MCS Configuration Tool

User Manual

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1 Introduction

Each MCS has a set of default parameters that are loaded on power-up from the internal EEPROM. While it is possible to take influence on some of the parameters during operation, either via the software interface or through a Hand Control Module, some users might want to change the default values for the parameters. This may be accomplished with the MCS Configuration Tool.

2 Overview

The MCS Configuration tool is a very simple tool that allows you to connect to one or more MCS devices and configure them easily. The main window is divided into two parts:

- Connection - Here you establish a connection to your MCS.
- Configuration - Once the connection is established you may configure your device(s) here.

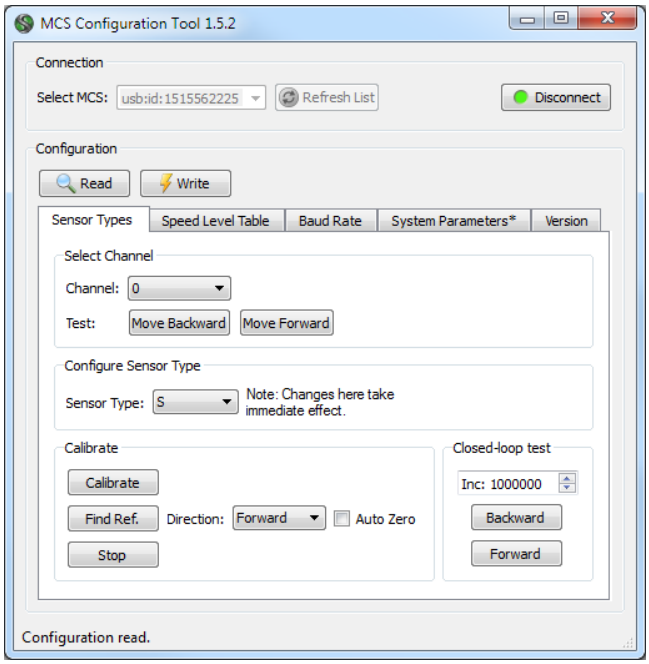

Figure 1: The application when connected via USB.

3 Connecting to the System

The MCS Configuration Tool may be used for controllers with a USB, a network or RS232 interface. Simply connect your device to the PC via a USB resp. RS232 cable and power up the system.

In the menu “Select MCS” select a system from the list of USB devices or serial ports. Alternatively you can enter a locator string for the controller you whish to connect to.

- If you have a USB device select one of the “usb:id:123456789” entries from the menu where “123456789” must match the system ID of the MCS you want to update.
  Please note that USB devices also install a virtual COM port on your PC, but cannot be connected by selecting the COM port from the menu.
- If you have a RS232 device select one of the “serial:COM1” menu entries where COM1 must be the COM port that the MCS is connected to.
- If you have a MCS with network interface, enter its *locator* string in the text field. A locator string for network controllers has the format:
  network:192.168.1.200:5000
  where 192.168.1.200 is the IP address and 5000 the port of the MCS. The IP address and port must match the network address that the MCS network interface has been configured for.

After you have selected the MCS, click the *Connect* button to establish a connection to your hardware. Please note that with USB devices it may take several seconds after power-up / cable connection before they are detectable by the software. If the connection fails, try to connect a few seconds later again.

Once the connection has been established the current device configuration will be automatically read and you will be able to configure your hardware in the *Configuration* box (see below). The status bar at the bottom of the application window will show *Connected*.

4 Configuring the System

The upper part of the configuration box consists a *Read* button and a *Write* button.

The *Read* button reads the current configuration from the device and displays them in the GUI elements below. The *Write* button will write the changes you have made to the configuration to the device and store them in non-volatile memory.

The lower part of the *Configuration* box consists of several tabs. The tabs may be used to configure different groups of settings. These groups are described below.

4.1 Sensor Types

This group lets you configure the sensor types for each channel of a system. For a positioner with an integrated sensor to function properly, the channel must be configured with the appropriate sensor type.

Please note that the *Read* and *Write* buttons do not affect this tab. Changes to the sensor type of a channel will be stored to the device immediately.

