

Precise DIGITAL CONTROLLER

Troubleshooting Guide



ADMET, Inc.
51 Morgan Drive, Norwood, MA 02062
Tel:(781) 769-0850 Fax:(781) 769-0884
sales@admet.com www.ADMET.com

For a Total Solution to all of your Materials Testing Needs

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7.0 Precise Troubleshooting

7.1 Analysis Problems (Modulus/Yield)

Analysis (Modulus/Yield) Problems		
Problem Description	Possible Cause	ACTION
Offset Yield Result is 0 or N/A.	Data logging threshold not set properly	Ensure that the data logging threshold is set to an appropriate value: it should be above any type of "foot" in the stress strain curve.
	Automatic algorithm for modulus calculation not appropriate for test data	Use Manually Select Points for Modulus feature to ensure that the data points being used for the modulus calculation are in the linear elastic portion of the test curve.
	Insufficient strain data collected	Ensure that enough strain data is being collected so that the stress/strain data point that is being specified by the offset percentage is included in the test data.
Autofreeze is triggering Prematurely	Data logging threshold not set properly	Ensure that the data logging threshold is set to an appropriate value: it should be above any type of "foot" in the stress strain curve.
	Automatic algorithm for modulus calculation not appropriate for test data	Use the Manually Select Points for Modulus feature to ensure that the data points being used for the modulus calculation are in the linear elastic portion of the test curve.
	Autofreeze Threshold not set to proper value	Ensure that the Autofreeze threshold is set to a higher value than the data logging threshold. If it is and you are still having a problem you can raise the auto freeze threshold to be closer to the yield point of the stress strain curve.
	Insufficient strain data collected	Add an extra strain based analysis at a higher offset than your desired value to force test to collect additional strain data. For example if your desired analysis is .2% yield offset add a .5% offset EUL analysis to the setup. This will provide safety factor in collecting enough strain data for the .2% offset yield. EUL (elongation under load) is preferable to Offset Yield for this purpose as it draws a vertical line from the strain axis to intercept the stress curve and is not dependent on the slope of the modulus line.
Modulus Calculation is wrong	Data logging threshold not set properly	Ensure that the data logging threshold is set to an appropriate value: it should be above any type of "foot" in stress strain curve.
	Automatic algorithm for modulus calculation not appropriate for test data	Use the Manually Select Points for Modulus feature to ensure that the data points being used for the modulus calculation are in the linear elastic portion of the test curve.
	Incorrect value for gage length entered.	Ensure that the correct gage length value is entered.

Analysis (Modulus/Yield) Problems cont'd.		
Problem Description	Possible Cause	ACTION
Test Ends Early with no Errors.	Sample Break and/or Threshold are not set properly	Ensure that the data logging threshold and the sample break% are set to values appropriate for your test. Threshold is where data logging begins. Once the threshold is crossed the software is looking for the load to drop to a percentage of peak as specified in sample break%. An insignificant drop in load at the beginning of a test can trigger the end of the test if the threshold is set to low.
	Data logging rate not set properly	Ensure that the data-logging rate is appropriate for the test length. The default data logging rate is 30Hz, which allows for 299 seconds of data logging. If your test is taking longer than 299 seconds you will need to lower the data logging rate.
No data is logged	Data logging threshold not set properly	Ensure that the data-logging threshold is set to an appropriate value. Data logging begins at Threshold. If, for example, the threshold is set to a value higher than the expected peak load for a particular sample, then no data will be logged for the test.

7.2 Load AND/OR Strain Reading Problems

Load (transducer) reading wrong		
Problem Description	Possible Causes	ACTION
A/D Saturation Error	Bad transducer and/or cable OR Failed analog channel	<p>If possible swap transducers on the Precise. For example if the instability is in the load channel, switch the extensometer and load cables at the back of the Precise so that the extensometer is now connected to the load channel and the load transducer is connected to the strain channel. If the instability stays with the load channel then it is likely that there is a hardware failure and the Precise needs to be returned to ADMET. If the instability moves to the strain channel then most likely the problem is with the load transducer and/or cable.</p> <p>Disconnect the transducer from the channel that has the A/D saturation error. If the saturation goes away (fluctuation normal with no transducer connected but not saturation) then the problem lies with the transducer and/or the cable.</p>

