
Instruction Manual

Keypad SM6 - 4

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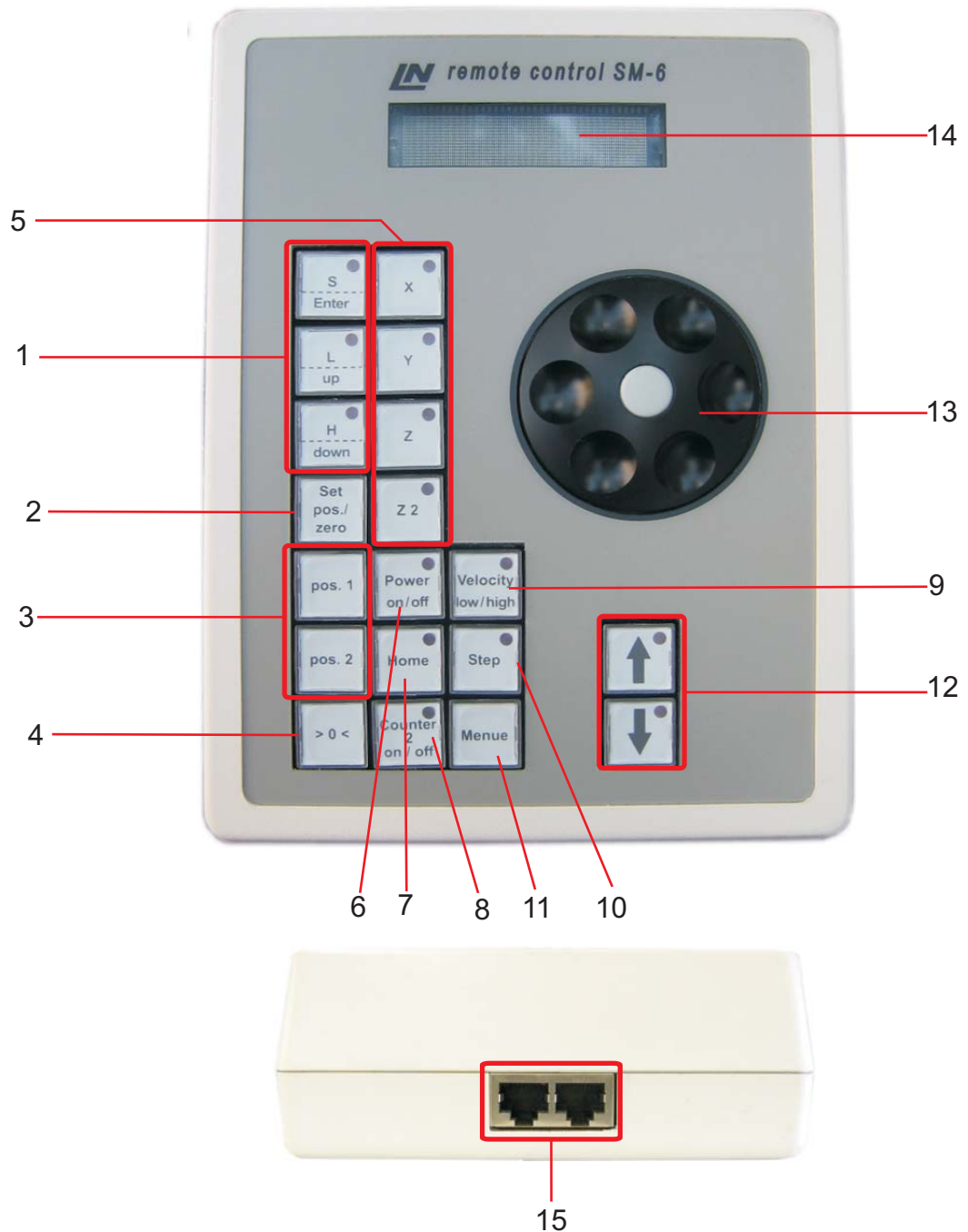
Tastenfeld SM6-4

The Keypad SM6-4 is connected to the Controller SM-6. Up to four motorized LN-Axes can be controlled via the Keypad SM6-4. Alternatively, the motorized LN-Axes can be operated via the hand-wheel or movement keys. Via the menu, it is possible to individually adjust the speed of movement, direction of movement, hand-wheel release, etc...

