

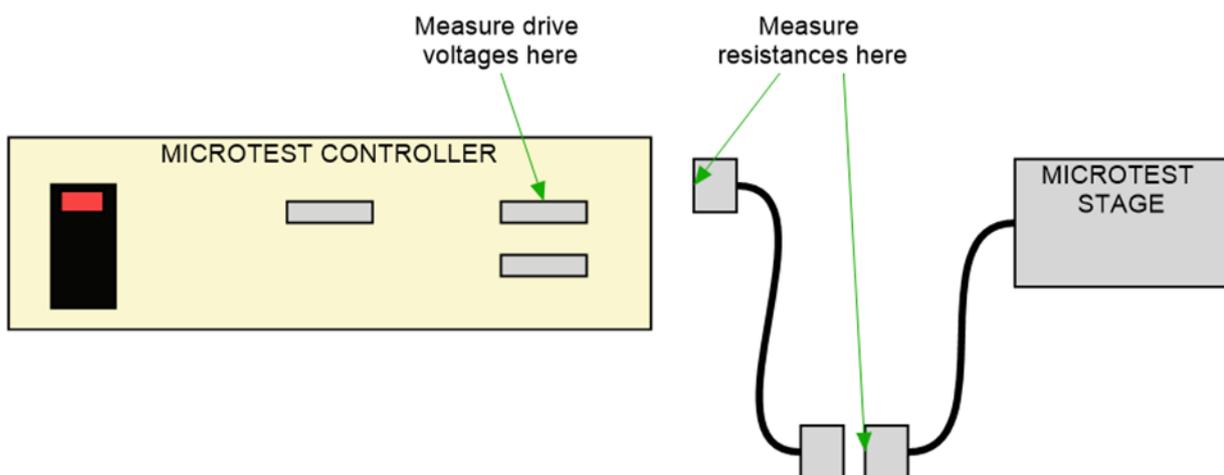
MICROTEST FAULT FINDING—LOADCELL

READING ‘UNDERRANGE’ OR ‘OVERRANGE’

There are a number of reasons why the loadcell can read underrange or overrange:

1. The loadcell zero offset has not been set correctly. Please refer to the user manual for details of how to set this.
2. Another possible cause is the 15 way D type not being fully connected to the rear of the electronics chassis. It is important that the connector is pushed in fully and that the screw locks are done up tightly.
3. Please make sure that the 6 way metal connector that is fitted to the wire that comes directly from the loadcell is also fully connected.
4. Check all power supply voltages inside the chassis. A missing +/-15V rail could cause these symptoms.
5. The problem could be due to a broken wire, a faulty loadcell, or faulty electronics. The first test is to plug the Microtest stage directly into the electronics chassis therefore bypassing the black extension cable and any feed-throughs. If the system now works then we know that the fault lies in one of these two parts and the fault can then be tracked down further.

If the system still does not work with the stage connected directly to the electronics then a multimeter can be used take some measurements.



LOADCELL MEASUREMENTS

This section applies to the following systems:

- 300N tensile
- 300N vertical bending
- 1KN single leadscrew
- 2KN single leadscrew
- 2KN vertical bending
- 5KN single leadscrew (not EBSD or Heating/Cooling stages)

Take these measurements on the 15 way D connector on the Microtest stage. The stage should be disconnected from the electronics chassis.

+VE probe	-VE probe	Reading	Units
1	2	260	Ω
1	9	260	Ω
1	10	350	Ω
2	9	350	Ω
2	10	260	Ω
9	10	260	Ω

If any of these measurements are not the same as the table above (+/-10%) then either the loadcell is faulty or a cable is broken.

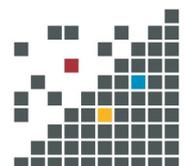
Take these measurements on the 15 way D connector on the Microtest electronics chassis. The chassis should be switched on, and the Microtest stage should be disconnected.

+VE probe	-VE probe	Reading	Units
1	10	3.5 – 4.5	V
1	15	See notes below	V
10	15	See notes below	V

If this measurement is not the same as the table above then the electronics may be damaged.

The voltages shown in lines 2 & 3 should be exactly half the voltage measured in line 1, and of opposite polarity to each other. So, if the voltage between pins 1 and 10 is 4.30V, then the voltage on pin 1 with respect to pin 15 should be +2.15V and the voltage on pin 10 with respect to pin 15 should be -2.15V. These two voltages should be balanced +/- 100mV.

Another test that can be performed is to connect the Microtest stage to the electronics, power on, and measure the loadcell output directly on the pins of the connector. The loadcell output is present on pins 2 and 9 of the connector. With no force applied, the voltage across these pins should be <10mV. If it is much more than this then the loadcell or loadcell cable may be damaged. Typically a value of 10mV-1V means that the loadcell may be bent, and a value of over 1V would indicate either a disconnected wire or a catastrophic failure of the loadcell.



This section applies to the following systems:

- 200N tensile
- 2KN/5KN dual leadscrew
- Tomography stages

Take these measurements on the 15 way D connector on the Microtest stage. The stage should be disconnected from the electronics chassis.

+VE probe	-VE probe	Reading	Units
1	2	810	Ω
1	9	810	Ω
1	10	1.4	k Ω
2	9	460	Ω
2	10	810	Ω
9	10	810	Ω

Take these measurements on the 15 way D connector on the Microtest electronics chassis. The chassis should be switched on, and the Microtest stage should be disconnected.

+VE probe	-VE probe	Reading	Units
1	10	10.0V	V
1	15	5.0V	V
10	15	-5.0V	V

If this measurement is not the same as the table above then the electronics may be damaged.

Another test that can be performed is to connect the Microtest stage to the electronics, power on, and measure the loadcell output directly on the pins of the connector. The loadcell output is present on pins 2 and 9 of the connector. With no force applied, the voltage across these pins should be <10mV. If it is much more than this then the loadcell or loadcell cable may be damaged. Typically a value of 10mV-1V means that the loadcell may be bent, and a value of over 1V would indicate either a disconnected wire or a catastrophic failure of the loadcell.

