TL6000 Tension Link
Users Manual

Intercomp Co.
3839 County Road 116
Minneapolis, MN 55340

(763)-476-2531
1-800-328-3336
Fax: 763-476-2613
http://www.intercompcompany.com/

Manual #: 700169-L

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Introduction

This manual contains specifications, operation instructions, and calibration instructions for Intercomp's model TL6000 tension link.

Specifications

Controls

General:	On/Off, Mode, Zero, Peak, Tare
Display:	1.2” 5 digit LCD.
Indicators:	9 display icons

Electrical

Batteries:	1 or 2 standard or Ni-Cad 9V cells
Battery life:	Standard: Approximately 800 hours battery life on 2 Alkaline cells, 400 hours on 1 Alkaline cell. Wireless version: 50 hours / 25 hours.
Resolution:	14 bit A/D delivers over 16,000 internal counts
Filtering:	Analog and digital
Sleep mode:	Operates in low-power mode after adjustable time without use or motion.
Auto off:	Low battery, or after adjustable time without use or motion.
Auto Zero:	Selectable 1, 2, or 3 graduations
Outputs:	RS232, RS485, 0V-2V analog, 2 Set Points (3.3V logic level) Optional cabled or wireless connection to a TL6000 Remote.

Performance

Accuracy:	For capacities 500 lb – 10,000lb: ±0.1% of applied load or ± 1 division, whichever is greater. For capacities 25,000 lb and higher: ±0.2% of applied load or ± 2 divisions, whichever is greater.

Environmental

Humidity:	10 to 95% Non-Condensing.
Temperature:	Operating: -10 C to +40 C / +14 F to +104 F.
	Storage: -40 C to +75 C / -40 F to +170 F.

Radio

Radio frequency (US/Canada)	902 -928 MHz, 100mW max output power, FHSS
Radio frequency (Europe)	869.7 - 870 MHz, 5mW max output power, FSK
License requirements	None. Pre-approved US/FCC, CAN/IC, EUR/EN
Range	200’ / 60m indoor, 400’ / 120m line of sight

WARNING: This equipment has been approved for mobile applications where the equipment should be used at distances greater than 20cm from the human body (with the exception of hands, wrists, feet, and ankles. Operation at distances less than 20cm is strictly prohibited.

Operations

Note If using your scale with a TL6000 remote: For best operation with the remote, set the *Rd Rate* to [3] (see section '***First four parameters***') and *Sleep* to [0] (see section '*SLEEP*') on the TL6000 scale.

Operating Practices

Warning: The crane scale will be operated by qualified designated persons, trainees under the direct supervision of designated persons, maintenance and test personnel when in performance of their assigned duties, or lifting device inspectors.

Warning: Do not exceed the rated load limit of the crane scale.

Warning: The crane scale shall be applied to the load in accordance with the instruction manual.

Warning: Prior to lifting the operator shall make sure that all ropes or chains are not kinked and if multiple lines are used they are not twisted around each other.

Warning: Ensure that the load is correctly distributed for crane scale use.

Warning: Ensure the temperature of the load does not exceed the maximum temperature limits of the crane scale.

Warning: Ensure that swinging of the crane scale is minimized when positioning it over the load.

Warning: Avoid any sudden acceleration of deceleration when moving the load.

Warning: Do not allow the crane scale or the lifter to come into contact with any obstruction when moving the load.

Warning: Do not operate the crane scale if it has damaged, malfunctioning or missing parts.

Warning: Do not lift people with the crane scale.

Warning: Do not lift suspended loads over people.

Warning: Do not use the crane scale to pull side loads or to slide loads unless specifically authorized by a qualified person.

Warning: Do not leave suspended loads unattended.

Warning: Do not remove or obscure warning labels.

Warning: Do not operate the crane scale without having read and understood the operating manual.