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Overview: Keypad SM6 - 4

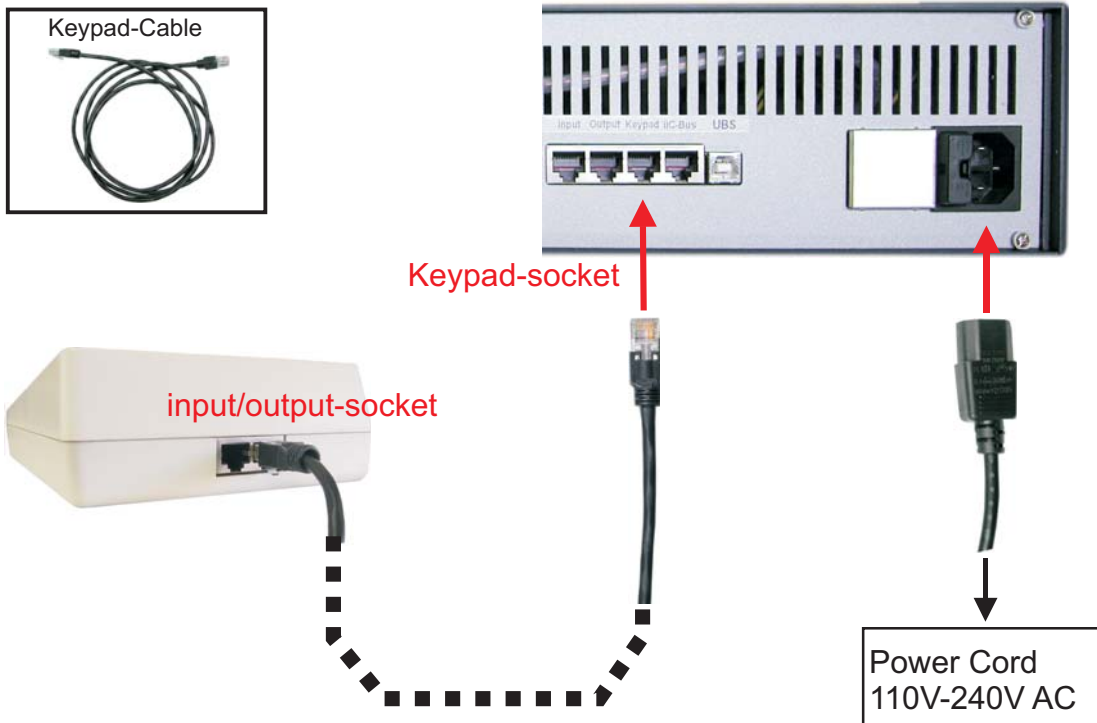


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|----|---|-----|--------------------------|
| 1. | Hand-wheel resolution and menu navigation | 9. | Velocity (Low / High) |
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| 7. | Home funktion (On / Off) | 15. | Keypad input / output |
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Keypad SM6-1 to Controller SM-6 Connection

