DataCan

QUICK GUIDE

LineWise Setup

www.datacan.ca

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History of Changes

Rev. No.	Date	Pages	Author	Description of Changes
0	June 9, 2020		Trevor Jones	Initial version
0.1	June 29, 2020		Nick Lahtinen	Minor revisions

About This Guide

This document is meant to supplement formal training. This is for customer and internal DataCan use.

Please also use the following documents:

- LineWise Manual.pdf

Warnings

⚠️**WARNING – All gauges, transducers encoders and interface modules should be treated with care as they contain sensitive electronics and sensor elements that can be damaged by impact and static electricity.**

3 About this guide

3.1 User

This guide assumes the user is familiar with the operation of computers, particulary those with Microsoft Windows operating systems. An internet connection is recommended for the software download, but not required. There are no significant system requirements for the use of LineWIse software, if the computer hardware can operate Windows XP and newer, it can operate the LineWise software. One USB connection is required.

Note that any operating system older than Windows XP is not supported.

4 Physical specifications

| Connector	Pin #	Quantity	Connection	Description	Specification
Red Redel	1	1	ENC_GND	Ground connection for Encoder power	0V
Red Redel	2	1	ENC_B	Phase B connection of Encoder Quadrature signal	0-24V frequency, 1.2MHz max
Red Redel	3	1	ENCVCC	Encoder Power	+5VDC ±0.3V
Red Redel	4	1	AUXVCC	Auxiliary supply for Encoder power	Max +12VDC
Red Redel	5	1	ENC_A	Phase A connection of Encoder Quatrature signal	0-24V frequency, 1.2MHz max
Blue Redel	1	1	DGND	Digital Ground connection for sensors attached to Blue Redel Connector	0V
Blue Redel	2	1	ACHNL4	Analog Channel 4 input	0-5V, 0-10V, ±10V, ±5V, 4-20mA configurable
Blue Redel	3	1	DVCC	Power supply to sensors connected to Blue Redel	+5VDC ±0.3V
Blue Redel	4	1	FREQ4	Frequency Input Channel 4	0-24V frequency, 81kHz max
Blue Redel	5	1	FREQ3	Frequency Input Channel 3	0-24V frequency, 81kHz max
Green Redel	1	1	SENS-GND	Sensor Ground connection for sensors attached to Green Redel Connector	0V
Green Redel	2	1	ACHNL3	Analog Channel 3 input	0-5V, 0-10V, ±10V, ±5V, 4-20mA configurable
Green Redel	3	1	SVCC	Power supply to sensors connected to Green Redel	+5VDC ±0.3V
Green Redel	4	1	FREQ2	Frequency Input Channel 2	0-24V frequency, 1.3MHz max
Green Redel	5	1	FREQ1	Frequency Input Channel 1	0-24V frequency, 1.3MHz max
Yellow Redel	1	1	SENS-GND	Sensor Ground connection for sensors attached to Yellow Redel Connector	0V
Yellow Redel	2	1	+IN	Positive Differential Input	0-5V, ±20mV from -IN
Yellow Redel	3	1	SVCC	Power supply to sensors connected to Yellow Redel	+5VDC ±0.3V
Yellow Redel	4	1	ACHNL2/-IN	Analog Channel 2 input/Negative Differential Input	0-5V, 0-10V, ±10V, ±5V, 4-20mA, ±20mV from +IN (configurable)
Yellow Redel	5	1	ACHNL1	Analog Channel 1 input	0-5V, 0-10V, ±10V, ±5V, 4-20mA configurable
USB		1		Computer connection to USB1.1, provides power to the Linewise and connected devices	Updates data every 50ms (20Hz)

5 LineWise Logger

To run the LineWise Logger program, click or .

The main purpose of the LineWise Logger program is to communicate with the LineWise Box. This program must be running at all times to acquire data and operate the software correctly.

LineWise Logger continuously saves the data to disk while it is running. By default the data is saved once a second. This can be adjusted under Sample Rate in the File menu.

By default LineWise Logger saves the data under C:\LineWise Data\. Each day the program creates a new folder using the following format C:\LineWise Data\YYYY-MM-DD. For example, a folder from May 15, 2020 would be named C:\LineWise Data\2020-05-15. The folder location can be changed in the File Menu by clicking on Select Recording Folder. Every time the program starts it will create a new file in this folder location. The filename format is LWData-1605.lwr.