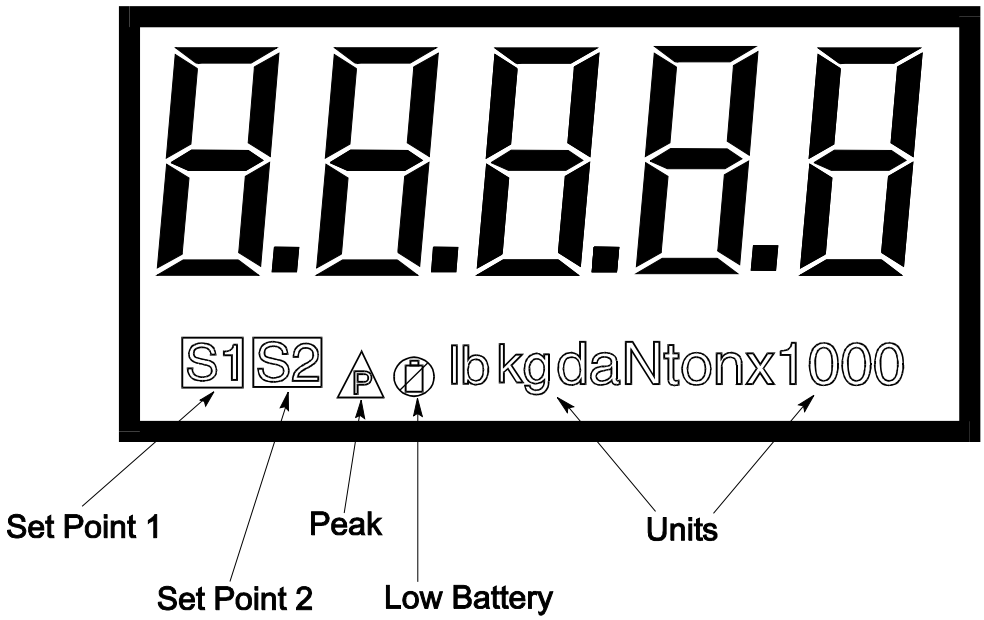
Warning: Stay clear of suspended loads.

Warning: Do not lift loads higher than necessary.

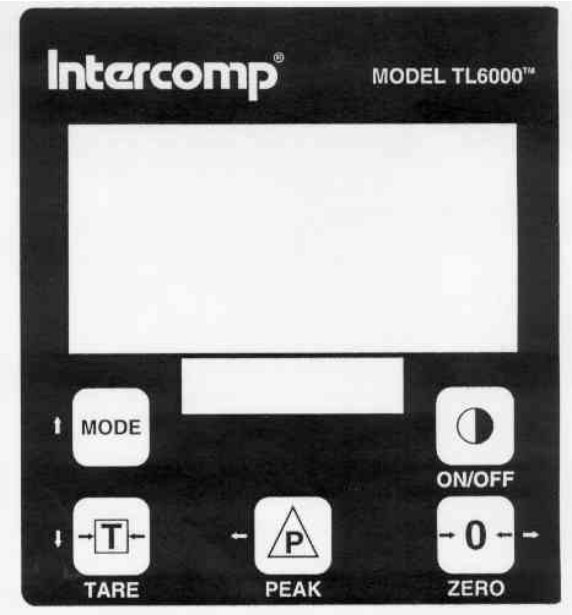
Warning: Do not make alterations or modifications to the crane scale.

Warning: Ensure all portions of the human body are kept clear of all device involved with the rigging during the lift.

Display



Controls



ON/OFF

Press this key to turn the scale on. The scale tests itself; when these tests have completed successfully, the system begins weighing. Press this key to turn the scale off.

MODE

Many of the internal parameters can be adjusted through the mode function. There are a total of 12 modes: Backlight, Print, Units, Set P1, Set P2, Sample Rate, Sleep, Auto-off, Serial data output, Baud rate, Analog output, Scale ID.

