FUTEK IPM500 / IBT500 DISPLAY SOFTWARE USER GUIDE (VERSION 2.0)

BENCH TOP DISPLAY
IBT500 (D500)

PANEL MOUNT DISPLAY
IPM500 (D500)

TEDS 1451.4 1001001 1001001...

FUTEK TEDS SENSOR *(SAMPLES)*

PANCAKE LOAD CELL
LCF455 (L2901)

ENDURANCE TESTING LOAD CELL
LCB500 (L2930)

S-BEAM JR. LOAD CELL
LSB200 (L2357)
(100g - 100 lb
w/ 1000% OVERLOAD PROTECTION)

T&C LOAD CELL
LCM300 (L1650)

LOAD BUTTON
LLB200 SERIES
(L1610 SERIES)

SQUARE DRIVE TO FLANGE TORQUE SENSOR
TDF SERIES

FLANGE TO FLANGE TORQUE SENSOR
TFF SERIES

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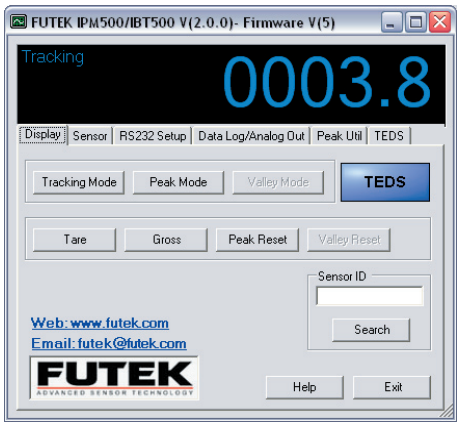
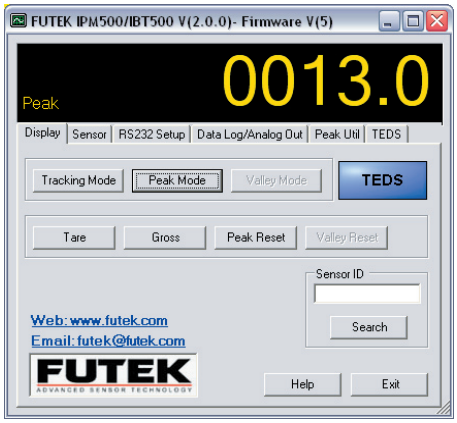
DISPLAY TAB FUNCTIONS



Tracking Mode (Blue)- Continuous readings from the display are shown on the screen.

Peak Mode (Yellow)- This function allows a peak (high) reading to be displayed on the screen. The peak reading will only change if a reading greater then the current reading is registered.



Valley Mode (Yellow)- This function allows a valley (low) reading to be displayed on the screen. The valley reading will only change if a reading smaller then the current reading is registered. This feature is useful when monitoring clockwise and counter clockwise torque values or tension and compression load values.

Note: Valley Mode and Valley Reset buttons will become active if the display has the peak and valley option, which became standard with FUTEK displays after September 2005.

TEDS (IEEE1451.4) Indicator- (Available when TEDS option card is installed)
When the TEDS icon is dark blue this means there is not a TEDS compliant sensor connected to the display and may require manual entry of the data to set up the display and sensor.

When the icon is light blue then a TEDS sensor is connected. If all data parameters are entered in the TEDS chip correctly it will automatically upload the sensor data to the display. This eliminates manual entry mistakes.

Tare- Allows you to zero or null out any existing preloads or zero readings in the display.

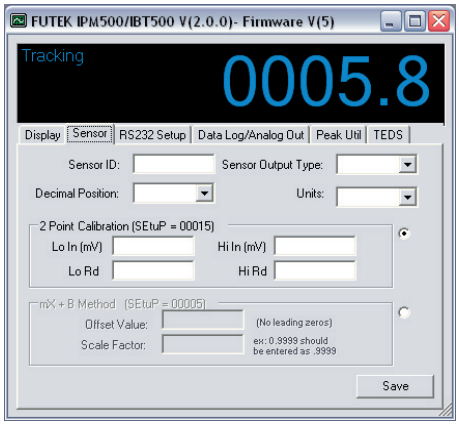
Gross- Shows the actual value of the display including the true zero reading.

