FC Series

Intelligent Stepper Motor Stages

Newport®
Experience | Solutions

Controller GUI Manual

Version 1.0.x

For Motion, Think Newport™

Preface

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Intelligent Stepper Motor Stages

1.0 Introduction

1.1 Purpose

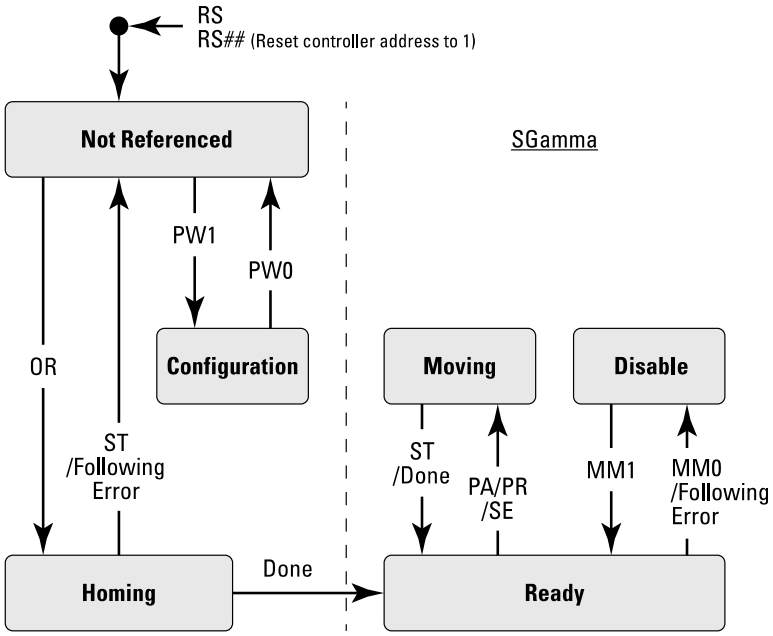
The purpose of this document is to provide instructions on how to use the FC Series Controller GUI.

1.2 Overview

The FC Series GUI is a graphical user interface (GUI) which allows the user to interact with the controller that is integrated with intelligent stepper motor stages. The user can initiate moves, change the state of the controller, adjust configuration parameters, etc. Communication with the FC series is achieved via an RS-422 serial link and a USB to RS422 adaptor. The provided GUI requires USB communication interface, based on Windows™ operating system. Advanced programming is simplified by an ASCII command interface and a set of two letter mnemonic commands.

1.3 Controller State Diagram

The FC series controller is defined by the following state diagram.



Actions in each state when End of Runs is encountered

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.

2.0 Getting Started

2.1 Overview and Setup

2.1.1 Components

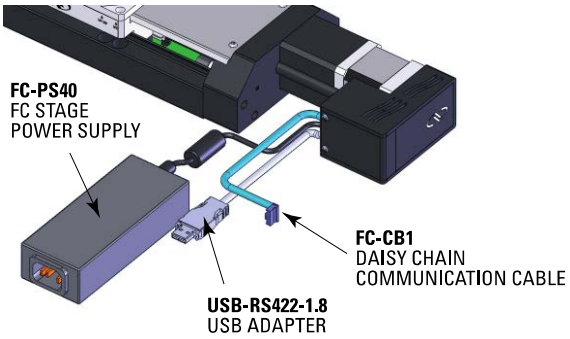
USB-RS422-1.8 USB Adaptor

FC-PS40 Power Supply

FC Series Intelligent Stepper Motor Stages

2.1.2 Electrical Installation

1. Connect the USB-RS422-1.8 adaptor cable to the FC series stage.
2. Connect the FC-PS40 power supply to the FC series stage.



3. Connect the USB cable to an available USB port of the PC

4. Connect the power cable to an electrical outlet.

2.2 First Connection

CAUTION

BEFORE ANY INSTALLATION, CONTACT YOUR I.T. ADMINISTRATOR TO VERIFY THAT YOU HAVE THE APPROPRIATE RIGHTS.

2.2.1 FC Series USB Driver Installation on Windows 7

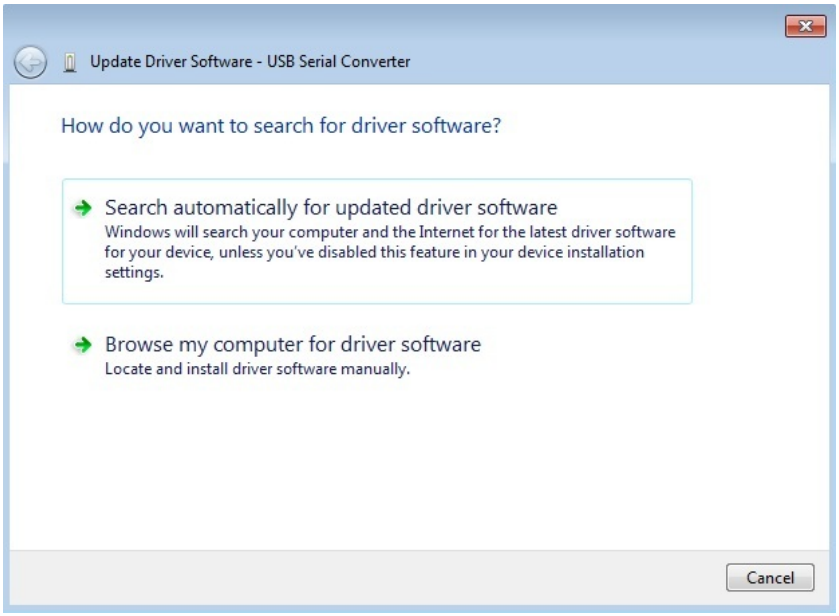
1. Connect the FC Series controller to a USB port with the provided USB cable.
2. Detection of this new connected device (the first time) is signaled by a message in the bottom-right of the screen.

3. For Windows 7 64 bit, the USB driver installation is completed when the message disappears.
4. For Windows 7 32 bits, right click on the new detected device and select “Update driver”.

