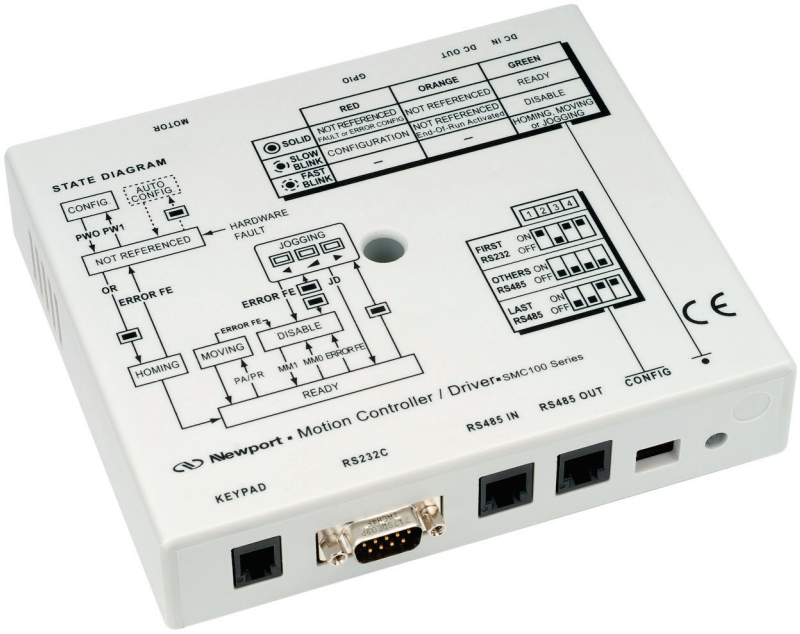
SMC100CC & SMC100PP

Single-Axis Motion Controller/Driver for DC or Stepper Motor



Controller GUI Manual

V2.0.x

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SMC100
Single-Axis Motion Controller

1.0 Introduction

1.1 Purpose

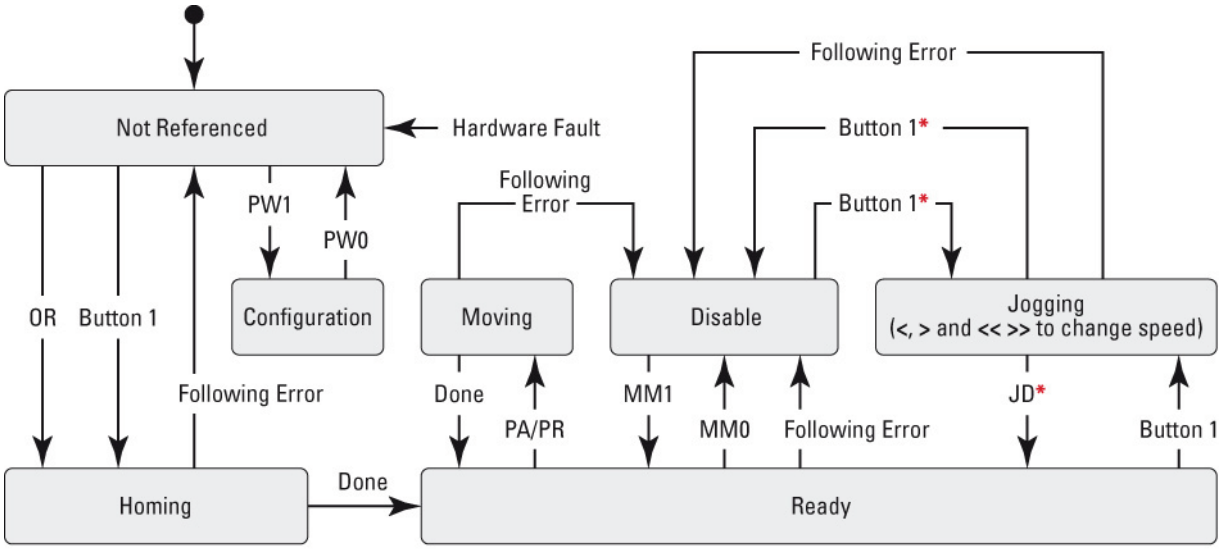
The purpose of this document is to provide instructions on how to use the SMC100 Controller graphical user interface (GUI).

1.2 Overview

The SMC100 Controller GUI is a graphical user interface, that allows the user to interact with the SMC100CC or SMC100PP controller that is connected to stages. The user can initiate moves, change the state of the controller, adjust parameters, etc.

1.3 Controller State Diagram

The SMC100 controller is defined by the following state diagram.



* No action, when jogging speed is different than zero, e.g. one of the keys "<", ">" or "<< >>" is pressed.

End of Runs encountered in the following state:

NOT REFERENCED:	No action.
CONFIGURATION:	No action.
HOMING:	Only check at end of HOMING and then change to NOT REFERENCED state.
MOVING:	Abort motion and then change to NOT REFERENCED state.
READY:	Change to NOT REFERENCED state.
DISABLE:	Change to NOT REFERENCED state.

Controller's LED display:

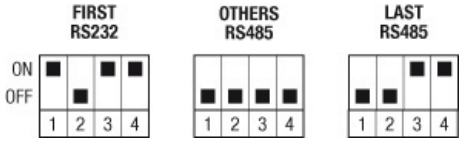
NOT REFERENCED:	If everything is OK then SOLID ORANGE.
NOT REFERENCED:	If hardware faults or wrong parameters then SOLID RED.
NOT REFERENCED:	If end of runs then SLOW BLINK ORANGE.
CONFIGURATION:	SLOW BLINK RED.
READY:	SOLID GREEN.
DISABLE:	SLOW BLINK GREEN.
HOMING:	FAST BLINK GREEN.
MOVING:	FAST BLINK GREEN.
JOGGING:	FAST BLINK GREEN.

1.4 Building the System

Up to **31 controllers** can be networked through the internal RS-485 communication link. The first SMC100 is connected to the RS232 connector (address #1) which is connected to the computer and the others are linked with the RS485 connectors (address #2 to address #31).

When the addresses of all controllers are set, you can build your system.

Pull out all cables from all controllers. Set the dip switches of the controller with the address number 1 as FIRST. Set the dip switches of the other controllers, except one, as OTHERS, and set the dip switches of one controller as LAST. When you have only two controllers, one has to be set as FIRST (the one with the address number 1), and the other one as LAST. See below graphic for illustration.

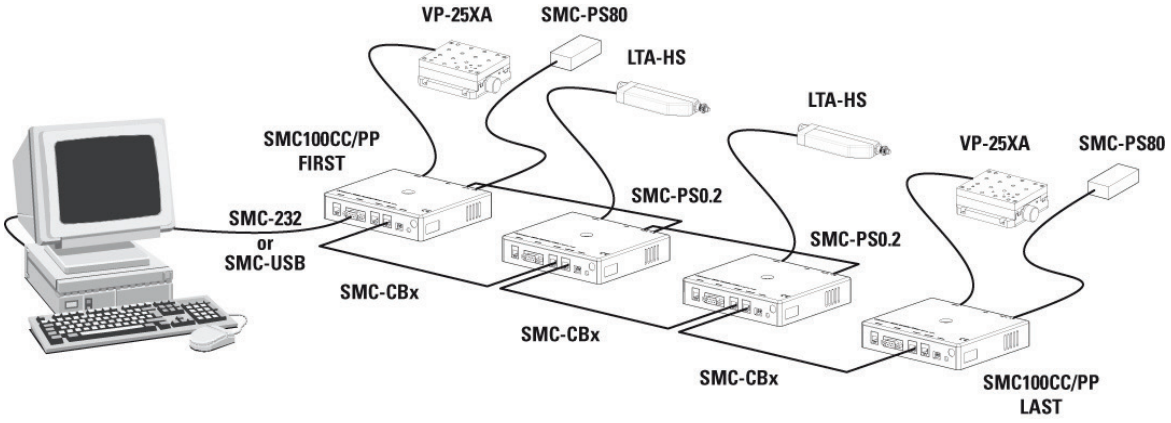


Connect the SMC100CC/PP configured as FIRST to the RS-232-C port or to the USB port of your PC. Connect a RS-485 network cable to the RS-485 OUT of the FIRST controller and to the RS-485 IN of the next controller. Proceed the same with all other controllers. When done, you can check your system:

- The controller configured as FIRST should have the RS-232-C cable connected to the computer. It has the **address #1**.
- All controllers configured as OTHERS should have one RS-485 network cable connected to the RS-485 IN and another one to the RS-485 OUT.
- The controller connected as LAST should have one RS-485 network cable connected to the RS-485 IN.

