



Canada Tech

 *A division of IROC Energy Services Partnership*

MLT300

Operator's Manual

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Sales, Marketing, and Support

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Introduction

Canada Tech was established in 1992. Now as a part of the IROC Energy Services Partnership, it is a specialized technology company that develops, designs, and manufactures an extensive line of memory gauges and permanent down-hole pressure and temperature monitoring systems for the oil and gas industry. These highly accurate devices can measure, log, transmit, and display both reservoir and surface pressure and temperature data.

Canada Tech's commitment remain be number one in this specialized field has resulted in a level of in-house expertise and experience that is second-to-none. Our commitment to customer satisfaction, combined with a significant investment in innovation, research, and development, have earned Canada Tech "Preferred Supplier" status with leading service companies and oil and gas producers worldwide.

Canada Tech offers three categories of products:

- Memory tools
- Subworks tools
- Surface tools

Memory Tools

Our memory tools are durable, innovative and easy to use for slickline, coiled tubing, frac, and other stimulation applications. A full line of quartz and piezo-resistive tools is available in 0.5", 0.75", or 1.25" outside diameter. These tools are characterized by their durability and ease of use.

Subworks Tools

Our continuous bottom-hole pressure and temperature monitoring system consists of modular components that can be tailored to match most reservoir monitoring applications and budgets. Common applications include long-term reservoir analysis and automated reservoir optimization solutions, including interfacing with PCP, ESP, and chemical injection equipment.

Surface Tools

Our collection of surface-related electronics include the innovative line of wireless surface gauges and accessories, and the Canada Tech Depth System that electronically records the depth, speed, and tension from a line truck.

About the MLT300 Operator's Manual

This manual explains how to get the best performance from the MLT300 Mini Logging Tool, and includes information about:

- Installation
- Operation
- Troubleshooting
- Servicing and Repairs

Before operating any MLT300, it is important to be familiar with all aspects of the equipment and to carefully read this manual.

CAUTION

When handling and working with these tools, it is vital to apply the safety precautions suggested herein. Misuse of the tools or equipment may be hazardous to one's health. Before continuing, read the [IMPORTANT SAFETY PRECAUTIONS](#) section.

Related Documentation

This manual is meant to be used with the following documents:

- Canada Tech MLTMod User Manual
- USB Driver Installation Guide – http://www.iroccorp.com/canadatech/Support_and_Downloads/USB_Driver_Installation_Guide.pdf
- Canada Tech Battery Tester User Manual - http://www.iroccorp.com/canadatech/Support_and_Downloads/CanadaTech_Battery_Tester_User_Manual.pdf

Product Description

The MLT300 is a compact version of a production logging string. Designed with multiple sensors, it is a modular tool that provides correlated data on pressure, temperature, depth, and flow rate. The three main Sensor Modules are the platinum Resistance Temperature Detector (RTD), the Casing Collar Locator (CCL), and the Pressure and Flow Module, and any combination of modules can be used at one time. Data is recorded onto the Memory Module that is connected to the top of the tool string.

The MLT is manufactured utilizing Toughmet® and 718 Nickel alloy for high corrosion resistance and reduced galling.

Memory Module

This is a replaceable module that can be interchanged, allowing for a second survey to be done with a new module, while data is being retrieved and examined from the first module.

RTD Module

The dual platinum RTDs provide a fast responding and high resolution temperature profile along the wellbore. Using dual RTDs increases the sensitivity of the module, and negates the chances of the RTD Module being shielded when the MLT300 moves off-center within the tubing string.

CCL Module

The CCL Module records depth by measuring the change in the electromagnetic field surrounding the CCL that occurs at each casing or tubing collar. Since the length of each joint is known, tool depth can be inferred from these measurements, and correlated with the rest of the data.

Pressure and Flow Module

As the external housing is universal, the Pressure and Flow Module is economical in design. Depending on the desired pressure range, different gauges are inserted into the external housing. It is only necessary to purchase one external housing to run multiple gauges, making the MLT300 a more versatile tool.

