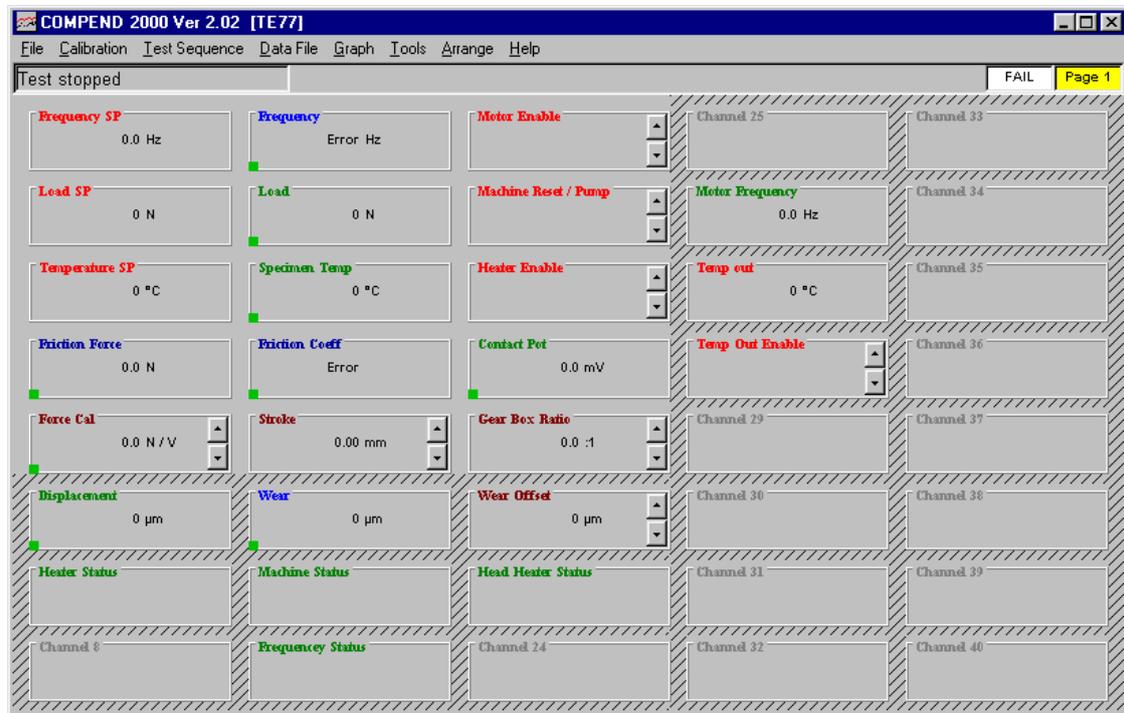


Editing the Setup File

The loaded Setup File is edited by selecting the **Edit Setup** item in the **File** menu of the COMPEND window. This permits editing of each box on the screen:



A single screen or Page contains up to 40 boxes and there are 6 Pages of display (giving a total of 240 boxes). The current Page Number is shown in the top right hand corner. The page Number may be increased with a right click of the mouse or pressing Page Up on the keyboard. The Page Number may be reduced by a left click of the mouse or by pressing Page Down on the keyboard. Home will return to Page 1 and End to Page 6.

A popup menu can be displayed for each individual box by positioning the mouse pointer on its title and then right clicking.

The number of boxes displayed on the screen defines the size of the boxes. The minimum is one box and the maximum is 40. Selecting **Set As Last Visible Box** in the popup menu sets the last visible box.

There are 40 box positions and the configuration of each box is set individually by selecting **Properties** in the popup menu.

Box configurations may be moved to a new position by left clicking on the box Title and then dragging and dropping onto a new position.

Box configurations may be copied to a new position selecting **Copy** in the popup menu. At the new position, select **Paste**. This method must be used if the box configuration is to be copied to another Page. A copy may also be made to a box position on the same Page by holding the Ctrl key (control key on the keyboard) and left clicking on the box Title then dragging and dropping.

To reset the entire configuration of a box (clear the settings), in **Properties** remove the **Check** from the **In Use** box of the **General** tab.