Connect your stages to the SMC100CC/PP's (MOTOR connector). Connect your SMC100CC/PP's to power.

The SMC100CC/PP allows chaining power from one SMC100CC/PP to another one using the SMC-PSC0.2 cable supplied with the controller. But the total power consumption of all stages connected to the same power supply should not exceed 80 W. The maximum power consumption of each Newport stage is listed in the Newport catalog and on the Newport web site. In case of questions, contact Newport. Once controllers have been networked the GUI can be used to switch between stages using the selected stage box.



2.0 Installation

2.1 Install SMC100 Graphical User Interface

Following are steps to install SMC100 GUI:

- For 32 bit, Select and launch “SMC100 Utility Installer Win32.exe”. For 64 bit, Select and launch “ SMC100 Utility Installer Win64.exe”.
- A window opens up showing Install welcome page.
- Click on “Next”.
- A window opens up allowing destination folder selection. By default it is showing C:\.
- Click on “Next”.
- Ready to install window opens up. Click “Install”.
- Then installation starts, wait for completion. Click on “Finish” to finalize the installation.

32 bit installer will be installed “Newport.SMC100.CommandInterface.dll” in GAC_32 folder and 64 bit installer will be installed the dll in GAC_64 folder.

NOTE

LabVIEW user can add reference of command interface dll from GAC during VI creation.

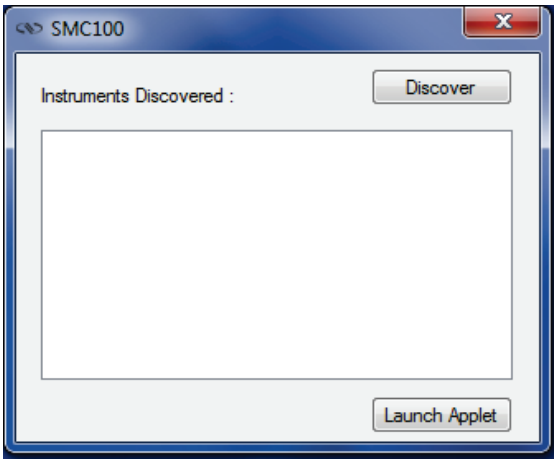
2.2 Launch GUI

From Windows “START” menu , select “All Programs\Newport\Motion Control\SMC100\SMC100 Utility”.

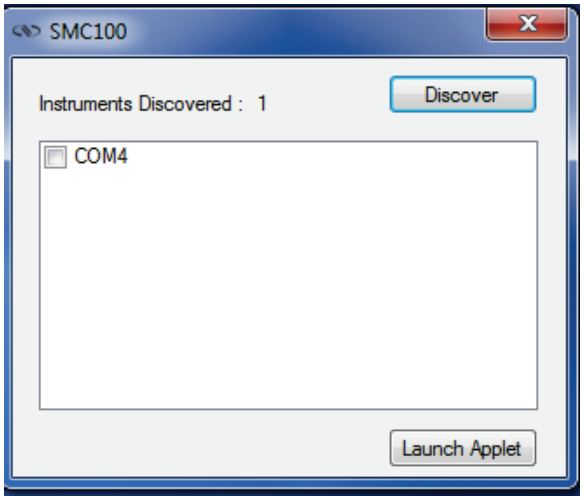
3.0 Getting Started

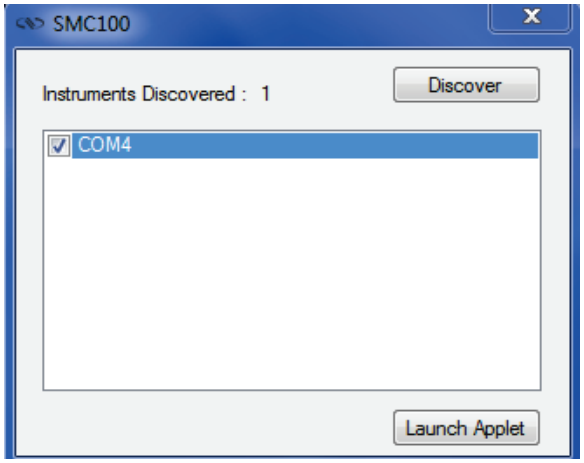
3.1 Discover Instruments

Start the Controller GUI from **Newport\MotionControl\SMC100**.



Next, click on "**Discover**" button and the number of instruments discovered will appear. This window allows the user to select a com port where the desired instrument is connected.





Next, click "**Launch Applet**" button.

4.0 User Interface

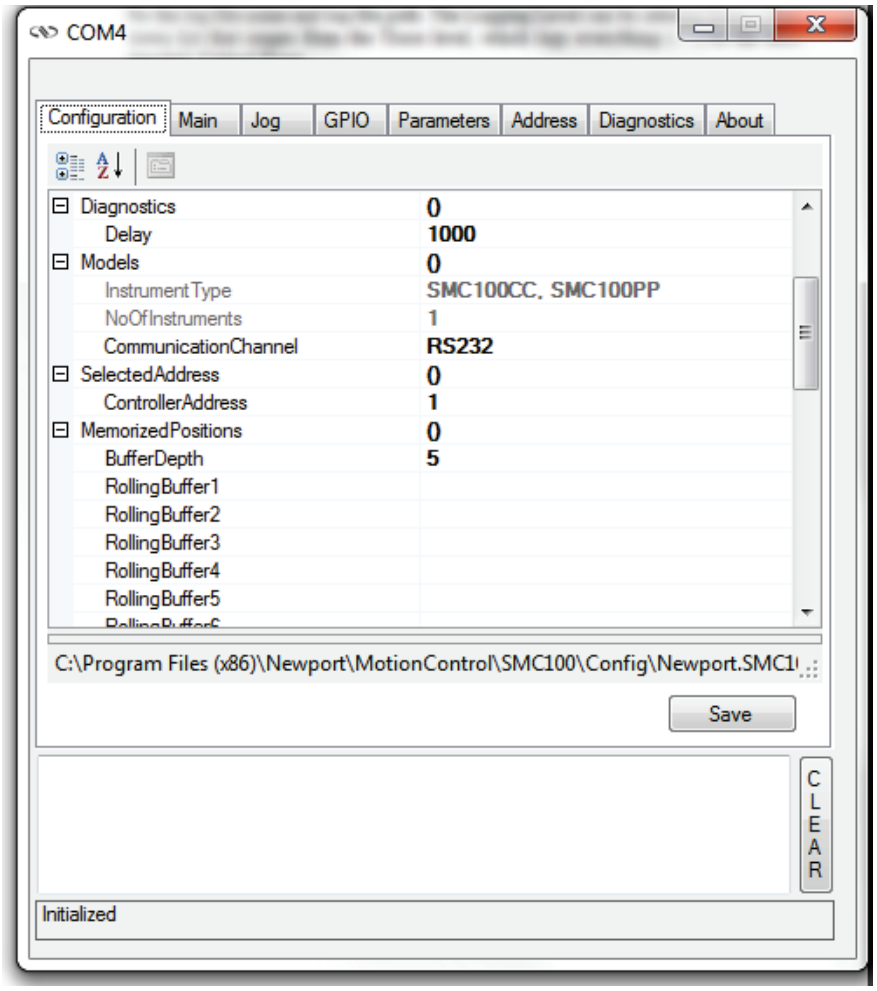
4.1 Configuration

The Configuration tab allows the user to view and/or change information related to the logging configuration and the instrument settings.