One of the File Output options is to save the data as a text file in real time. This can be setup in the File menu. The filename format of the text file is LWData-1605.txt.
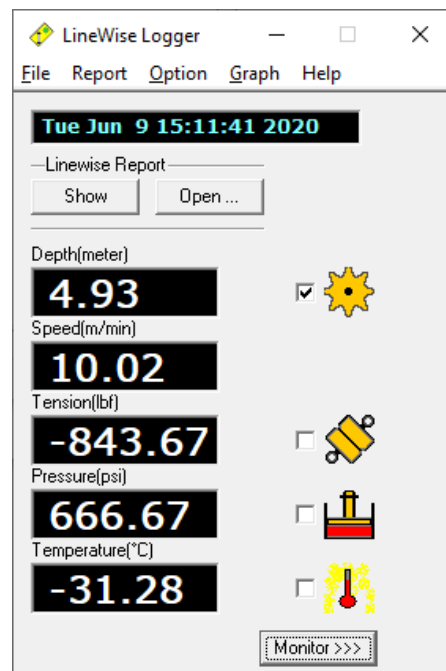
5.1 **Monitoring Data in LineWise Logger**

Clicking the Monitor button allows the user to view the raw channel data from the LineWise Box.

The raw channel data is displayed on the right hand side. Click the Monitor button to show it.

Analog Channels:

- The analog data is shown in volts.

- Channel 1 and 2 show the data from the yellow connector on the LineWise Box. By default the LineWise Box includes an amplifier circuit on channel 2.

- Channel 3 is connected to the green connector.

- Channel 4 is connected to the blue connector.

Digital Channels:

- The digital data is a measure of frequency of pulses counted on the corresponding digital channels.

- The digital data is shown in hertz.

- Channels 1 and 2 show data from the green connector.

- Channels 3 and 4 show data from the blue connector.

Accumulator Channels:

The accumulator channels are data that is calculated by the software and is a cumulative count of all the pulses counted on each respective channel.

5.2 How to record data to a text file in LineWise Logger

In the File menu click on **Text (.txt)** under the **File Output** submenu, to start saving to a text file.
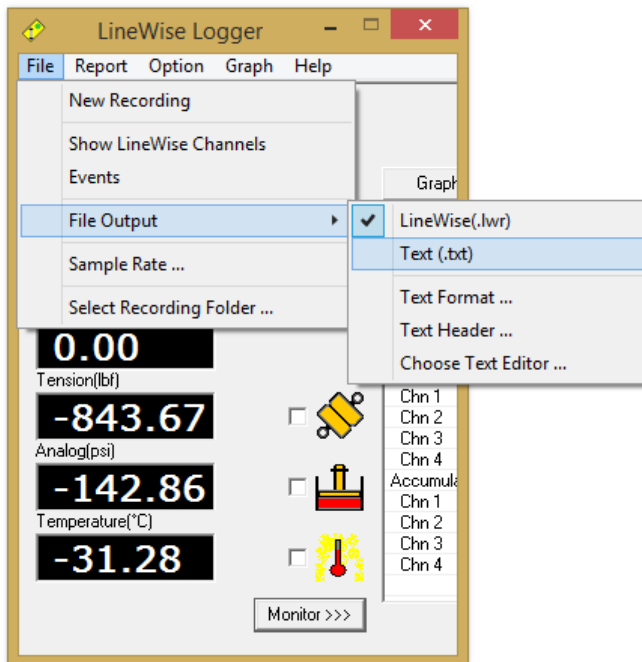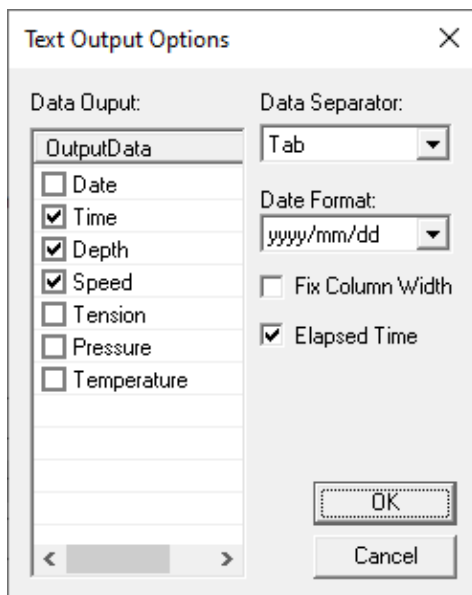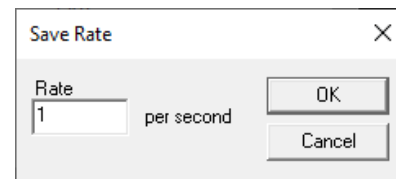