Mode	Description	Notes	Default
Pr int	Print ticket	Hold MODE to print	-
Un itS	Unit of weight	lb, kg, daN, N, ton, kg x 1000	lb
SEtP 1	Set point 1	0 to 99999	99999
SEtP2	Set point 2	0 to 99999	99999
S rt	Sample rate	1 to 100	5
SLEEP	Sleep mode	1 to 180 (min.) 0 = disable	5
AOFF	Auto off	1 to 180 (min.) 0 = disable	60
S OUt	Serial data out	0 = print (on-demand) 1 = continuous 3 = fast continuous (variable)	0
bAUd	baud rate	300,600,1200,2400,4800,9600	9600
A OUt	analog out	0 = disable, 1 = enable	0
SC Id	scale ID	1 to 20	1

Press the MODE key to sequentially toggle through the modes. To edit a mode press and hold the MODE key until the display changes. The value can be changed by using the **arrow keys:**

↑	MODE
↓	TARE
←	PEAK
→	ZERO

Please see the information below for specific instructions on editing each mode. To save the information you edited, press and hold the MODE key until the display reads 'Save'. The TL6000 will then return to normal measurement mode.

PRINT

This feature allows the net weight to be printed. See "Serial Output" section for more information.

To print ticket:

Press the MODE key until the display reads "Pr int". Press and hold the MODE key until the display reads "Pr int" again. The net weight will be printed and the remote returns to normal operating mode.

UNITS

Measurements can be taken in 6 different units: lb (pound), kg (kilogram), daN (DakaNewton), N (Newton), ton (English ton), kg x1000 (Metric ton).

Changing Units

Press the mode key twice until the display reads '*Un itS*'. Press and hold the MODE key until it reads '*UEd it*'. Press the left and right keys (PEAK and ZERO) to toggle through the units of measurement. The current unit is displayed on the bottom of the LCD. To save the unit you want to operate in press and hold the MODE key until it reads '*SAvE*'. The TL6000 will return to measurement mode.

Notes: If you change the units while a tare is set, the tare will be erased. Changing units can affect the set points. If you are using the set points, be sure to check them after changing units.

SET P1, SET P2, Audio Alarm (optional)

When the weight displayed is equal to or greater than the set point, the corresponding indicator is displayed on the LCD. The set point indicators are the 'S1' and 'S2' icons located at the lower left corner of the display. Changing units can affect the set points. If you are using the set points, be sure to re-set them after changing units. There are set point output signals which can be utilized by using the connector located on the side of the TL6000. When Set Point #1 is reached, a logic 'high' will be present on pin 1 of the connector. When Set Point #2 is reached, a logic 'high' will be present on pin 2 of the connector.

Note: *If your scale has the optional audio alarm, Set Point #1 and #2 are not wired to the external connector. Instead, Set point #1 controls when the alarm will sound. The alarm will sound whenever the weight applied to the scale is greater than or equal to the weight entered into "Set P1".*

Changing Set Points

Press the MODE button three times until the display reads '**SEtP 1**'. Press and hold the mode button until it reads '**Ed it**'. Change the value by using the up/down, left/right (MODE/TARE, PEAK/ZERO) buttons. To save the set point press and hold the MODE button until it reads '**SAvE**'. The TL6000 will return to measurement mode. To change Set Point 2, press the MODE button four times, until the display reads '**SEtP2**' and follow the same instructions as above instructions.
Default = 99999.

SAMPLE RATE

The higher the sample rate, the more averaging of past readings the tension link uses to compute the displayed weight. '1' results in the fastest update times, while '100' gives you the most stable read-outs.

Changing the Sample rate:

Press the MODE key five times until the display reads '**S rt** '. Press and hold the MODE key until the display reads '**Ed it**'. Change the value by using the arrow keys. To save the new sample rate press and hold MODE until the display reads '**SAvE**'. The TL6000 will return to measurement mode.
Default = 5.

SLEEP

The TL6000 features a low-power mode to conserve battery power. If the scale does not experience any activity for a predetermined amount of minutes, the system will switch to low -power mode. When in low power mode, the scale still operates normally. The only difference is a slowed response rate. You may have to wait a second or two for a change in weight to show up on the display. Any key pressed or change in weight will return the scale to normal mode.

Adjusting Sleep:

Press the MODE key six times until the display reads '**SLEEP**'. Press and hold the MODE key until the display reads '**Ed it**'. Change the value (in minutes) using the arrow keys. Any entry from 1 to 180 minutes is allowed. To disable the sleep feature enter 0. To save your data press and hold the MODE key until the display reads '**SAvE**'. The system will return to measurement mode.
Default = 5.