In LoggingConfiguration, read only values are displayed for the log file name and the log file path. The logging level may be changed to any of the settings in the drop-down list on the right hand side.

Trace is the most detailed option of the settings. When this setting is selected, the Controller GUI logs all the information.

Critical Error is the least detailed option of the settings. When this setting is selected, the Controller GUI will log errors that are defined to be critical only.



The polling interval defines the number of milliseconds between each time the Controller GUI polls the SMC100 for the latest information. The user may change the polling interval by entering a value. Diagnostics Delay defines the time delay in milliseconds between each command sent from a text file. InstrumentType and NoOfInstruments display the type of controller and number of the connected instrument.

The **Save** button allows to save the current settings to the configuration file.

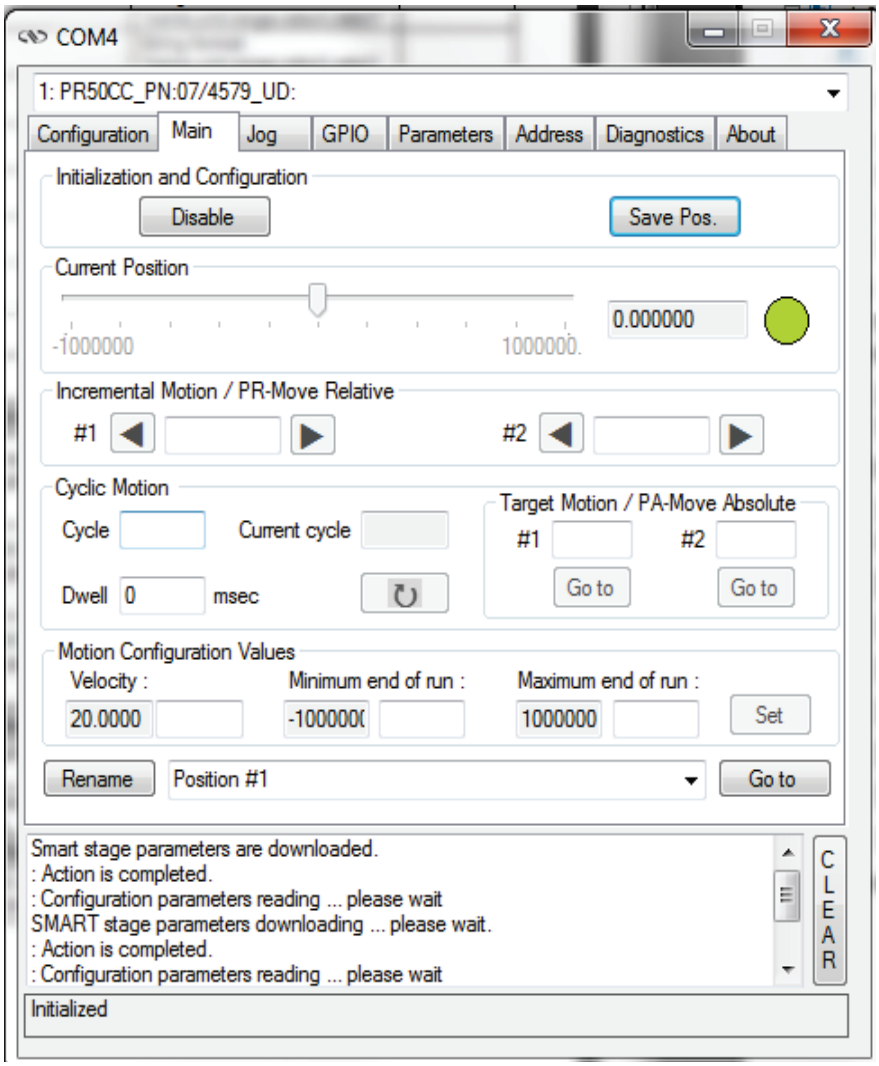
Selected stage

This box allows the user to switch between stages connected to networked S.

Parameter	Description	Values / Type	Default
LoggingConfiguration			
Level	Logging level. Trace is the most detailed of the settings and when this setting is selected the Controller GUI logs everything. Critical Error is the least detailed of the settings and when this setting is selected the Controller GUI will only log errors that are defined to be critical.	Trace Detail Equipment Message Info Warning Error Critical Error	**Trace**
InstrumentInformation			
PollingInterval	The polling interval defines the number of milliseconds (delay) between each time the Controller GUI polls the instrument for the latest information.	An Integer	**200**
NbDigits	Number of fractional digits after the decimal point.	An Integer	**6**
Models\InstrumentInfo			
CommunicationChannel	The communication channel	RS232	**RS232**
Diagnostics			
Delay	The delay defines the number of milliseconds between each sent command from a text file		**1000**
MemorizedPosition			
BufferDepth	MaxItem defines the maximum number of memorized positions in each rolling buffer.	An Integer	**5**
RollingBuffer	The list of the memorized position in the rolling buffer for a selected controller address	A String	
ControllerAddress	List of the selected controller address.	A String	

4.2 Main

The *Main* tab displays the main controls in the Controller GUI like a virtual front panel. It is updated each time the polling interval timer expires.



"Initialization and Configuration"

In the "Initialization and Configuration" area, the first button changes the controller status to "Enabled" or "Disabled". To see the different controller states, refer to the controller state diagram. The second button "Save Pos." memorizes the current positions in the combo box. As soon as a new position is memorized, this is displayed in the trace.

"Current Position"

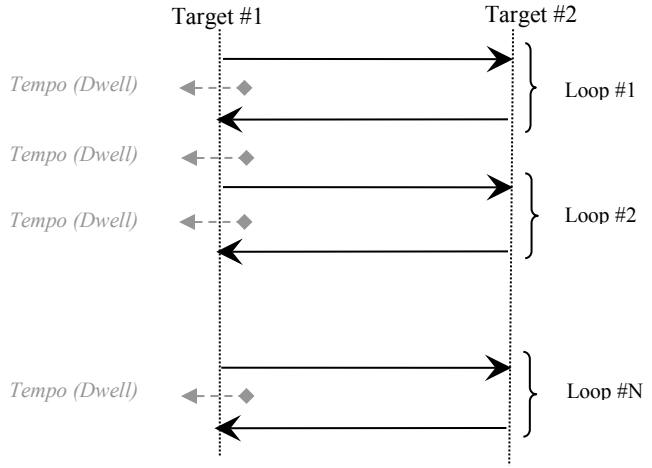
In the "Current Position" area, the current position is displayed in a text box and visualized in a slider. The slider limits are defined with the ends of run. An LED icon shows the current controller state. When the mouse hovers over the LED icon, the controller state is displayed in an information balloon.