Peak Reset- Allows the Max Peak value to be reset back to zero so further peak values can be observed.

Valley Reset- Allows the Max Valley value shown to be reset back to zero so further valley values can be observed.

Sensor ID- If the sensor is not equipped with the TEDS Chip feature, the data parameters can be saved per sensor identification number. This data is entered in using the Sensor tab. To recall the sensor data enter the Sensor ID number and press search. This will locate already saved parameters and load them into the display.

SENSOR TAB FUNCTIONS



This tab allows the user to enter in different Sensor configurations per Sensor ID. To retrieve and load the data refer to Display Tab Functions- Sensor ID (pg. 2).

To begin configuration of a new system enter in the following required information:

Sensor ID- Allows entry of Alphanumeric.

Sensor Output Type- Select the appropriate type from the drop down list.

Decimal Position- When selecting the decimal point value the max resolution of the display must be taken into account. Normal default resolution of the display is 20000 but should be verified by checking the jumper selection (Refer to the IPM500 manual, Section 17).

Units- Select the appropriate units from the drop down list.

Calibration Type

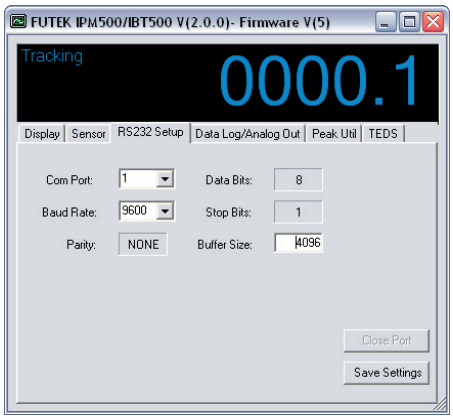
2 pt Calibration- This method requires that the Rated Output and the Maximum Capacity of the sensor be known. The user enters in the low input signal for Lo In (typically at zero load) and the corresponding minimum display reading for Lo Rd. Similarly, the high input signal (Rated Output in mV) is entered for Hi In and the corresponding maximum display reading (Maximum Capacity) for Hi Rd. The meter automatically calculates the scale factor (This requires the second number from the right in the SEtuP menu to be set to 000**1**5).

Scale Factor (mX+B)- This method requires that the Offset Value and Scale Factor be known. The sensor does not have to be connected to the meter in order to configure the meter. With this method the user will enter the Offset Value and Scale Factor and the meter will apply the scaling factors to the input signals in order to determine the corresponding displayed values (This requires the second number from the right in the SEtuP menu to be set to 000**0**5).

Press the Save button to save the new configuration.

(If display was supplied with system calibration then input the data from the calibration certificate)

RS232 SETUP FUNCTIONS



If parameters are not selectable then you must first select the Close Port Button.

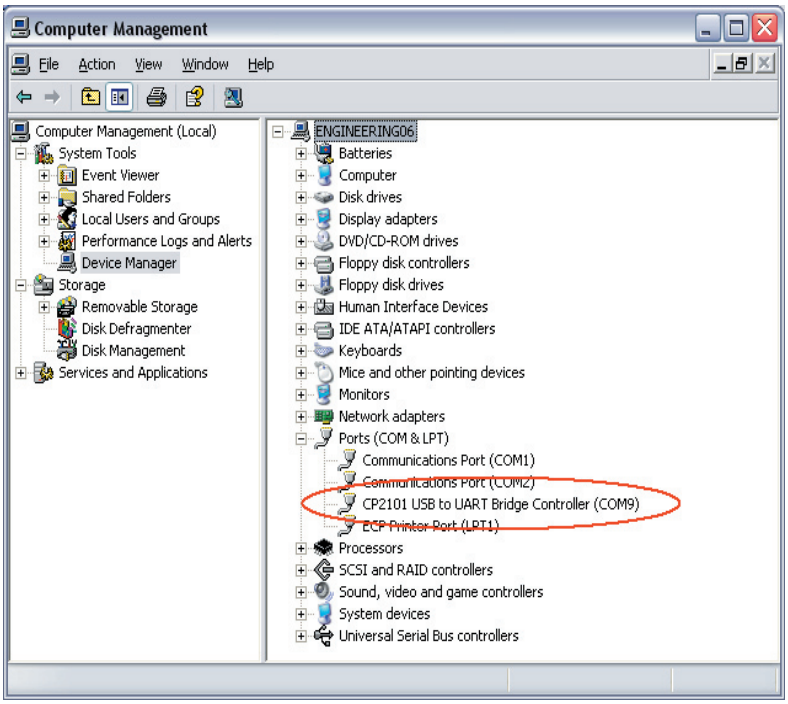
Com Port- Select the Com Port that the display is connected to.