Load (transducer) reading wrong, cont'd.		
Problem Description	Possible Causes	ACTION
Load or Strain reading is incorrect	Incorrect calibration selected in procedure	Ensure that the correct transducer calibration is selected in the procedure.
	Bad Calibration	Ensure that the calibration for the transducer in question is good. You can print the calibration either to WinCom or to an HP printer to review. The relationship between A/D counts and engineering unit values should be linear and there should be no duplicate points. First point in calibration MUST have engineering unit value of zero. (eg 0 lbs)
	Bad transducer and/or transducer cable OR Failed analog channel	Check the A/D counts for the channel. Select Chk Transducer from the Utilities menu. The typical A/D count span from zero to full scale of the transducer should be between 12,000 to 28,000. If there is little or no span with the transducer in question connected, try swapping a known good transducer and cable to the channel in question. If little to no span stays with the transducer/cable then the problem is with the transducer/cable. If little to no span stays with analog channel then problem is likely with hardware and unit may need repair. If you do not have known good transducer and cable to perform this test then test could be done with voltage simulator with mv/V output.
Load or Strain reading is unstable	Incorrect calibration selected in procedure	Ensure that the correct transducer calibration is selected in the procedure.
	Bad Calibration	Ensure that the calibration for the transducer in question is good. You can print the calibration either to WinCom or to an HP printer to review. The relationship between A/D counts and engineering unit values should be linear and there should be no duplicate points. The first point in the calibration MUST have engineering unit value of zero. (eg 0 lbs)
	Bad transducer and/or cable OR Failed analog channel	If possible swap transducers on the Precise. For example if the instability is in the load channel, switch the extensometer and load cables at the back of the Precise so that the extensometer is now connected to the load channel and the load transducer is connected to the strain channel. If the instability stays with the load channel then it is likely that there is a hardware failure and the Precise needs to be returned to ADMET. If the instability moves to the strain channel then most likely the problem is with the load transducer and/or cable.

7.3 Testing Machine Control Problems (Servo Control Systems Only)

Control Problem (Servo Control Systems Only)		
Problem Description	Possible Causes	ACTION
Test Ending Early	Threshold and/or Sample Break% not set to values appropriate for your test	Ensure that the data logging threshold and the sample break% in the SET UP menu are set to values appropriate for your test. Threshold is where data logging begins. Once the threshold is crossed the software is looking for the load to drop to a percentage of the peak load as specified in sample break%. An insignificant drop in load at the beginning of a test can trigger the end of the test if the threshold is set to low.
	Servo Profile not set properly	Ensure that the programmed test control profile is correct for what you want to do. The machine will stop when it reaches the programmed end point in any particular step and the test will end if there are not subsequent steps in the profile.
	Load Range value	Ensure that the Load Range value in Utilities menu is set to an appropriate value for the test. The purpose of this parameter is to limit loading to value less than the capacity of the machine for non destructive test (do not break sample). If you are testing samples to break then set the Load Range value to the full-scale value of the load transducer being used.
Machine not controlling at requested rate	Machine not tuned in requested control channel	Ensure that the machine has been tuned in the requested control channel.
	Incorrect test procedure selected	Ensure that the test procedure being used has the proper PID gains. NOTE that the PID tuning gains are specific to each Test Procedure.
	Incorrect Gear is selected	Ensure that the correct gear is selected. In hydraulic and single gear electromechanical machines only the Low Gear settings are used. In electromechanical machines with multiple gears, the gear selection in the software must match the gear the machine is currently in.
Machine not stopping at requested endpoint	Machine not tuned in requested control channel	Ensure that the machine has been tuned in the requested control channel.
	Programmed control rate and/or end amount not practical for test machine and/or test specimen	Ensure that your programmed Control Rate and End Amount are practical for the machine and test sample. For example: programming a machine to move at a very fast position rate to an end point of 5lbs on a machine with a load capacity of 25,000lbs. 5lbs is in the noise area relative to the full-scale capacity of 25,000lbs so you will not be able to control to 5lbs.

Control Problem (Servo Control Systems Only), cont'd.		
Problem Description	Possible Causes	ACTION
Machine not moving	Machine not tuned in requested control channel	Ensure that the machine has been tuned in the requested control channel.
	Incorrect test procedure	Ensure that the test procedure being used has the proper PID gains. NOTE that the PID tuning gains are specific to each Test Procedure.
	Incorrect gear selected	Ensure that the correct gear is selected. In hydraulic and single gear electromechanical machines only the Low Gear settings are used. In electromechanical machines with multiple gears, the gear selection in the software must match the gear the machine is currently in.
	Position tuning gain and/or calibration is incorrect	Ensure that the position channel calibration and tuning gains are correct. If the position channel tuning gain has been overwritten with the default value then the machine may not move at all.
Machine Moving in Wrong Direction	Incorrect load cell calibration selected in test procedure	Ensure that the correct load calibration is selected for the procedure. Ensure that the load cell calibration was setup with the proper value for calibration direction, positive or negative. The proper setting depends on the type of testing machine. On ADMET universal testing machines the tension direction is Positive and the compression direction is Negative.