"Incremental Motion / PR-Move Relative"

In the "Incremental Motion / PR-Move Relative" area, two increment values can be defined. For each defined increment, a relative move is preformed in either the negative direction or positive direction.

"Cyclic Motion" and "Target position / PA-Move Absolute"

In the "Cyclic Motion" area, a motion cycle is configured with a number of cycles (Cycle) and a dwell time in milliseconds. The motion cycle gets the defined target positions from the "Target position / PA-Move Absolute' area to perform the cycle.



In the "Target position / PA-Move Absolute" area, two target positions can be defined. The "Go to" button executes the absolute move to the specified target position.

"Motion Configuration Values"

In the "Motion Configuration Values", the current ends of run and the velocity are displayed in a disabled text box: "Minimum end of run", "Maximum end of run" and "Velocity". These ends of run and the velocity can be modified and saved with the "Set" button.

Memorized positions

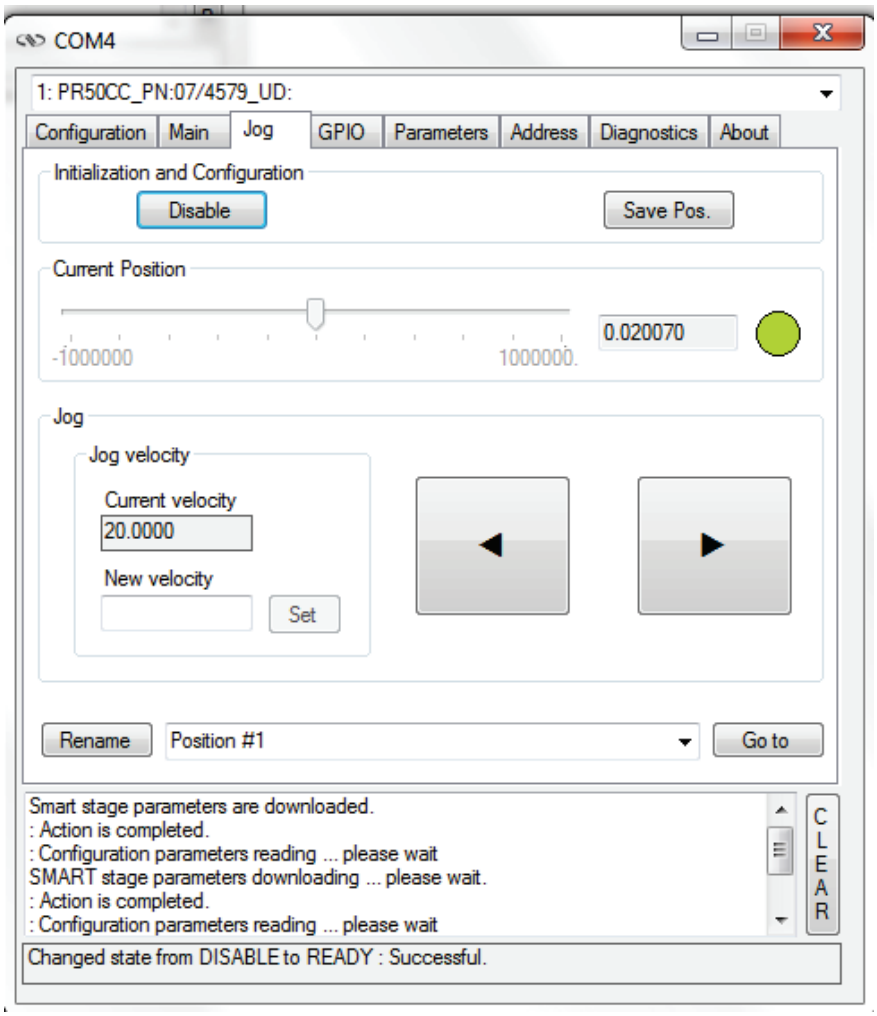
The combo box allows memorizing the positions by the "Save Pos." button. Each of these positions can be renamed or deleted. To execute an absolute move to one of these memorized positions, select one item of the combo box and click on the "Go to" button. When the mouse hovers over the combo box, the selected memorized position is shown in an information balloon.

Rename a memorized position: Select an item from the combo box, edit the position name and click on the "Rename" button to save the new position name.

Delete a memorized position: Select an item from the combo box, right-click on the mouse and select the "Delete" to delete the selected memorized position.

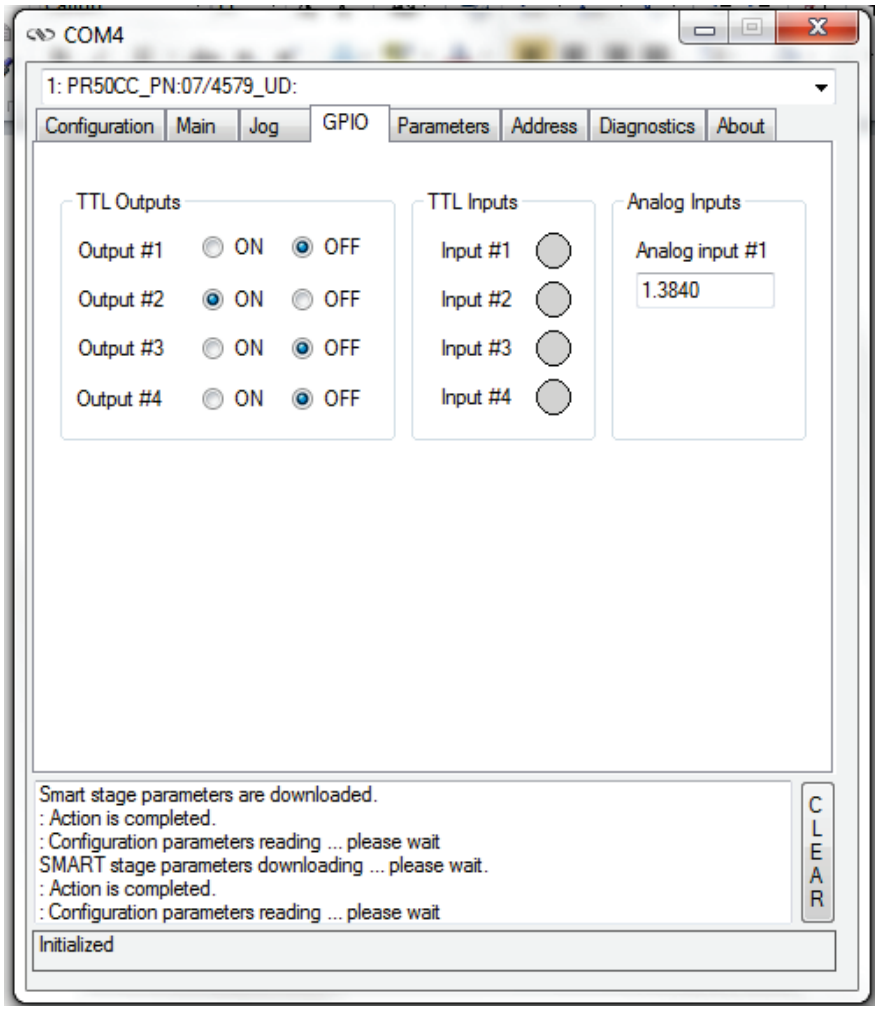
4.3 Jog

Under this tab, the controller allows the jog mode with use of two arrow buttons.



4.4 GPIO

The *GPIO* tab allows the user to modify digital outputs and to view digital and analog inputs.



Digital IO

TTL outputs

The four TTL outputs can be modified with a radio button (ON/OFF) and are updated each time the polling interval expires.