Click on **Text Format** to change the time format and data separator.

Click **Select Recording Folder** to choose the recording folder.

The default recording folder is **C:\LineWise Data**

Click **New Recording** to make a new file.

Click on **Sample Rate** to adjust the rate up to 10. The default sample rate is 1 second.

The text output options are setup under the **Text Format** menu item in the File Output sub menu. Select the data that will be saved in the text file.

Click the **Elapsed Time** box to save data in elapsed time.

Both date and time will be saved for each data sample if the Elapsed Time box is unchecked.

The data columns are normally separated by a **Tab**.

Click the Data Separator box to change the separator to **Comma**.

**Note: Click on the Report menu to view the text file.**

6 Weight Indicator

- Run the Weight Indicator program ![icon].
- The main purpose of the Weight Indicator gauge is to display tension on the wireline.
- The gauge is set up by right clicking on the large gauge and not the smaller sub-gauge.
- The appearance, scale, and calibration is setup through the right-click menu.
- Click on Select Loadcell to create a new calibration or edit an existing one.
- Click on Gauge Scale to edit the current scale or to add new one.
- Each scale can have its own alarm, unit, and limits.
- The alarm will sound a tone through the computer when the tension goes over the alarm value.
- Click on Appearance to set the Logo, Background Color, and to customize the gauge.
- Click on Sheave Angle to adjust the angle if required.
- Click on Weight Diff or press the space bar to show the difference in tension from that point in time.
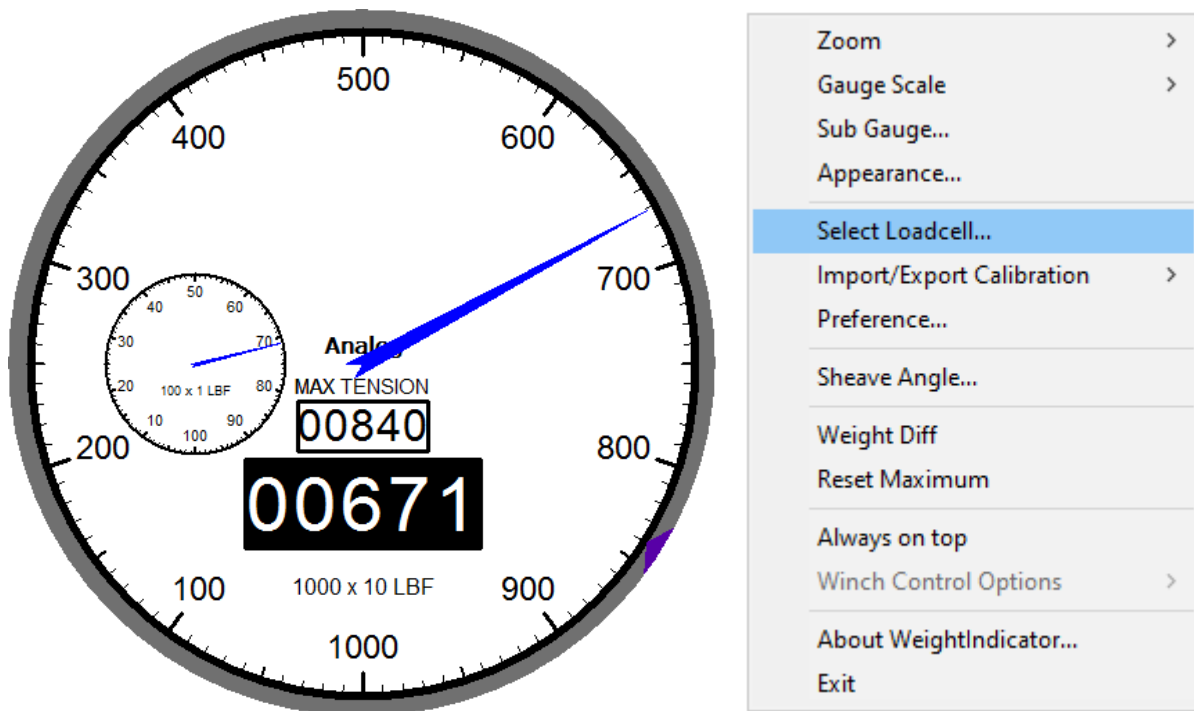
6.1 **Weight Indicator Calibration**

