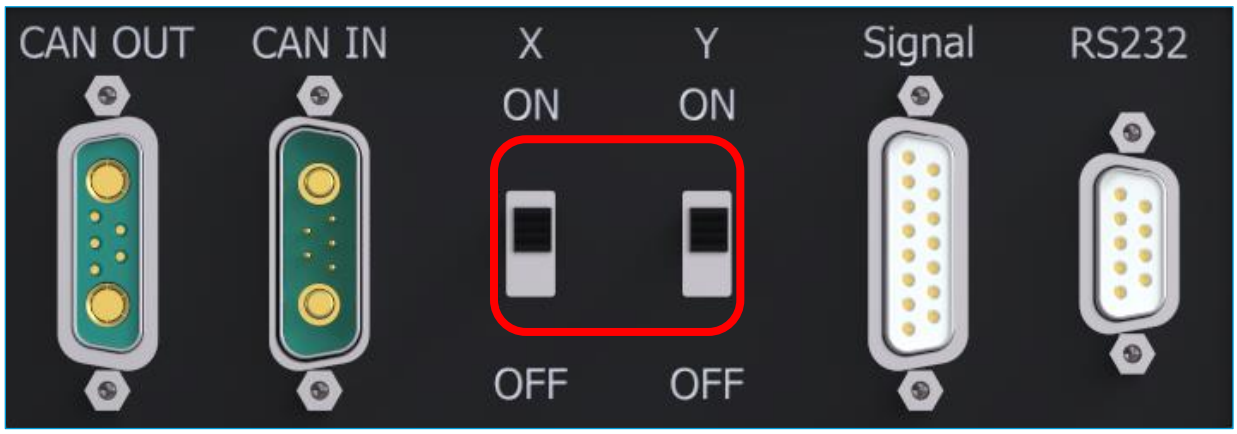
8.7 CAN bus Termination

In the neMAXYS positioning system all control components are connected to a single CAN bus. This CAN bus requires a terminating resistor of 120 Ω on both ends. Via the both interfaces CAN IN and CAN OUT the CAN bus also connects to the outside. If both interfaces are used to attach additional external devices to the CAN bus, the CAN bus must be terminated with a dedicated terminator resistor of 120 Ω.

If you don’t have attached any additional external devices and only use the neMAXYS basic system with Z-axes, terminate the CAN bus with the included terminator plug and socket according to description in chapters 7.3.2 and 7.3.3

8.8 Disconnecting axes from CAN bus

All positioning controllers are connected via CAN bus and communicate with a baud rate of 1,000 Kbit/s. In rare cases, e.g. due to incorrect configuration of the positioning controller of an axis, the bus communication may be corrupted. Then and for the required servicing, it could be necessary to disconnect controllers from CAN bus individually. There are two switches on the back of the instrument to do this (see figure below).



In the OFF position, the X- or Y-axis is disconnected from the power supply. This makes it possible to disconnect faulty axes from the bus in order to correct the faulty configuration.

IMPORTANT. Please ensure the ON position of both switches. Only in this case all axes will be visible for the configuration tool and the QmixElements Software.

9 Maintenance and Care

9.1 Care

If used in accordance with intended purpose, the device is maintenance-free.

For cleaning the surface can be rubbed gently with a soft, damp cloth. The cloth must not be wet, to prevent liquid sloping into the device. In case of greater soiling you can also use a little bit of detergent or alcohol.

Check the neMAXYS positioning system for visible damage of the cover, the axes, the power supply cord and the used wiring every time before using it.

Do not use the neMAXYS in case of damage.

ATTENTION. Risk of injury from damaged electrical components or mechanical parts. Do not use the neMAXYS when you recognize an unnormal condition. Do not repair the neMAXYS by yourself. Connect CETONI GmbH to reset your neMAXYS into its save and original condition.

9.2 Faults

FAULT	POSSIBLE FAILURE
• neMAXYS cannot be switched on. • Power lamp is not illuminated	• Make sure that the power supply cord is completely connected to the wall socket and the device socket of neMAXYS. • Make sure that the wall socket is activated.
• communication problems between neMAXYS and computer	• Regard the installation procedure as described in chapter 6.1 • Connect your computer and neMAXYS positioning system with the delivered USB-cable • Make sure that the CAN-bus termination is connected completely on both ends of your installation. Refer to chapter 8.7.

Should there be a failure despite this, which you cannot eliminate yourself, or which requires opening the device, please contact CETONI GmbH to coordinate further actions.

The device may only be opened by CETONI GmbH or an authorized service staff. Otherwise the warranty claims are void.

Prior to returning the neMAXYS to CETONI GmbH or entrance of service personal for repair carry out a decontamination.

IMPORTANT. Prior to returning the neMAXYS to CETONI GmbH or entrance of service personal for repair carry out a decontamination. Attach a declaration of decontamination for every part to the return shipment. Ask CETONI GmbH to get a form.

Software-related troubles are dealt within the Software Manual.

The software manual can be found for download at

https://www.cetoni.de/fileadmin/user_upload/Documents/Manuals/QmixElements_Handbuch_DE.pdf

10 Disposal

Please send your unused neMAXYS devices when token out of service back to CETONI GmbH. We will take care of proper disposal.

IMPORTANT. Do not discard the neMAXYS into the public waste collection

IMPORTANT. Prior to returning the neMAXYS to CETONI GmbH or entrance of service personal for repair carry out a decontamination. Attach a declaration of decontamination for every part to the return shipment. Ask CETONI GmbH to get a form.