Baud Rate- Set the baud rate equal to the baud rate in the display (FUTEK display default is set to 9600).

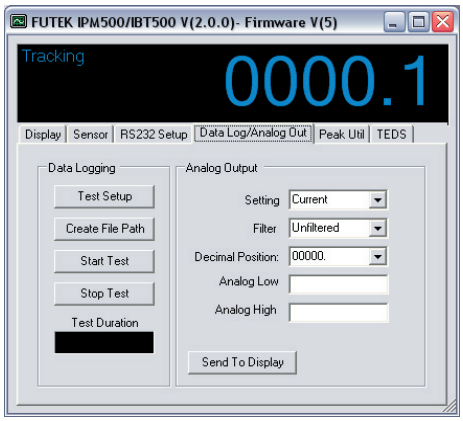
Close Port- Allows changes to Com Port and baud rate settings.

Save Settings- Saves current Com Port and baud rate settings.

When using the USB option you must first determine the correct Com Port that the computer assigned the USB drive. This can be done by going to Control Panel and finding the Computer Management -Device Manager. Under Ports find the device CP2101 USB to UART Bridge Controller. In this case it is set for Com Port 9.



DATA LOG/ANALOG OUTPUT FUNCTIONS



Data Logging

Test Setup- Define the test interval and test duration (minimum interval is 0.1 sec).

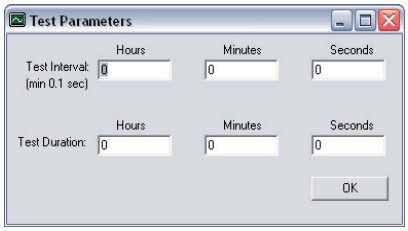
Test Interval- This is how often a reading is taken.

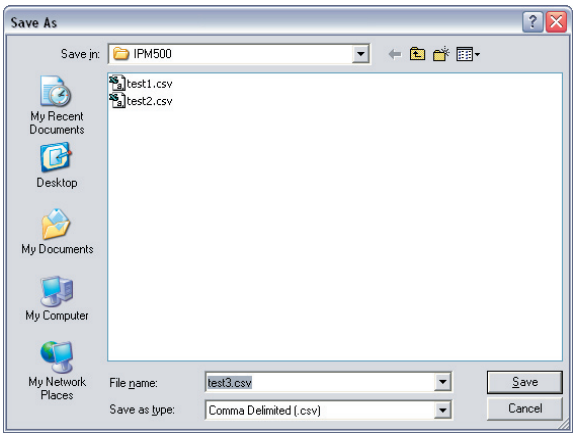
Test Duration- How long the entire test will last.

Create File Path- Set the location of the comma delimited (.csv) data logging file.

Start Test- Begins test based on defined Test Setup parameters. The test duration window counts up to the test duration time defined.

Stop Test- Stops the test and data logging.





Analog Output

Setting- Select Current or Voltage Mode (Make sure wiring connection on back of display is correct for current or voltage).

Filter- Select filtered or unfiltered data.

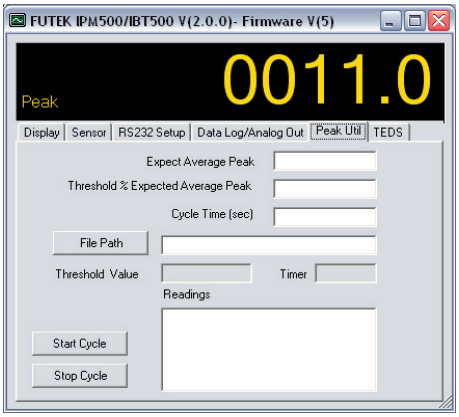
Decimal Position- Select the correct number of decimal places that will be shown in the Analog Low and High settings in the display.