TTL inputs

The four TTL inputs are updated each time the polling interval expires.

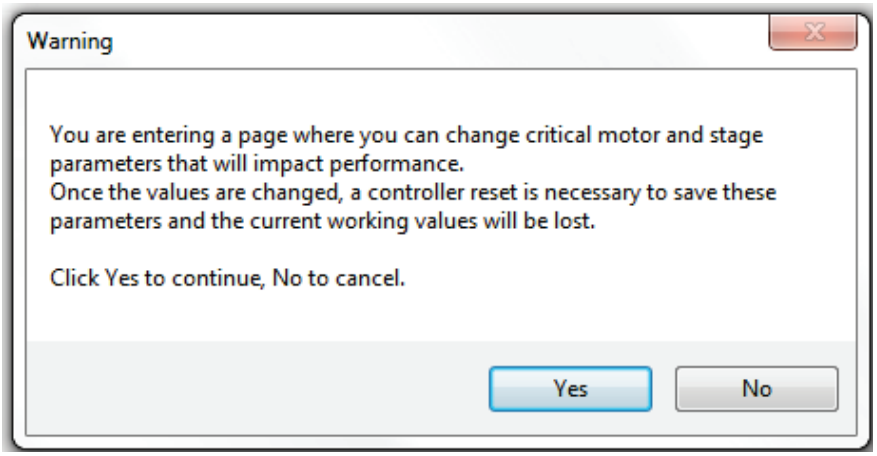
Analog Inputs

Analog input #1

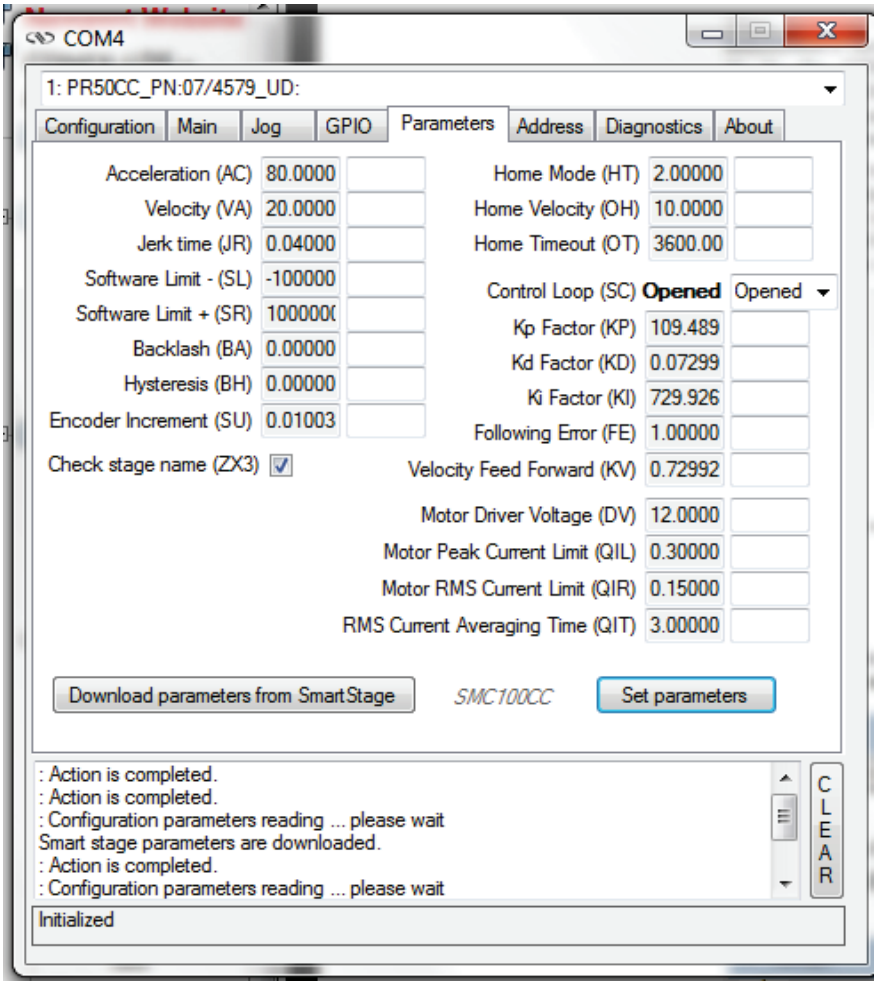
The analog input is updated each time the polling interval expires.

4.5 Parameters

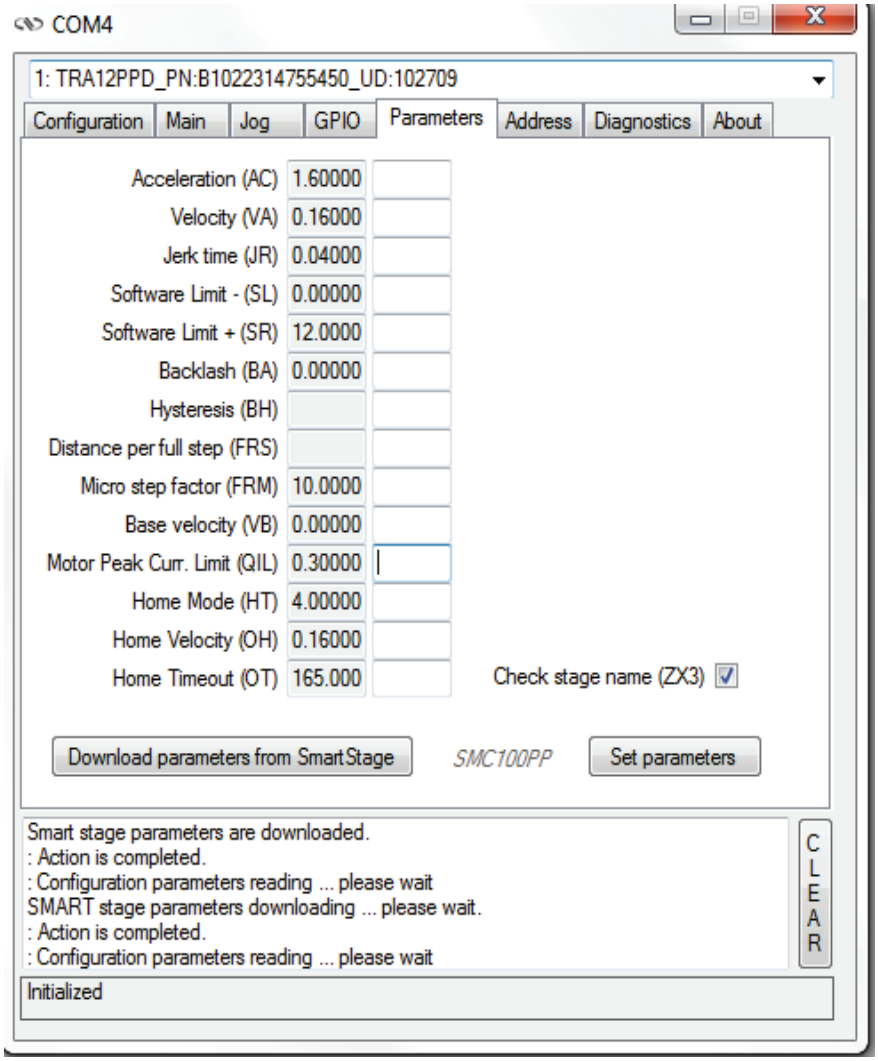
The *Parameters* tab allows the user to view or modify stage parameters for the selected controller. A warning message is displayed as below.