AUTO OFF
The TL6000 will automatically shut off if it does not experience any changes in weight or keys pressed for a user set amount of time.

Adjusting Auto Off:
Press the MODE key seven times until the display reads '**AOFF**'. Press and hold the MODE key until the display reads '**Ed it**'. Change the value (the unit is in minutes) using the arrow keys. Any entry from 1 to 180 minutes is allowed. To disable the auto off feature enter 0. To save your data, press and hold the MODE key until the display reads '**SAVE**'. The system will return to measurement mode.
Default = 60.

SERIAL DATA OUT
The TL6000 has a RS232 and a RS485 output so the scale may be connected to a printer, computer or other external device. See "Serial Output" section for more information.
Note: Serial data does not transmit during sleep mode.

Enabling/Disabling Serial data out:
Press the MODE key until the display reads '**S OUt** '. Press and hold the MODE key until the display reads '**Ed it**'. Change the value using the arrow keys. "on-demand print" means there will only be output when the user presses print (see 'PRINT' section for details). When set to "continuous", there will be a continuous serial output at a rate of about 1 weight transmission/second. When set to "fast continuous (variable)", the transmission rate can be much faster, varying from about 1 to 13 weight transmissions/second. In this mode the rate varies depending on your settings of "Read Rate" and "Baud Rate". For the fastest transmission rate set Read Rate=7 (see calibration section) and Baud Rate = 9600 (see below). **Warning:** In "fast continuous" mode, the unit's display will update as fast as it prints. At the highest settings this can result in the display changing so fast that it is sometimes difficult to read.

On-demand print	0
continuous	1
fast continuous (variable)	3

To save your data, press and hold the MODE key until the display reads '**SAVE**'. The system will return to measurement mode.

BAUD RATE
The baud rate is the frequency at which the serial data output is sent.
Operational baud rates: 300, 600, 1200, 2400, 4800, 9600.

The default value for the baud rate is 9600 baud (bits/sec). This setting only affects the printer output.

Changing the baud rate:
Press the MODE key nine times until the display reads '**b rt** '. Press and hold the MODE key until the display reads '**Ed it**'. Change the value using the arrow keys. To save your data, press and hold the MODE key until the display reads '**SAvE**'. The system will return to measurement mode.

ANALOG OUT
This optional feature allows a 0V to 2V analog voltage that is spanned linearly by the applied weight to the tension link. The capacity the user sets equals the maximum voltage level (2.0V) and no weight applied equals 0V. All other voltage levels will be linear (ratio metric) with the weight value. For example, if the applied weight is ½ the capacity, the voltage will be 1.0V. The analog output is utilized by the connector on the side of the scale.

Enabling or Disabling analog output
Press the mode key ten times until the display reads "**A OUt**". Press and hold the MODE key until the display reads '**Ed it**'. Press the up and down keys to change the setting. '1' enables the analog out and '0' disables the analog out. To save your data, press and hold the MODE key until the display reads '**SAvE**'. The system will return to measurement mode.

Enable	1
Disable	0

SCALE ID
The scale ID parameter is used when you have a wireless TL6000 system. Each TL6000 scale must have a different scale ID (1 to 20).

Changing the scale ID:
Press the MODE key until the display reads '**SC Id** '. Press and hold the MODE key until the display reads '**Ed it**'. Change the value using the arrow keys. To save your data, press and hold the MODE key until the display reads '**SAvE**'. The system will return to measurement mode.

ZERO
Tells the scale to display a zero weight. This key is used any time the scale shows a non-zero value with no weight on the scale. If you press ZERO with weight on the hook, that weight becomes the zero condition for the scale. This can be useful to cancel the weight of chains or cables. When this weight is removed, a negative weight shows until the system is zeroed again.

The zero point is saved into memory. This means you can turn the scale off and

on with weight applied, so that the displayed weight is the actual gross weight.

The scale contains a feature called **Auto Zero Tracking (AZT)**, which corrects for slight zero changes during normal operation. If the AZT is enabled and small weights are added slowly, the scale could zero them off.

TARE

Pressing the TARE key will set the tare equal to the current gross weight and switch the display to net weight. The display will read '**nEt**' when the TARE button is released. The net weight is equal to the gross weight minus the tare weight. The tare weight will only be set if the current gross weight is positive.