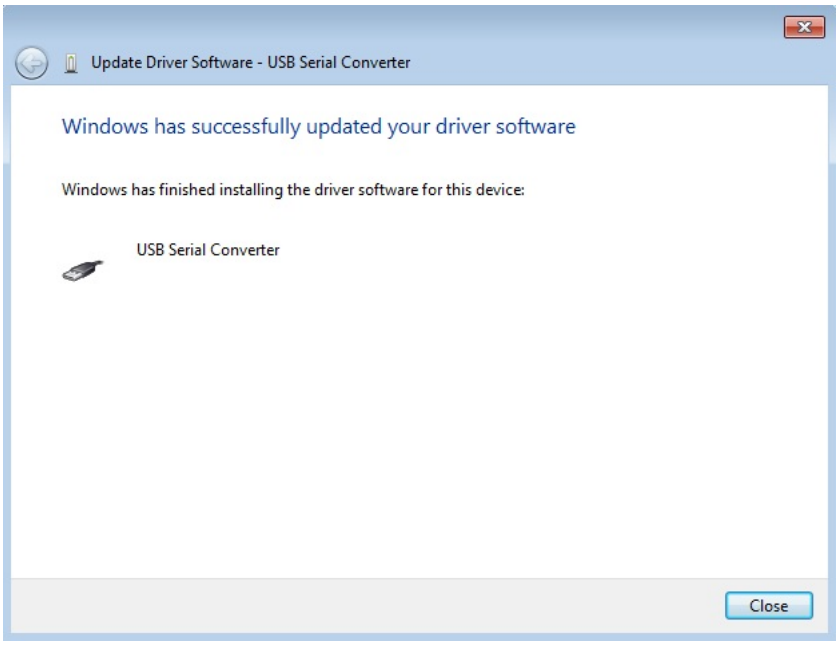
NOTE

Automatic driver installation requires internet connection.

Click “Search automatically for updated driver software”.

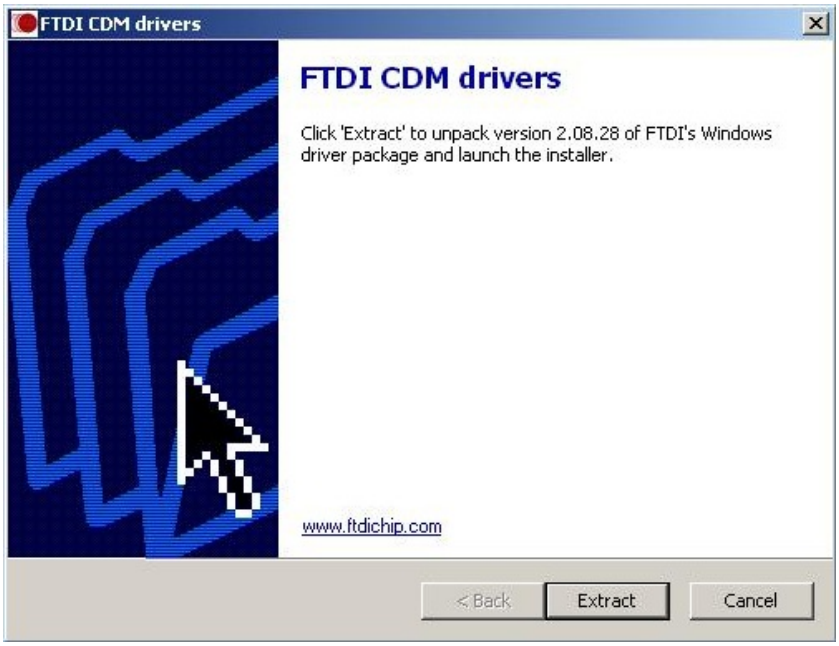


5. The following window will pop up after driver installation is completed.



2.2.2 FC Series USB Driver Installation on Window XP

1. Download FC_USB_RS422_driver from newport.com
2. Run the executable file included.



3. Select “Extract” and the following window will pop up.

The following page indicates that the drivers have been successfully installed.

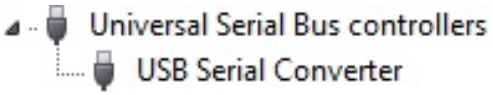
4. Once the drivers are installed connect the FC series stage to a USB port with the USB-RS422-1.8 cable.
5. Detection of this new connected device (the first time) is signaled by a message in the bottom -right of the screen.

Now, your FC series is installed and ready to use.

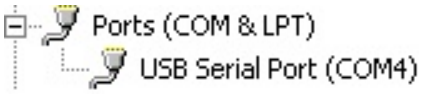
2.3 USB Driver Installation Verification

Open the “Device Manager” and select the “Device” tab to check your configuration. In the display menu, select “View devices by type”.

Expand “USB Bus controllers” line and check the new line USB Serial Converter:



Expand “Ports (COM and LPT)” line and check the new line USB Serial Port (COMx):