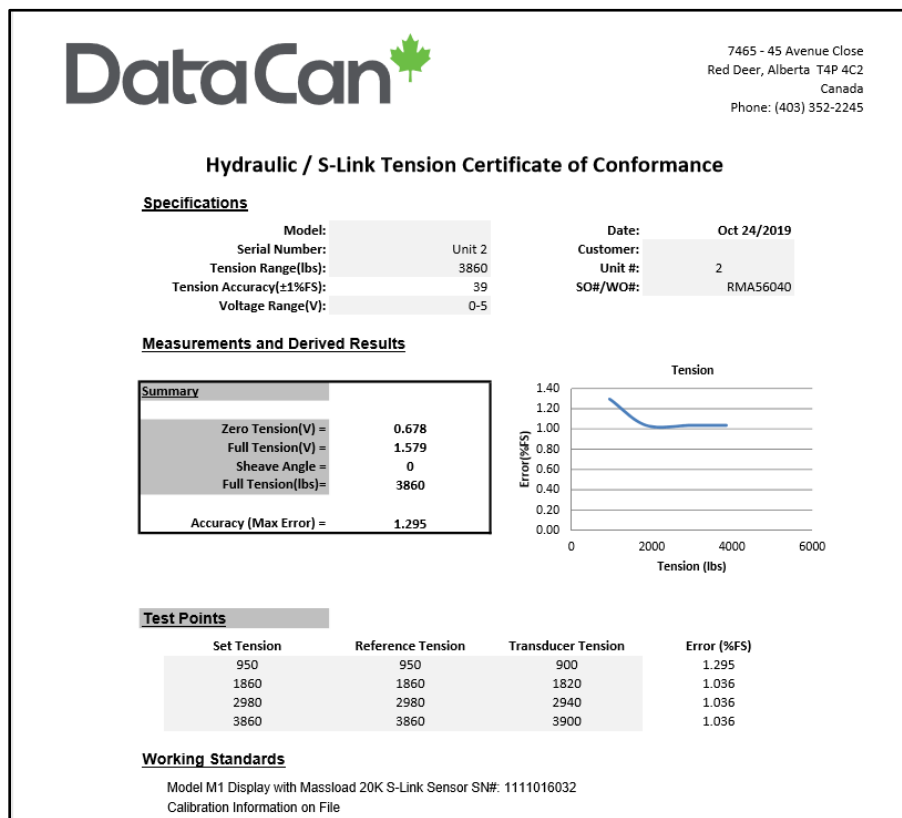The instructions below explain how to perform a generic two point tension calibration.

- Right click on the gauge and click Select Load Cell to change the calibration.

- Choose an existing calibration and click OK to change the calibration for the gauge.

- Click on the Calibrate button to edit an existing calibration or create a new one.