Displaying the tare weight:
If a tare weight is set, pressing the TARE key will display the current value of the tare. The tare will be displayed as long as you hold the key.

Clearing the tare:
Pressing the ZERO and TARE key together will reset the tare to zero. The display will read '**GroSS**' when the keys are released. This signifies that the scale will now display gross weight, which is equal to the net weight when tare = 0.

PEAK

The peak hold feature will remember the maximum weight applied. While in peak mode it will not display any weight less than the maximum weight. To turn on the peak mode press PEAK, to turn off the peak mode press PEAK again. To clear the peak weight, press the ZERO key.

Note: When you turn off the peak mode, the current peak weight will still be remembered internally. This will show up if you then turn the peak mode back on. Press ZERO (or turn the scale off) to clear the peak weight.

Power/Batteries

Remove the two screws on the side of the unit (either side). Replace the 9V battery. Replace the cover.

You may use rechargeable Nickel-Cadmium 9V cells or standard alkaline 9V cells in the TL6000. Note: Only one 9V battery is required to run the TL6000. The second 9V battery will double the observed battery life.

The typical recharge time for Ni-cad cells is 16 hours. The rechargeable batteries have a life span up to 1000 cycles.

Maintenance

Periodic Inspection

The crane scale and all associated adaptive devices require periodic inspection and maintenance. The frequency and recording of the inspection requirements are found in service categories below and are dependant on the type of service that the equipment is used in as described below.

Service Categories

Normal Service – Crane scale is operated at less than 85% of it's capacity except for isolated instances. Complete the frequent service inspection monthly and record the periodic service inspection annually.

Heavy Service – Crane scale is operated at 85% - 100% of it's capacity as part of normal usage. Complete the frequent service inspection weekly to monthly and record the periodic service inspection semi-annually.

Severe Service – Crane scale is operated at 85% - 100% of it's capacity and used in environmental conditions that are unfavorable, harmful or detrimental to the use of the crane scale. Complete the frequent service inspection daily to weekly and record the periodic service inspection quarterly.

Inspection Requirements

Frequent Service Inspection (records not required)
A frequent visual inspection is completed at intervals indicated by the service category above by the operator or designated person of the following.

1. Inspect for structural deformation, cracks or excessive wear of any part of the crane scale or associated adaptive devices.
2. Inspect for loose or missing guards, fasteners, covers, stops, or nameplates.
3. Inspect all functional operating mechanisms and automatic hold and release mechanisms for improper adjustments interfering with operation of the crane scale or associated adaptive devices.
4. Inspect for distortion such as bending, twisting, or increased throat opening (if applicable)

Periodic Service Inspection (records required)
A periodic visual inspection is completed at intervals indicated by the service category above by the operator or designated person and documented to provide the basis for continuing evaluation. The periodic inspection will cover areas in the frequent service inspection above and the following.

1. Inspect for loose bolts or fasteners.
2. Inspect for cracked or worn gears, pulleys, sheaves, sprockets, bearings, chains, and belts.
3. Inspect for excessive wear of linkages and other mechanical parts.

4. Inspect for excessive wear at hoist hooking points and load support clevices or pins.
5. Inspect for any visible bends or twists of all used rigging devices.
6. Inspect all latches and locks for proper operation (if applicable)

Removal from Service Criteria

Note: Replacement parts of any device or parts of any device used in any aspect of rigging to lift a load shall be at least equal to the original manufacture's specifications

Hooks

Hooks shall be removed from service if damage such as the following is found and shall only be returned to service if a qualified person approves their continued use and initiates corrective action.

1. Hooks show cracks, nicks, or gouges.
2. Hook has wear exceeding 10% of the original sectional dimension.
3. Hook has any visible bend or twist from the plane of the unbent hook.
4. Hook has an increase in throat opening of 5% not to exceed ¼ of an inch.
5. If self-locking hooks have the inability to lock.
6. A hook latch that is inoperable (if applicable)

Shackles

Shackles shall be removed from service if damage such as the following is visible and shall only be returned to service when approved by a qualified person.