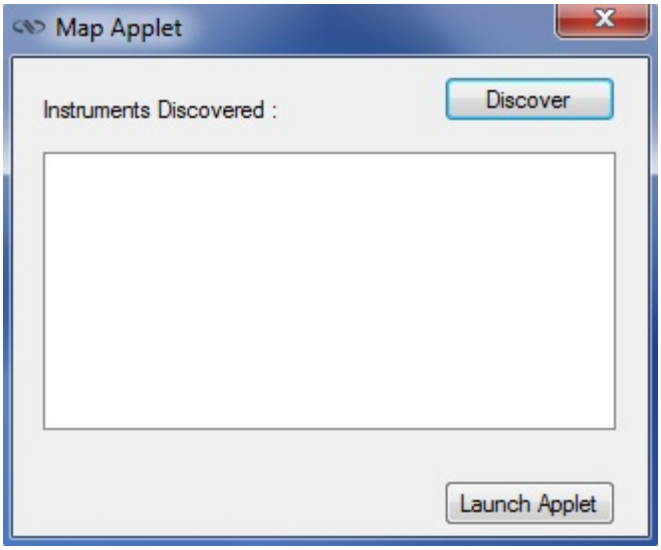


NOTES

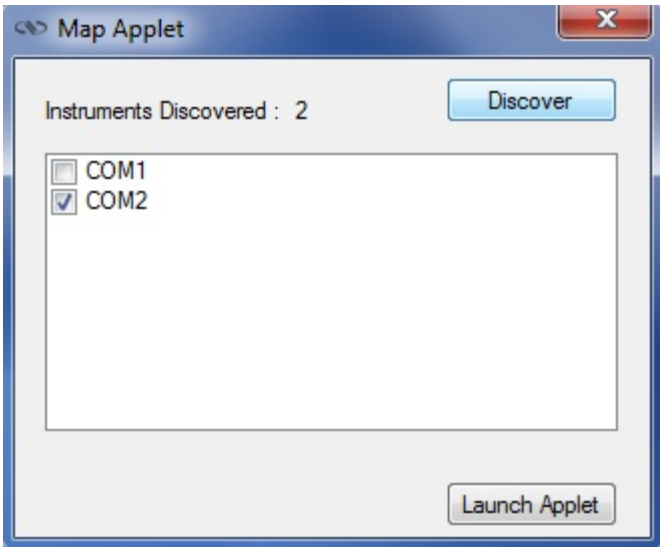
Note the COM port number (x) assigned to the device. This will be required for troubleshooting.

2.4 Discover Instruments

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



Next, click on “**Discover**” and the number of stages discovered will appear. This window allows the user to select a COM port where the desired stage is connected.



NOTE

When more than one FC stage is connected, multiple instances of this GUI can be open to control each individual stage. To discern a COM port for a specific instrument, note their COM number in the Device Manager when the connection is added.

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

3.0 User Interface

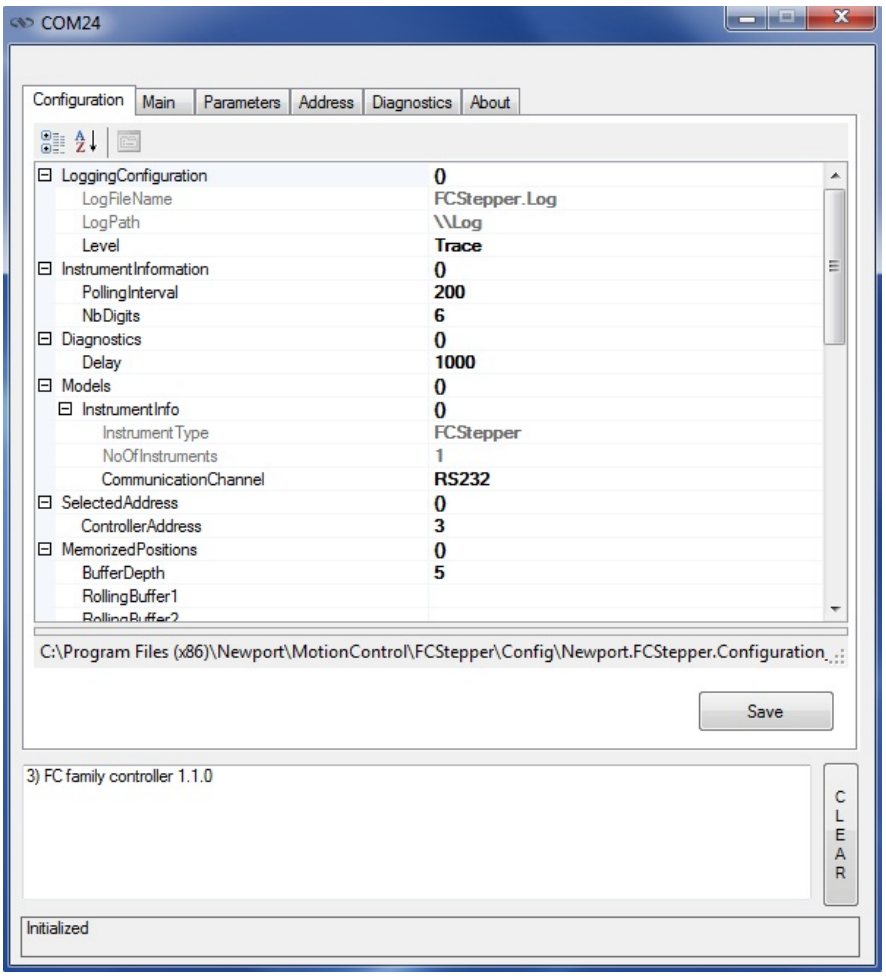
3.1 Configuration

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 of the settings. When this setting is selected, the Controller GUI logs all the information.

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



The polling interval defines the number of milliseconds between each time the Controller GUI polls the FC series 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 name and number of connected instruments.

