Basic 793 Operation for Service Activities

January 14, 2019 Rev B

be certain.

Introduction

» This module is designed to use the customer system and the 793 software installed on their PC.

- It is presumed that 793 is already installed and the software is currently in use with an appropriate controller.

» This training is intended for a new FSE to gain knowledge of basic software operation of a 793 system to perform service activities.

» Detailed 793 setup, usage, and installation will follow in future training.

Service Activities

» 793 software will be used while performing service activities. This module will prepare you for these functions.

» Some examples are:

- Turn on hydraulics and check for leaks.
- Move actuator to allow for fixture install or removal.
- Tighten spiral washers
- Assess and adjust servovalve performance
- Run cyclic waveform

Start Station Manger

» Station Manager is the software program that controls the actuator.

» The first step is to start the Station Manger program

» Start > All Programs > MTS 793 > Station Manager

» An alternative is to use the shortcut if present on desktop

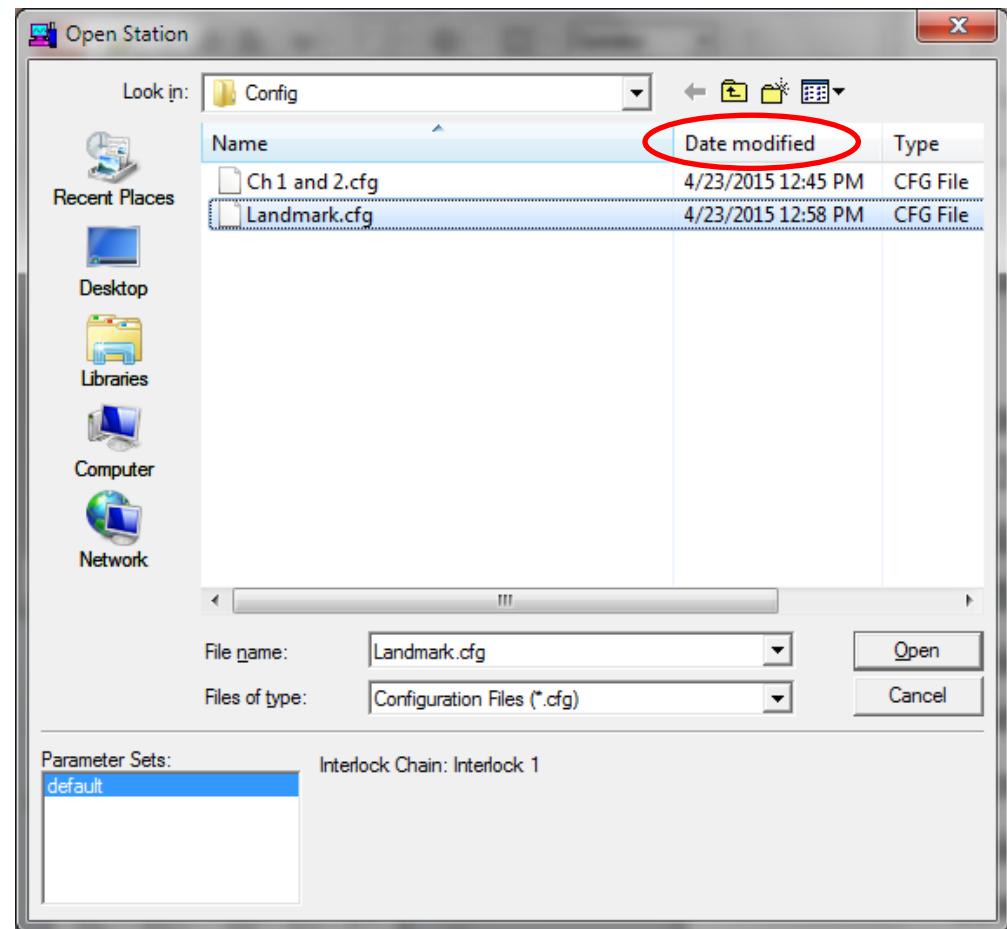Station Manager
Shortcut
1.85 KB

Start Station Manger

» The "Select Project" window will appear asking for "Project" folder unless default was previously selected

  - Do not set default without customer approval

» If customer had selected "Set as Default Project" previously, the select project window will not appear.

» If the select project window appears choose "Project1" for this training
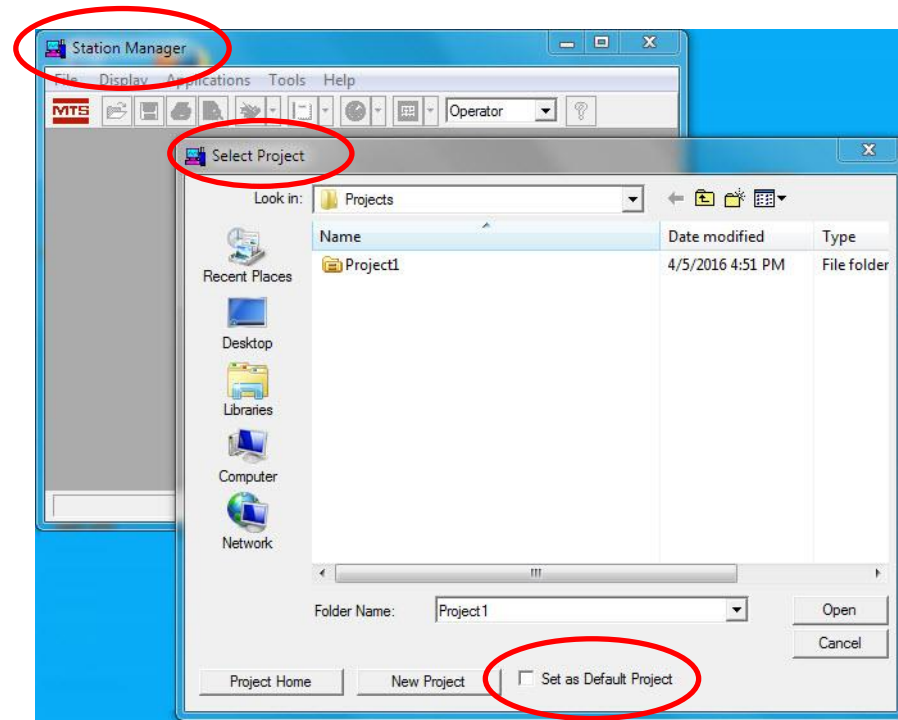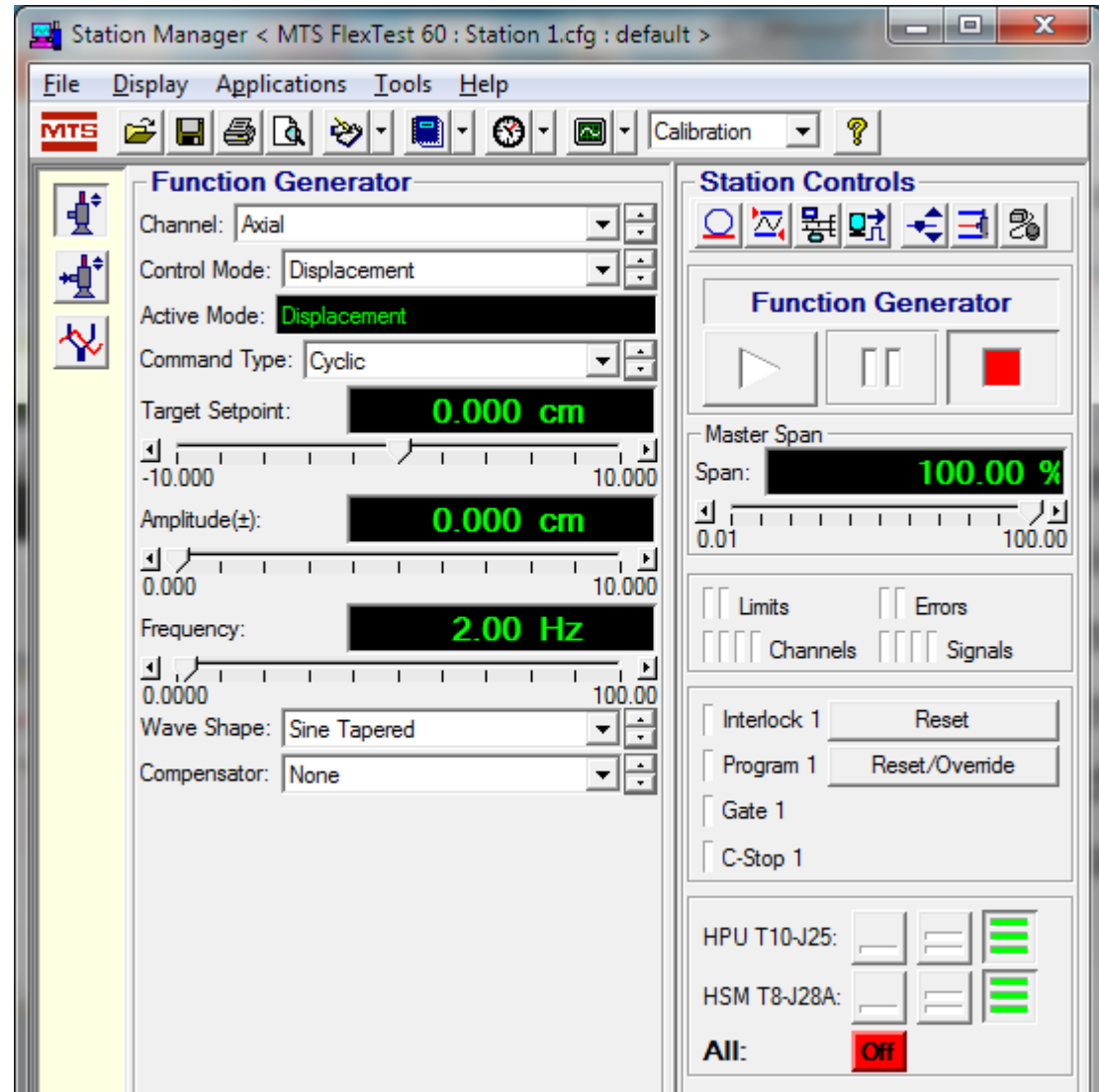
Start Station Manger

» Next the open station window will appear to select a station for use.

» If you do not know what configuration the customer was using, clicking on the "Date Modified" column header will cause the open station window to sort by date.