Property Tabs

The number of active **Property** tabs will vary according to the type of parameter connected to that box (Analogue Output, Analogue Input, Digital Output, Digital Input, Manual or Derived channel).

General Tab

In each case the **General** tab contains the Description (the box Title, describing the parameter), Units (actual calibrated engineering units for that parameter), number of decimal places, smoothing (a simple filter where 10 = 1 second smoothing period) and colour. The standard Phoenix Tribology notation has the following colour scheme:

Analogue Outputs are RED

Digital Outputs are RED

Analogue Inputs are GREEN

Digital Inputs are GREEN

Manual Channels are BROWN

Derived Channels are BLUE



There are two Check Boxes. One defines whether the box is **In Use** and if this is NOT checked, the box will be reset with no properties on clicking **Ok**. The other defines whether that Parameter is going to be recorded in a Data File. Check the **Data Enabled** box to ensure that this parameter is being recorded. Once a channel has been selected for data collection a green square is displayed in lower left hand corner of its corresponding box.

Connection Tab

The parameter type is defined in its **Connection** tab. For Phoenix Tribology single SUPERSLIM applications, the connection Group List contains MANUAL, DERIVED or SLIM 1. For multiple SUPERSLIM applications SLIM 2, 3 and 4 will be connected as appropriate.

A **MANUAL** Channel has no connection to the interface hardware; there are three types:

MANUAL CHAN Manual Channels (total 16 available): these are simple manual inputs for keyboard data entry to display manual values. They can be used in calculation expressions in Derived Channels.

ANALOGUE O/P Analogue Outputs (total 8 available): these are the same as Manual Channels except that they automatically appear in Test Sequence Files and therefore can be used to prompt an operator to ensure that manual settings or actions are correct.

DIGITAL O/P Digital Output (total 8 available): these again appear in the Test Sequence File, but only have two states: ON or OFF. These can be used, for example, to instruct a machine operator to make a change to a switch setting.

A **DERIVED** Channel takes other parameters and performs a mathematical operation on them. A derived value may also be fed to an output to give complex set-point operation. There are a total of 16 Derived Channels available.

For a **SLIM** unit the connection options are:

| | |
|--------|---|
| ANOUT | Analogue Output (total 4 per SUPERSLIM): linking to the 12 bit resolution configurable voltage or current outputs each with PID control option. |
| TACHO | Pulse Counting Input or Tachometer (total 2 per SLIM): linking to the 16 bit resolution opto-isolated, 60 ppr counter inputs. |
| ANIN | Analogue Input (total 8 per SLIM): linking to the 12 bit resolution configurable voltage or current inputs. |
| DIGOUT | Digital Output (relay switching, total 4 per SLIM): linking to the board-mounted clean-contact changeover relays. |
| DIGIN | Digital Input (switch sensing, total 4 per SLIM): linking to the opto-isolated dc or ac (240 V) rated digital inputs. |

Connections will be machine specific and pre-set for the equipment when delivered. In general, editing of parameters will be confined to the creation of new DERIVED channels based on existing MANUAL or ANALOGUE inputs.

The Group List and Channel List may be browsed and any new selections made (in all groups) will be held during the browse.

Final selection is made by clicking **Apply**. This will establish the connection currently highlighted and visible, the appropriate **Property Tab(s)** will then be enabled and the **Ok** button will be enabled.

Clicking **Restore** at any time will re-establish the original connection current when the box edit was started.

Calibration Tab

The calibration is defined in the **Calibration** tab.

Refer to the Calibration Section in the machine Manual for information on the editing of the system calibrations.

To check the calibration of an input channel the following steps are carried out.

Press **Edit Setup** in the **File** menu to enter set up mode. Right click on the desired channel box to display the popup menu and then right click to select **Bypass Calibration**. Then exit set up mode by pressing on Edit Setup in the File Menu.

Now apply to the sensor low and high mechanical values at either end of the required sensor range and note the corresponding bit number in the sensor box - these will be the Bits Low and Bits High for the corresponding mechanical units Low and High.

Return to the set up mode by pressing Edit Setup on the File Menu. For the channel Box, right click to unselect Bypass Calibration. Then right click and select Properties. Click on the Calibration Tab and enter the Units Low and Units High, Bits Low and Bits High as just measured. Press **Ok**. Exit the set up mode and save the new calibration by selecting Save Setup from the File Menu.