1. If the manufacturers name or trademark and / or the rated load identification is missing or illegible.
2. The device shows signs of heat damage including weld spatter or arc strikes.
3. The device shows excessive pitting or corrosion.
4. The device is bent, twisted, distorted, stretched, elongated, cracked, or has broken load-bearing components.
5. The device has excessive nicks or gouges.
6. The device has a 10% reduction of the original or catalog dimension at any point around the body or pin.
7. The device has incomplete pin engagement.
8. The device has excessive thread damage.
9. The device shows evidence of unauthorized welding.
10. Any other condition including visible damage that causes doubt to the continued use of the shackle.

Calibration

How to test the calibration

This calibration procedure should be performed annually for normal operating conditions. If the scale is dropped or damaged, or service has been performed on the scale, use this calibration check. Recommend weights from 10% through 100% of scale capacity in 10% increments.

1. Press the ON switch. The display does a lamp test; during this time the scale does a quick check of itself. Then the weighing system starts weigh mode.
2. Intercomp recommends that you allow the electronics to operate for three minutes after first turning the power on. This allows the electronics to become stable for maximum accuracy before you check the calibrations.
3. Make sure no weight is on the hook. Press the ZERO key. Press the TARE and ZERO key to clear tare. The weight shown is zero.
4. Apply weights throughout the weighing range, and verify the correct weight is displayed at each step. (+/- 0.1% of applied load or ± 1 division, whichever is greater for scales 500 – 10000 lbs and ±0.2% of applied load or ± 2 divisions, whichever is greater for scales 25000 lbs or greater)
5. Remove weights and verify the display returns to zero.
6. If there is a failure to meet any of the conditions above, please refer to the Calibration Procedure.
7. When all the conditions above are correct, the scale is operational.

How to enter a number

During this routine you will be asked to enter numbers at many points. The scale will show a number (originally all zeros) with a blinking digit. At this point the commands listed at the sides of the keys become active. Press the UP and DOWN arrow keys to increase and decrease the blinking digit. Press the LEFT and RIGHT arrow keys to move to other digits. Press the ZERO and PEAK keys together to save the value and advance to the next parameter.

Five point span

The scale has a five point calibration feature that reduces the effects of non-linearity in the load cells. This requires that you place five weights on the cell during calibration. The first weight must be greater than zero, the second greater than the first, the third greater than the second, the fourth greater than the third, and the final weight somewhere between the fourth and the capacity. To use less than five calibration points, turn the scale off before reading the next cal point.

Calibration Strap

The calibration header that uses the calibration shorting strap is located on the bottom side of the circuit board (opposite side of the display). This 90° header is labeled CAL.

Enabling the calibration.

The first four parameters may be edited with or without the calibration strap. To perform the actual weight calibration, you must remove the calibration blocking strap. Remove the 4 screws on the back plate of the tension link. Remove back plate. The calibration header is located on the lower right corner of the circuit board. Remove the black shorting strap and slide it on <u>one</u> of the pins (for convenience). Screw the back plate back on.

How to calibrate the scale

The following details the calibration procedure for the tension scale. All parameters can be set without the calibration strap. If the cal strap is in place, only the first four parameters may be calibrated.

Step	Function	Note	Default
rd rt	Read Rate	1 to 7 (see table)	4
A2t	Auto Zero Tracking	0=off, 1=1, 2=2, 3=3	3
9rAd	Graduations	0 to 12 (see table)	6
CAP	Capacity	Enter Capacity	
	Information saved		
	Check Cal Strap		
LOAd0	Zero Read	No weight applied	
LOAd1	First weight	Enter first weight	
LOAd2	Second weight	Enter second weight	
LOAd3	Third weight	Enter third weight	
LOAd4	Fourth weight	Enter fourth weight	
LOAd5	Fifth weight	Enter fifth weight	

Start up

Note: Read section titled: How to enter a number

1) Turn scale power ON.
2) Wait for scale to warm up (3 minutes from power on).
3) Press ZERO and PEAK together and release to enter the calibration mode.