» Using this method it is easy to choose the last configuration used. Select the most recent used station to open.
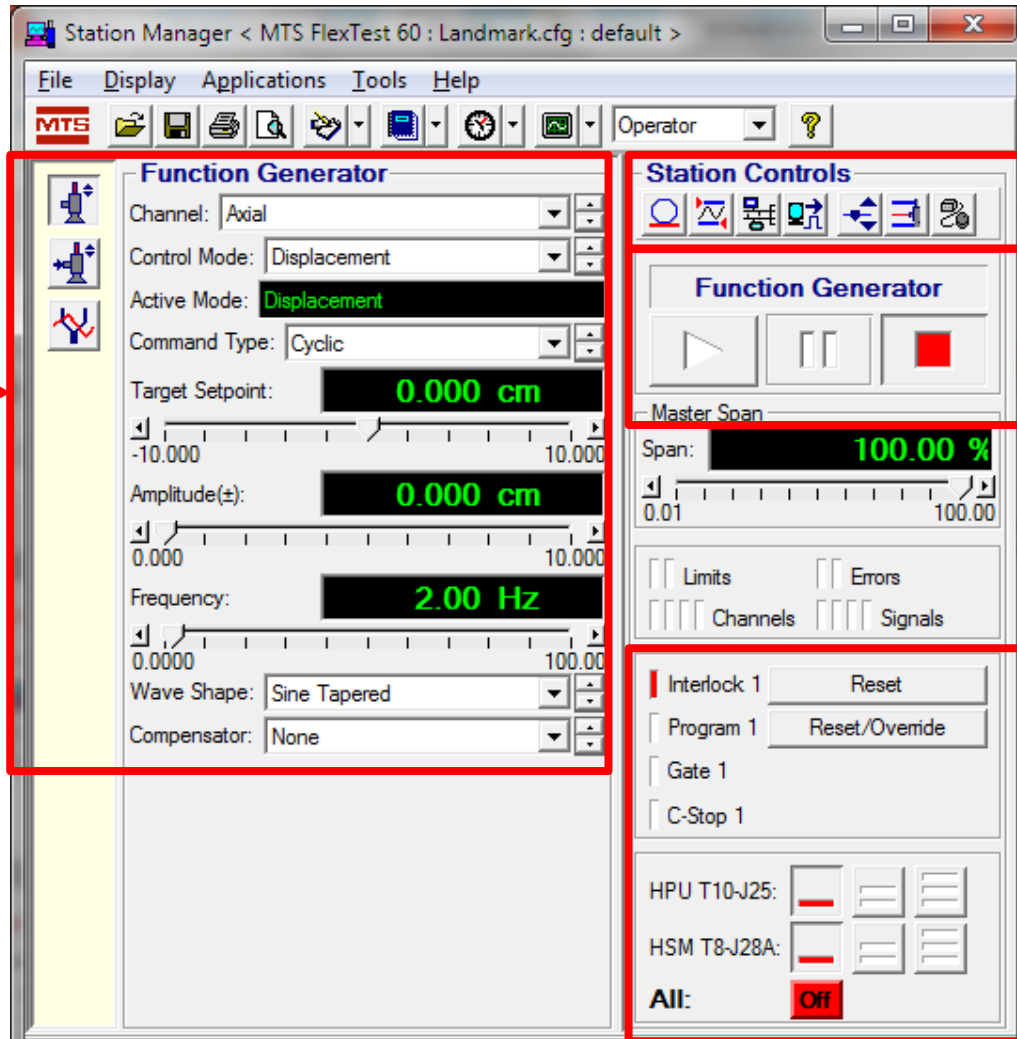
793 FlexTest Software

» 793 is the base software that operates MTS Controllers

- Provides closed loop control
- Transducer calibration
- Limits
- Function Generation
- Hydraulic Control

793 Main Screen

» The station manager window is divided into sections performing different functions


Test Program

Shortcut Icons

Start / Stop

Hydraulic Control

Exclusive Control

» On controllers with more than one location to control the actuator such as both the computer and a remote handset the software uses the "Exclusive Control" function to ensure only one source is moving the actuator at a time. The exclusive control function is only present if there is more than one location to control the actuator. To operate the system from the computer - station manager application you must check the exclusive control box if it is present. When exclusive control is not checked the HPU / HSM buttons, program start, and manual command check box are grayed out.
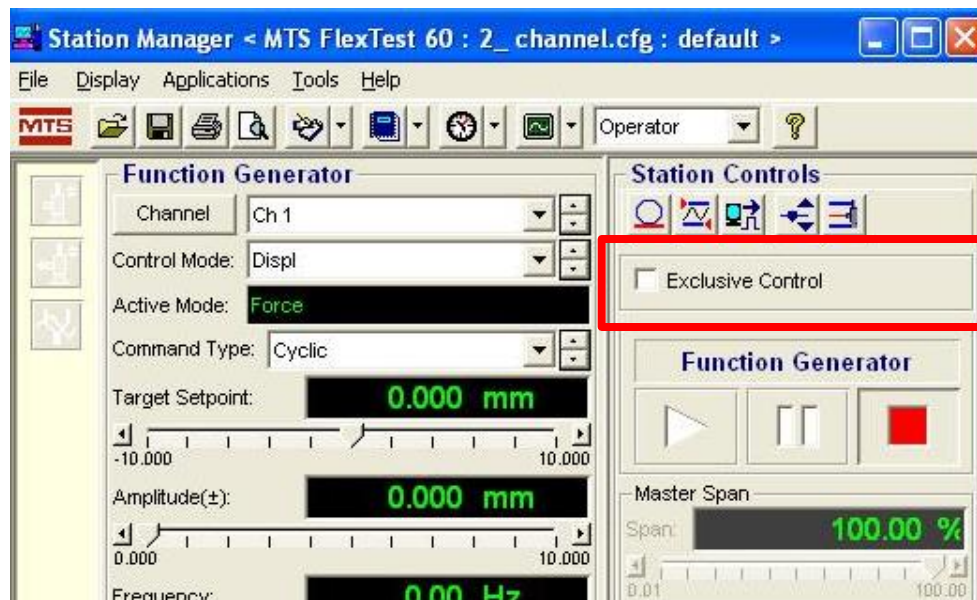
Exclusive Control

» No application selected for control
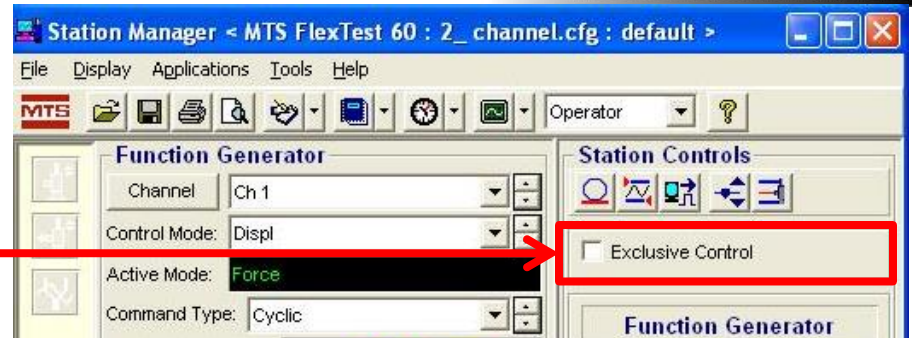
» Station Manager selected for control
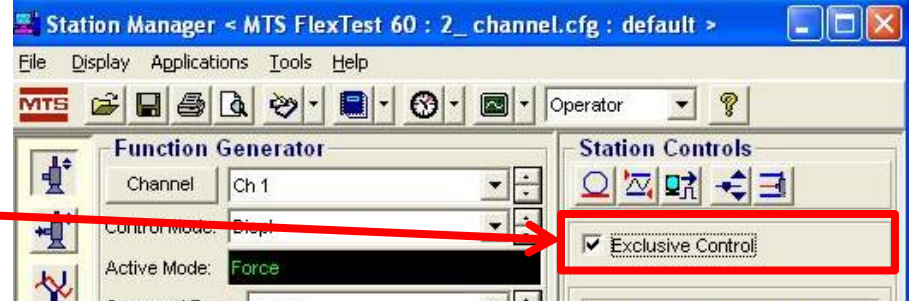
» Remote device selected for control.
 - Must deselect on remote device before you can select on station manager.

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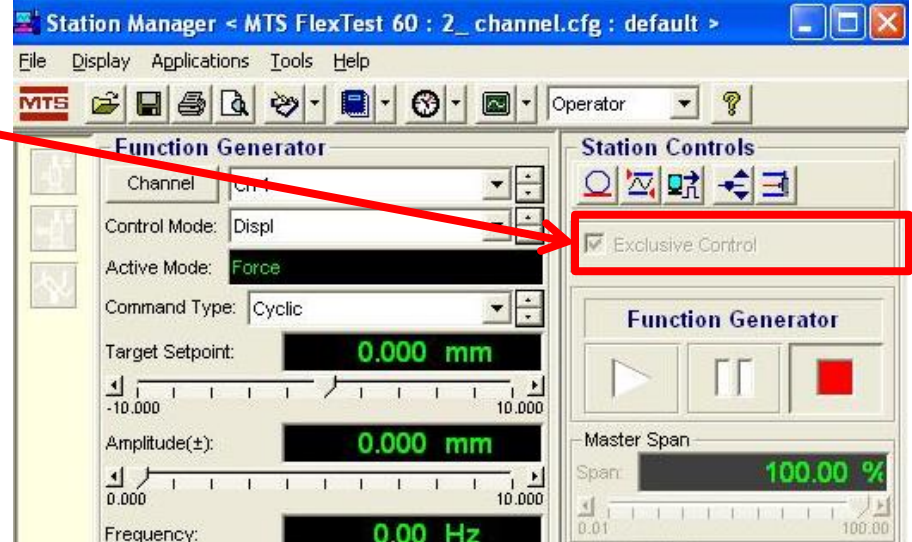
793 Control Mode

» The first step to turning on hydraulic power is to verify the control mode for the testing to be performed. Many service activities use the displacement control mode. The name of the control mode is flexible and might be displacement, disp, stroke, or any other word or abbreviation the customer has selected. Begin by displaying the manual command window using the shortcut bar.
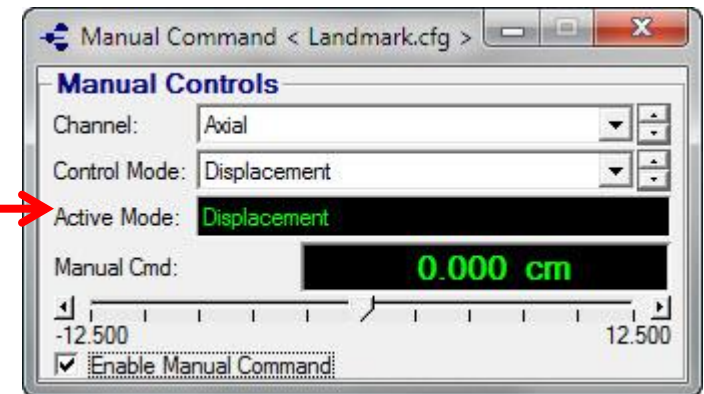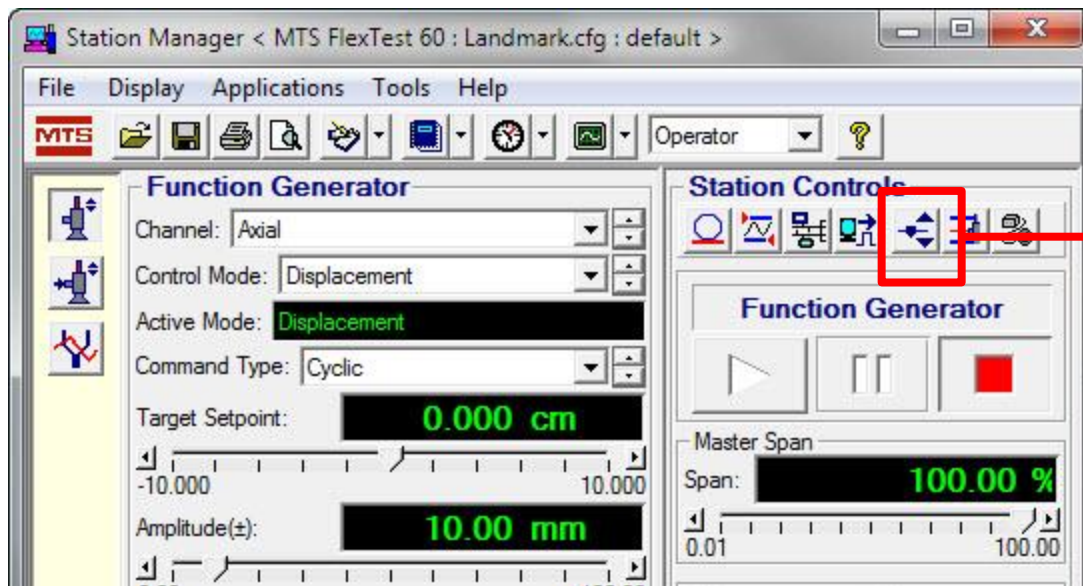
793 Control Mode