Analog Low- Input the lowest capacity that you want to equal 0V or 4mA (Normally this is set at 0, but can be used to offset the analog signal to allow for a sensor to be used in both directions)**.**

Analog High- Input maximum capacity or high point value that you want to equal to 10V or 20mA.

Send to Display- This will send and store the above data values in the display. To change them simply input new values and select the Send to Display button.

PEAK UTILITY FUNCTIONS



The Peak Utility was designed to help customers test numerous parts in a semi/fully automated system and transfer the peak data to a file for SPC analysis.

Expected Average Peak- Enter in the expected average peak value (To determine this value several peak tests should be completed before entry of the average peak value).

Threshhold %- Set a threshold value as a percentage of Expected Average Peak.

Cycle Time- This is to allow enough time to capture the peak value.

File Path- Detemines the location to save the peak value readings.

Threshhold Value- This value is the calculation of Expected Average Peak multiplied by the Threshhold %.

Timer- Shows remaining time left to take the data reading.

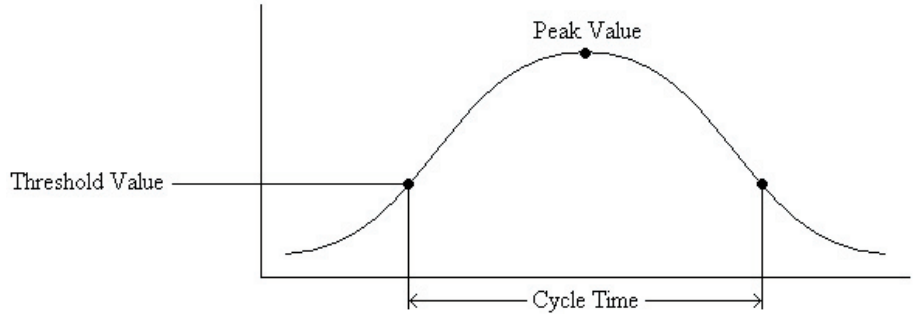
Readings- Shows maximum peak reading after timer has gone down to zero.

Start / Stop Cycle- Starts and Stops the Peak Utility.

PEAK UTILITY EXAMPLE

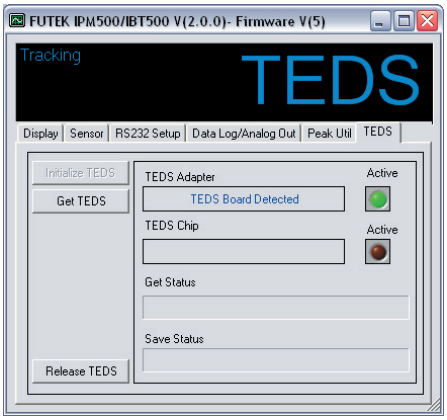
Make sure the display is tared or zeroed out before starting the Peak Utility. After pressing the Start Cycle button the display is set in peak mode and a peak reset is initiated. It will continuously monitor the peak readings until the peak value reaches to greater or equal to the Threshold Value. The program would then initiate a countdown timer (The timer is set by the cycle time value). This would allow enough time for the test cycle to be completed and the max peak value to be determined (The user would have to determine the ideal time of their testing cycle). When the timer finishes, the reading is shown in the readings box and stored in the selected file location.

After each test the display is set back into tracking mode and then the peak mode and peak reset is reinitialized. If the value being displayed is less than the Threshold Value then the program sits idle until the reading again becomes greater or equal to Threshold Value. Pressing the Stop Cycle button will turn off the peak utility function.