To configure a channel follow these steps:

1. In the *Select Channel* box select a channel from the drop down box. The drop down box lists the channel indexes that are also used when addressing channels via the software interface of the MCS. You may check which physical positioner you have selected by pressing the *Move Backward* and *Move Forward* buttons. Pressing a button will issue a slow movement of the positioner as long as you keep the button pressed. The positioner will be stopped when you release the button.

Note: If you switch to a different channel the *Sensor Type* field below will be updated automatically to reflect the setting that is currently configured for the channel.

2. In the *Configure Sensor Type* box select the sensor type for the channel using table 2 in the appendix. A channel with currently no attached sensor still can be configured to use a specific sensor type once a sensor becomes available on that channel.

3. In the *Calibrate* box you may perform a calibration of the sensor or move the positioner to its reference mark.
   If the sensor type for a channel was changed then it **must be calibrated** for proper operation. The calibration of the sensor will take a few seconds to complete. The positioner will make some sound while calibrating. This is normal behavior. The status bar will notify you when the calibration has completed.
   Important note: Please make sure that the positioner is not near a mechanical end stop while performing a calibration. Otherwise the positioner may behave oddly when issuing closed-loop commands.
   Finding the reference mark is optional. You may specify the initial search direction and whether or not the position should be set to zero once the reference mark has been found.
   The stop button will abort any ongoing movement of the positioner.

With the *Closed-loop test* group you can perform a closed loop movement either forward or backward with the specified distance in nanometers or microdegrees (depending on the current sensor type).

4.2 Speed Level Table

For MCS devices that are equipped with a Hand Control Module this group may be used to configure the Speed Level Table (SLT) for the Simple Control Mode (see user manual). In this mode a positioner will perform a burst of (open-loop) steps when turning the control knob of the corresponding positioner by one notch. The number of steps, the step amplitude and the step frequency are defined by the current speed level. The SLT holds these parameters for each speed level.

To modify a value of the table simply double-click it, enter the new value and hit return. To add speed levels to the table or remove speed levels from the table right-click on a row and select the appropriate item from the pop-up menu.

The valid ranges for the parameters are:

Table 1: Speed Level parameters

Parameter	Minimum Value	Maximum Value
Steps	1	29999
Amplitude	150	4095
Frequency	1	18500
# of Speed Levels	1	32

Once you are satisfied with your modifications click the *Write* button to store the settings onto the device. Click the *Read* button to abort the changes and re-read the current settings from the device. Unsaved changes are displayed with a star symbol next to the tab name.

4.3 Baud Rate

This tab is only available when the application is connected via RS232 with an MCS. Here you can set the desired baud rate of the MCS Controller. Note that the setting does not take effect until the next system reset. After configuring the interface, either do a power down/power up cycle or send a reset command. The valid range for these parameter is 9,600..115,200 Baud.

The MCS will set the baud rate to the closest value that the internal baud rate generator is able to produce. For standard baud rates the error is small enough for a stable communication.

Click the *Write* button to store the settings onto the device. Click the *Read* button to abort the changes and re-read the current settings from the device. Unsaved changes are displayed with a star symbol next to the tab name.

4.4 System Parameters

Inside this tab you can configure several parameters of the Device. Some parameters, e.g. the *Closed Loop Max Frequency*, can be configured either for the whole MCS Controller or a single channel. This can be selected via the *Separate Values* check box inside this tab. The parameters you can set are:

Default Sensor Mode (global): Selects which sensor mode should be selected at system start up. The valid values are *Enabled*, *Powersave* and *Disabled*.

Closed Loop Max Frequency: Sets the max. frequency a channel can use to drive its positioner. The valid range is 50..18,500 Hz.

Dynamic Amplitude Detection: The MCS can try to improve sensor signals of an axis. This parameter is used to activate/deactivate this feature.

Distance Code Inverted: In some positioners the sensor can be mounted inverse according to the positioners positive driving direction (e.g. due to assembly boundaries). This can be corrected with this property.

Note: This parameter is set automatically during the calibration process. A change of this parameter can lead to undefined behavior of the positioner and to damage of itself or its environment.