First four parameters

4) The scale shows '**rd rt**'. The read rate is the number of internal reads per second the scale performs. A higher setting will result in a faster responding scale, but will also use the battery life more quickly. Press ZERO and PEAK together to edit the read rate. Enter the read rate (1 to 7).
Note: When you plan to connect the TL6000 to a cabled or wireless TL6000 remote, set the read rate to (3) or less for best results.

Read Rate	Readings / sec
1	1
2	2
3	4
4	7
5	10
6	18
7	25

Note: If the "Serial Out" setting in your unit is set to "3 = fast continuous" then the above read rates will be slower because of the time the scale spends transmitting data out the serial port.

5) The scale shows '**AZt** '. Press ZERO and PEAK together to edit the Auto Zero Tracking. Enter the AZT size (0 to 3 divisions). AZT is the number of graduations the auto zero tracking can remove. An entry of '0' disables the feature.
6) The scale shows '**GrAd**'. Press ZERO and PEAK together to edit the Graduations. Use the following table to select and enter a graduation value.

Graduations and Units

Grad Setting	lb	Kg	N	daN	ton	kg x 1000
0	100	50	100	50	0.05	0.05
1	50	20	100	20	0.02	0.02
2	20	10	100	10	0.01	0.01
3	10	5	50	5	0.005	0.005
4	5	2	20	2	0.002	0.002
5	2	1	10	1	0.001	0.001
6	1	0.5	5	0.5	0.0005	0.0005
7	0.5	0.2	2	0.2	0.0002	0.0002
8	0.2	0.1	1	0.1	0.0001	0.0001
9	0.1	0.05	0.5	0.05		
10	0.05	0.02	0.2	0.02		
11	0.02	0.01	0.1	0.01		
12	0.01	0.005	0.05	0.005		

Note: Grads 9-12 do not exist for ton and kg x1000.

NOTE: The stated accuracy specifications are based on the graduation setting in the table below. If the graduation setting is set other than the value in the table below the accuracy specification remains with the graduation size listed below.

If your capacity is:	Set your graduation to:
1000 lb / 500 kg	1 lb / 0.5 kg (6)
2000 lb / 1000 kg	2 lb / 1 kg (5)
5,000 lb / 2,500 kg	5 lb / 2 kg (4)
10,000 lb / 5,000 kg	10 lb / 5 kg (3)
25,000 lb / 12,500 kg	20 lb / 10 kg (2)
50,000 lb / 25,000 kg	50 lb / 20 kg (1)
100,000 lb / 50,000 kg	100 lb / 50 kg (0)

7) The scale shows '**CAP**'. Press ZERO and PEAK together to edit the Capacity. Enter the capacity. Press the ZERO and PEAK keys together to save the data and the display will read '**SAvE**'.

Calibrating the weight accuracy

Note: At this time the scale saves any changes that have been made.
Note: A check is then made to see whether or not the calibration blocking strap is in place. If the blocking strap is in place, the scale shows 'CALSt' for a few seconds and then returns to normal weighing.

8) Assuming the calibration strap was removed, the display will read 'LOAd0'. With no weight applied to the scale, press ZERO and PEAK together.
9) The display will read 'LOAd 1'. Apply the first weight. When the weight is stable press one of the arrow keys. The display will read 'HOLd' while the scale acquires the first weight. After this, enter the value of the applied weight. Press ZERO and PEAK together to save the value and advance to Load 2.
10) The display will read 'LOAd2'. Apply the second weight. When the weight is stable press one of the arrow keys. The display will read 'HOLd' while the scale acquires the second weight. After this, enter the value of the applied weight. Press ZERO and PEAK together to save the value and advance to Load 3.
11) The display will read 'LOAd3'. Apply the third weight. When the weight is stable press one of the arrow keys. The display will read 'HOLd' while the scale acquires the third weight. After this, enter the value of the applied weight. Press ZERO and PEAK together to save the value. The display will read 'SAvE' for a few seconds and advance to Load 4.
12) The display will read 'LOAd4'. Apply the fourth weight. When the weight is stable press one of the arrow keys. The display will read 'HOLd' while the scale acquires the third weight. After this, enter the value of the applied weight. Press ZERO and PEAK together to save the value. The display will read 'SAvE' for a few seconds and advance to Load 5.
13) The display will read 'LOAd5'. Apply the fifth weight. When the weight is stable press one of the arrow keys. The display will read 'HOLd' while the scale acquires the third weight. After this, enter the value of the applied weight. Press ZERO and PEAK together to save the value. The display will read 'SAvE' for a few seconds and return to measurement mode.
14) Verify calibration.
15) Replace the cal strap to protect against accidental entry into the calibration routine in the future.
16) Calibration complete.