» In the example below the current mode is force control. This means when commanded the system will want to achieve the commanded force regardless of the amount of displacement required.

» To change to displacement control begin by selecting displacement in the "control mode" drop down window.
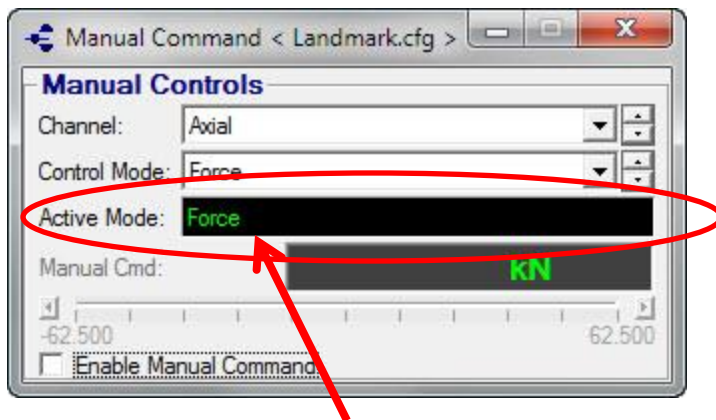
Current Control Mode
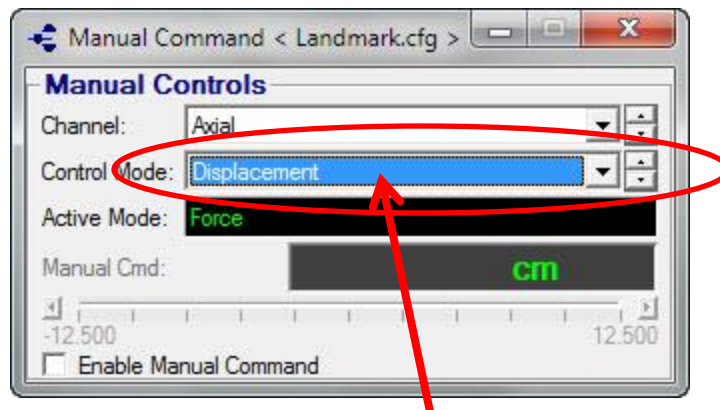
What the control mode will be when manual command is enabled

793 Control Mode

» The final step is to check the "Enable Manual Command" check box. This will both change the control mode to displacement and allow you to command the system to move to a position.
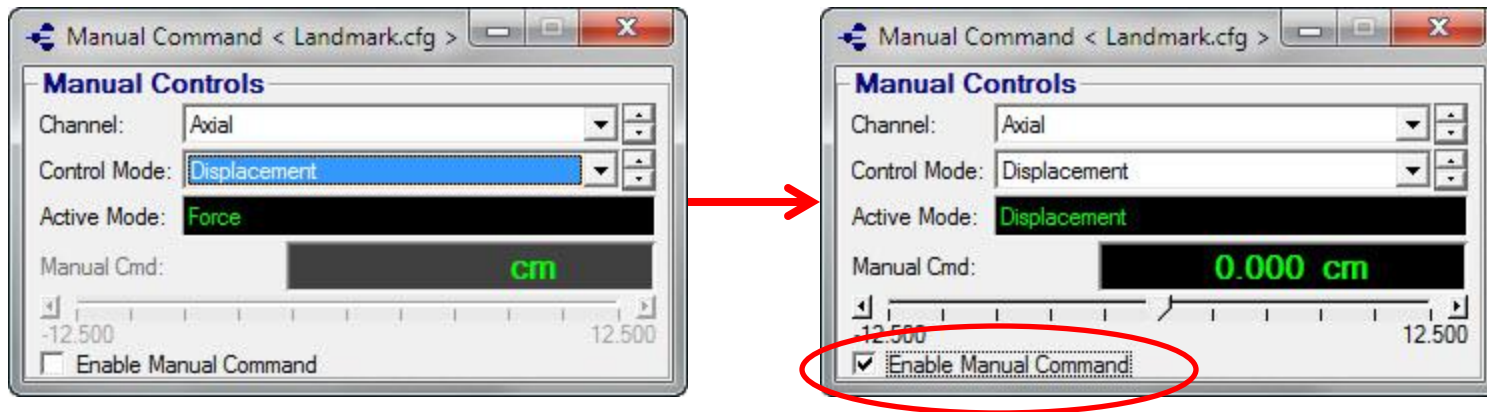
Hydraulic Power

» Once the control mode is selected hydraulic power can be applied.

» If the red Interlock 1 light is on press the "Reset" button. If the light does not go off, the system is in a condition which prevents hydraulic power from being turned on and the limit or error must be cleared first.

» If the light stays off proceed.
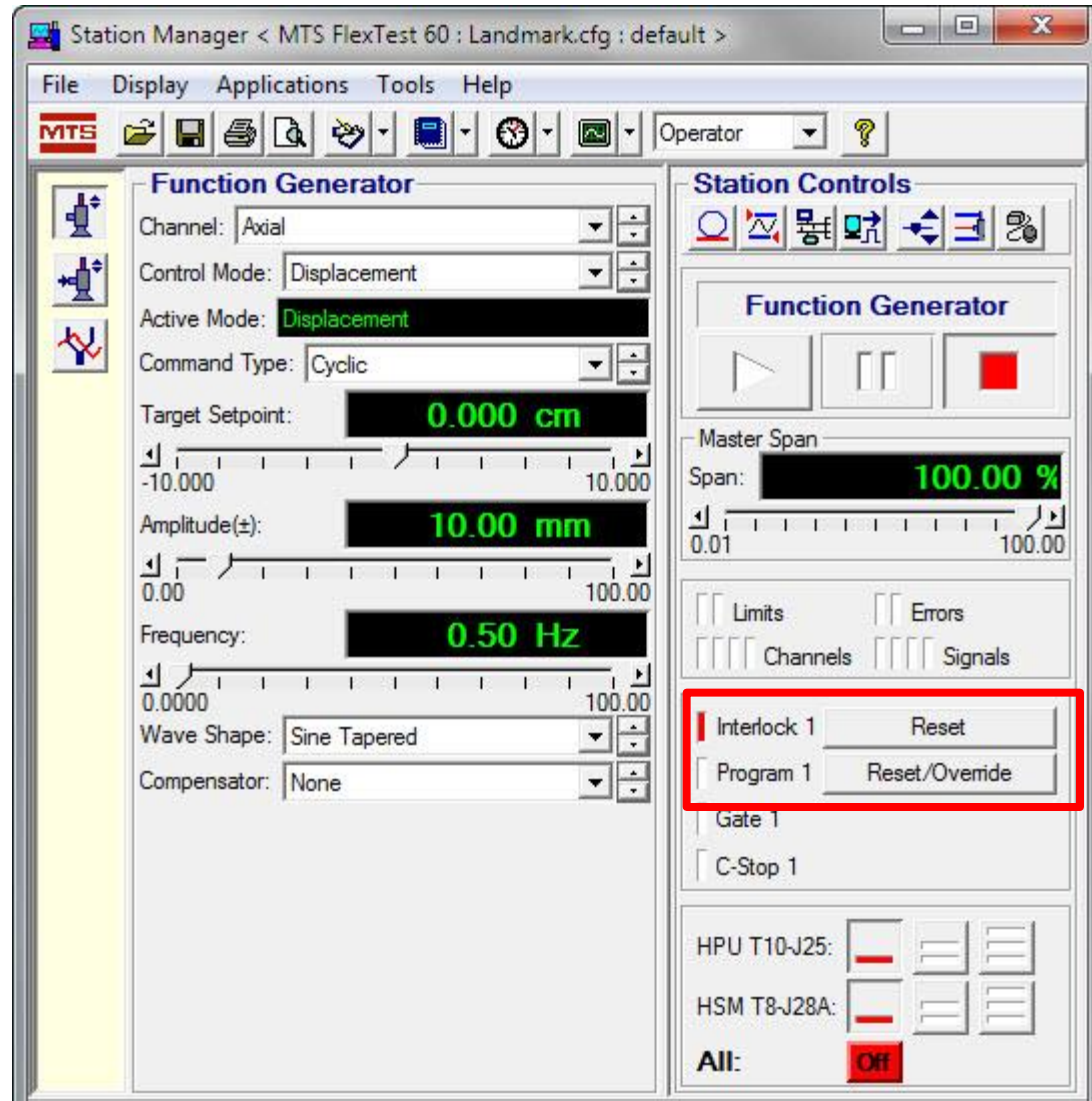
Limits

» If the Interlock light will not go out and the limit indicator is lit, open the detectors, find the tripped limit indicated by the red light, and disable so hydraulic power can be applied.

Program Interlock

» If the program interlock or gate interlock is on this will not prevent hydraulic power from being turned on. This only stops the function generator from running or starting a test.

