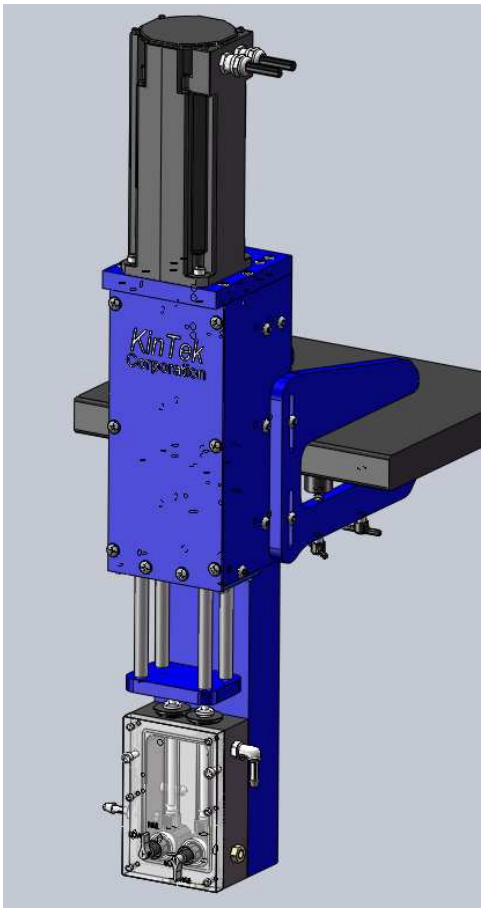
KinTek Corporation

Model 2SD-1x

2 Syringe Drive Operator's Manual



Revision 2.0

10/17/2011

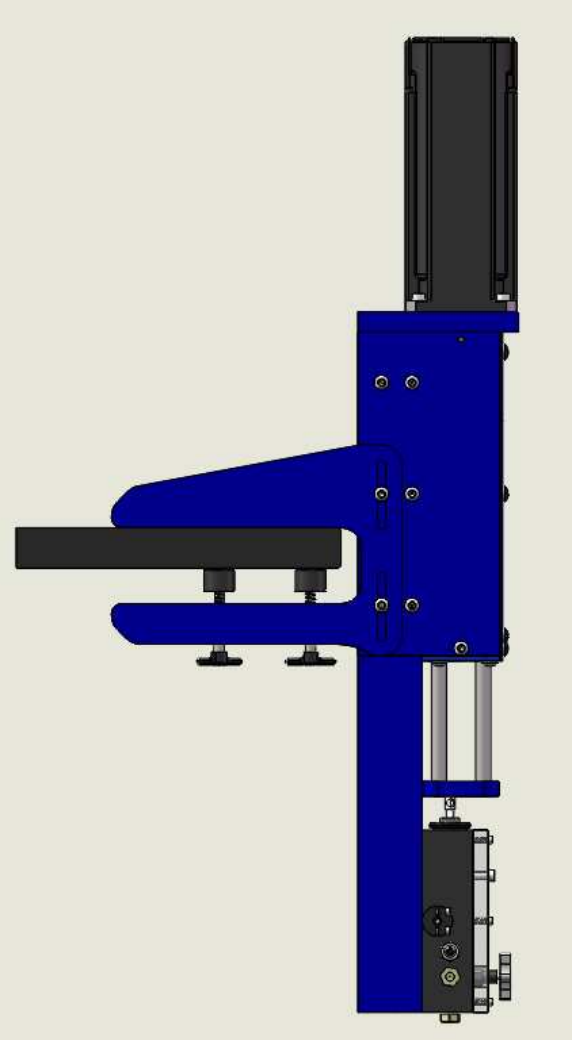
Contents

I. Introduction

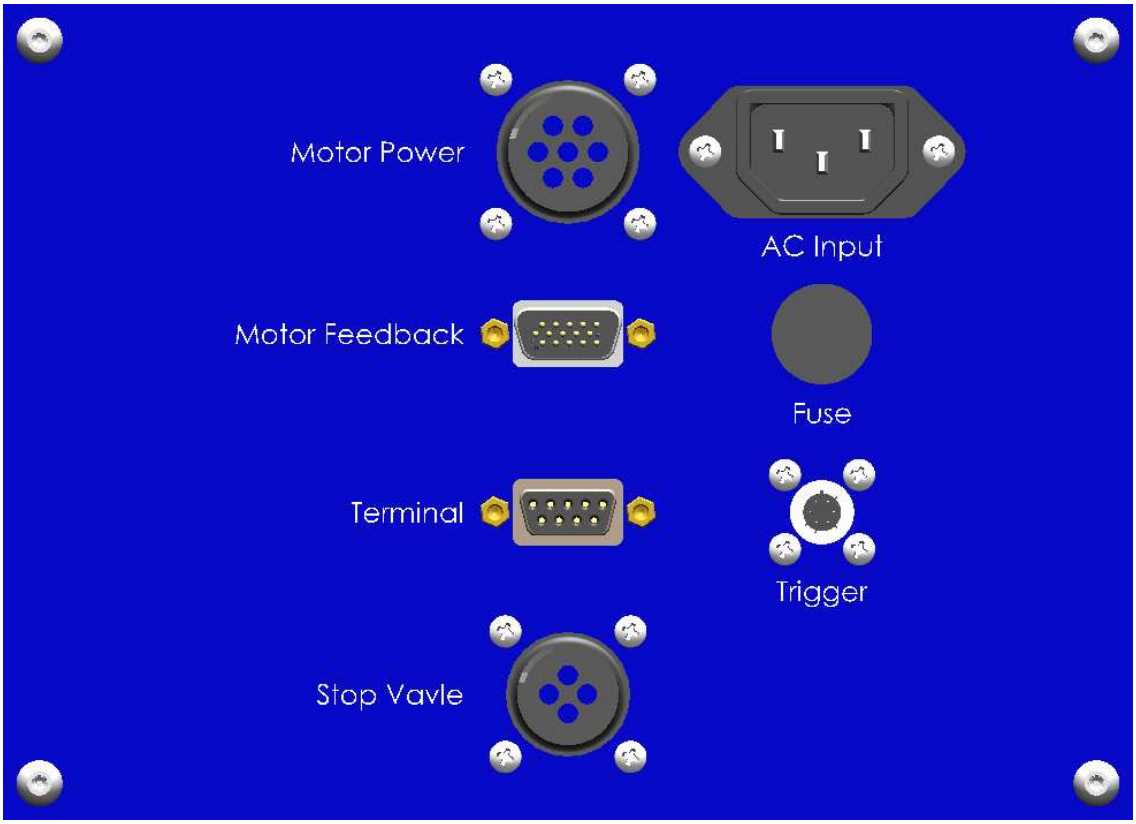
The KinTek 2SD-1x is designed for use with spectrophotometers for real-time data collection. It delivers precise volumes at defined flow rates with the ability to either trigger data collection, or receive a trigger from an external source for collection. In addition, it provides an output for a "stop valve" to curtail overshoot and improve delivered volume accuracy.

II. Setup

1. Mechanical Setup – the 2SD-1x is setup through the use of 2 adjustable mounting brackets bolted to the sides of the unit and clamped to a shelf above the mixing chamber. The diagram below illustrates the mounting of the instrument.