Physical Scale Offset: Defines how much the logical scale used to calculate positions differs from the physical scale. For more information see e.g. “Shifting the Measuring Scale” in the “MCS Programmers Guide”. The valid range is ±2,000,000,000 nm.

Signal Amplitude Threshold: The MCS Controller can detect a noisy sensor signal an inform the user. This parameter is used to specify the value the sensor signal can drop to before a warning is emitted. The valid range is 0..4095 (0..100%).

Note: This feature is not available on all controllers. Please contact SmarAct for more information.

High Voltage Threshold: The MCS Controller can detect a drop on the high voltage output and inform the user. This parameter is used to specify the minimum voltage the output can drop to before a warning is emitted. The valid range is 0..1023 (0..100V).

Note: This feature is not available on all controllers. Please contact SmarAct for more information.

Temperature Threshold: The MCS Controller can sense the temperature of the controller hardware and inform the user if the system gets to hot. This parameter is used to specify the temperature which the controller can reach before a warning is emitted. The valid range is 0..1023 (approx. 0..150°C).

Note: This feature is not available on all controllers. Please contact SmarAct for more information.

Logical Sclae Offset: Defines an offset value between the logical and the physical scale, thus shifting the logical position of the channel. For more information see e.g. “Shifting the Measuring Scale” in the “MCS Programmers Guide”. The valid range is ±2,000,000,000 nm.

Logical Scale Inversion: Specifies if the logical and the physical scale are counted int the same or the opposite direction. For more information see e.g. “Shifting the Measuring Scale” int the “MCS Programmers Guide”. The allowed settings are *Normal* and *Inverted*.

4.5 Version

Inside this tab you can check the current firmware version of the connected device. Together with the channel types, the serial numbers and configured permission bytes.

5 Appendix

Table 2: Sensortypes

Symbol	Type Code	Positioner Series	Comment	Reference Type
S	1	SLCxxxxs, SLxxxxs	linear positioners with nano sensor	mark
SR	2	SR36xxs, SR3511s, SR5714s, SR7021s, SR2812s	rotary positioner with nano sensor	mark
SP	5	SLCxxxxrs	linear positioners with nano sensor, large actuator	mark
SC	6	SLCxxxxsc	linear positioners with nano sensor, distance coded reference marks	mark[1]
SR20	8	SR2013s, SR1612s	rotary positioners with nano sensor	mark
M	9	SLCxxxxm, SLxxxxm	linear positioners with micro sensor	end stop
GD	11	SGO60.5m	goniometers with micro sensor (60.5mm radius)	end stop
GE	12	SGO77.5m	goniometers with micro sensor (77.5mm radius)	end stop
GF	14	SR1209m	rotary positioners with micro sensor	end stop
G605S	16	SGO60.5s	goniometers with nano sensor (60.5mm radius)	mark
G775S	17	SGO77.5s	goniometers with nano sensor (77.5mm radius)	mark
SC500	18	SLLxxsc	linear positioners with nano sensor, distance coded reference marks	mark[1]
G955S	19	SGO95.5s	goniometers with nano sensor (95.5mm radius)	mark
SR77	20	SR77xxs	rotary positioners with nano sensor	mark
SD	21	SLCxxxxds, SLLxxs	like S, but with extended scanning Range	mark
R20ME	22	SR2013sx, SR1410sx	rotary positioners with MicroE sensor	mark
SR2	23	SR36xxs, SR3511s, SR5714s, SR7021s, SR2812s	like SR, for high applied masses	mark
SCD	24	SLCxxxxdsc	like SP, but with distance coded reference marks	mark[1]
SRC	25	SR7021sc	like SR, but with distance coded reference marks	mark[1]
SR36M	26	SR3610m	rotary positioners, no end stops	none
SR36ME	27	SR3610m	rotary positioners with end stops	end stop
SR50M	28	SR5018m	rotary positioners, no end stops	none
SR50ME	29	SR5018m	rotary positioners with end stops	end stop
G1045S	30	SGO104.5s	goniometers with nano sensor (104.5mm radius)	mark
G1395S	31	SGO139.5s	goniometers with nano sensor (139.5mm radius)	mark

1 These positioners are equipped with multiple reference marks. The positioner will only have to move a few millimeters to know its physical position.