- The properties for the current calibration will appear on the right hand side.
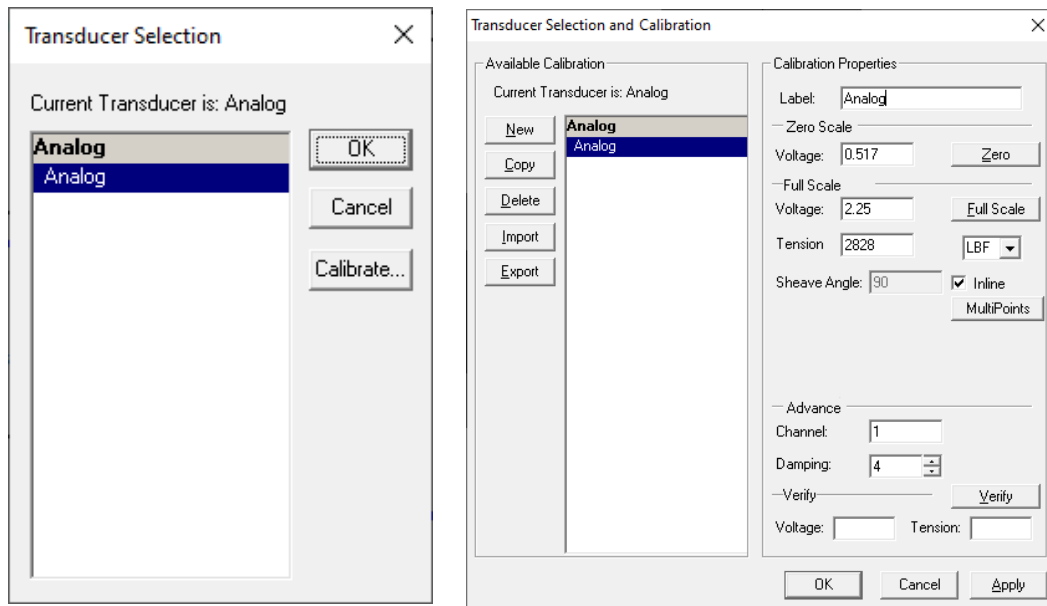
- The name of the calibration is shown under Label, this can be customized.

- The channel number and damping value are shown in the Advance section.

- The channel number should be set to 1 for a tension device that is plugged into the yellow connector and does not need its signal amplified. [ex] Hydraulic tension device.

- Set the channel number to 2 for a device that does require the signal to be amplified and is plugged into the yellow connector. [ex] DataCan's Inline and S-Link style tension devices

- The damping value represents the number of samples to average to help smooth the response of the needle. The higher the value the slower the response of the needle. If unsure, set it to 4.

- The Sheave Angle should be set to Inline for any devices that do not require an angle, otherwise type in the appropriate value.

- The Zero Scale Voltage represents the low end input value (reading).

- The Full Scale Voltage represents the high end input value (reading).

- The Tension value represents the actual tension (reference) at the time the Full Scale Voltage was taken (read).

## 6.2 **Weight Indicator Certificate of Conformance**

The Certificate of Conformance is obtained through DataCan when a sensor is calibrated at DataCan's facility.

The certificate contains the information for the Zero and Full Scale values.

Type in the voltages for Zero and Full Scale, the actual tension value, and the Sheave Angle from the Summary section in the certificate. If the Sheave Angle is 0 make sure the Inline checkbox is checked.

Right click on the gauge, click Select Load Cell, and then click Calibrate to open the Calibration Window as shown below.
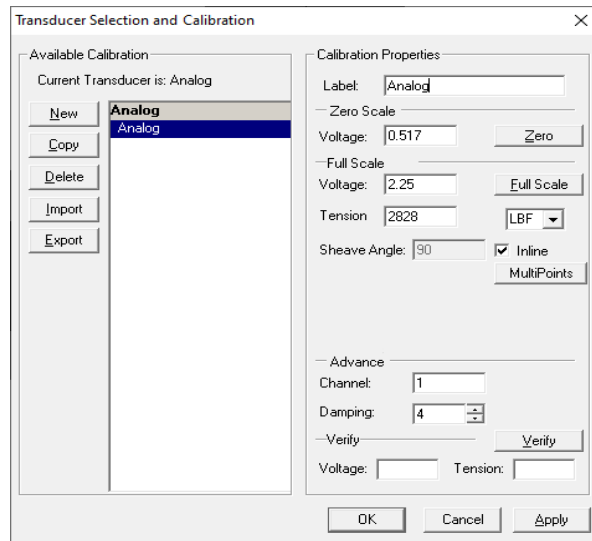
Note that the Certificate of conformance can also be obtained from the DataCan website by referencing the serial number of the load pin at https://www.datacan.ca/downloads

6.3 **Performing a Hydraulic Tension Calibration**

The instructions below explain how to perform a hydraulic tension calibration for two points.