2. Electrical Connections – the electrical connections must be made for the system to operate.



a. Motor Power – Connect the 7-pin motor power connector here. Optionally, a motor power cable has been provided in the event that the electronics box must be placed further from the drive unit than the leads from the motor will allow.

b. Motor Feedback – Connect the 15-pin motor feedback connector here. Like the motor power connector, this port also has an optional extension cable.

c. Terminal – Connect the 9-pin terminal cable here. This port is also used for serial port communications with a PC.

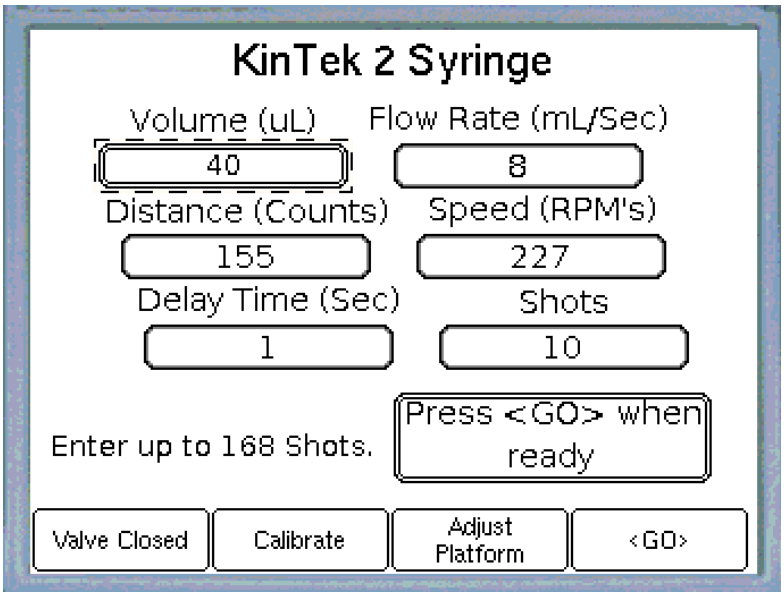
d. AC Input – Connect 120 VAC or 240 VAC here. This connector is for a standard IEC320 power cable.