» This is caused by

- Crosshead unlocked

- Rabbit / Turtle switch in turtle mode

- Test area enclosure open
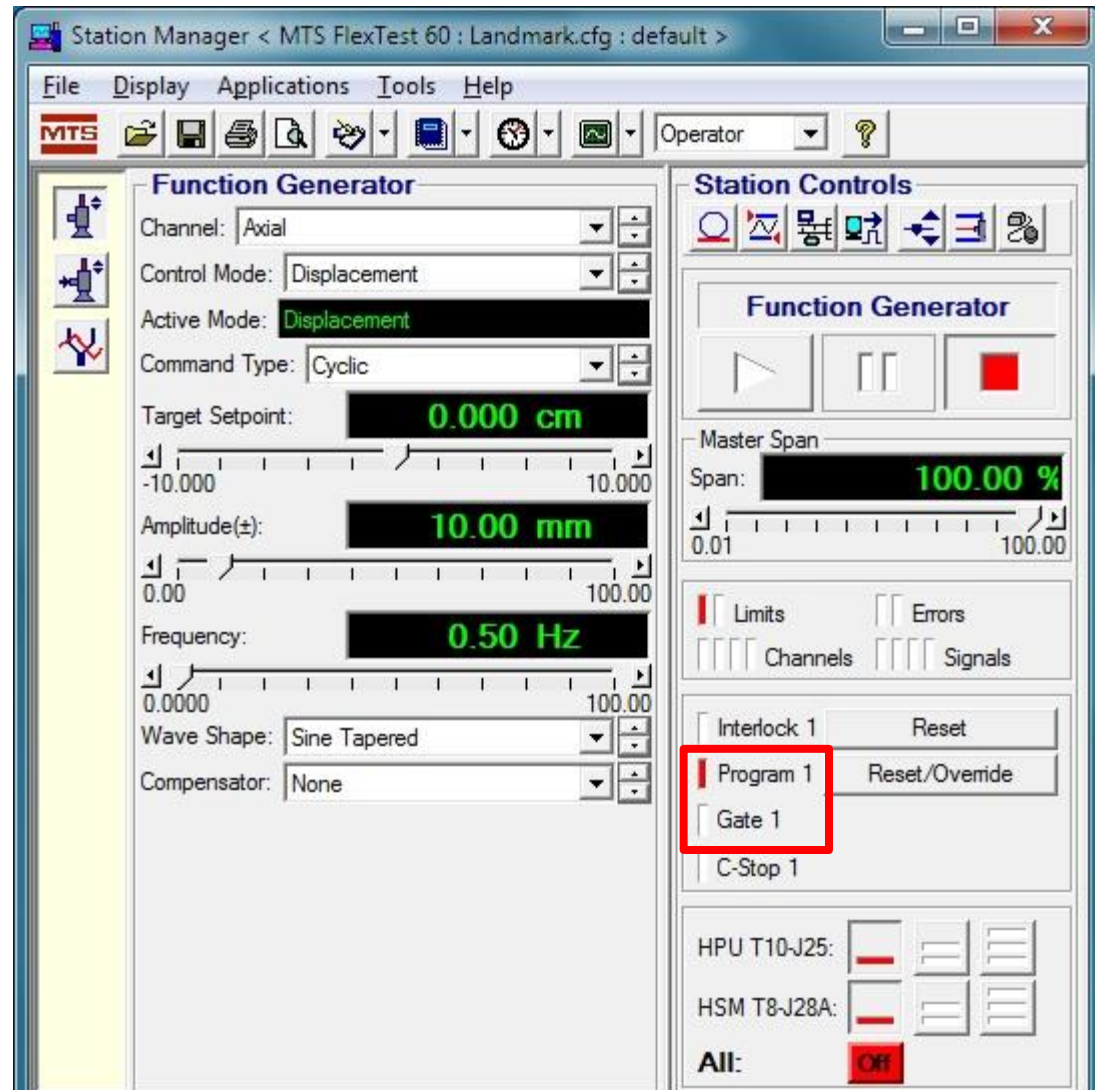
Hydraulic Power

» If the HPU buttons are present on the screen start the HPU in low and then High. Even if the HPU is not setup for remote control and is not connected to the controller by a cable the HPU buttons in the software still need to be pressed.

» Then push the HSM low pressure button followed by the high pressure button.
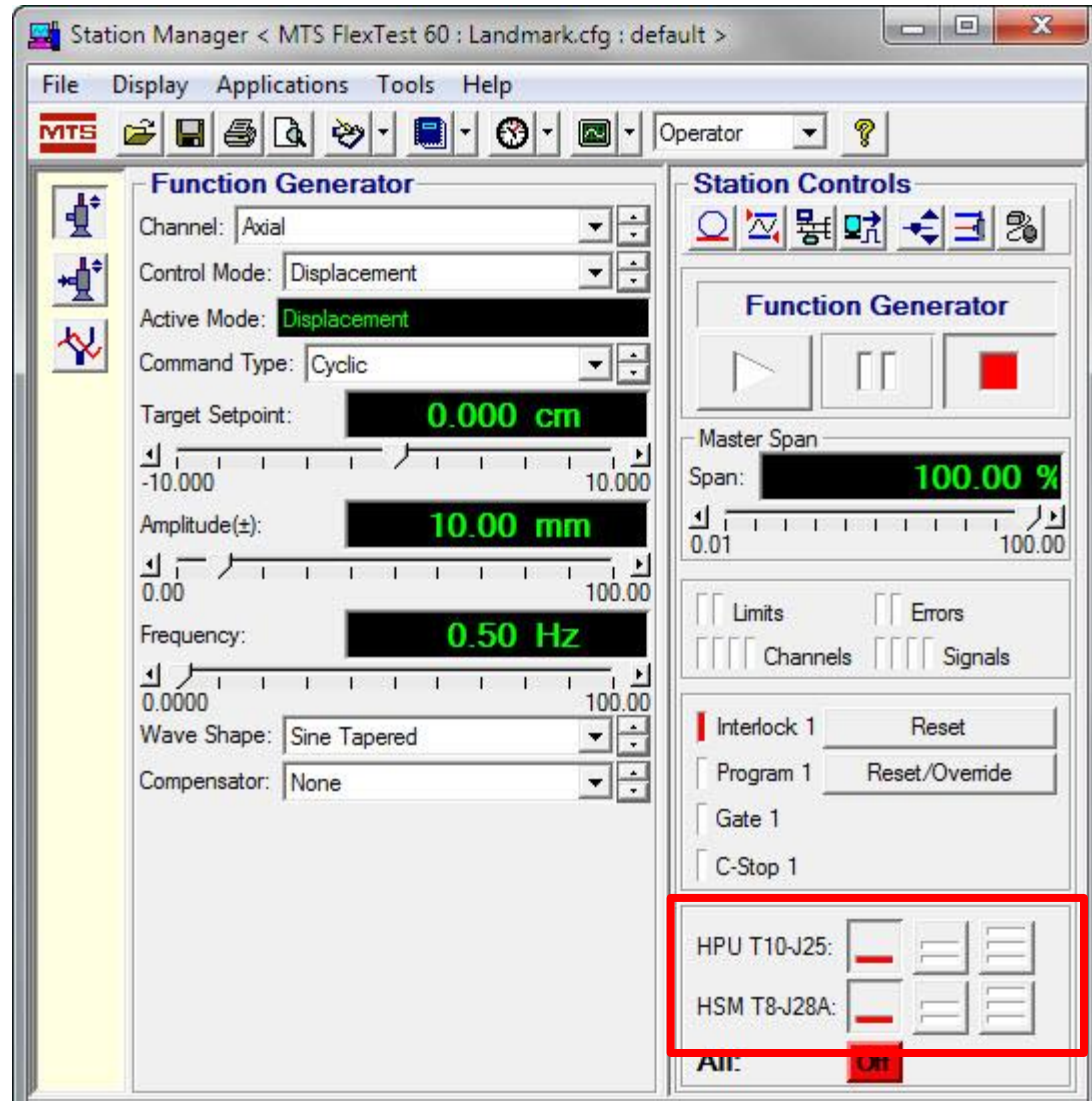
Hydraulic Power

» This system zeros the error before applying hydraulic power. This topic will be discussed in future training.

» This means it is safe to apply power once you have confirmed the desired control mode and cleared any interlocks without any other pre-adjustments.

Scopes and Meters

» Digital Meters and a scope are available using the shortcut icons

Meters

» To setup a meter press the bar above the meter. Select a signal and the meter type.

Press to setup meter
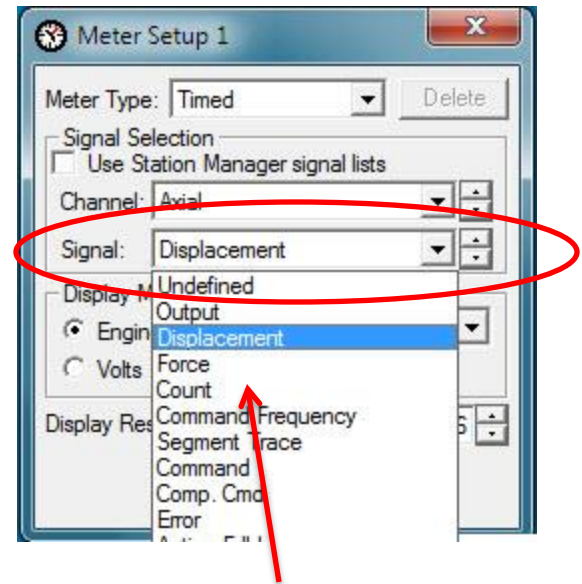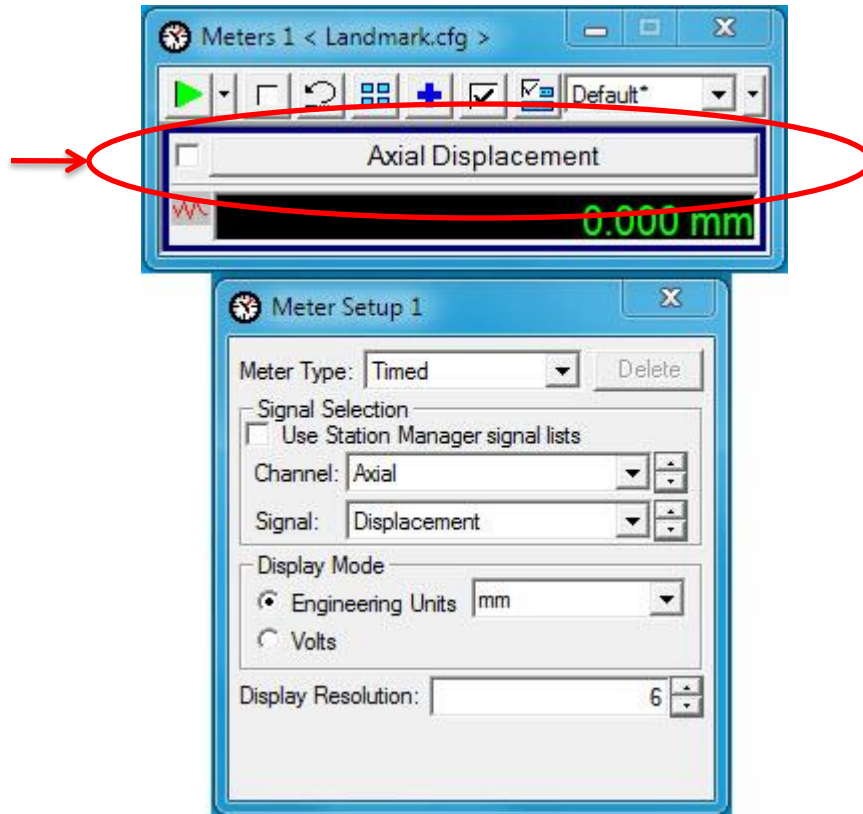
Signal to view
- Force
- Displacement
- and others

Meters

» There are 4 different meter types.