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

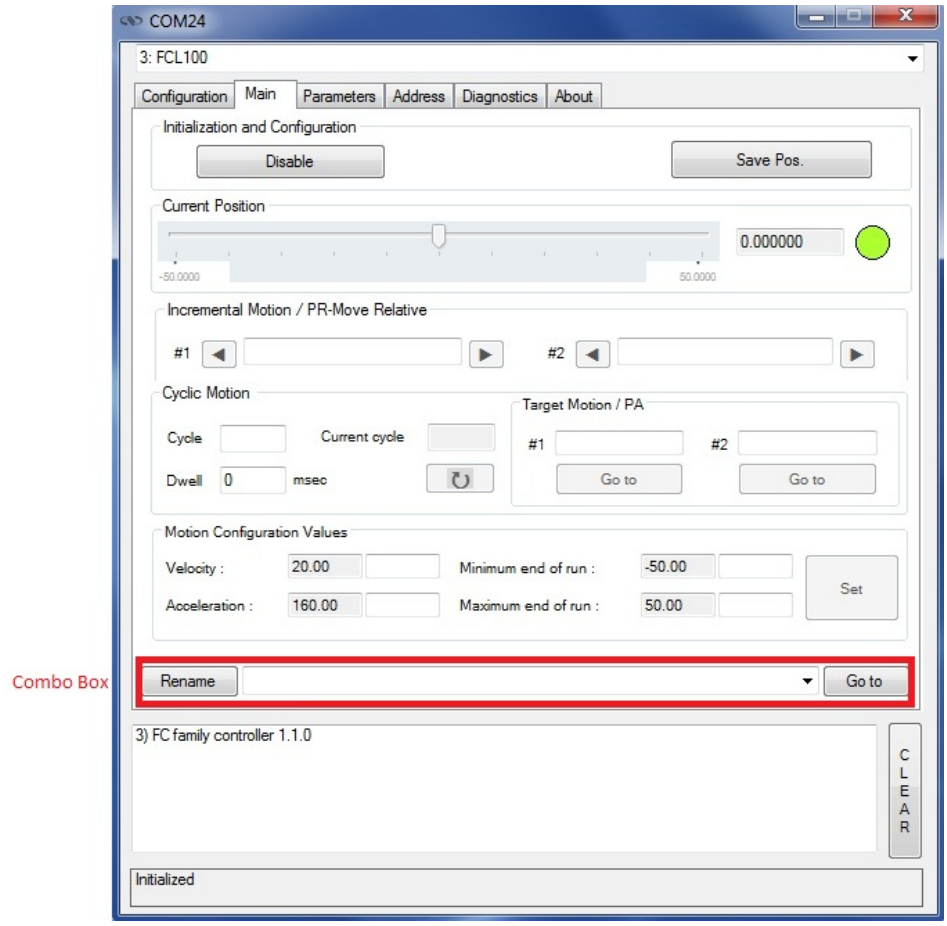
Configurable settings

The following table describes all the settings that can be changed by the user.

Parameter	Description	Values / Type	Default
LoggingConfiguration			
Level	Logging level. Trace is the most detailed of the settings and when this setting is selected the applet logs everything. Critical Error is the least detailed of the settings and when this setting is selected the applet 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 applet polls the instrument for the latest information.	An Integer	**200**
NbDigits	Number of fractional digits after the decimal point.	An Integer	**6**
Diagnostics			
Delay	The delay defines the number of milliseconds between each sent command from a text file.		
Models\InstrumentInfo			
CommunicationChannel	The communication channel	RS232	**RS232**
MemorizedPosition			
BufferDepth	BufferDepth defines the maximum number of analog I/O values displayed in the chart.	An Integer	**5**
RollingBuffer	The list of the memorized position in the rolling buffer for a selected controller address	A String	
SelectedAxis			
ControllerAddress	List of the selected controller address.	A String	

3.2 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 in section 1.3. The second button "Save Pos." memorizes the current position in the combo box. As soon as a new position is memorized, this is displayed in the trace.

"Current Position"

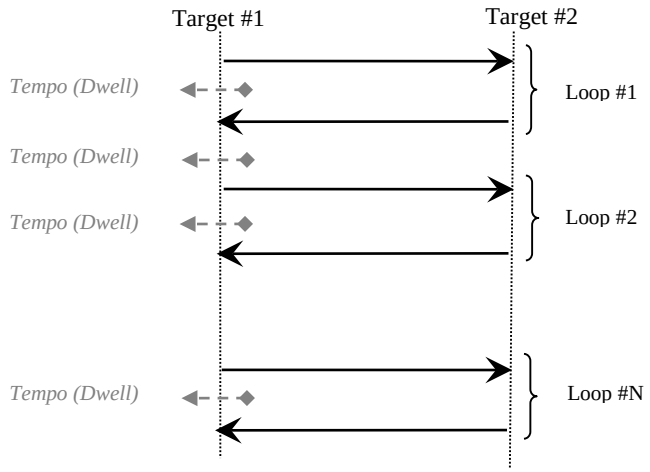
In the "Current Position" area, the current position is displayed in a text box and visualized in a slider. The slider limits are defined with the ends of run. An LED icon shows the current controller state. When the mouse hovers over the icon, the controller state is displayed in an information balloon.

"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 performed in either the negative or positive direction.

"Cyclic Motion" and "Target position / PA"

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 Motion / PA" area to perform the cycle.



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

"Motion Configuration Values"

In the "Motion Configuration Values", the current ends of run, velocity, and acceleration are displayed in this area: "Minimum end of run", "Maximum end of run", "Acceleration", and "Velocity" can be modified and saved with the "Set" button.

Memorized positions

The combo box memorizes the positions set 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 moves over to the combo box, the position is shown in an information balloon.

Rename a memorized position: Select an item from the combo box, edit the position name to change it 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" menu to delete the selected memorized position.

NOTE

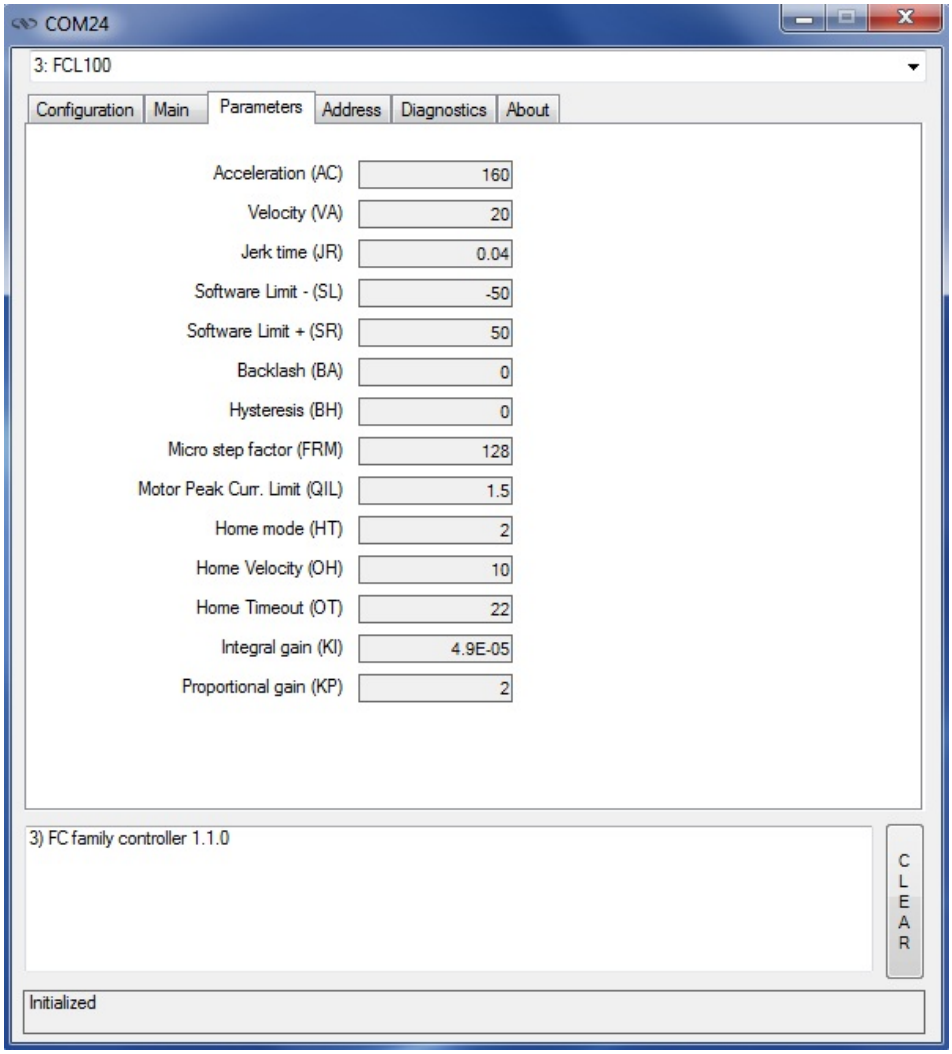
The FC series controller supports native units of millimeter (FCL) or degrees (FCR). All the parameters such as position, velocity and acceleration are defined on the same scale. These units are not shown in the GUI.