e. Fuse – This port contains a 10 A, 250 VAC quick blow fuse.

f. Trigger – Connect an optional trigger cable here. The trigger cable and its functions are outlined in the 2 Syringe Drive Trigger Cable document.

III. Operation

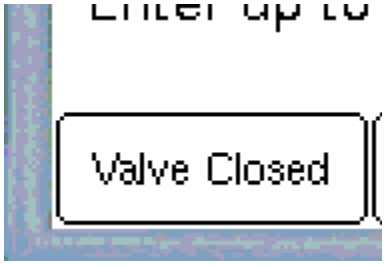
The 2SD-1x can be operated via a hand-held terminal, or a PC serial port with the provided software installed.



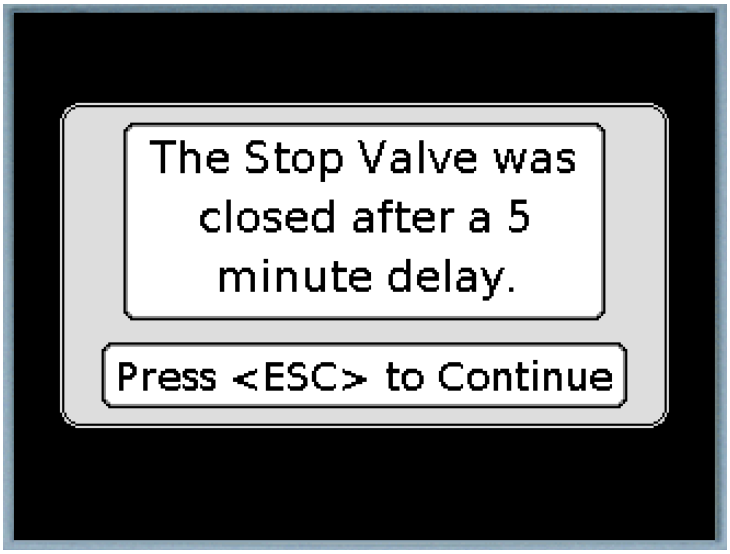
1. Main Screen – This screen is the first to appear on the hand held terminal.
    a. Volume – The volume (in uL) is the amount delivered from 2 syringes. The example above illustrates a push of 20 uL from each syringe.
    b. Flow Rate – The Flow Rate (mL/Sec) is the speed at which the solution will be pushed through the system. This field has a maximum of 10 mL/Sec.
    c. Distance (Counts) – The distance in counts is either calculated be the terminal, or entered manually (if known). The motor travels 1 inch (25.4 mm) in 1 revolution. 1 revolution is 8192 counts. With this information and the Volume Per Revolution (VPR) discussed under Calibration, a precise number of counts can be calculated and entered.
    d. Speed (RPM's) – The speed corresponds to the flow rate. The RPM's can be calculated based on the VPR and the Flow Rate.
    e. Delay Time (Sec) – The delay time in seconds is the amount of time elapsed between shots. This value is limited to a minimum of 0.25 seconds.
    f. Shots – this value is the number of consecutive shots to be fired. The dialog in the lower left corner will display the maximum number of shots that can be entered based on the entered volume and the current position of the platform with respect to the end point.

2. Soft-keys – the function keys (F1-F3 and “GO”) operate functions as displayed in boxes along the bottom of the screen. These functions, in some cases, change depending on the operating mode of the instrument. On the main screen, the functions are as follows:

   a. F1 – Valve control – This key opens and closes the stop valve. The display will show the current status of the valve.