TEDS FUNCTIONS

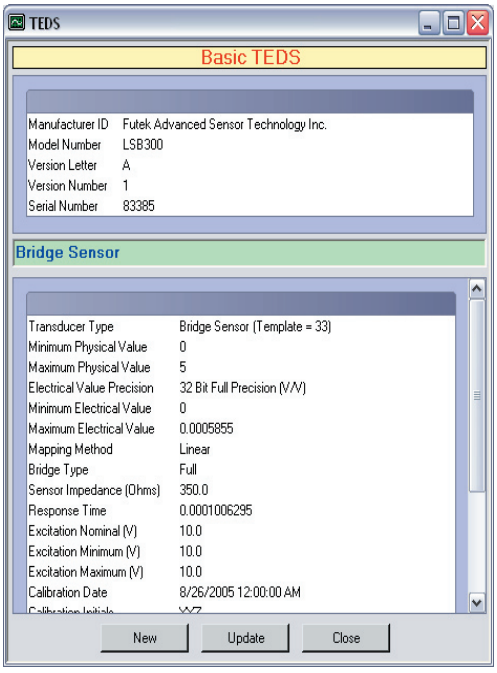
TEDS (IEEE1451.4)- was designed to eliminate operator entry error and allows the Transducer Electronic Data Sheet to be stored in the sensor for easy retrival. The IPM490/IPM500 and IBT500 are available with the TEDS reader/writer function. This allows the display to be automatically configured when a TEDS sensor is connected. The software allows users to read and write the appropriate parameters to the TEDS Chip. Currently this software only supports the Maxim DS2433 Chip set. The software does support Template 33 (Bridge Sensors), Template 30 (Voltage Sensors) and Template 31 (Current Loop Sensors). Templates 30 and 31 will only function when using the IPM490.



Initialize TEDS- This activates the TEDS board (if installed) and deactivates the normal operation mode of the display. The numbers will change and show TEDS.

Get TEDS- Retrieves the data parameters from the TEDS Chip and shows the data in the appropriate templates. Template details explained on proceeding pages.

Release TEDS- Sends the display back into the normal operational mode.



Caution must be taken when writing over existing TEDS data as it is not recoverable.

Data Parameters- After selecting the Get TEDS button the data parameters will appear. If the TEDS Chip has been already programmed then the data will show up in the appropriate fields.

New- This allows a new file or template to be selected and entry of the data into the correct field. The correct template should be choosen for the appropriate sensor. All fields must be completely filled out.

Update- Saves the selected template and all data onto the TEDS Chip. The display is also refreshed with the new data values.

Close- Closes the data parameters window of the display and returns to the main TEDS tab.

TEDS TEMPLATES DEFINED

Basic Template

Basic TEDS information used to uniquely identify the sensor and manufacturer.

Model Number feature- To create your own custom manufacturer ID and list of model numbers, first locate the directory in which the IPM500/IBT500 software is installed (Default directory is C:\Program Files\Futek\IPM500) and open the file called manu.txt. Manufacturers are listed on each line of the text file in the format of "Manufactuer Name, Manufacturer ID Number." Add your own custom information to a new line at the end of the text file using the same format with a unique ID number.

Save the file and now create a new text file in the same directory. The name of this new text file should be the same unique ID number assigned earlier. Open the file and type MODEL as the first line of the text file. List model numbers on each subsequent line below this using an alphanumeric format and save the file. This list of model numbers will now appear as a pull down menu in the Model Number section of the basic TEDS template if the unique Manufacturer ID is entered in the appropriate field.

Description	Explanation
Manufacturer ID	Defined by companies that have registered with IEEE and have been assigned unique numbers starting with #17. FUTEK has been assigned #55
Model Number	A sequential numbering system starting from 0 to 32767 and is defined by each manufacturer (See Model Number pull down feature above for more information)
Version Letter	Revision letter of the product
Version Number	Revision number of the product
Serial Number	Unique identification of the sensor. FUTEK refers to this as ID number

FUTEK IPM490/IPM500 and IBT500 Custom Settings

Located on the bottom of templates #30, #31, and #33, these settings allow the automatic configuration of a FUTEK display once a TEDS enabled sensor is plugged into the system.

Description	Unit	Explanation
Decimal Points		Number of digits to display to the right of the decimal point. Acceptable values are 0 to 3
User Text		Any custom notes for the user
Analog Setup		Select type of analog output signal
Analog Lo	V or mA	Input signal value that corresponds to the low analog output (Units are in V if voltage is selected for Analog Setup or mA if current is selected)
Analog Hi	V or mA	Input signal value that corresponds to the high analog output (Units are in V if voltage is selected for Analog Setup or mA if current is selected)

High Level Voltage Output Sensor Template #30

This template should be used for any sensors with analog voltage output.