- Right click on the gauge, click Select Load Cell

- Click Calibrate to open the Calibration Window. The properties for the current calibration will appear on the right hand side.

- Click one of the other available calibrations or click New to create a new calibration if necessary. Choose Analog when creating a new calibration.

- Edit calibration name under Label.

- Set **channel number to 1** if tension device is plugged into the yellow connector

- Set **Sheave Angle** to the appropriate value. If the reference value for tension is at the end of the line set it to inline.

- Calibrate the low end by either clicking on **Zero** to read the current voltage value or type in the voltage shown in LineWise Logger. Remember to release any tension on the hydraulic device.

- The current voltage for channel 1 can be seen in LineWise Logger by clicking on Monitor.

- Clicking the Zero button will average the samples taken over a short period of time.

- Calibrate the high end by either clicking on **Full Scale** to read the current voltage or type in the voltage from LineWise Logger. Remember to add tension to the hydraulic device.

- Next type in the actual Tension applied at the high end and choose the appropriate unit. This does not affect the unit displayed in the gauge. The units are independent of each other.

- If the reference for tension is a Martin Decker style gauge and the line is not going through the sheaves it is necessary to multiply the actual tension by 1.414. Those types of gauges assume the sheave angle is 90 degrees.

- It is often useful to write down the voltages for the low and high end for future reference.

6.4 **Performing an Inline Tension Calibration**

The instructions below explain how to perform an inline tension calibration for two points.

- Right click on the gauge, click Select Load Cell

- Click Calibrate to open the Calibration Window. The properties for the current calibration will appear on the right hand side.

- Click one of the other available calibrations or click New to create a new calibration if necessary. Choose Analog when creating a new calibration.

- Edit calibration name under Label.

- Set **channel number to 2**. The tension device should be plugged into the yellow connector

- Set **Sheave Angle to Inline**.

- Calibrate the low end by either clicking on **Zero** to read the current voltage value or type in the voltage shown in LineWise Logger. Remember to release any tension on the inline device.

- The analog voltage for channel 2 is seen in LineWise Logger by clicking on Monitor.

- Clicking the Zero button will average the samples taken over a short period of time.

- Calibrate the high end by either clicking on **Full Scale** to read the current voltage or type in the voltage from LineWise Logger. Remember to add tension to the inline device.

- Next type in the actual Tension applied at the high end and choose the appropriate unit. This does not affect the unit displayed in the gauge. The units are independent of each other.

- It is often useful to write down the voltages for the low and high end for future reference.