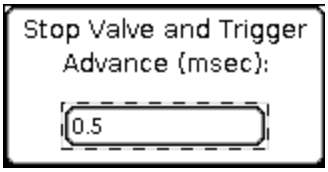
If the stop valve is opened manually, and left open, it automatically closes after 5 minutes.



b. F2 – Calibrate – This key displays a pop-up menu that gives the user the option of entering timing calibration, or performing volume calibration.

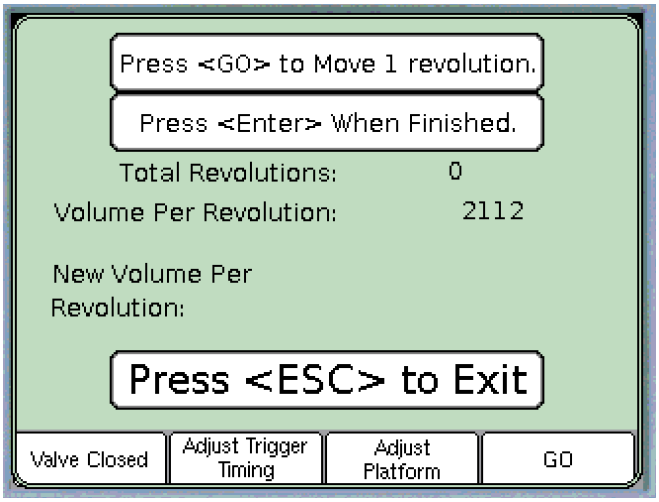
Enter “1” for trigger timing, or “2” for volume calibration.

1 – Adjust Trigger Timing:

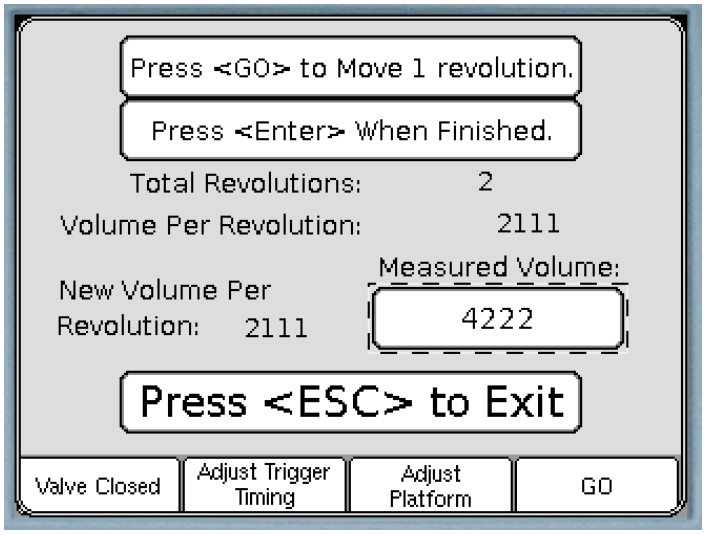


The trigger timing refers to the precise moment that the motor platform stops. This also corresponds to the moment the stop valve (if present) closes. This value determines the amount of time (in msec) that the signal for the trigger and stop valve is sent BEFORE the motor stops. The stop valve and trigger signals are advanced in time to account for delay factors so that the motor stops and trigger and valve close at precisely the same time.

2 – Volume Calibration:

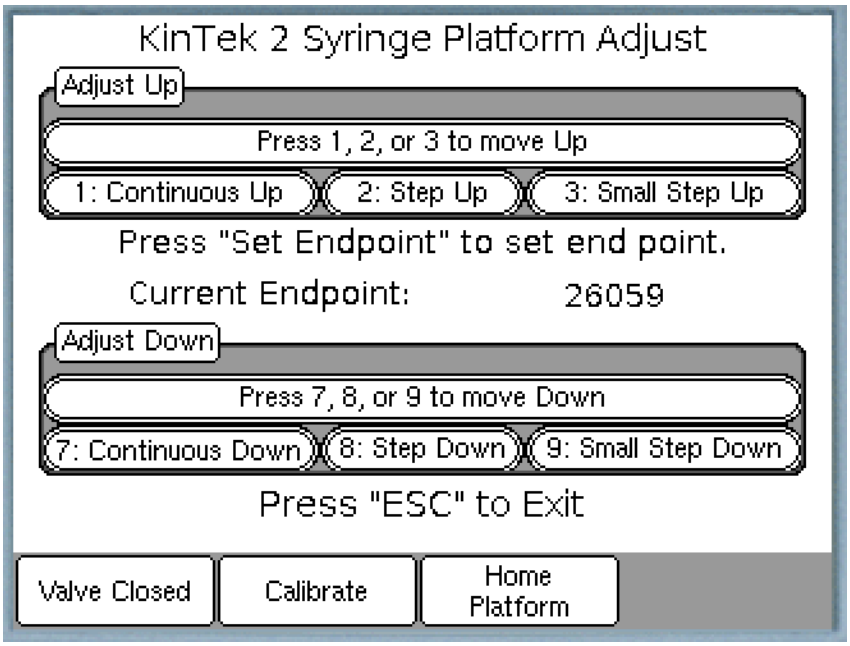


This screen is used to determine the "Volume Per Revolution", or VPR. Fill the syringes and prime the system completely by driving solution through the system with the platform. Press <GO> to move the platform. It will travel 1 inch (25.4 mm). Each press will drive the platform another revolution. The platform's movement will be restricted by the endpoint. If more revolutions are desired, the user can press <F3> to enter the platform adjust screen, home the platform, and re-fill the syringes.
Once the delivered volume is measured, press <Enter>.



Enter the total measured volume in the "Measured Volume" box and the system will calculate and display the new VPR.

c. F3 – Adjust Platform:

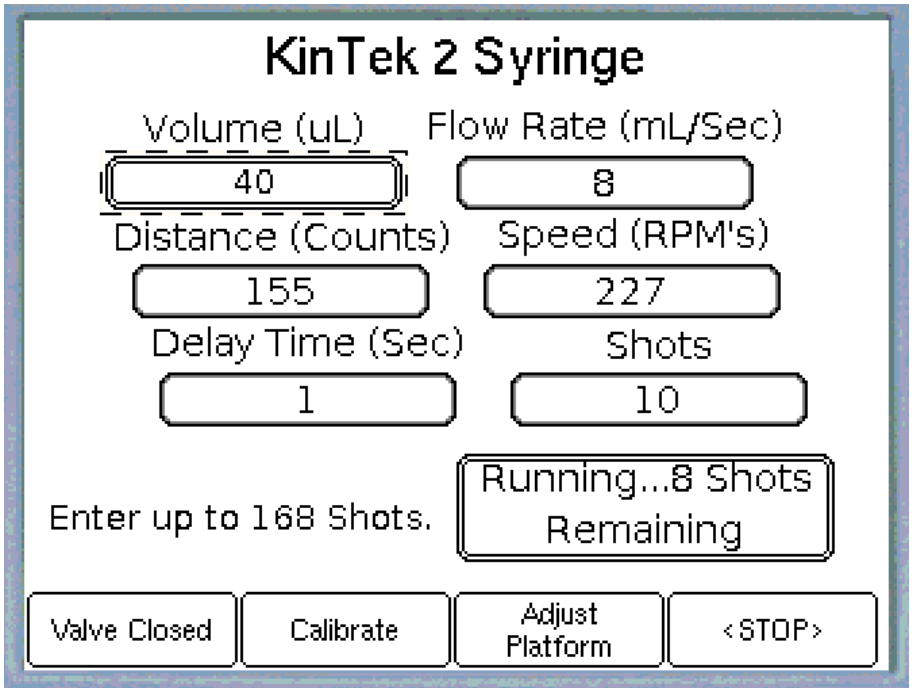


This screen allows for manual control of the syringe drive platform. "UP" is controlled by the "1", "2", and "3" keys. Pressing 1 allows for continuous movement, while 2 and 3 are medium and small steps. "DOWN" is controlled similarly with the "7", "8", and "9" keys.

The Endpoint (or bottom-most desired position of the platform) can be set from this screen as well. Move the platform to the desired point and press the "Set Endpoint" key on the key pad.

The "F3" key homes the platform from this screen. "Home" position is the upper-most position of the platform. Any movement of the platform will stop when the <ESC> key is pressed. To ensure the motor has completed its "Home" move, remain on the adjust screen until the motor stops.

d. “GO” – This key, when applicable, starts (or stops) platform movement.



While the system is firing, it will count down the shots remaining, and the maximum number of shots that can be entered. At any time during a collection group, the user may press <GO> again and cancel a run. The system will stop firing and update the maximum shots available according to where the run was interrupted.