- **Position (Units)**
- **Velocity (Units/s)**
- **Acceleration (Units/s^2)**

3.3 Parameters

The *Parameters* tab displays the stage parameters for the selected controller.

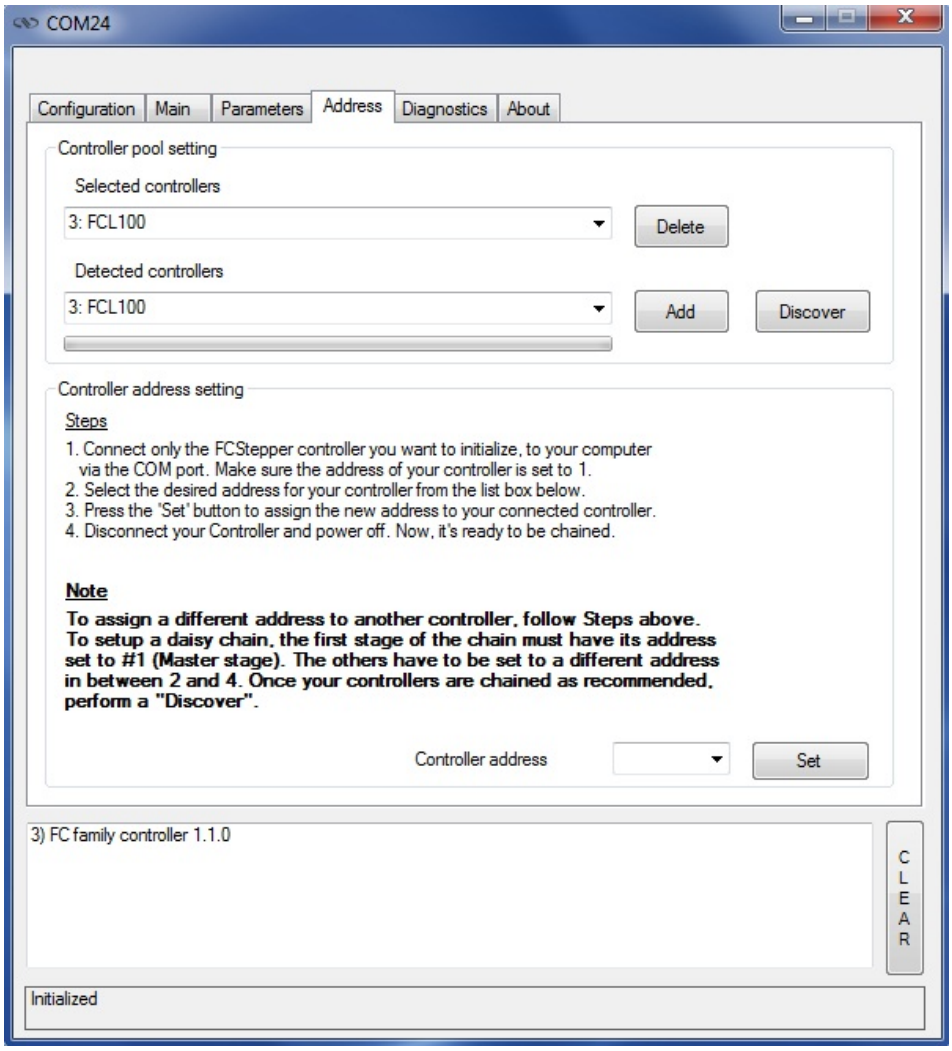
Note modification of parameters is disabled in the Parameters tab. User configuration parameter such as velocity, acceleration and End of Runs can be changed in the main tab. Other configuration parameters can be modified in the diganostics tab by using the commands. Refer to user's manual for details of the commands.