- Timed – Continuously updating for use when not running a cyclic test

- Peak / Valley – Updates with each peak and valley when running dynamic sinusoidal test, displays only the peak and valley

- Mean / Amplitude – Shows the mean (setpoint) and amplitude (span) when running dynamic sinusoidal test.

- Max / Min – Displays the outright largest and outright smallest values detected since being reset. Only updates when a larger max or min is present.
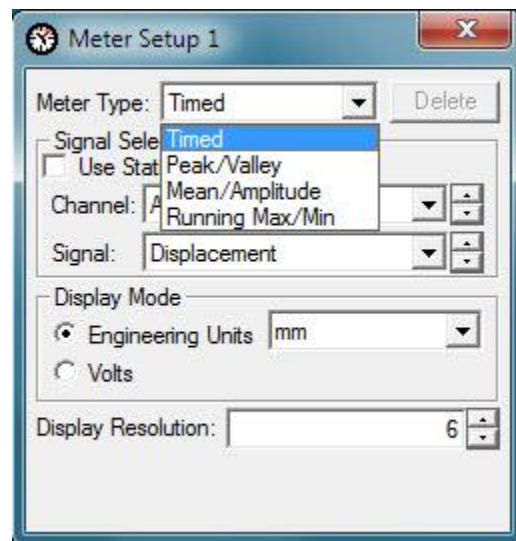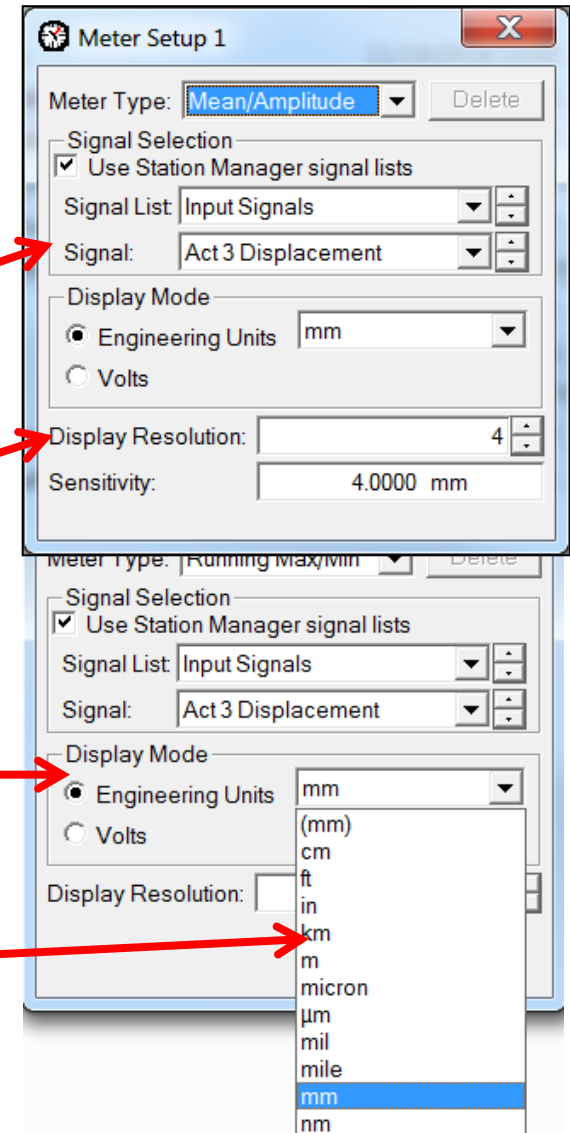
Meters

» Meters allow you to monitor the amount of force applied or the position of the actuator.

» By selecting a timed meter type with a signal of Force this will display the amount of force currently applied to the load cell.

» By selecting a timed meter type with a signal of Displacement this will display the current position of the actuator.
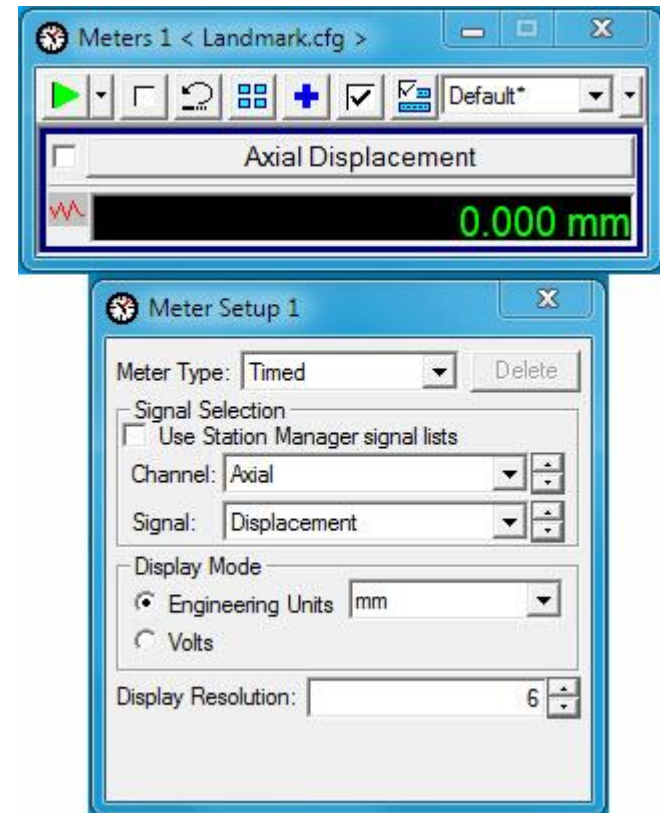
Meters

» In the Meter Setup window you can configure/edit parameters listed below.

» In Signal Selection area you can choose what Signal to monitor.

» The Display Resolution can be changed.

» In Display Mode section you can choose to display in Engineering Units or Volts.

» Select the drop down menu to choose units for Engineering Units.

Meters

» The Sensitivity setting in the Meter Setup window is very important for Peak/Valley and Mean/Amplitude meters.

» Sensitivity setting sets the amount that the signal must change by before the meter updates.

» If the setting is too high, the meter will never change and will not be representative of what is really happening.
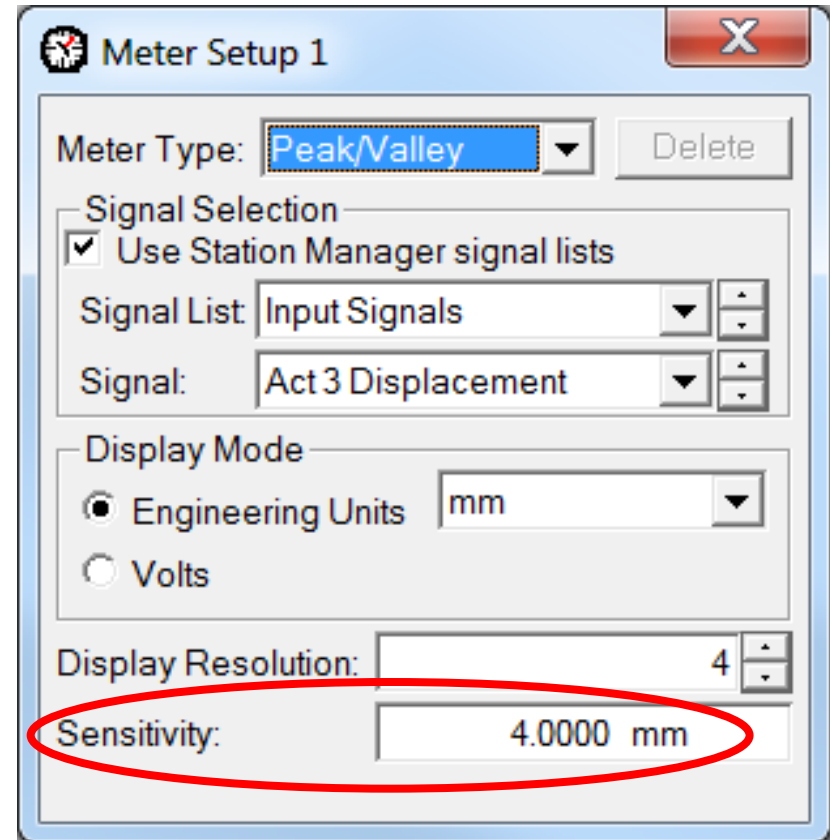
Scopes

» The Scope window is an oscilloscope. You can use it to plot signals against time, frequency, and against each other.