Description	Unit	Explanation
Transducer Type		High Level Voltage Output Template #30
Minimum Physical Value		Minimum capacity of the sensor
Maximum Physical Value		Maximum capacity of the sensor
Electrical Value Precision		Select the accuracy that best fits the sensor output range
Min. Electrical Value	V or mV	These values are the sensitivity of the sensor and are determined through calibration or from the FUTEK calibration certificate (Units are in mV if 20mV precision is selected for Electrical Value Precision, otherwise units will be in V)
Max. Electrical Value	V or mV	
Mapping Method		Linear is required
Coupling		Select whether sensor is AC or DC based
Output Impedance	Ohm	Output resistance of the sensor
Response Time	sec	Not relevant for FUTEK sensors. Setting of 0.001 is entered. (All fields are required to be completed)
Power Requirements		Select if sensor requires a power supply
Excitation Nominal	V	This is the normal voltage used when calibrating the FUTEK sensor
Excitation Minimum	V	Lowest voltage that can be used
Excitation Maximum	V	Highest voltage to be used without damage to the sensor
Excitation Voltage Type		Type of voltage used to calibrate the FUTEK sensor
Excitation Current Draw	A	Maximum current draw at nominal excitation
Calibration Date		Date and time the calibration of the sensor was performed
Calibration Initials		Technician that performed the calibration
Calibration Period	Days	Days before the next recalibration is required
Measurement Location ID		Identification number for physical location of the sensor

Current Loop Output Sensor Template #31

This template should be used for any sensors with current loop output (typically 0-20mA or 4-20mA).

Description	Unit	Explanation
Transducer Type		Current Loop Output Template #31
Minimum Physical Value		Minimum capacity of the sensor
Maximum Physical Value		Maximum capacity of the sensor
Electrical Value Precision		Select the accuracy that best fits the sensor output range
Min. Electrical Value	mA	These values are the sensitivity of the sensor and are determined through calibration or from the FUTEK calibration certificate
Max. Electrical Value	mA	
Mapping Method		Linear is required
Response Time	sec	Not relevant for FUTEK sensors. Setting of 0.001 is entered. (All fields are required to be completed)
Power Requirements		Select external or internal loop power supply
Loop Supply Min	V	Minimum supply voltage required for a 2-wire system
Loop Supply Max	V	Maximum supply voltage allowed for a 2-wire system
Excitation Nominal	V	This is the normal voltage used when calibrating the FUTEK sensor
Excitation Minimum	V	Lowest voltage that can be used
Excitation Maximum	V	Highest voltage to be used without damage to the sensor
Excitation Voltage Type		Type of voltage used to calibrate the FUTEK sensor
Excitation Current Draw	A	Maximum current draw at nominal excitation
Calibration Date		Date and time the calibration of the sensor was performed
Calibration Initials		Technician that performed the calibration
Calibration Period	Days	Days before the next recalibration is required
Measurement Location ID		Identification number for physical location of the sensor

Bridge Sensor Template #33

This template should be used for any sensors that have a resistive bridge electrical configuration with linear output. This is the most common template used by FUTEK.

Description	Unit	Explanation
Transducer Type		Bridge Template #33
Minimum Physical Value		Minimum capacity of the sensor
Maximum Physical Value		Maximum capacity of the sensor
Electrical Value Precision		32 Bit Full Precision is preferred for the most accuracy
Min. Electrical Value	V/V	These values are the sensitivity of the sensor and are determined through calibration or from the FUTEK calibration certificate
Max. Electrical Value	V/V	
Mapping Method		Linear is required
Bridge Type		Determines what type of bridge is being used. Selection of Quarter, Half and Full bridge are available. FUTEK sensors are normally Full bridge
Sensor Impedance	Ohm	Output resistance of the sensor
Response Time	sec	Not relevant for FUTEK sensors. Setting of 0.001 is entered. (All fields are required to be completed)
Excitation Nominal	V	This is the normal voltage used when calibrating the FUTEK sensor
Excitation Minimum	V	Lowest voltage that can be used
Excitation Maximum	V	Highest voltage to be used without damage to the sensor
Calibration Date		Date and time the calibration of the sensor was performed
Calibration Initials		Technician that performed the calibration
Calibration Period	Days	Days before the next recalibration is required
Measurement Location ID		Identification number for physical location of the sensor