STM Series Controller Software Manual

This manual covers the STM-200 and STM-300.

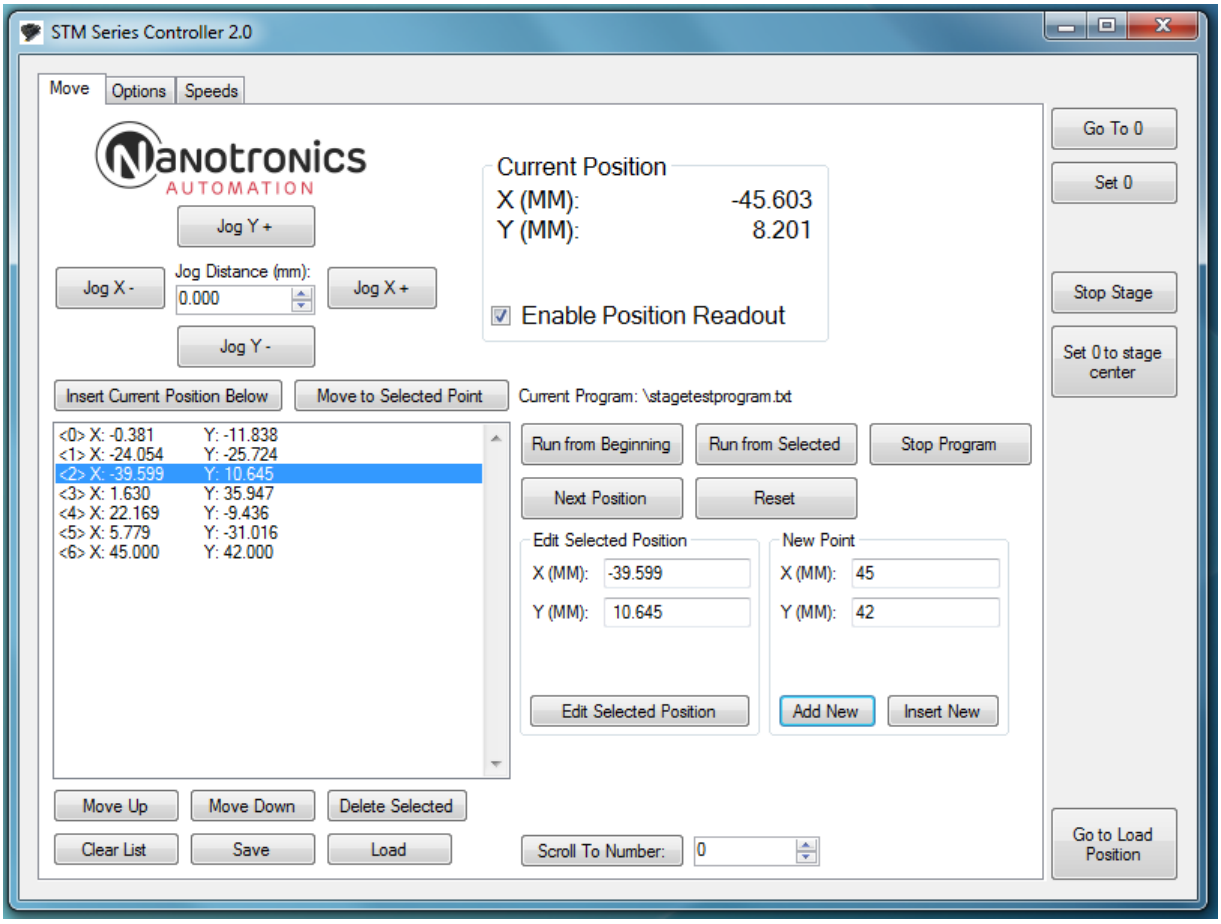


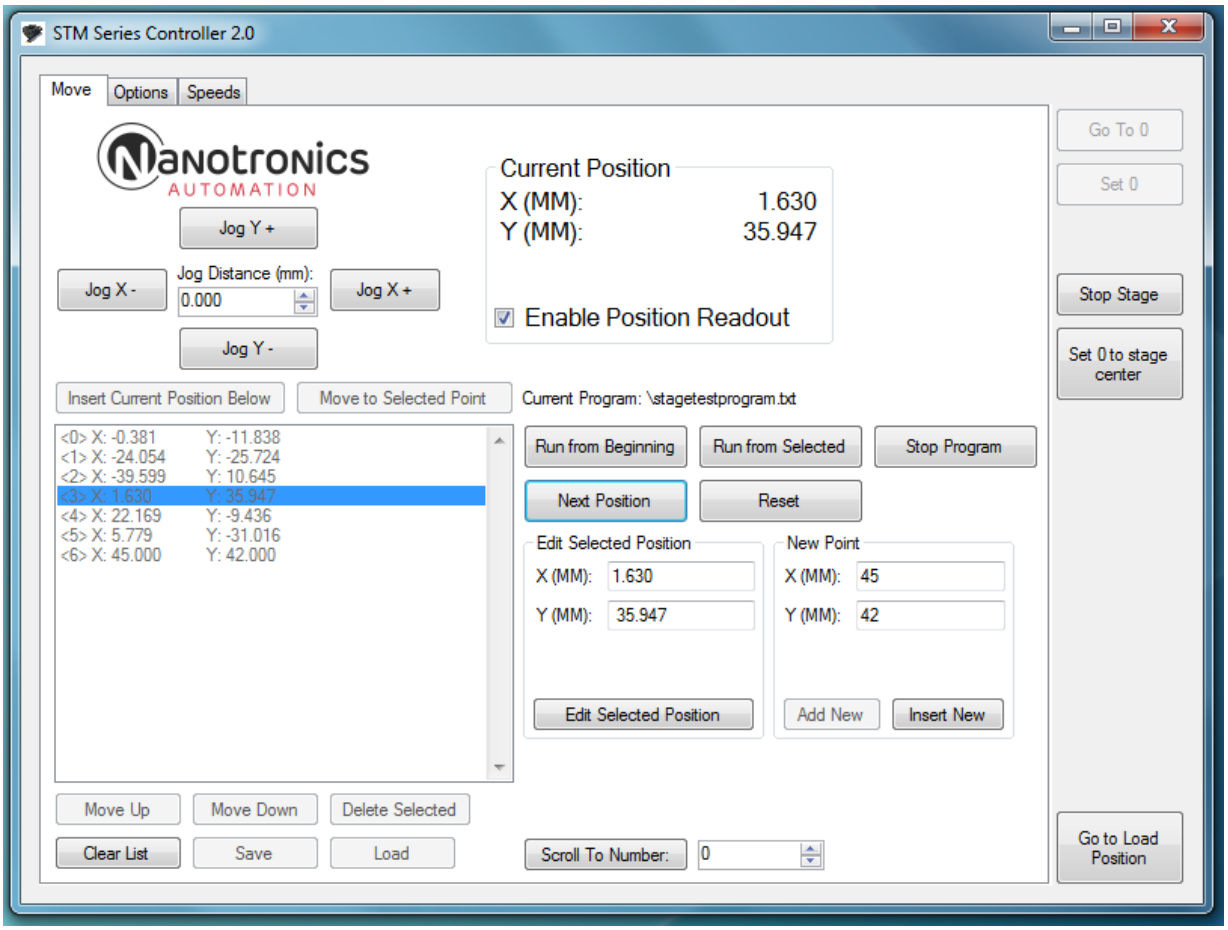
Table of Contents

Overview

The software allows for basic positioning and configuration of a stage using a Nanotronics Automation STM series controller. The stage can be commanded to move specific distances, positions can be saved, and a program can be created to run through a set of saved positions.