3.4 Address

The *Address* tab allows the followings:

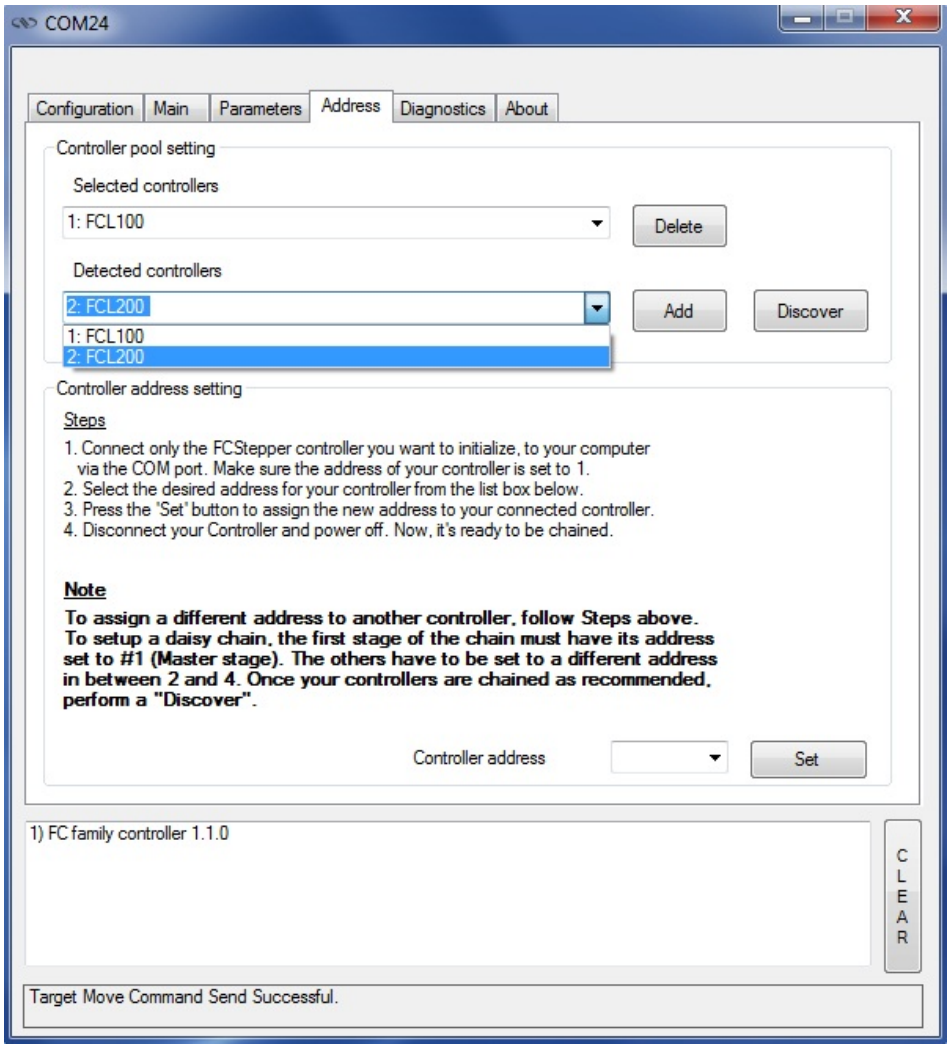
1) To scan and select connected FC series controllers.
2) To configure the controller address



3.4.1 Controller pool setting

“Discover” button
The Discover button scans to detect connected FC controllers (address #1 to address #4).

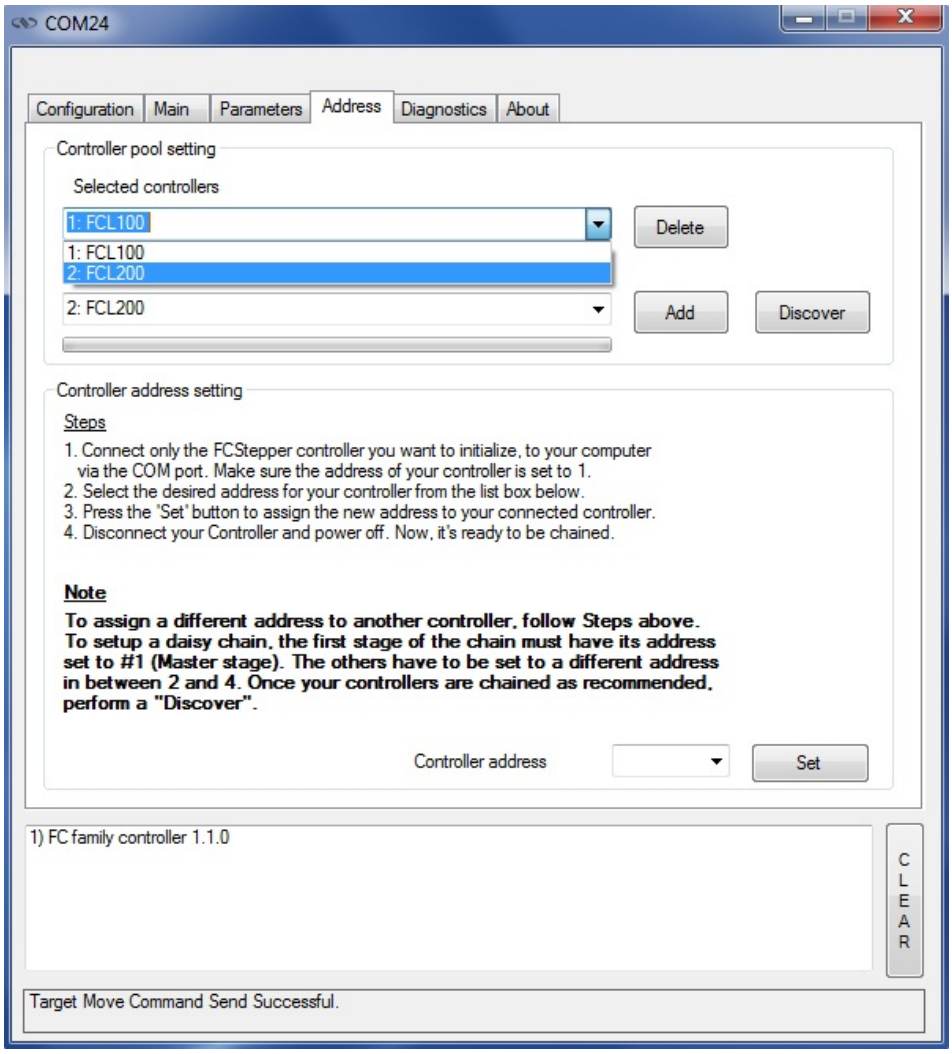
After a *Discover* action, the list of detected controllers is filled. Stage model number is shown next to the address #1 through #4. This address helps to identify each controller connected.



"Add" button

The *Add* button allows the user to add a connected FC controller to the list of selected controllers.