Analogue Output Tab

The value entered in the **Default Value** tab will be automatically set when starting COMPEND and also at the end of a test sequence. The **Increment** value is used to increase or decrease the output channel by the required value when controlling the machine manually using the up or down arrow displayed on the side of each output. If the Increment value is zero then the up and down arrows are not displayed on the side of the box.

Analogue Outputs (machine control set-points) can use closed-loop PID control and for this the **PID Enable** box is checked and relevant PID terms, Feedback Channel (**F-Back Connection**), **Cycle Time** and maximum power (**Max Power**) are set.

On Phoenix Tribology machines, the system is tuned during test and the PID terms entered in this tab. In certain cases, the **Max Power** setting may need to be adjusted, especially when heating is being carried out near to the maximum system capacity. Other connections are not routinely changed.

The **Manual Adjust** check box defines whether the selected parameter can be adjusted manually when running a Test Sequence File. If this box is NOT checked, the parameter will only be altered by the Test Sequence.

For the highest level of safety in running an unattended test, the **Manual Adjust** box should NOT be checked.

The **Re-Transmit Only** checkbox can be used to retransmit any analogue inputs, manual or derived channel to an analogue output.

Digital In/Out Tab

This is used to define the **Off State Text** and the **On State Text** to be displayed in the COMPEND box. The **Default State** can also be selected (the state when no test is running). 0 = OFF and 1 = ON.

When the digital output is set to its On state, either manually using the arrows on the side of the box or by test sequence, if the **Momentary Action** box is ticked, the digital output will only stay in its On state for a second, before returning to its Off state.

As for the analogue outputs the **Manual Adjust** check box defines whether this parameter can be manually adjusted in the COMPEND window while running a Test Sequence File. If this box is NOT checked, the parameter will only be altered by the Test Sequence.

The **Reverse Button Action** check box enables the user to reverse the action of the up down arrows on the main screen for individual channels.

Default Alarms Tab

Analogue Inputs and Derived Channels have a **Default Alarms** tab. These are the "global" protection alarm levels for the machine. Alarms can be adjusted relative to these default values in the Test Sequence File on a step-by-step basis as required. There are four alarm settings:

Low Stop

If the current value of a channel falls below the value set here then any test in progress will be terminated automatically. The level is in the engineering units of the channel. The shutdown is accompanied by a red display panel at the top of the Control Panel Window with the name of the channel that fell below the alarm level and the last data value for this channel.

The stop action is subject to the alarms being enabled (see **Test Control Panel, Alarms, Alarms Disable**) and the alarm being specified correctly in the Test Sequence File. The alarm is disconnected by writing "off" or "OFF" instead of a value.

Low Warn

If the current value of a channel falls below the value set here then a warning panel will be displayed at the top of the Control Panel window. The warning will say that the data on the channel in question has fallen below the value entered here. The channel name is also given. The level is in the engineering units of the channel.

The warning is subject to the alarms being enabled (see **Test Control Panel, Alarms, Alarms Disable**) and the alarm being specified correctly in the Test Sequence File. The alarm is disconnected by writing "off" or "OFF" instead of a value.

High Warn

If the current value of a channel exceeds the value set here then a warning panel will be displayed at the top of the Control Panel Window. The warning will say that the data on the channel in question has risen above the value entered here. The channel name is also given. The level is in the engineering units of the channel.

The warning is subject to the alarms being enabled (see **Test Control Panel, Alarms, Alarms Disable**) and the alarm being specified correctly in the Test Sequence File. The alarm is disconnected by writing "off" or "OFF" instead of a value.

High Stop

If the current value of a channel exceeds the value set here then any test in progress will be terminated automatically. The level is in the engineering units of the channel. The shutdown is accompanied by a red display panel at the top of the Control Panel Window with the name of the channel that rose above the alarm level and the last data value for this channel.

The stop action is subject to the alarms being enabled (see **Test Control Panel, Alarms, Alarms Disable**) and the alarm being specified correctly in the Test Sequence File. The alarm is disconnected by writing "off" or "OFF" instead of a value.