Parameters page for a CC stage

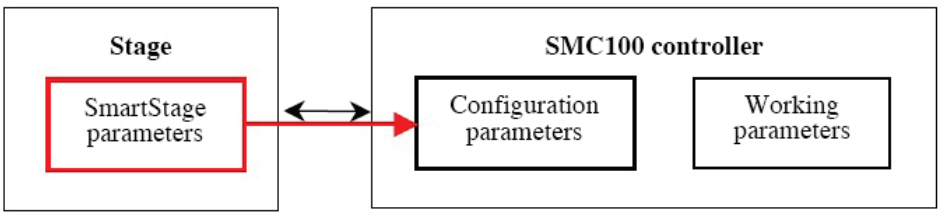


Parameters page for a PP stage



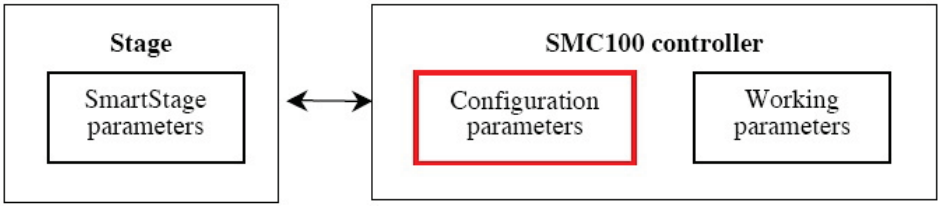
"Download parameters from SmartStage" button

The "Download parameters from SmartStage" button downloads parameters from the SmartStage and saves them in its flash memory (configuration parameters). After the parameters have been downloaded the configuration parameters are read and updated.



“Set parameters” button

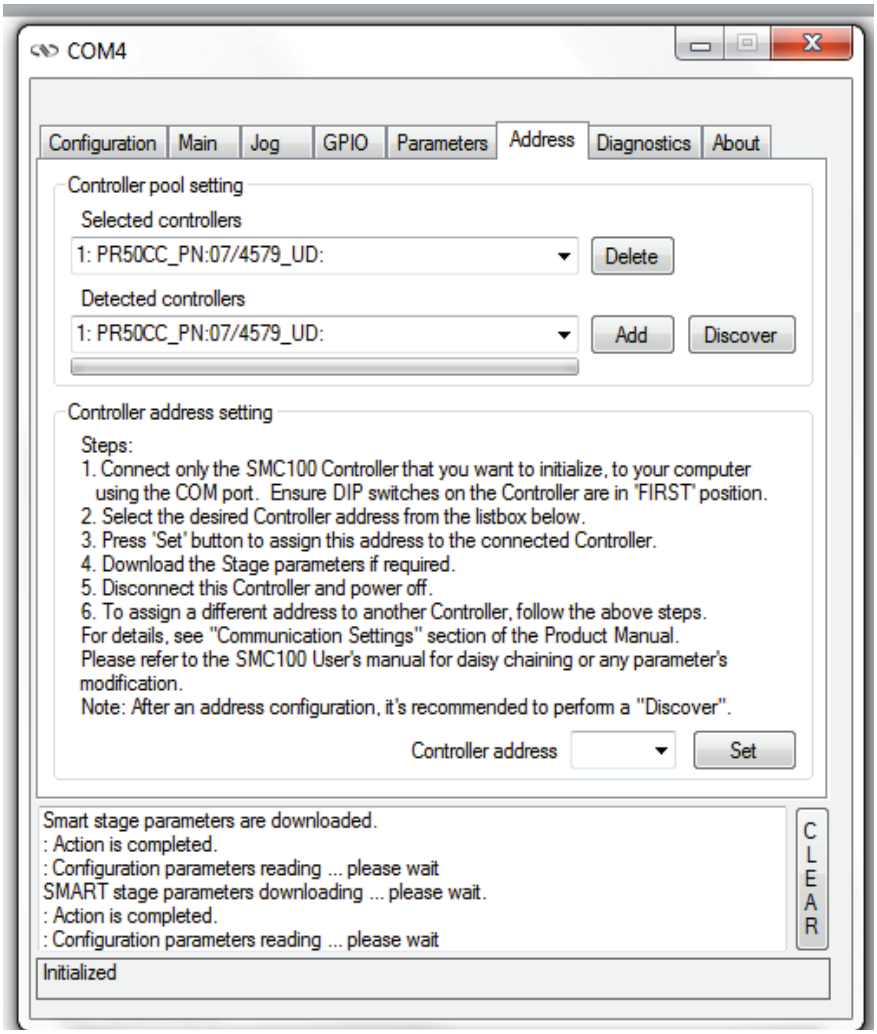
The “Set parameters” button modifies the configuration parameters.



4.6 Address

The *Address* tab allows two things:

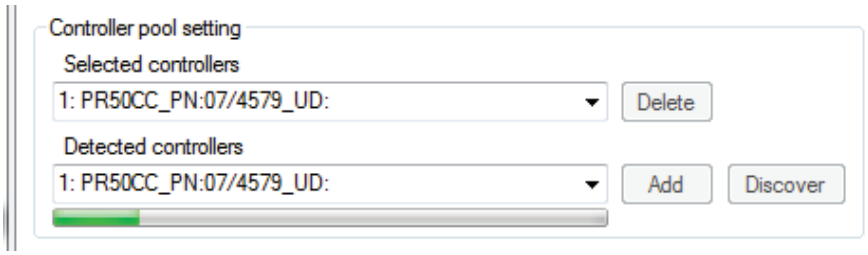
1) To scan and select connected SMC100 controllers.
2) To configure an RS485 address



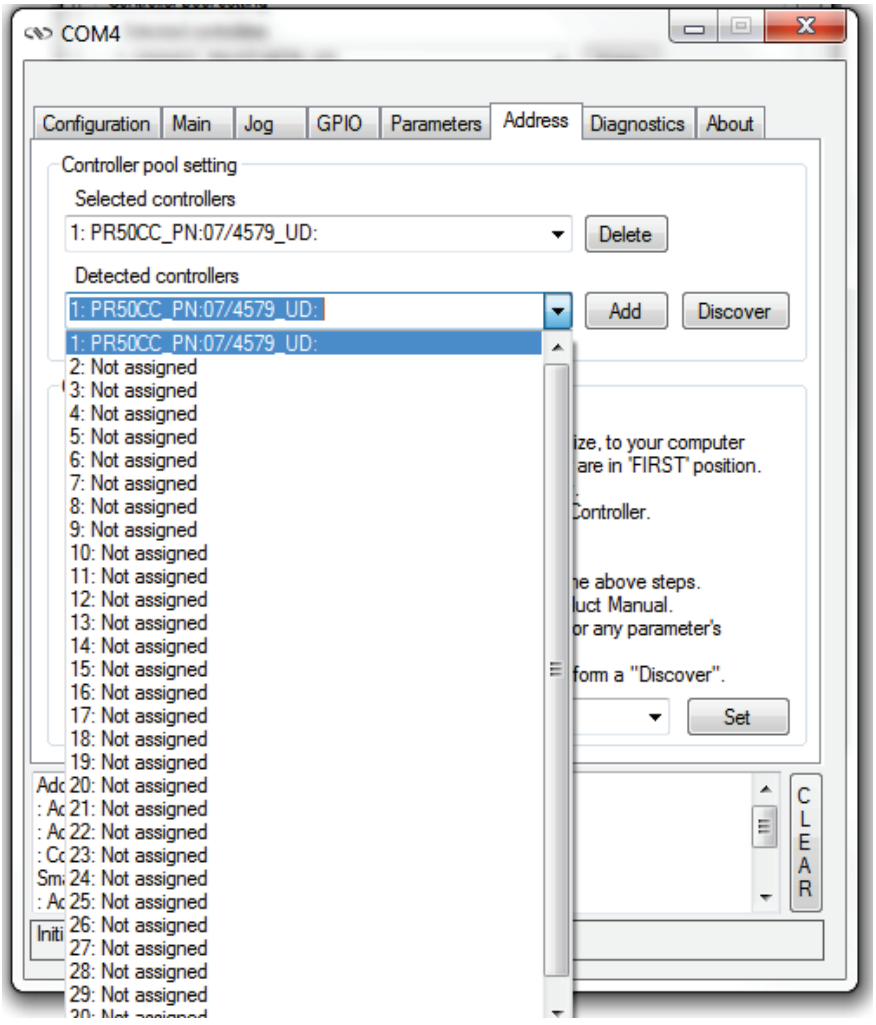
4.6.1 Controller pool setting

“Discover” button

The Discover button scans to find connected SMC100 controllers (address #1 to address #31).