Running a Program

The software allows the user to run through all of the saved stage positions, moving to each position and then waiting for the user to click a button to move to the next position. When moving through the list of saved positions in this way, many of the controls on the Move tab are not available - specifically, the list of saved stage positions cannot be edited, and the 0 position cannot be changed. The following screenshot shows the software running through a list of positions. Note that many controls are greyed out and cannot be used.



Controls

Most of the controls are located on the Move tab. A few controls are on the right side and are visible when either tab is selected; these controls are related to setting the 0 position. They are:

1. "Go To 0" button - Moves the stage to the current 0 position.
2. "Set 0" button - Sets the stage 0 position to the current position of the stage.
3. “Set Z 0” button - Only visible for STM-300. Sets the 0 position for the Z axis.
4. "Stop Now" button - Stops the stage.
5. "Set 0 to Stage Center" button - Sets the 0 position to the position halfway between the stage's limits, which should be at the exact middle of the stage's travel.
6. “Log Out” button – Logs out of the system so that you can change between Administrator and User.
7. “Go to Load Position” button – Only visible if using a loader. Moves the stage to the loader handoff position.

On the Move tab are controls related to moving the stage and running through a saved set of stage positions, referred to as the currently loaded program. In the upper left hand corner are 4 buttons and a number box which allow the stage to be moved in exact increments. In the upper right hand corner is a box which displays the current position of the stage. The position readout can be disabled, which may improve stage response times and also reduces the size of the log file.

Most of the controls have to do with saving stage positions and running the loaded program. On the left is a box containing the saved stage positions; the controls above and below this box are:

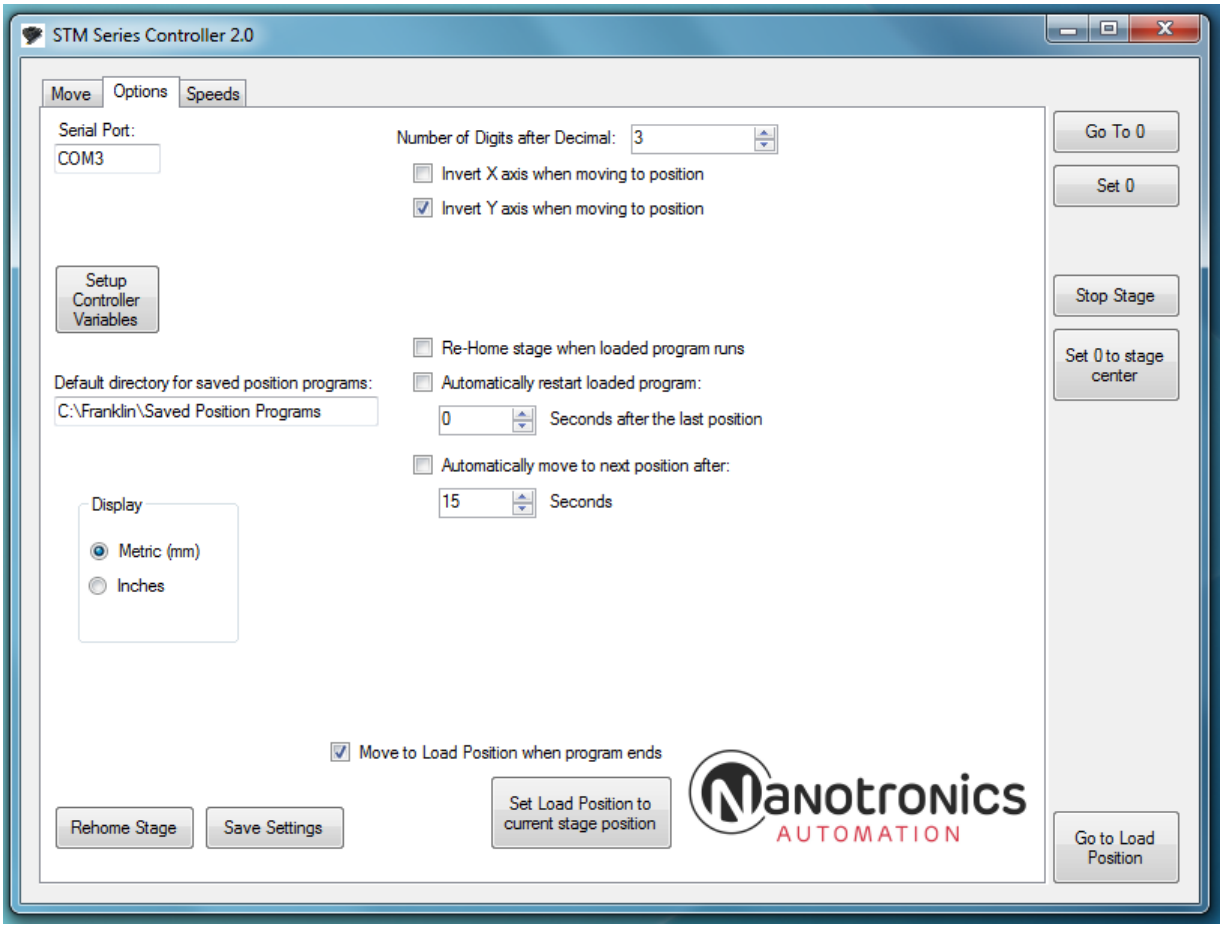
1. "Insert Current Position Below" button - Saves the current position of the stage and adds it to the list of saved stage positions. If a position is selected in this list, the saved position will be added just below the currently selected position; if there is not a position currently selected, the saved position will be added at the end.
2. "Move to Selected Point" button - Moves to the currently selected position in the list of saved stage positions.
3. Saved positions list - Displays the current set of saved stage positions. Double clicking on a position moves the stage to that position.
4. "Move Up" button - Moves the currently selected stage position up one in the list of saved stage positions.
5. "Move Down" button - Moves the currently selected stage position down one in the list of saved stage positions.
6. "Delete Selected" button - Removes the currently selected stage position from the list of saved stage positions.
7. "Clear List" button - Deletes all saved stage positions.
8. "Save" button - Saves all of the currently selected stage positions to an XML file. The stage 0 position is also saved. This button is disabled until unsaved changes have been made to the saved stage positions.
9. "Load" button - Loads a set of saved stage positions from a file.

