



**CANADA
TECH**

SLIMLINE/SHORTLINE

Assembly and Service



Canada Tech Corp.
210 600 6th Ave SW
Calgary, Alberta
Canada T2P 0S5
Phone 403.232.1400 Fax 403.232.1401
info@canadatech.com
www.canadatech.com

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I. Introduction Overview

The major purpose of this manual is to inform users on how to use and maintain the Slimline 0.75", 0.875" and the 1.25" gauges. The user will find information on operation, maintenance, and troubleshooting.

Canada Tech offers a wide range of oilfield related memory devices. These include downhole memory gauges utilizing both Peizo-Resistive and quartz transducers, surface readout pressure recorders, surface pressure loggers and various products utilized by the slimline / wireline industry. These products have been developed and manufactured to obtain the highest accuracy and resolution in the industry.

A. Components and Accessories

A complete set of Slimline / Shortline (hotpill) gauges comes complete with the following items:

- 2 Electronics housings
- 2 Battery housings
- 2 Bullnoses
- 1 Crossover Adapter
- 1 Maintenance Kit (containing 10 extra O-rings)
- 1 Data Download Box (RS232 Serial or USB – customer specific)
- 1 Data Download Cable (RS232 Serial or USB)
- 1 USB Drivers Disk (only needed with USB Communications)
- 1 Interface Power Supply (only needed with RS232 Communications)
- Gauge Calibration files and Certificates
- 1 Tool Box Program CD

Extra Accessories may be ordered:

- Pelican Case
- Lithium Batteries
- Battery Tester

Canada Tech software requires an IBM compatible 60 MHz Pentium computer or better, along with Microsoft Windows.



B. Power Consumption

Slimline gauges are designed to operate under low power consumption, therefore the battery life can be extended to save operational expenses for our customers.

Tool Modes and Computer requirements

1. **Sampling Mode:** (2.3 μ Amps) The tool is in Sampling Mode when a battery is placed on the gauge without the Data Download Box and Data Download Cable attached to it. Under normal operating conditions the recorder is programmed at the operations base and then transported to the well site. Prior to running the recorder in the well, the battery pack is connected to the electronics and the gauge carries out the program in accordance with the instructions pre-stored in memory.
2. **Stand-by Mode:** (20 μ Amps) The gauge is called to be at Stand-by-Mode when the gauge is not sampling (ie. in between the sample). All the gauges are designed to switch to Stand-by-Mode automatically when a sampling is finished.
3. **Communications Mode:** (8mAmps) The gauge is said to be in Communication Mode when the Data Download Box and Data Download Cable are connected to the gauge and the computer. Communication mode is used to program the tool, download file, upload calibration information and do other related operations through the software.

II. Assembly and Operation

Once the sampling program has been saved to the tool, there is a simple procedure in the assembly of the tool before operation can occur.

1. Before connecting the lithium battery to the gauge, it is important to **check the voltage** with our Canada Tech battery tester. Any standard 150°C single AA lithium pack should have a voltage from 3.6 - 3.9V (see manufacturer data) when new. The gauge will start to record samples with voltages less than 3.2 V. A lithium battery with a starting voltage under manufacture specification should not be used. If a new battery shows a voltage less than expected, it may have a passivity layer problem. Insert the battery into a Canada Tech battery tester and leave it for approximately 30 minutes. This will draw a current from the battery and should increase the voltage if a passivity layer is the problem.

It is unknown what type of environmental changes the gauge experienced while it is down the well. Extreme temperature changes will definitely shorten the lifespan of the battery. Therefore it is suggested that a new battery be used each time the gauge is run into the well. Canada Tech does not officially support the use of used battery packs for any job.

2. For each gauge, **record the serial number and voltage** of the battery pack being used with that gauge.

3. **Note the exact time and connect the battery pack to the housing battery socket.** To minimize potential damage, the lithium battery has only one alignment with the gauge connector. Line up the red dot on the lithium battery with the red dot on the gauge and insert carefully. If this does not happen gently, double check to make sure the red dots are lined up. The gauge starts sampling immediately after the battery pack is connected and before the first flash of the LED.



4. **Watch the LED** on the side of the lithium battery. For some gauges, if the connection has been successful, the LED will flash red sixteen times. The first flash has a 2-second delay and a 1-second delay between each of the remaining flashes. Any other combination of delayed flashes may mean problems. This connection now initializes the gauge to begin pressured temperatures. If the connection was unsuccessful and the LED does not flash red, try disconnecting and reconnecting the battery again or place the battery in the tester and check the voltage. Wait several seconds and try connecting the battery again. If the light still does not flash, and the voltage checks properly, try re-connecting the battery and log the tool for 5 minutes. Check the tool director and see if a file has been created. The LED on the battery might have been damaged.

Lithium Battery



5. **Record the exact time** (noted in Step 3) **and date** when the battery was connected. This is the start time and date you will enter into the software when downloading this data file.

6. Make sure the **O-rings and threads on the gauge are properly lubricated.**

Threads
O-rings



7. **Slide the battery housing over the battery** and tighten it onto the electronics housing. If this process is not easily done, STOP. Remove the housing and the battery. Try sliding the battery into the housing by hand to see if there are any obstructions. If there is a problem, check to see if the inside of the housing is clear and clean and check the outside of the battery for foreign material or swelling. The battery will twist off inside of the electronic housing socket if it does not fit freely in the battery housing.