6.4.1 **Using the Inline Tension Calibrator**

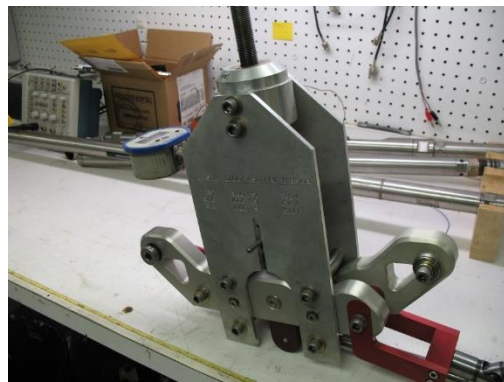|	
Disassemble one of the side plates of the inline calibrator. 	Unscrew the cylinder all the way up
Slide the cylinder over the load pin roller (center roller) 	Put the removed side plate back in place and attach all screws.
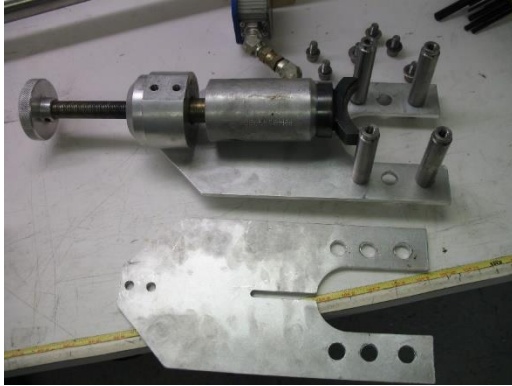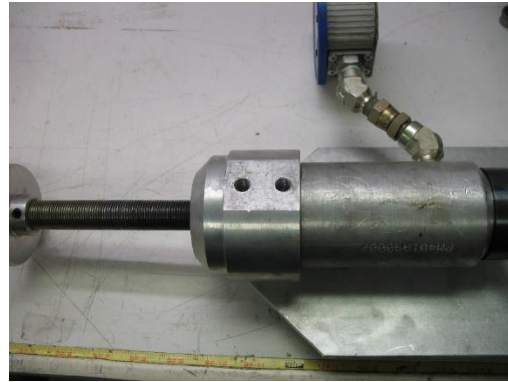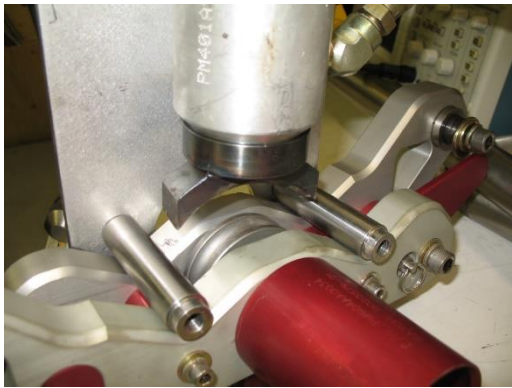
Position the jaw of the cylinder centered over the roller and screw it down until it just contacts the roller. Remember not to put any pressure on the roller while performing the low end.

- Run the Weight Indicator program and open the Calibration Window.
- Click **Zero** to calibrate the low end or type in the voltage shown in LineWise Logger on analog channel 2. Remember to release any tension on the inline device.
- Increase the pressure on the load pin by screwing the handle downwards. According to the values found in the table below and the line size that will be used, increase the pressure on the calibrator until it reads either 500 or 1000.
- Next click **Full Scale** to calibrate the high end or type in the voltage shown in LineWise Logger on analog channel 2.
- Now type in the appropriate Tension value from the chart below and set the unit to **lbf**. This does not affect the unit displayed in the gauge. The units are independent of each other.
- It is often useful to write down the voltages for the low and high end for future reference.

Line Size in Inches	3/16" (0.1875)	7/32" (0.21875)	1/4" (0.25)	9/32" (0.28125)	5/16" (0.3125)	3/8" (0.375)	15/32" (0.46875)
Full scale Tension Number	4312	3984	3702	6915	6487	5774	4959
Pressure on Calibrator	500	500	500	1000	1000	1000	1000

The Inline Tension Calibrator connects to the DataCan Inline Tension Device. This device allows operators to apply tension to the load pin and monitor the pressure (psi). The maximum pressure rating is dependent on line size with smaller lines sizes having a maximum pressure rating of 500 psi and larger line sizes having a maximum of 1000 psi as shown in the table above.

7 Depth Panel

- Run the Depth Panel program ![icon].

- The main purpose of the Depth Panel program is to display depth and speed.

- The Depth Panel is setup through the main menu.

- Click on Settings under the Edit menu.

- The Encoder tab should already be selected.

- Enter the number of encoder pulses per revolution in the Pulse/Rev field. This value maybe written on the side of the encoder or is in the part number.

- Select the Reverse check box ONLY IF the depth is counting in the opposite direction from what it should. This will depend on which side of the measuring wheel the encoder is mounted.

- Set the Minimum Depth value to the lowest depth the Depth Panel will display before wrapping. The default minimum is -100 meters.

- Enter the circumference or diameter of the measuring wheel in the Size field.

- Select the Circumference or Diameter radio button as required.