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



"Delete" button

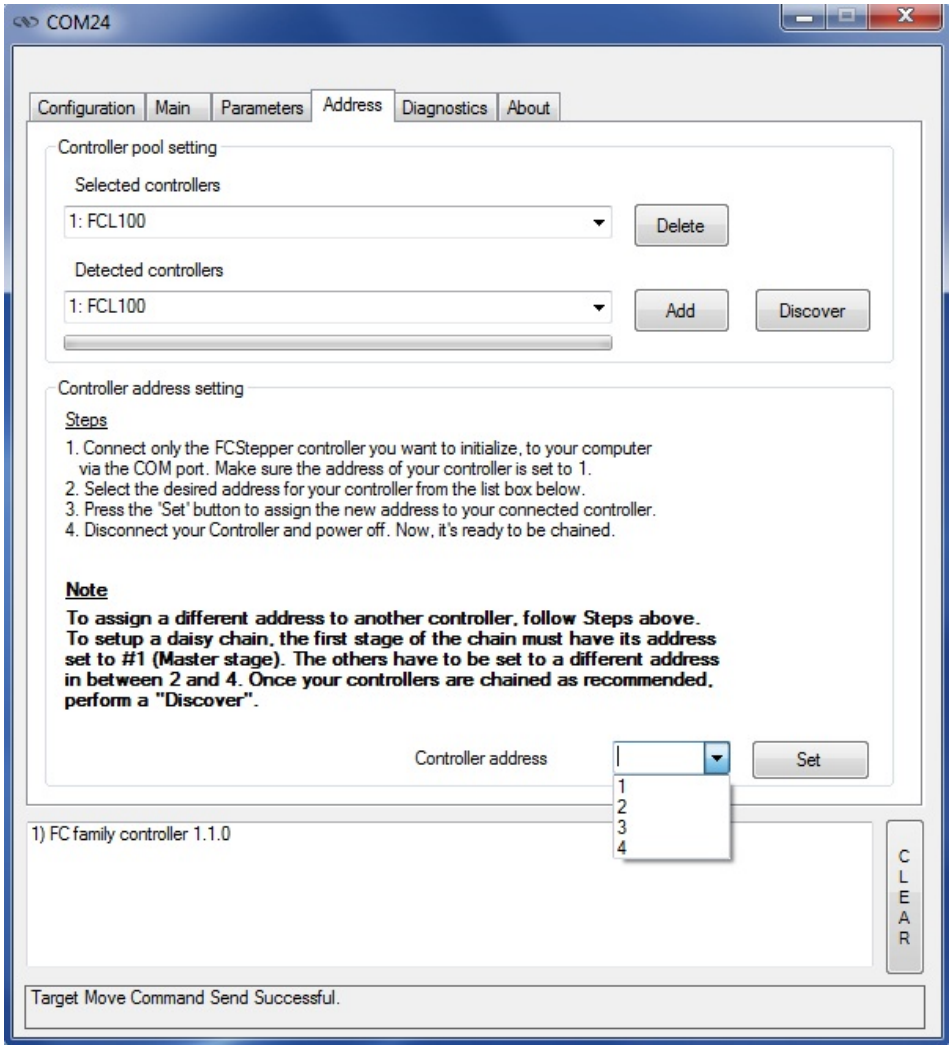
The *Delete* button removes the selected FC controller from the list of selected controllers.

3.4.2 Controller address setting

This part allows the user to configure the address of the FC controller.

"Set" button

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



Now disconnect this controller from your PC and connect the next one. Select a new, unallocated address and press the "Set" button again (proceed the same way with all other controllers).

3.4.3 Daisy-chaining

Up to **4 FC series controllers** can be networked through the internal RS232 communications link. Before daisy-chaining, the controller address of each stage must be set separately. The FC controller that will be connected to the PC must have its controller address set to 1 and all subsequent stages must have a different controller address set between 2 and 4.

Once the controller address of each stage is set, **unplug all the power cables** and **disconnect the USB cable** from all the stages except for the FC controller that has its address set to 1. Use the daisy chain cables to connect each controller. It does not matter whether you use the upper or lower RS422 connector to daisy chain the stages.

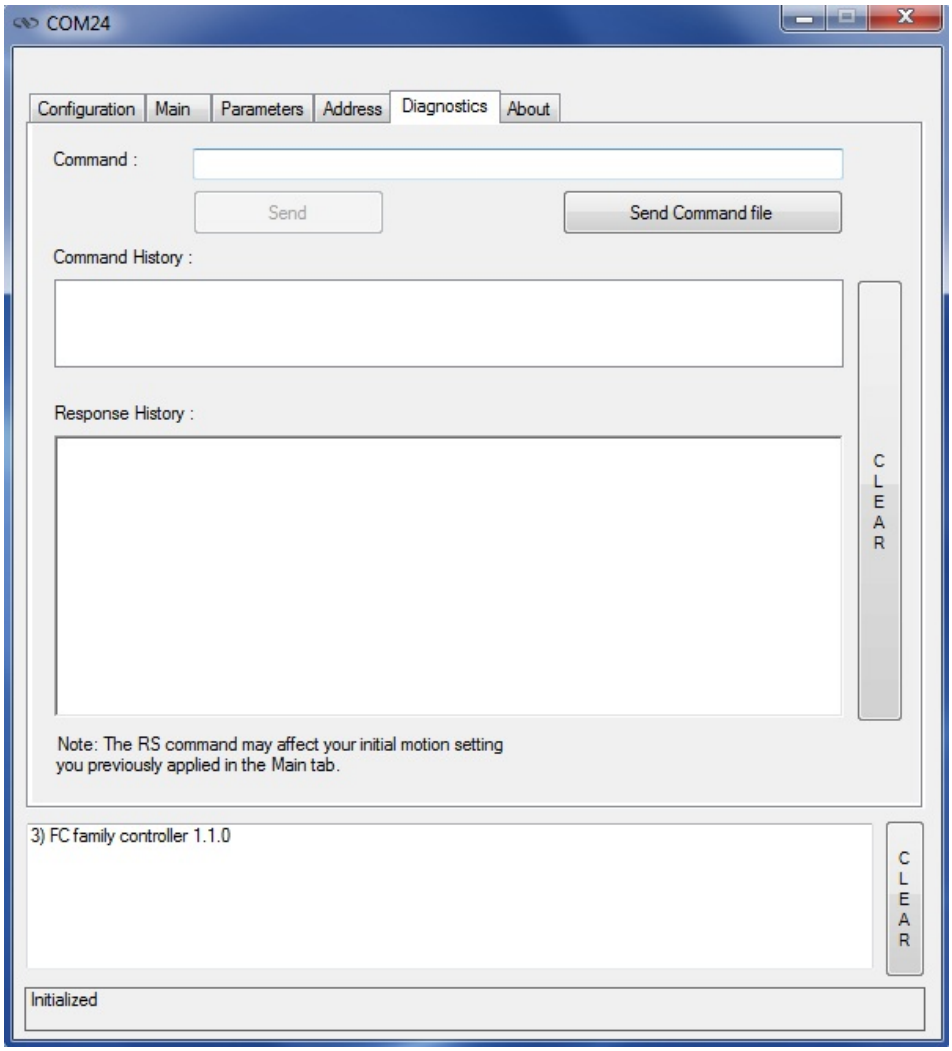
- Only the FC controller with address 1 should be connected to the PC
- All other FC controllers must be daisy-chained.