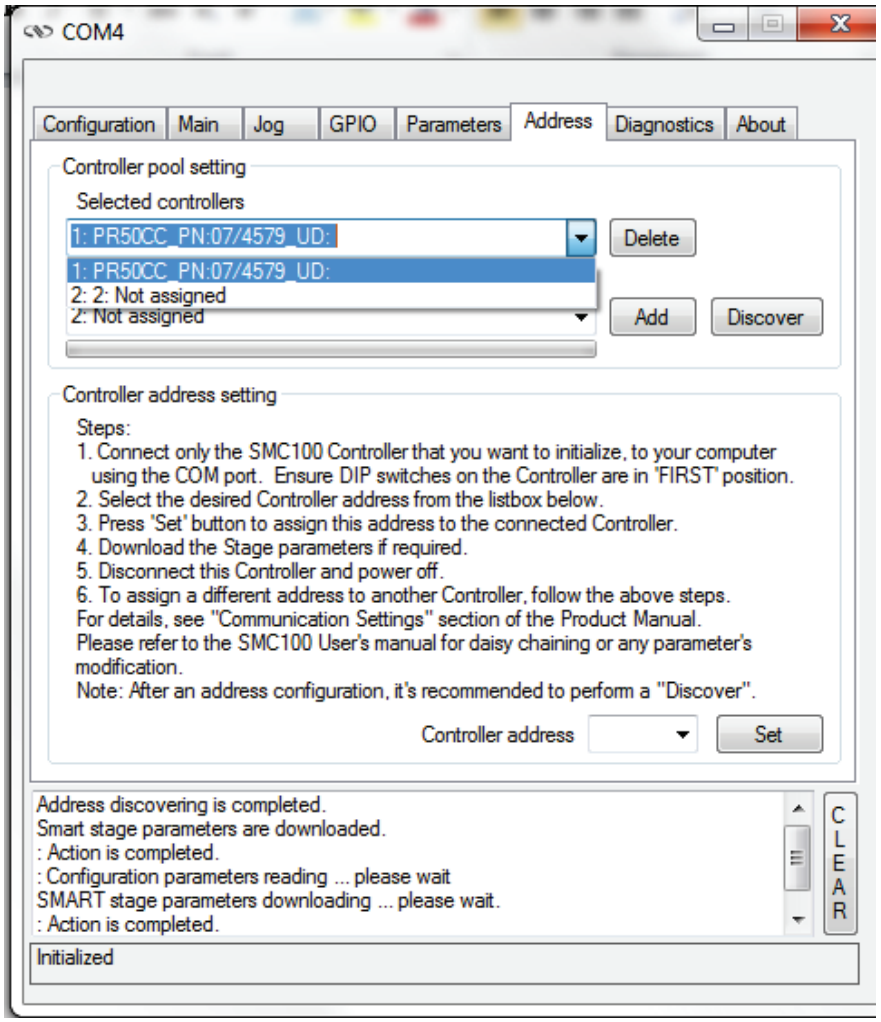
After a *Discover* action, the list of detected controllers is filled.



"Add" button

The *Add* button allows the user to add a connected SMC100 controller to the list of "Selected controllers".

After adding a detected controller, the list of selected controllers is updated.



"Delete" button

The *Delete* button deletes an SMC100 controller from the list of selected controllers.

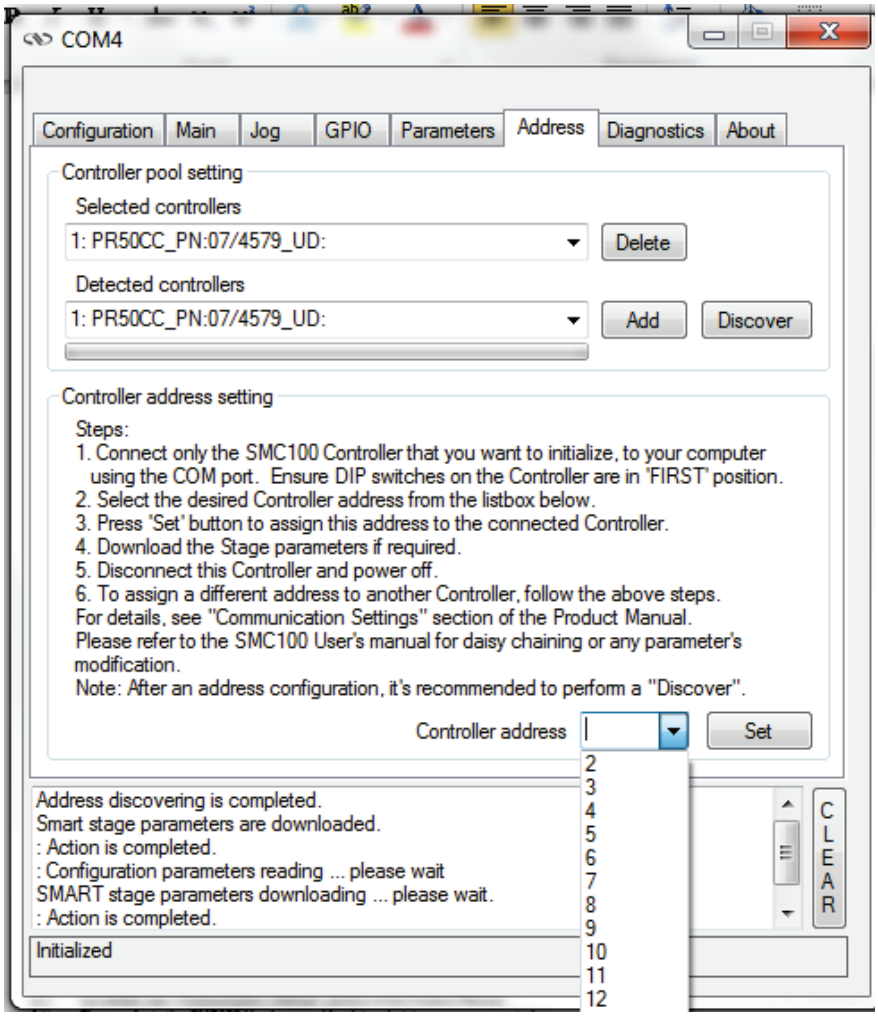
4.6.2 Controller address setting

This part allows the user to configure the RS485 address of the FIRST controller.

“Set” button

Select a controller address from the list and press the “Set” button. A progress bar is displayed during the address configuration.

It is recommended to note the address of the controller somewhere. For example, use the stickers supplied with the SMC100CC/PP.