Manual Channel Tab

Manual Channels are for parameters that are manually input (from the keyboard in the case of Manual Channels, from the Test Sequence File in the case of Manual - Analogue O/P and Manual - Digital O/P).

A manual parameter may be incremented by press of a button on the COMPEND display box and **Increment** defines the step of this increment.

Default Value is the value displayed in the Manual Channel box when the Setup File is first loaded. If the number entered here is less than the **Minimum Value** or greater than the **Maximum Value**, a warning box is displayed.

Setting the **Default Value** of the Manual Channel can be used for the most frequently used value for the system.

Where an operator has to be prompted to set a manual value as part of a test program, use connection to the MANUAL - ANALOGUE OUTPUTS. These will appear in the Test Sequence File, so that the test specific manual setting becomes part of the test to be run. For instance the test can be Paused until the operator has set the manual value and then restarted by pressing Resume.

There are no alarms for Manual Channels, but **Minimum Value** and **Maximum Value** limits can be set, preventing the user from entering an erroneous number in the Default Value box or the Main Control Panel box.

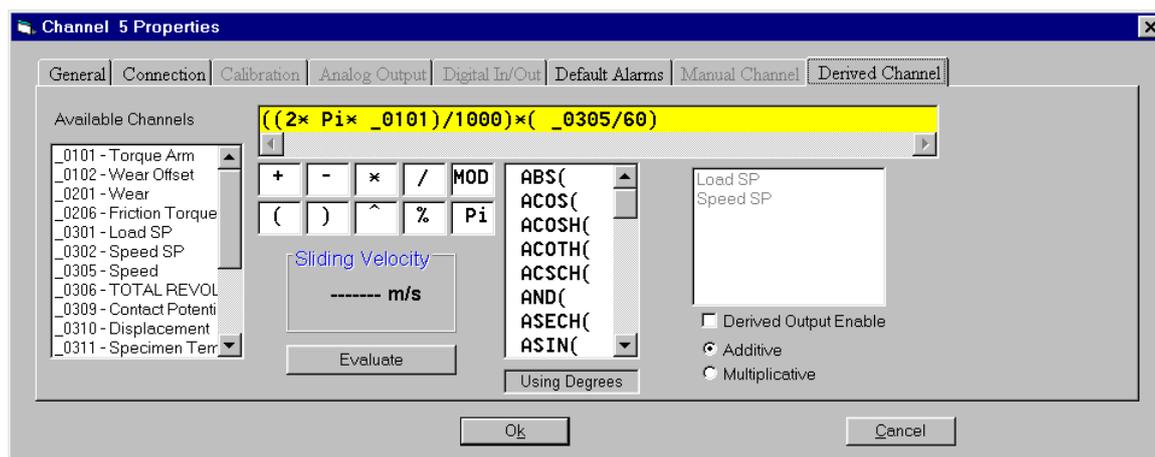
Where the **Default Value** exceeds the limits, a warning box is displayed.

Where an erroneous value is entered on the Main Control Panel, no warning is given, but the entered value will not exceed the **Maximum Value** or be less than the **Minimum Value** set here in the **Manual Tab**.

Derived Channel Tab

Derived Channels take other parameters and perform an operation on them. The derived value may also be fed to an output to give complex set-point operation.

In the **Derived Channel** tab there is a yellow area, which is the "calculation"



expression. The other fields are used to construct the calculation.

Available Channels is a list of the currently configured and defined parameters or channels in the current Setup File. Double click on a channel to enter it into the expression window.

Included in this list are four **Timers**, which are used for generating waveforms such as sine, triangular and saw tooth. These can be applied to an Analogue Output on an additive or multiplicative basis, thus creating non-steady state set-points.

By having the frequency and amplitude of these waveforms as Manual Channels, the waveform can be manipulated in the Test Sequence File or manually from the main COMPEND control panel.

To use the mathematical and trigonometric operators double click on the operator. Trigonometric operators are based on degrees not radians.

To enable a **Derived Output**, Check the **Derived Output Enable** box and select the relevant output to which the calculation expression applies. The number generated by the calculation may be added that Output or multiply that Output by checking the relevant box.

The calculation may be checked (based on current data being read by the interface) by pressing **Evaluate**.