» You can create up to four scopes per station, and add up to four signal pairs per scope.
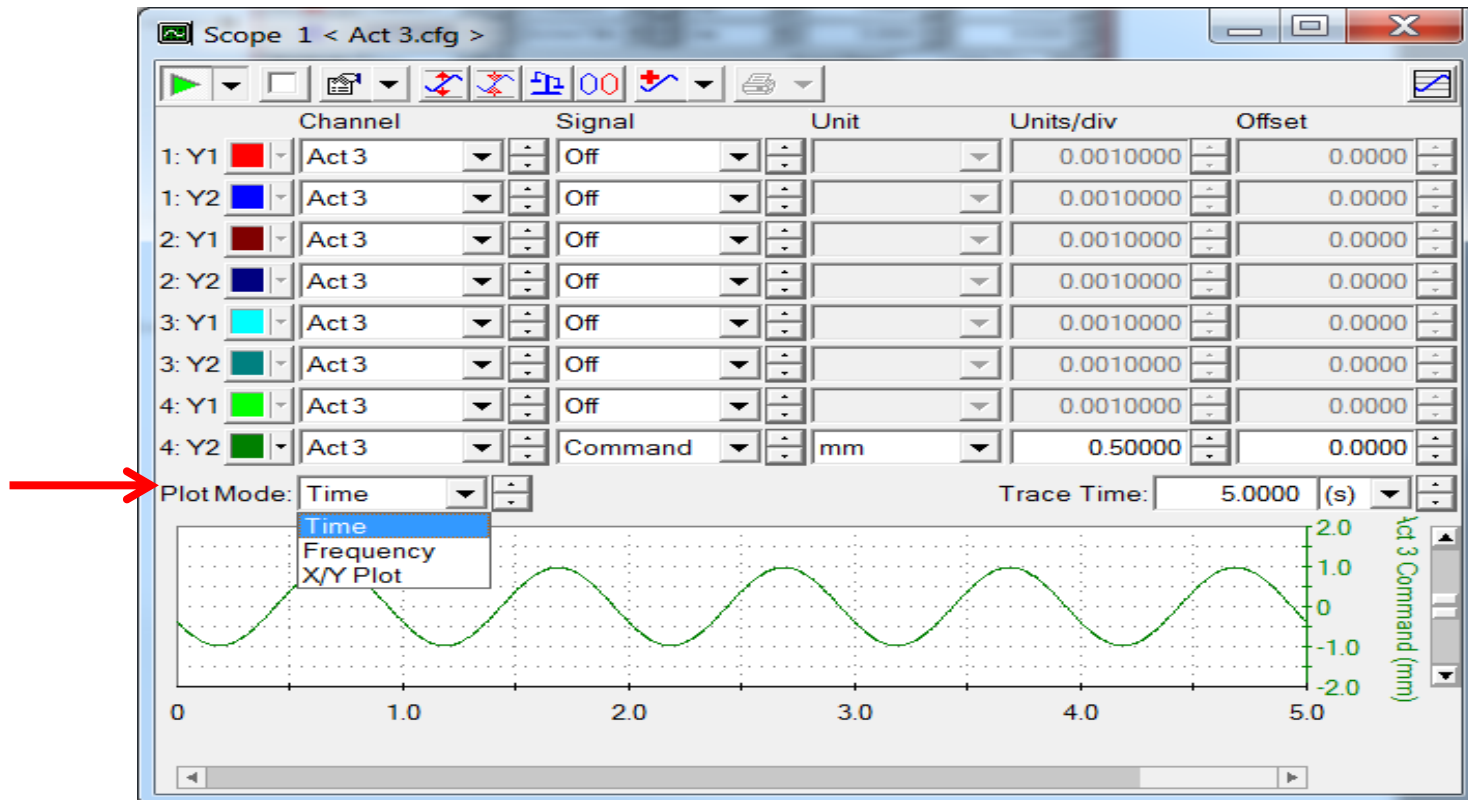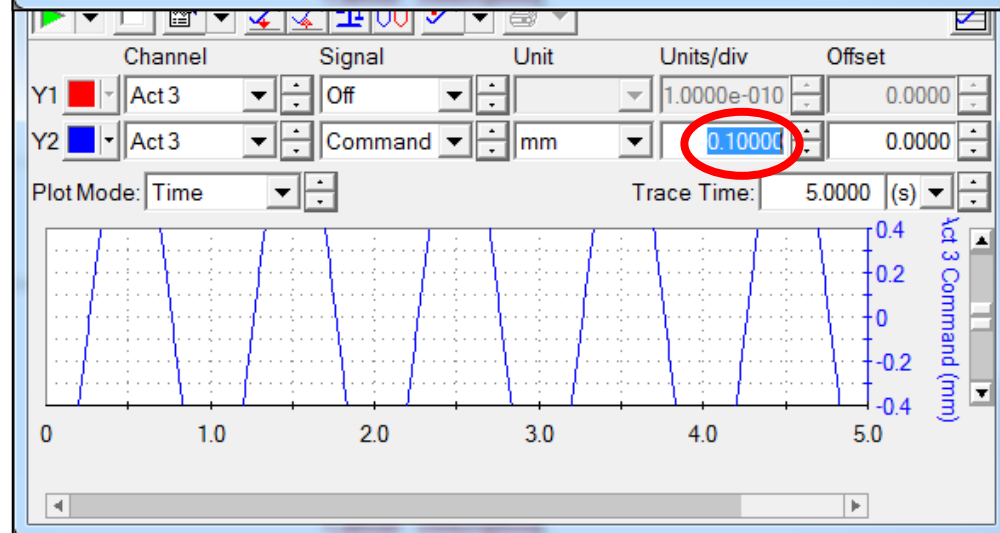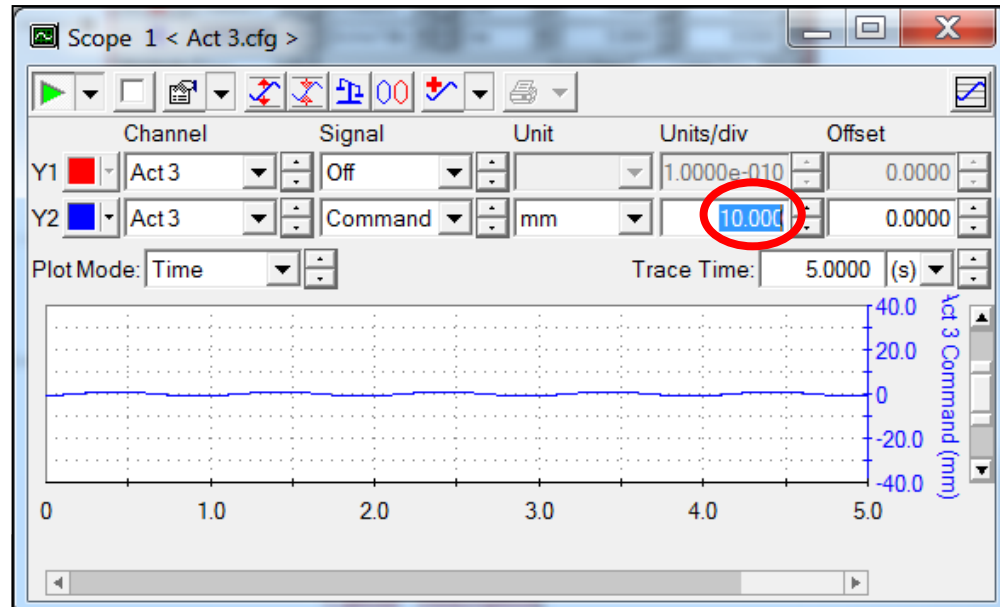
Scopes

» Running a 1 mm sine wave at 1 Hz. for these scope examples.

» Units/div setting too large and trace is not much use to you.

» Setting is 10 mm/div. ——————>

» Units/div setting too small and trace is not much use to you.

» Setting is .1 mm/div. ——————>

Scopes

» Running a 1 mm sine wave at 1 Hz. for these scope examples.

» Units/div setting good, trace is useful. Setting is 0.5 mm/div

» Auto-scale button turns auto-scaling on and off.

» When enabled, auto-scaling continuously adjusts the scope to accommodate increasing signal amplitudes and make them fit into your scope window.
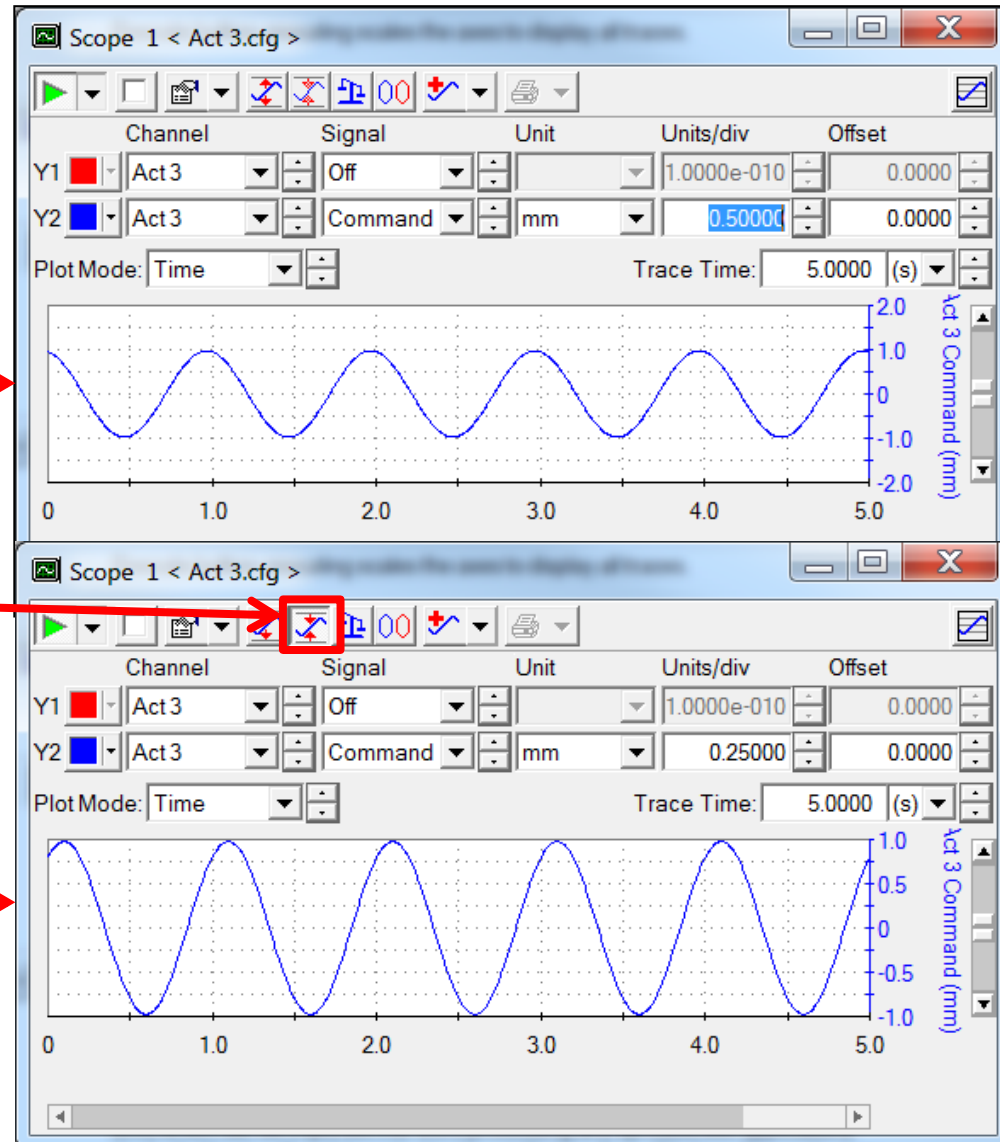
Scopes

» Running a 1 mm sine wave at 1 Hz. for these scope examples.

» Trace Time can be adjusted to adjust how much of the trace you see in scope screen.

» Units for time can be selected from the drop down box.