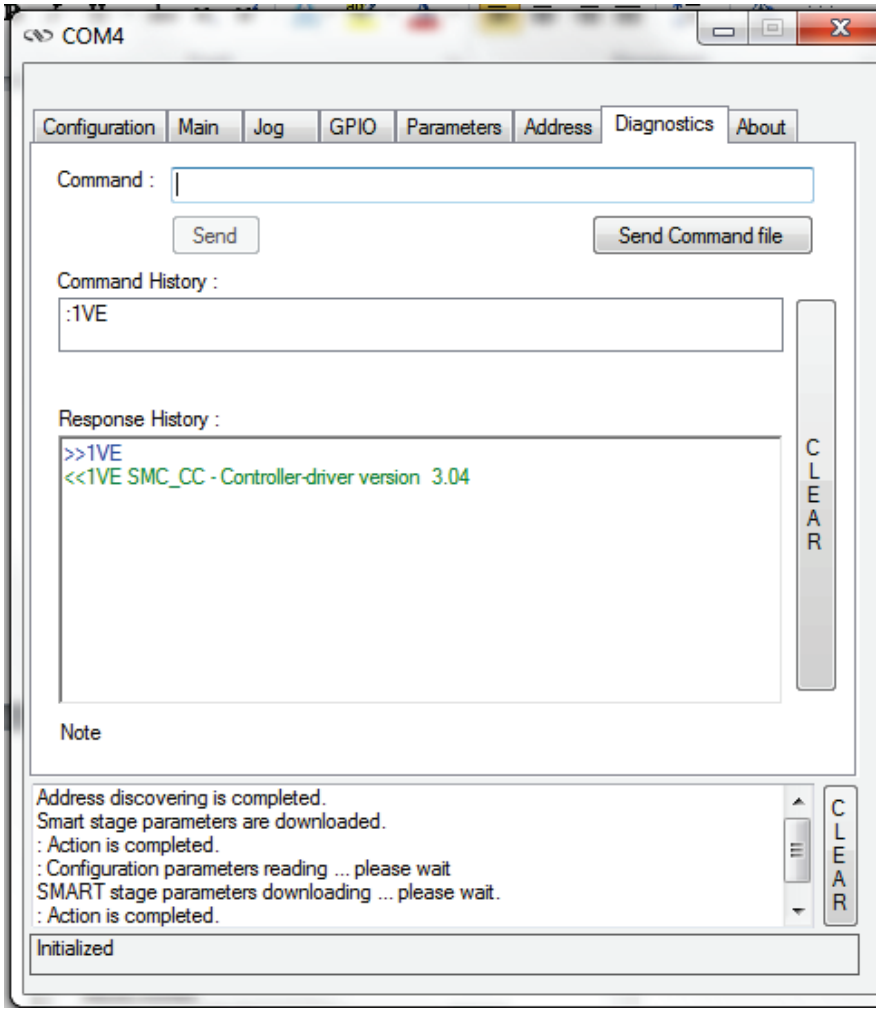


Now disconnect this controller from your PC and connect the next one instead. Select a new, not yet allocated address and press the “Set” button again (proceed the same with all other controllers).

4.7 Diagnostics

The Diagnostics tab allows the user to enter instrument commands and to view the history of commands that were sent and the responses that were received. This list of commands and the syntax of each command can be found in the Command Interface User Manual.

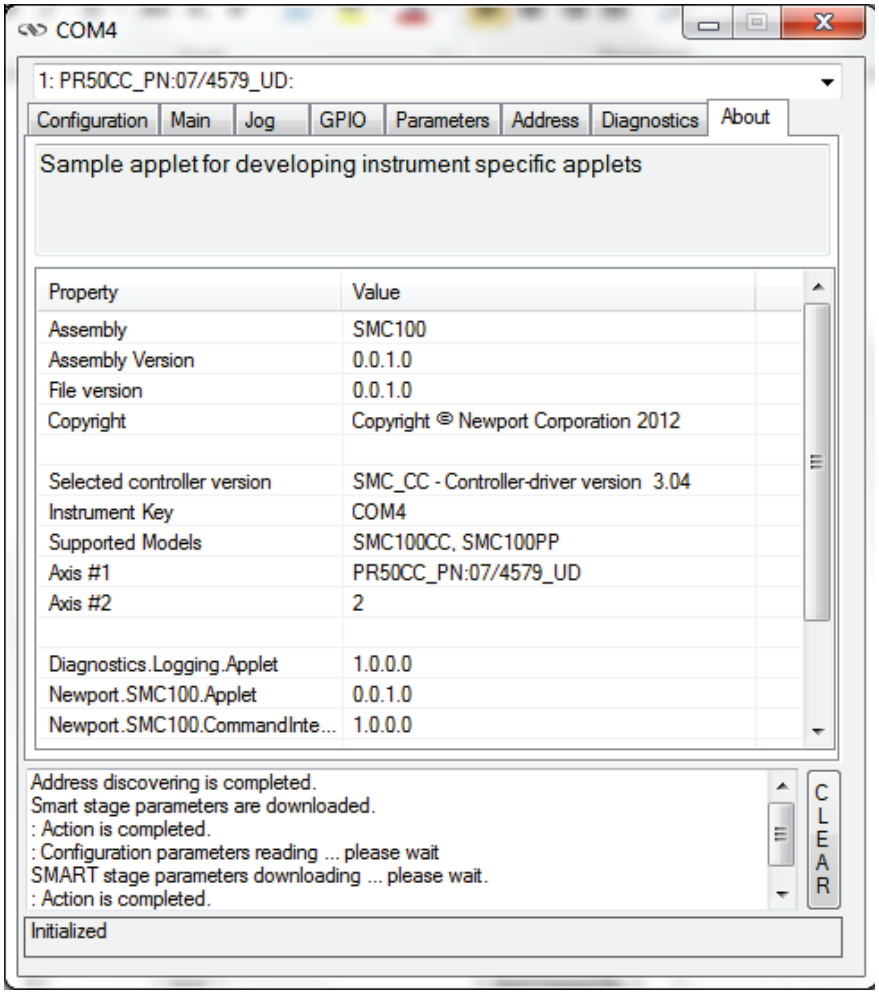
A file of commands can be sent line by line to the controller with the “Send Command file” button.



4.8 About

The About tab displays the information about the Controller GUI and the connected instruments. It displays the Controller GUI name, version, and copyright information.

It also displays the instrument model, the instrument key (serial number or COM port), the firmware version for the selected axis and the list of the selected axes.



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Service Form

Your Local Representative

Tel.: _____

Fax:_____

Name: _____

Company:_____

Address:_____

Country:_____

P.O. Number:_____

Item(s) Being Returned:_____

Model#: _____

Return authorization #: _____
(Please obtain prior to return of item)

Date: _____

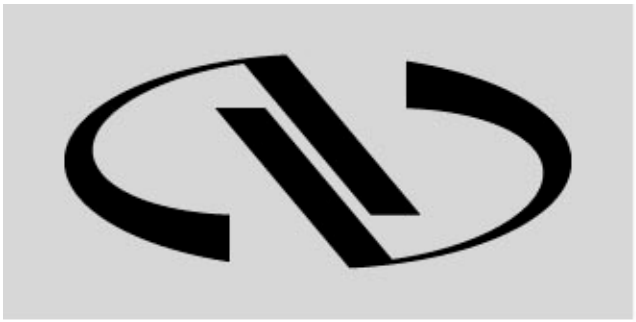
Phone Number: _____

Fax Number: _____

Serial #: _____

Description: _____

Reasons of return of goods (please list any specific problems): _____



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