Error Messages

OuEr	The scale is over capacity. Reduce the weight applied to the scale.
OE	The scale is outside the internal A/D converter range. Reduce the weight applied to the scale.
dISP	Display error. Value is too large to fit on the display. Reduce the weight applied to the scale, or try changing graduations.
-dISP	Display error. Value is too negative to fit on the display. Press ZERO to zero the scale.
EEPE	EEPROM error. The scale has had it's calibration corrupted or destroyed; the scale will require calibration.
Err 1	Error during calibration. The scale automatically exits calibration mode. When calibrating, make sure that each of the three calibration weights is larger than the previous weight.
Err 2	EEPROM error. The scale is unable to read the EEPROM.
Err 4	EEPROM error. The scale is unable to write to the EEPROM.
CALSt	This message will show for a few seconds if you have attempted to access weight calibration with the calibration strap in place. See the "Calibration" section if you need to calibrate.

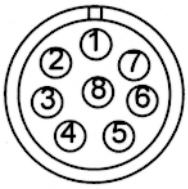
Troubleshooting

Problem:	**Solution:**
Display freezes or is blank and no response to keys pressed	The MCU may have locked up. Try removing both batteries together, and then replacing one or both of them. As a general rule to reduce lock-ups, whenever turning the TL6000 off, wait at least 5-10 seconds before turning it on again.
Batteries are good but the scale won't power up.	If the scale is turned off and turned back on right away, the scale may not be able to power up. Wait about 10 seconds after powering off before pressing the ON key again.

Serial Output

The TL6000 can be set to output (continuous) to a scoreboard or other external devices using RS232 or RS485 formats. See mode menu / serial data out. The TL6000 can also transmit and receive RS232 signals (continuous) to communicate with a Tension Link remote. The TL6000 can also be set to output (on demand) to a printer.

The signal comes out of the 8-pin Serial I/O connector located on the right side of the unit. The connector has the following pinout:



Signal	Pin
RS232-TXD1 (remote)	3
RS232-TXD2 (printer/scoreboard)	4
RS232-RXD	5
GND	6
RS485-A (printer/scoreboard)	7
RS485-B (printer/scoreboard)	8
Set Point #1 (3.3V logic level)	1
Set Point #2 (3.3V logic level)	2

NOTE: If your scale has the wireless option, pins 3 & 5 will be unconnected internally.

The transmitted serial data has the following characteristics:

Fixed 8 Data bits, no parity, 1 stop bit.
Baud rate is configurable. See Mode section.
The RS232 output swings from -6 VDC to 6 VDC.

Scoreboard

The scoreboard output is an externally available signal designed to drive a numeric overhead display board or a computer's RS-232 input.

Transmitted data: xxxxxxx lb
↑ (or current unit)

The net weight field is seven characters long and could contain preceding spaces a decimal point and/or a minus sign.

The connection to a 9-pin PC communication port is:

Signal	PC 9-pin
TXD2 (4)	2
GND (6)	5

NOTE: For some setups it may be necessary to jump pins [6, 1, and 4] together, and pins [7 and 8] together on the PC port connector.

The connection to a 25-pin PC communication port is:

Signal	PC 25-pin
TXD2 (4)	3
GND (6)	7

NOTE: For some setups it may be necessary to jump pins [6, 8, and 20] together, and pins [4 and 5] together on the PC port connector

How to reach Intercomp Service

Things to know:

When did you purchase your tension link?
What is your serial number?
Whom did you purchase the tension link through?

For Intercomp Service call or fax:

FAX # (763)-476-2613
(763)-476-2531
1-800-328-3336

or fill out Service Support from at :

www.intercompcompany.com