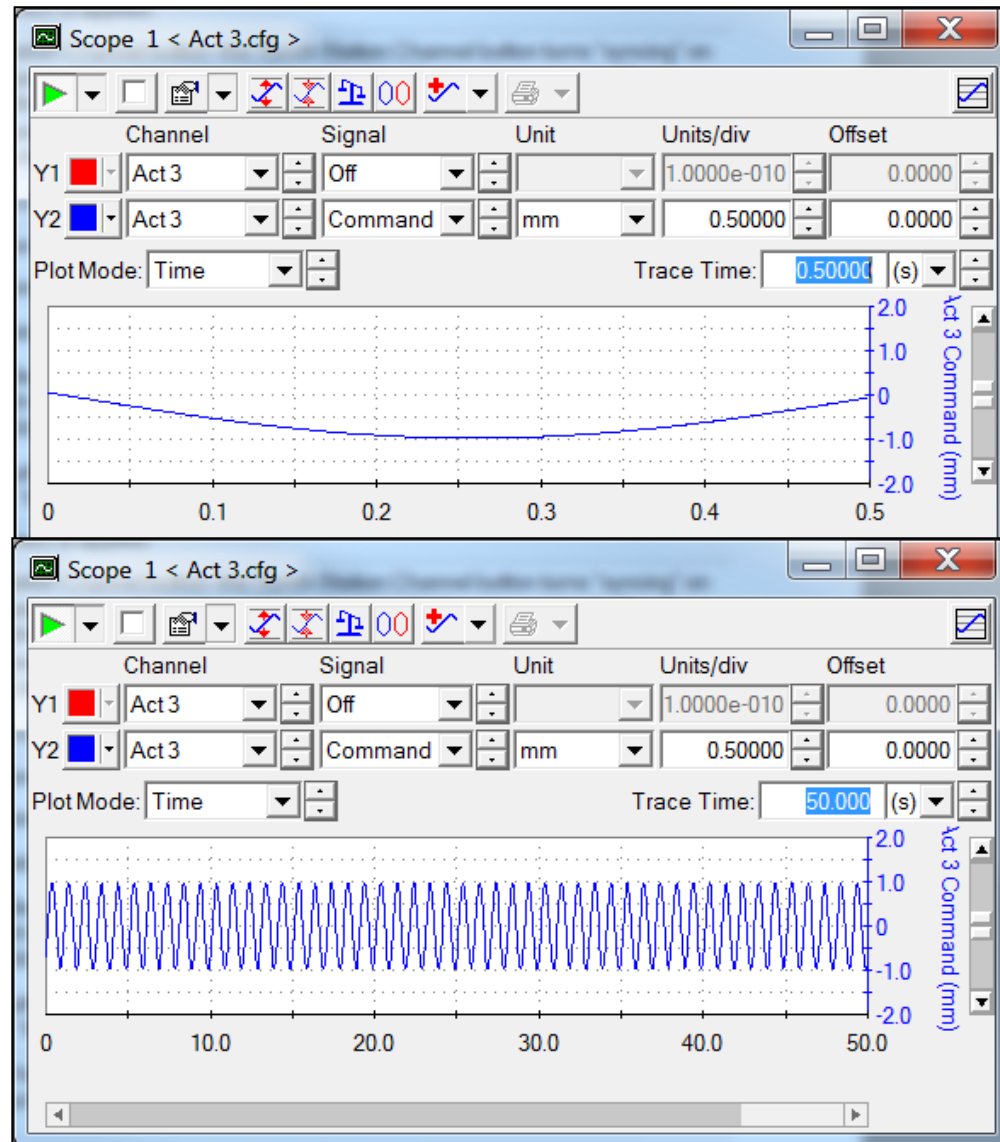» Trace Time set for 5 s for this example. This can be adjusted to suit your needs depending on what you want to see.
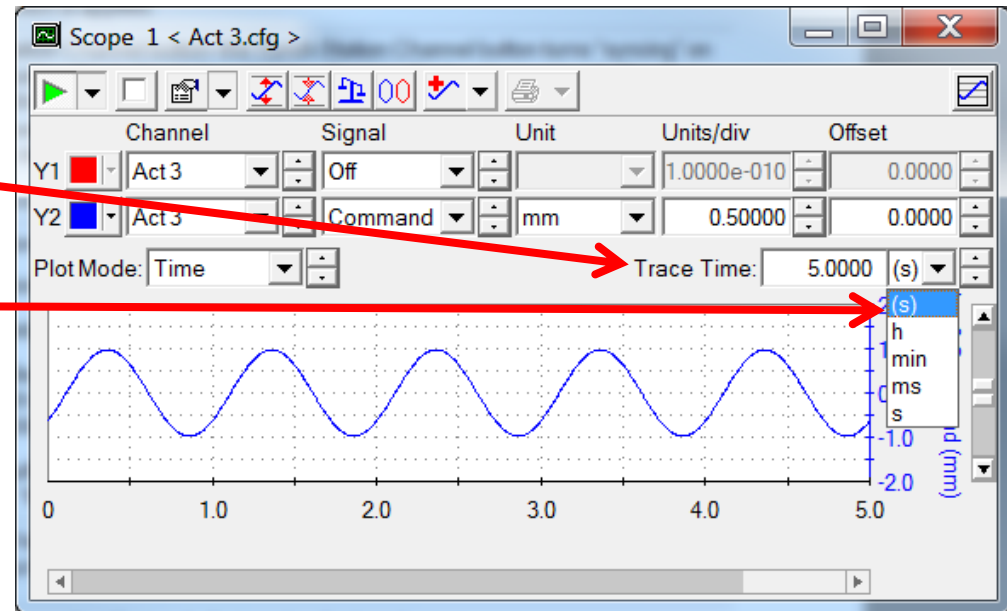
Scopes

» Running a 1 mm sine wave at 1 Hz. for these scope examples.

» For comparison, trace time is 0.5 s. ➝

» Depending on what you want to see in the scope, the Trace Time can be adjusted to change how much of the trace you see.

» For comparison, trace time is 50 s. ➝

Moving the actuator

» 2 common service activities are to either manually move the actuator to one end or the other or to run a sine or square wave cyclic program.

» To manually move the actuator to a new position open the manual command window and ensure displacement control is selected.

» Then enter a new command in the manual command window. This can be done by using the slider, using the arrow keys at the ends of the slider, or directly typing in a value.
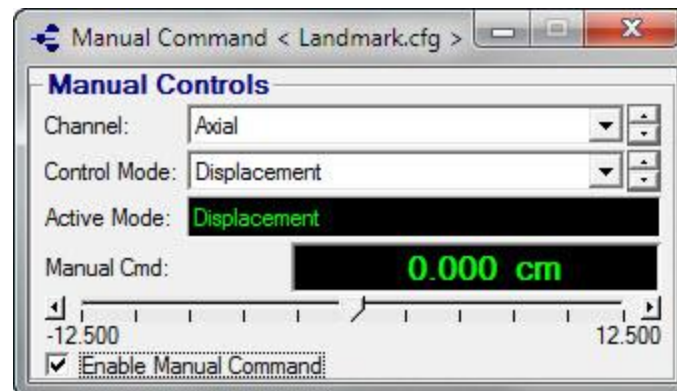
Running a cyclic program

» To run a cyclic program you need to enter the target setpoint and amplitude into the function generator window.

» Setpoint = Mean of signal

(Peak + Valley) / 2

» Amplitude = Amount dynamic program goes above and below mean

(Peak – Valley) / 2
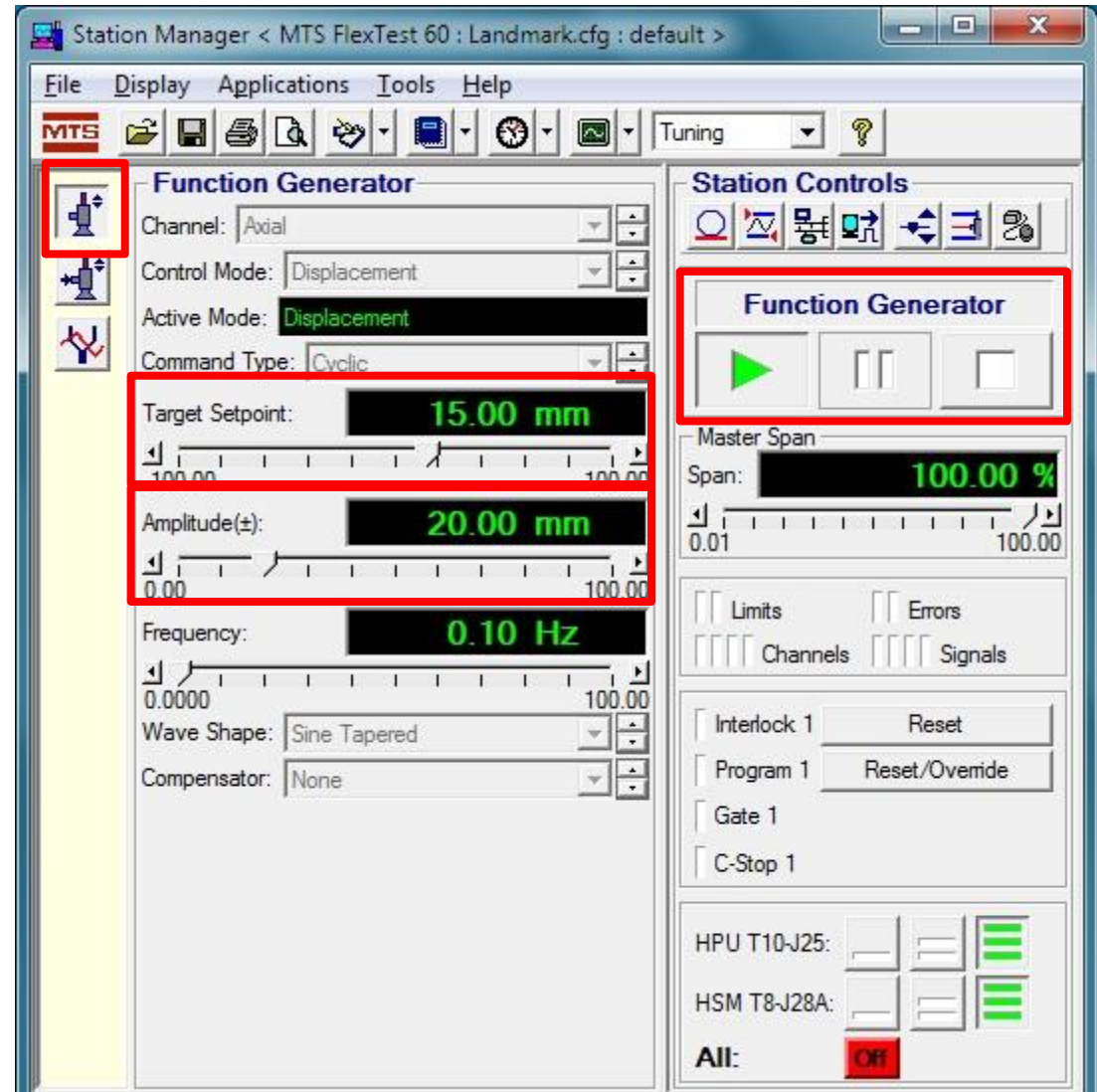
Cyclic Program

» The values displayed in the function generator on the previous page will generate a peak of +35mm and valley of -5mm

» Setpoint = (Peak + Valley) / 2
   (+35mm + (-5mm)) / 2
   +30mm / 2
   Setpoint = +15mm