8. **Tighten the battery housing** on to the electronic housing using 5/8" wrenches on the wrench flats. These gauges are O-ring sealed (not metal to metal sealed) and therefore should only be slightly more than hand-tight.

*** Do not over-tighten and do not use pipe wrenches on these gauges as you could damage the housings.**

9. The gauge is now ready to be run into a well.

A. After Removal of the Gauge

1. The gauge should be allowed the **cool** sufficiently before working with it.

2. **Loosen the battery housing** from the electronics housing using a 5/8" wrench.



3. Slowly **remove the battery housing** from the electronics housing. Ensure no pressure has built up inside housing. Lift the battery housing off of the battery.

4. Remove the battery from the electronics housing socket by gripping the battery as close to the pin as possible and pull straight off of the electronics housing. ***Do not twist the battery!!** It is now time to start downloading the information recorded by the gauge.

B. Communication with the Gauge

To start communicating with the gauge, the following procedure is recommended:

1. **Attach the female end of the 9 pin serial cable**, which was provided with gauges, **to an empty parallel port in the back of the computer**. Attach the male end of the cable to the Serial Data Download Box. The Serial Data Download Box is an electric interface adapter, which allows communication between the computer and the gauge. If you are using the USB Download Box, connect the USB cable to the USB port on the computer. With the USB connection, no interface power supply is needed. With the USB connection, no interface power supply is needed. Make sure



the USB Drivers are installed on the computer for the USB connection to work. A USB Driver disk is provided with the complete package or you can find the latest driver on our website www.canadatech.com >>> Support >>> Downloads >>> USB Drivers.

- Line up the red dot on the interface box to the red dot on the gauge and insert carefully.** They will only connect this way. Do not force or twist!! If the connection is difficult, stop and look to see what the obstruction might be. Clear all obstructions and try the connection again. When these three components are connected together, the gauge is said to be in *Communication Mode*. This mode is used to program the tool, download file, and upload calibration information and other related operations through the software. The power consumption in this mode is 8mA. Once again, for USB connections, line up the red dot on the interface box to the red dot on the gauge and insert carefully, but no interface power supply is needed.
- Connect the battery pack to the interface box** by lining up the red dots on the interface box and the red dot on the battery pack. You will know if the connection is ready when the LED on the battery pack flashes red on and then off. If the flashing does not occur, try this connection again. This is not needed with USB connections.



- Open the program Tool Box. Refer to Tool Box Manual for connection and operation instructions



III. Servicing of the Gauge

1. After all data is downloaded from the tool, carefully disconnect all components.
2. Clean and lubricate the tool after use. Replace all o-rings after every run to protect the gauge from potential damage caused by o-ring failure. There are only two o-rings on the Slimline II gauge at the top section of the electronics housing. Standard o-rings are number 014 - V90 which are supplied with the tools. O-rings should be selected based on the environment the tool will be run in.

A. Cleaning the Transducer



3. Remove the bullnose (or crossover) after every run and clean the pressure ports. If the pressure ports get plugged, then the gauge may not read accurately. With the bullnose or crossover adapter off, carefully rinse the pressure transducer without directly touching it.

CAUTION: DO NOT TOUCH THE PRESSURE TRANSDUCER DIRECTLY AS IT CAN BE DAMAGED VERY EASILY. WHEN THE TOOL IS NOT BEING SERVICED, ENSURE THE BULLNOSE IS INSTALLED ON THE GAUGE TO PROTECT THE TRANSDUCER.

B. Lubricating the Gauge Threads

4. The threads on the top of the electronics housing and on the bullnose should be lubricated with the proper lubricant, such as Dow Corning 55-O-ring lubricant. This should be done prior to usage.

***It should be noted that the gauge does contain electronics and should be treated gently whenever possible. Store gauges in their storage cases when not in use.**

***Never submerge the tool in fluid unless it is completely assembled.**

***If you are running a slick line test, do not exceed 150 feet per minute when running the gauge(s) into and out of the hole.**

IV. Troubleshooting Problems

A. Gauge is not communicating

- Press the connect button on the Tool Info page
- Unplug the cable, gauge and battery from the Download Box. Re-install the gauge, cable and battery to the Download Box. If the LED on the battery flashes once on and then off, this means connection has been initialized and no software problems should exist.
- Change the COM port selection on the back of the computer or on the Config page of the Tool Box software.
- Download Box may be defective and may need be replacement.

B. Gauge was communicating and stopped

- Low battery voltage may be the problem. Gauges require at least 3.2 V to communicate. Test batteries on the Canada Tech battery tester.
- Data Download Box may be defective and should be replaced.
- Communication may be blocked. Unhook and reconnect all communication devices. (Cable, Download Box, Battery, and Gauge)

C. LED does not flash after the battery is installed

- Battery may not have been installed correctly. Unplug the battery and plug it in again.
- Battery voltage may be lower than 3.2V.
- The LED on the battery may be dysfunctional.

D. Data recorded to memory is of poor quality or non-existent

- There may be low voltage going to the transducer. Test and possibly replace batteries.
- Data is constantly out of specification. Download data sample to see if the transducer is giving out the correct data, verify with the calibration sheets.
- Memory may be full. Check memory specs and compare the memory spec s documented on the Tool Info or Program tab.

E. Graph doesn't show pressure and temperature lines

- Download file from gauge first, then click on the graph tab.