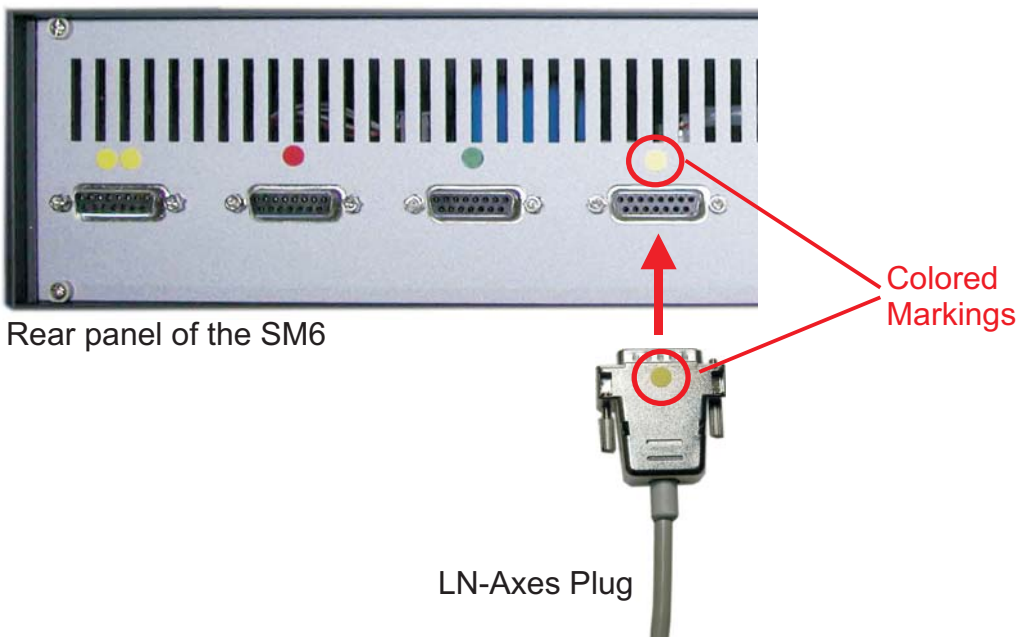
Connect the Keypad SM6-1 to the Controller SM-6 using the keypad cable.

This is done by inserting one end of the keypad cable into the Controller SM-6 keypad socket and the other end into one of the Keypad SM6-1 in/output sockets.



Connect the motorized LN-Axes to the Controller SM-6.

Both the plug and the corresponding socket are marked with colored spot/s.



Selection of the active motorized LN-Axis

Selection of the LN-Axes

Up to four individual LN-Axes can be controlled using the Keypad SM6-4.



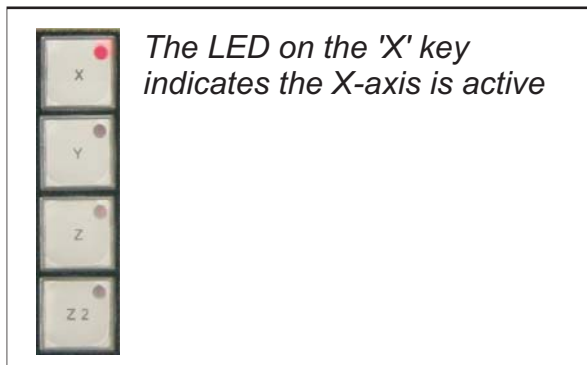
Selection of the active LN-Axis is done using one of the four selection keys [5].

An illuminated LED on the selection key indicates which LN-Axis is active.
! Note that only one LN-Axis can be active at any point in time !

All settings and values in the display always refer to the active LN-Axis.

Only the active axis can be controlled with the movement keys and hand-wheel

Selection keys for the active LN-Axes



The number of LN-Axes available for selection is dependant on the assembly of the Controller SM-6.

Operation of the motorized LN-Axes

The motorized LN-Axes can be controlled via either the Hand-wheel or the direction keys. When controlling the LN-Axes via the direction keys, two speeds are available (high or low). However, when utilizing the hand-wheel, three different resolutions are available.

Hand-wheel

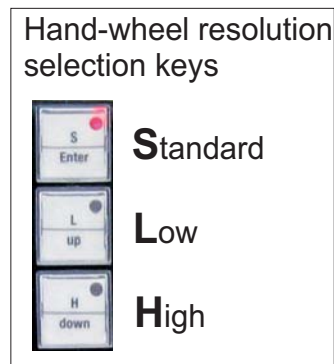
Use of the hand-wheel allows for very fine control over the movement of the motorized LN-Axes.



The direction of motion controlled by the hand-wheel is adjustable independently from the direction of motion controlled by the direction keys.

The three resolution options available for the hand-wheel can be individually adjusted in the Menu.