To the right of the list of saved stage positions, just under the position readout, is a label which shows the file name of the last loaded file of saved stage positions. Underneath this label are more controls, they are:

1. "Run From Beginning" button - This button runs through the saved stage positions starting with the first position in the list.
2. "Run From Selected" button - This button runs through the saved stage positions starting with the currently selected position.
3. “Stop Program" button - Stops running through the set of currently loaded stage positions.
4. "Next Position" button - If the software is currently running through a set of saved stage positions, this button selects the next position and moves to it. If the program is at the end of the saved stage positions, the program ends.
5. "Reset" button - Stops running through a set of saved stage positions and selects the first point in the list of saved stage positions.

6. "Stop Program" button - Stops running through the set of currently loaded stage positions.

Under these controls are two more groups of controls, one for editing stage positions and one for adding new stage positions. The currently selected point's X and Y coordinates will be shown in the boxes labeled X and Y above the button labeled "Edit Selected Point": when this button is clicked, any changes to the selected point will be saved back to the list of saved stage positions. To the right of this are two boxes which allow X and Y coordinates to be entered manually. The "Add New" button will add a point indicated by these boxes to the end of the list, and the "Insert New" button will add a point indicated by these boxes to the end of the list of saved stage positions. The last button allows the user to zoom to a particular point in the list of numbered stage positions.