- Select or clear the Straight line counter check box as required. If the measure wheel accommodates for the line diameter select the straight line counter check box. Clear the straight line counter check box if the line diameter needs to be taken into account.
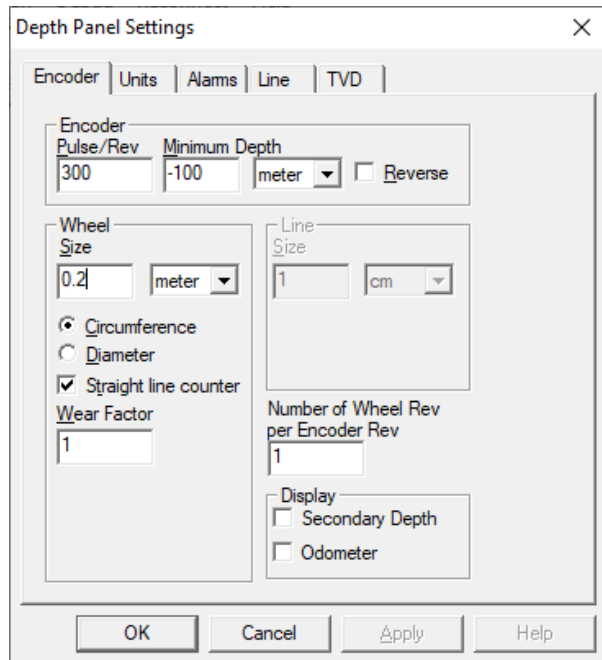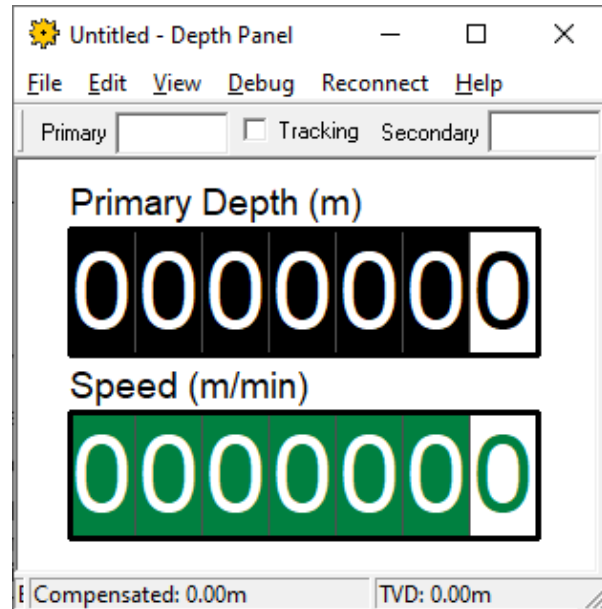
- Enter a value in the Wear Factor field if required. Always start at 1 before adjusting the wear factor. If the wear factor is being used to compensate for wheel wear the value should be less than 1 to compensate for the smaller wheel size.
- The ratio of wheel revolutions to encoder revolutions needs to be set to 1 unless the ratio is different.
- Click the OK button to accept the changes.

7.1 Change the Display Units

- Click on Settings under the Edit menu.
- Click the Units tab to change the page.
- In the Depth drop-down list, select meters or feet.
- In the Speed drop-down list, select m/min, ft/min, or ft/hr.
- In the Decimal field, type in how many decimal places you want to appear on the odometer display.
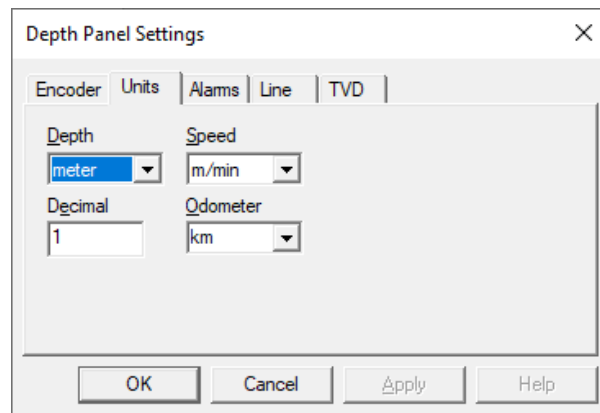
7.2 Adjust the Depth Alarms

- Click on Settings under the Edit menu.
- Click the Alarms tab to change the page.
- In the Over Speed field, type the speed value at which you want to trigger an alarm.
- Select the Enable Speed Alarm check box to activate the alarm.
- In the Depth field, type a value at which you want to trigger the alarm.
- Click the "add value" button to add the depth value to the list pane. NOTE: You can add more than one depth
- Select the Enable Depth Alarm check box to activate the alarm.

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