*See "Menu" Chapter [set hand-wheel resolution]



The active selection is shown by the LED on the corresponding key.

Direction Keys



Direction Keys



Pressing a direction key propels the motorized LN-Axes in a particular direction.

Movement via the direction keys is performed at one of two speeds (high or low) as selected by the user.

Selection keys for high / low

LED illuminated  High velocity enabled	LED not illuminated  Low velocity enabled
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Illuminated LEDs on the Direction Keys have the following meaning

Both LEDs illuminated



LN-Axes enabled

* Both keys can be used to control the motorized LN-Axes.

Both LEDs not illuminated



The LN-Axes are switched off.

* See Power on/off (The motorized LN-Axes are unable to be moved).

One of the LEDs is no longer illuminated



The LN-Axis in this direction has reached the limit switch.

* It is not possible to move the LN-Axis any further in this direction.

One of the LEDs flashes; the other is not illuminated



The LN-Axes are in the HOME-position.

* See HOME-Function.

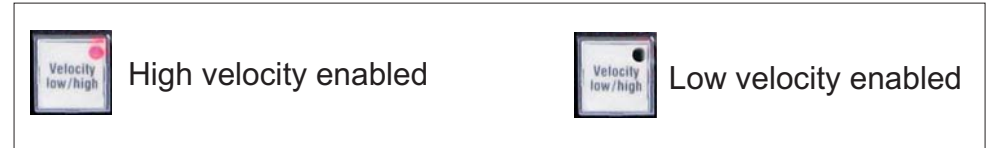
Features

Speed of Movement

Speed selection for the direction keys can be pre-set individually in the menu. There are two speeds available for selection (high / low)

* See Menu: Set movement (fast / slow)

Selection keys for high / low



Hand-wheel Resolution



The hand-wheel has three resolutions that can be individually adjusted in the menu.

* See Menu: Set hand-wheel resolution.

An illuminated LED shows which of the resolutions is currently enabled:

Standard, **L**ow or **H**igh

Power on / off

The "power-off" function stops current flow to the the LN-Axes motors, however in doing so, the exact position (in μm) will be retained.

Both LEDs illuminated



LN-Axes enabled

* These keys can be used to control the movement of the motorized LN-Axes.

Both LEDs not illuminated



The LN-Axes are switched off

* The motorized LN-Axes are unable to be moved; the power is switched off.

Features

Home

The “Home” function is used to quickly remove the LN-Manipulators from the work area.
The LN-Manipulator will be driven automatically to the maximum end-position, however can be precisely returned to its previous position.

**The speed and direction of movement are adjustable in the menu*

Activation



Press the “Home” key



LED begins to flash.
The home function is activated.



Pressing either one of the two movements keys drives the LN-Manipulator to the end-position

And



LED constantly illuminated



One LED is illuminated
one is off

Pressing the movement key again causes the LN-manipulator returns precisely to its starting position.

Deactivation



The home key flashes

Press the home key again



LED is out.
The home function is deactivated.

Moving to the Endposition

It is possible to stop the automatically move to the End-position

If one of the movement keys is pressed while the LN-Manipulator is moving to the endposition, the manipulator will stop immediately.

** Both LED's on the movement keys are illuminated and the LED on the home key flashes.*

Pressing the movement key again the LN-manipulator returns exactly to its starting position.

Features

Zero Point

In the display the “pos: Worth” will be set to zero and the current position stored as the zero point.
This can always be specified again at a later stage.

Storage



Press “set position/zero” key whilst holding down the 'zero' key



The display is set to zero and the current position is stored as the zero position

Movement



Pressing the “zero” key moves the LN-Manipulator automatically to the zero position

Automatic Positioning

Two individual positions can be stored by the SM-6 Keypad.
The stored positions can be moved to repeatedly with high (μm) precision and can be overwritten if desired at a later stage

Storage



Press “set position/zero” key ,then press either the Pos.1 or Pos.2 key.

The position is saved.

Movement



Pressing the appropriate position key moves the LN-Manipulator to the stored position.