» Amplitude = (Peak – Valley) / 2
   (+35mm –(-5mm)) /2
   40mm / 2
   Amplitude = 20mm
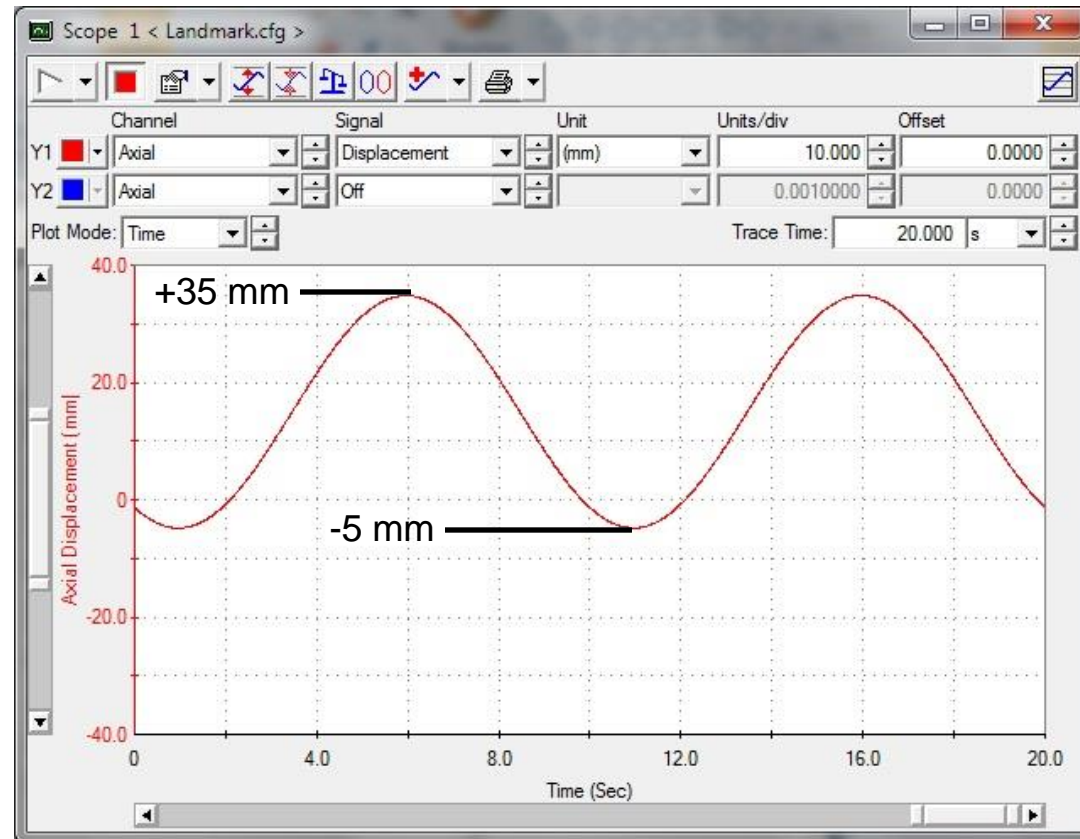
Passwords

» There are 4 levels of access. Each higher level adds additional privileges. To change access level select the desired level and enter the password.

- Operator
- Tuning
- Calibration
- Configuration

» Passwords are case sensitive. The default passwords begin with an upper case and match the access level:

- Operator = No password required
- Tuning = Tuning
- Calibration = Calibration
- Configuration = Configuration
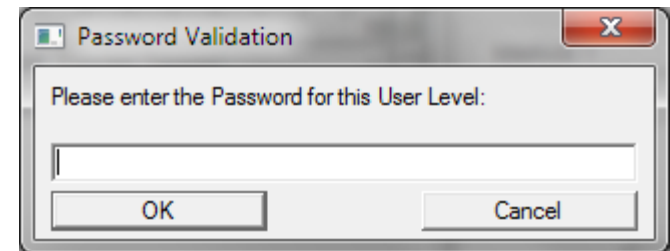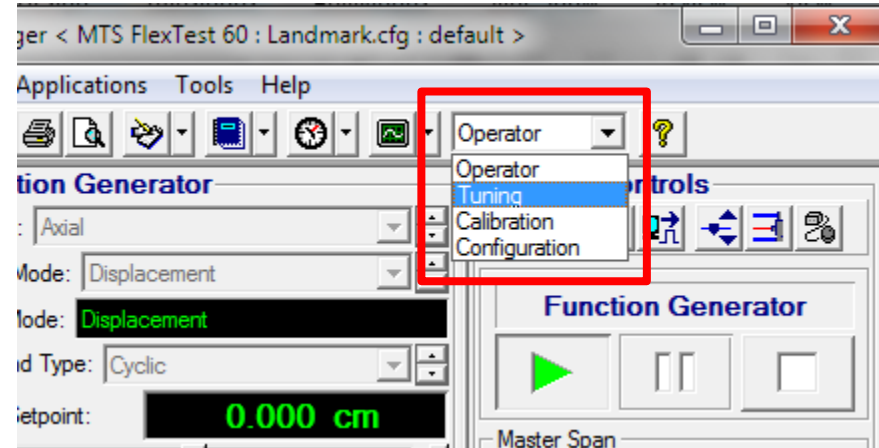
Station Setup

» All Configuration of the station is performed using the station setup window

1/14/2019

Station Setup

» Station setup is divided into 3 panes and works by selecting from left to right
  - Far left pane is where you select the signal to work with
  - The center pane is where you select the type of function to perform
  - The right pane is where the adjustment is made

Select Signal

Select Function

Adjust

Station Setup Functions

» Channel Input Signals
  - Sensor Calibration
  - Limits
» Channel Drive
  - Valve Balance
  - Dither
» Channel Tuning
  - P, I, D
» Channel Compensators

Station Setup 1 < Landmark.cfg >

- Channels
  - Axial
    - Displacement
    - Force
    - Inputs
- Readouts
- Auxiliary Inputs
- Station Signals
- Digital Inputs/Outputs
- Detectors
- Calculations
- State Machines
- Remote Setpoints
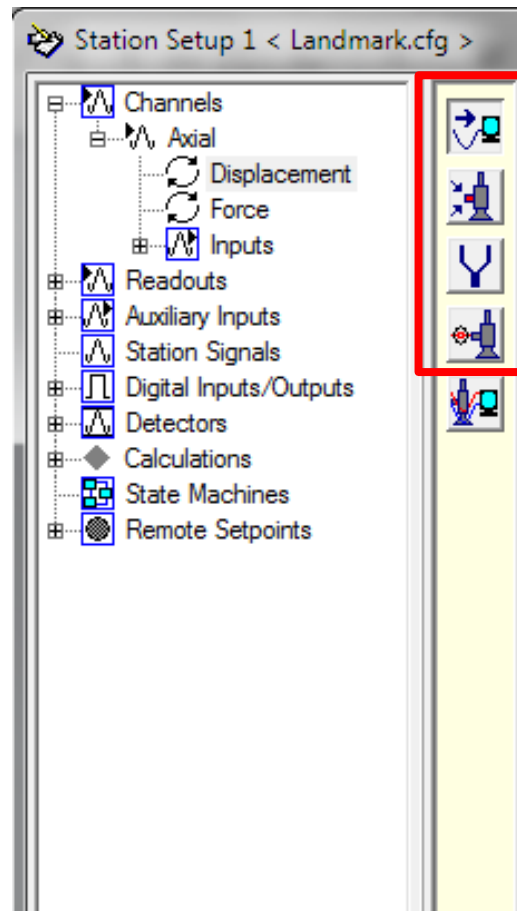
Inputs
Drive
Tuning
Compensators

Valve Adjustments

» The servovalve adjustments are located on the channel drive page in station setup.

» Additional details on how to perform servovalve adjustments will be discussed in future training.

Tuning Adjustments

» Tuning adjustments are found on the Tuning pane

» Tuning an actuator will be thoroughly discussed in future training.
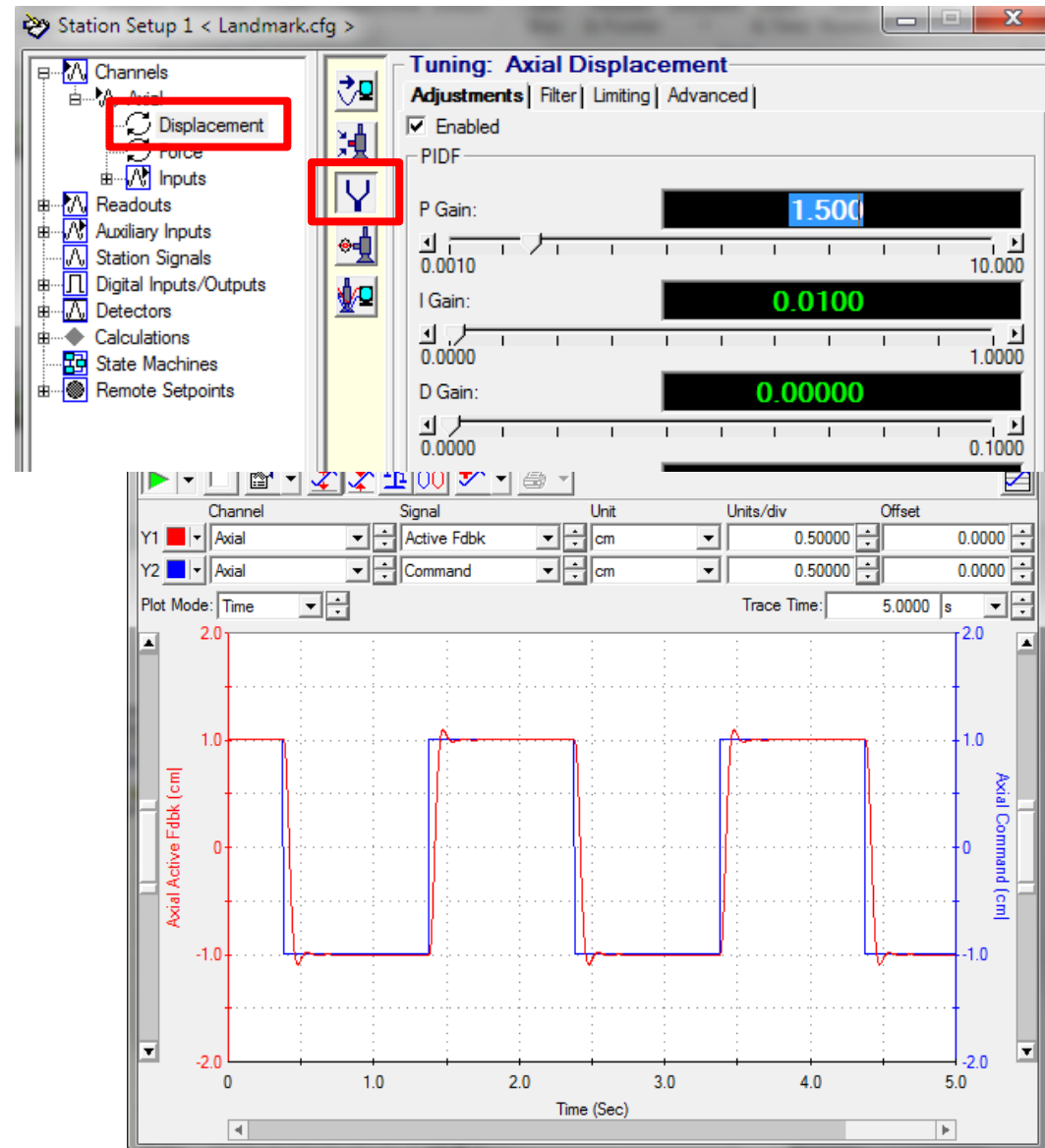
Additional details

» Specific procedures and additional software details will be discussed in future training.