On the Options tab are controls related to setting up the stage or running maintenance. The options tab is only visible if the user is logged in as Administrator. On the left side, moving down, the controls are:

1. "Serial Port" text box - Controls the COM port used to communicate with the controller.
2. “Change User Password” button – Allows the user password to be changed. The current password will need to be entered to change the password. Setting the password to nothing

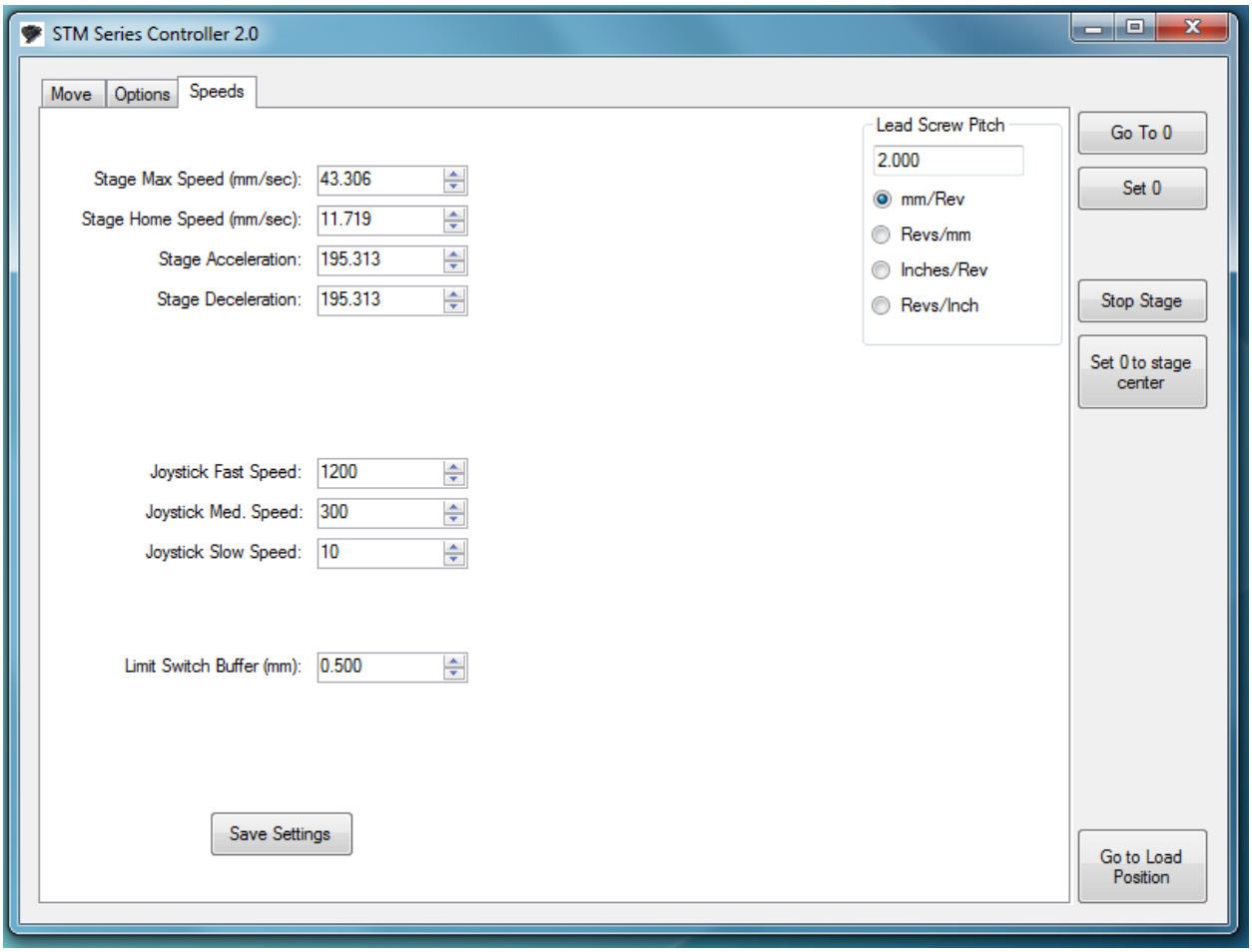
(leaving the box empty) will cause the software to automatically log in as User when the software starts. By default there is no password.