! WARNING !

Altering the zero-position in Counter 1 also alters the stored positions (Pos.1 and Pos.2) according to the new zero-point

Features

Counter 2 Measuring Counter

“Counter 2” is an additional counter, used to measure distance without involving “Counter 1” and thus without altering positions 1-5.



Pressing this key switches between Counter 1 and Counter 2



LED not illuminated Counter 1 (reference counter)



LED illuminated Counter 2 (measuring counter)



The display indicates the current counter ("Cnt2" = Counter 2)

The zero function for Counter 2 has no influence over the zero position or over the stored positions in Counter 1

The stored positions always refer to Counter 1.

Features

STEP

When “step” function is activated, pressing one of the movement keys drives the LN-Manipulator forwards or backwards with the pre-set step length and step speed.

Both the step length and step speed are individually adjustable in the menu.

* See Menu, Set step dist / speed

Activation



Press the step key



LED illuminated-the step function is activated



Press one of the movement keys.

The LN-Manipulator moves a preset distance with constant speed (both speed and distance are preset in the menu).

Deactivation




To deactivate the step function, press the 'step' key.
The step function is deactivated when the LED is no longer illuminated

The step function can also be released by an external TTL-signal at the D-Sub plug output 'trigger' of the Controller SM-6.

* (See Appendix)

Menu

The Keypad SM-6 has a set menu where the basic settings are saved, for example speed and direction of movement, etc...

To open the set menu, press the  key.
"Collecting data" will appear on the display and after a few seconds the menu will be opened.

SET MENUE



The first menu available is the 'Set menu'.
From the 'set menu' it is possible to select which setting you would like to adjust.

Use the keys 'S/Enter', L/Up' and 'H/Down' to access the individual settings



Confirm

One line upward

One line downward



The arrow at the right end of the display indicates the current position.

From the set menu, select which setting you would like to adjust and confirm the selection using the "Enter" key

ADJ. MENUE

After making a selection in the "set menu", the 'Adj. menu' is opened and the selected parameter can be adjusted.



The individual parameter is adjusted using the 'up' and 'down' keys and confirmed via the 'Enter' key.
Pressing the 'Enter' key again returns you to the set menu.

To exit the menu system (from the set menu), press the  key

Menu Overview

SET MENU	ADJ. MENU	
- Set move fast	Adjust Move fast X:0...15	“Fast speed” is adjustable from 0 (minimum) to 15 (maximum)
- Set move slow	Adjust Move slow X:0...15	“Slow speed” is adjustable from 0 (minimum) to 15 (maximum)
- Set home speed	Adjust Home speed X:0...15	“Driving to home position” speed is adjustable from 0 (minimum) to 15 (maximum)
- Set pos. Speed	Adjust Position speed X:0...15	“Driving to home position” speed is adjustable from 0 (minimum) to 15 (maximum)
-Set step speed	Adjust Step speed X:0...15	Speed of movement to the stored positions is adjustable from 0 (minimum) to 15 (maximum).
-Set home dir.	Adjust Home direction X:-/+	Direction of travel when moving to the 'Home' position is set to (X: -/+) or (X: +/-)
- Set step dist.	Adjust Step distance X:1...1000µm	The distance of a single step is adjustable from 1µm to 1000µm.
- Set ramp length	Adjust Ramp length X:0...15	Ramp length for driving and deceleration of the motorized LN-Axes is adjustable from 0 (minimum) to 15 (maximum).
- Set move dir.	Adjust move direction X:-/+	Direction of movement for the movement keys is set to (X: -/+) or (X: +/-)
- Set pos. Sign.	Adjust Pos sign X:-/+	The position signal in the Display is set to (X: -/+) or (X: +/-)
- Set hndw dir.	Adjust Handwheel direction X:-/+	Direction of movement for the handwheel is set to (X: -/+) or (X: +/-)
- Set hndw. res.	Adjust Handwheel resolution L:0...255 S:0-255 H:0-255	Handwheel resolution is adjustable from 1 (minimum) to 255 (maximum)