Plug in all the power supplies and open the GUI. Under the Address tab select the Discover button to scan for connected FC's. Once the scan is complete, discovered controllers will be added in "Detected controllers" list. Use the "Add" button to add controllers to the "Selected controllers" list.

3.5 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 user's manual.

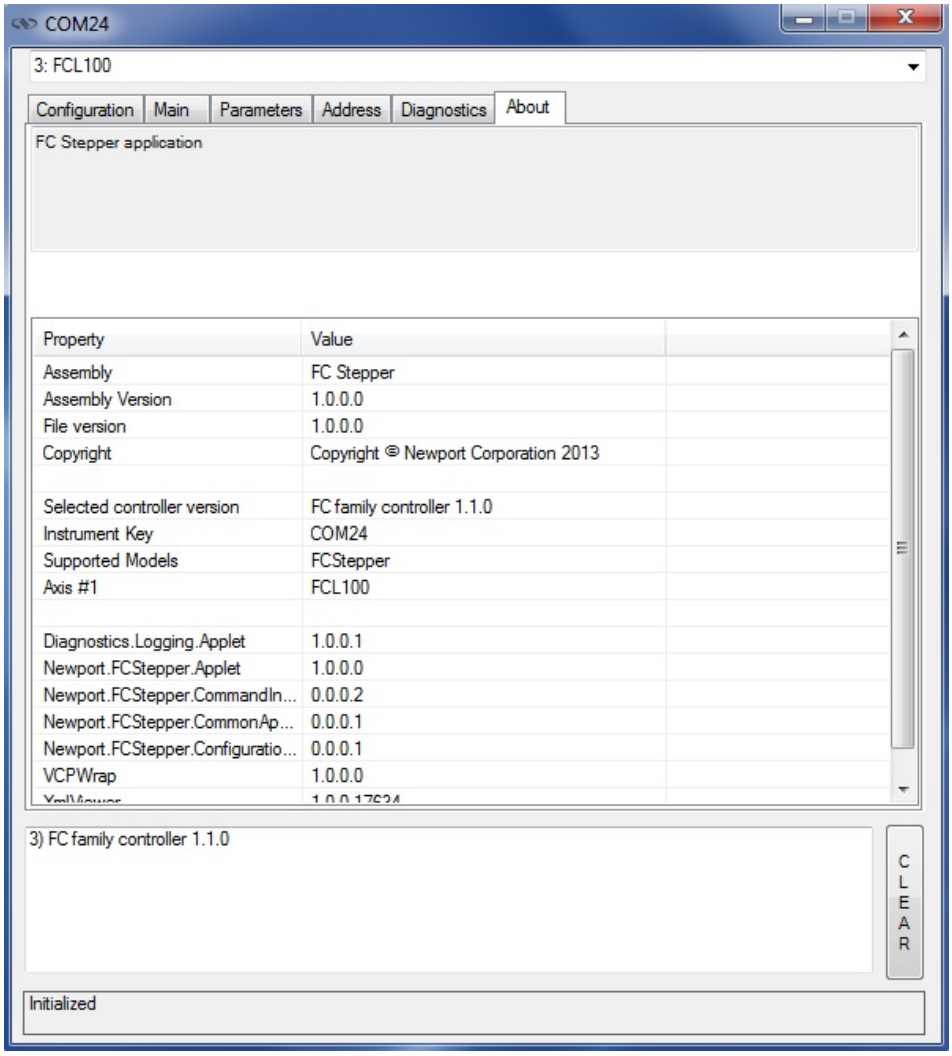
A file of commands can be sent line by line to the controller with the "Send Command file" button.



3.6 About

The About tab displays the information about the GUI and the connected instrument. 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 and the list of the selected axes.



Service Form

Your Local Representative

Tel.: _____

Fax:_____

Name: _____ Return authorization #: _____

(Please obtain prior to return of item)

Company:_____

Address:_____ Date: _____

Country:_____ Phone Number: _____

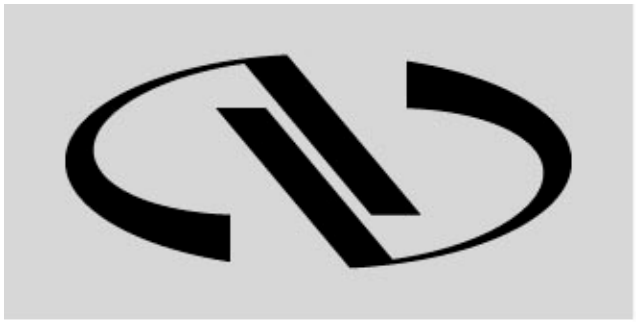
P.O. Number:_____ Fax Number: _____

Item(s) Being Returned:_____

Model#: _____ Serial #: _____

Description: _____

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



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