3. “Change Admin Password” button – Allows the admin password to be changed. The current password will need to be entered to change the password. Setting the password to nothing (leaving the box empty) and also setting the user password to nothing will cause the software to automatically log in as Administrator when the software starts, effectively disabling the password. By default there is no password.
4. "Setup Controller Variables" button - Allows for configuring the parameters of the MForce units used in the controller. Should not be used unless you are familiar with programming an MForce.
5. "Default directory for saved position programs" text box - Indicates the path that will be used as the default location for saved stage programs.
6. "Display" options - Indicates whether to use Inches or Metric (millimeters) for entering and moving to positions.
7. "Rehome Stage" button - Re-homes the stage.
8. "Save Settings" button - Saves all of the configuration options, including the current 0 position of the stage, to the configuration file.

On the right side, the controls are:

1. "Number of Digits after Decimal" number box - Controls the number of digits displayed after the decimal point for saved stage positions as well as for the current position of the stage and the stage speed number boxes.
2. "Invert X Axis when moving to position" check box - If checked, the positions of the X axis will be inverted.
3. "Invert Y Axis when moving to position" check box - If checked, the positions of the Y axis will be inverted.
4. “Use Saved Z Position when moving to position” check box – If checked, the stage will move to the saved Z position when moving to a saved position; if not checked, the Z axis will not move when moving between saved stage positions. Only for the STM-300.
5. “Move Z Up” check box – Makes the Z axis move up out of the way during a move to a saved stage position.
6. This controls the distance the Z axis moves when it moves out of the way during a stage movement.
7. "Re-Home stage when loaded program runs" checkbox - If checked, the stage will be homed whenever the software starts running through the saved stage positions.
8. "Automatically restart loaded program:" checkbox - If checked, the software will start running through the saved stage positions again after it finishes running through the saved stage positions.
9. This controls the delay between when the stage program ends and when it is restarted when the software is configured to restart moving through the stage positions automatically.

10. "Automatically move to next position after:" checkbox - This causes the software to automatically move the stage to the next position while running through the saved stage positions.
11. This controls the delay before the stage moves to the next position on the list when the software is configured to move to the next position automatically.
12. “Move to Load Position when program ends” check box – If this is checked, the stage will automatically move to the load position after running through a set of saved stage positions. This option is only displayed if using a loader.
13. “Set Load Position to current stage position” button – Sets the load position to the current stage position. The user will be prompted to confirm this action. This button is only displayed if using a loader.



The Speeds tab allows for the stage speeds to be changed. This also includes settings related to homing the stage and the lead screw pitch. All speeds can be set differently for the Z axis - the control for setting the Z speed is to the right of the control for setting the speed for X and Y and is only displayed for STM-300 models. Each speed control will only be described once but the description applies to both controls. The main speed controls are:

1. "Stage Max Speed" number box - Shows the speed of the stage used when the software moves the stage into position. Edits to this number are applied to the stage immediately.
2. "Stage Home Speed" number box - Shows the speed of the stage used when the stage is homing.
3. “Stage Acceleration” number box – Controls the acceleration of the stage.
4. “Stage Deceleration” number box – Controls the deceleration of the stage, which can affect homing. Setting the deceleration speed too slow may result in the stage hitting a hard stop when homing.
5. "Joystick Fast Speed" number box - Controls the speed of the stage when moved by the joystick in High speed.
6. "Joystick Med. Speed" number box - Controls the speed of the stage when moved by the joystick in Medium speed. For models equipped with only a 2-speed joystick this is not displayed.
7. "Joystick Slow Speed" number box - Controls the speed of the stage when moved by the joystick in Low speed.
8. "Limit Switch Buffer" number box - Controls the distance that the stage backs out of the home switch when homing. When moving to position, the stage will not move closer to the limit switches than this amount. This setting cannot be set differently for the Z axis.

Below all of these settings is a button labeled “Save Settings” which saves all changes to the configuration file, just like the button with the same label located on the Options tab. To the right of the speeds are boxes which allow the lead screw pitch to be set – one for the stage X and Y and one for the Z axis.