Specifications

Materials	
Housing	Inconel 718
Transducer	Hastelloy C-276
O-Rings	Viton 90 Durometer or Chemraz
Pressure and Temperature	
Maximum Pressure	25 ksi ¹
Maximum Temperature	+177°C ²
Minimum Temperature	0°C
Power	
Operating Voltage	3.2 – 3.6 V
Current	15 – 20 mA
Battery Life	Temperature Dependant
Data Acquisition Memory	
Sampling Interval	0.1 Seconds to 1.82 Hours
Capacity	1 600 000 Samples (when configured as kit 106173)
Communications	Canada Tech Embedded USB Download Cable
Software	Canada Tech MLTMod Software (MS Windows compatible)
RTD Module	
Sensor Type	Dual Platinum RTDs
Accuracy	± 0.1°C
Repeatability	± 0.2°C
Pressure and Flow Module	
Sensor Type	Piezo-Resistive
Accuracy	± 0.050% of Full Scale
Long Term Stability	0.015% of Full Scale
Drift	0.02% of Full Scale per Year
Resolution	< 0.008 psi/sec

¹ Maximum pressure rating varies with individual modules.

² Maximum temperature rating varies with individual modules.

Warranty Statement

Canada Tech warrants that its products are free from defects in material and workmanship under normal conditions of use and service.

Canada Tech's obligation under this warranty shall be limited to replacement to the original purchaser only, and only for any parts demonstrated to be defective within one year of purchase for 150°C and below gauges, and 6 months for 177°C gauges.

WARNING

EXCEEDING THE TOOL SPECIFICATIONS VOIDS THE WARRANTY!

Should repairs to warranty items be required, repair and shipping costs will be at Canada Tech's expense. The balance of the original warranty period will apply to all parts.

IMPORTANT SAFETY PRECAUTIONS

The greatest threat to safety when operating memory pressure and temperature tools is posed by the handling and use of lithium battery packs. While safe when handled according to the manufacturer's recommendations, lithium batteries contain a large amount of potential energy that could pose hazards if released at a fast and uncontrolled rate, including possible battery venting, explosion, and fire.

Be aware of the following facts:

- Leaked fluid from a lithium battery is corrosive!
- Gram for gram, lithium can be as destructive as dynamite!
- Above their rated temperature, batteries can explode!

WARNING

USE EXTREME CAUTION WHEN HANDLING LITHIUM BATTERIES!

- Ensure that the working area is clean and free of moisture, clutter, and debris.
- Always follow the manufacturer's directions for their proper use, handling, and storage. Documentation and Material Safety Data Sheet (MSDS) for batteries manufactured for Canada Tech are available from [Electrochem](http://www.electrochemsolutions.com/support/safety.aspx) at <http://www.electrochemsolutions.com/support/safety.aspx>.
- Keep a copy of the MSDS in the battery storage area.
- Store large quantities of batteries away from people and other hazardous materials because lithium batteries can release toxic material if crushed or broken open.
- Always wear appropriate personal protective equipment when disassembling a tool.
- As an additional safety precaution, Canada Tech recommends that sodium phosphate powder be kept nearby with appropriate signs. Sodium phosphate can neutralize the corrosive electrolyte contained in lithium cells.

In particular, to prevent trouble and remain safe, avoid the following:

- Electrically conductive work surfaces (use wood or plastic)
- Electrical short-circuits
- Forced over-discharging
- Excessive heating (including incineration)
- Crushing, puncturing, or disassembling
- Any welding to the battery/battery pack including stray arcs
- Explosive and/or flammable environments

See also: [Lithium Battery Performance Enhancement](#)

When the tool is in a hazardous location, the following must be observed:

- The tool must be completely assembled, gauge(s) inserted, and set screws installed
- Batteries and electrical connections cannot be installed or removed while in a hazardous zone

WARNING!

THERE IS A DANGER FROM BUILT UP PRESSURE AND MATERIALS, INCLUDING H₂S, BEING RELEASED FROM BETWEEN REDUNDANT O-RINGS. AN H₂S MONITOR SHOULD BE PRESENT WHEN THE TOOL IS DISASSEMBLED. TOOLS SHOULD ALSO BE DISASSEMBLED IN A WELL VENTILATED AREA.

Preparing for Operations

Setting up to operate the MLT300 requires the completion of the following activities:

	Activity	Covered in this Topic
<input type="checkbox"/>	1. Check to see that all of the required tools to complete the set up are present	Items Required to Operate the MLT300
<input type="checkbox"/>	2. Install the Canada Tech ToolBox Software	How to Install the MLTMod Software
<input type="checkbox"/>	3. Install the Canada Tech USB Drivers	How to Install USB Drivers
<input type="checkbox"/>	4. Be familiar with the component assembly drawing	Component Assembly
<input type="checkbox"/>	5. Connect the MLT300 to the PC	How to Connect the MLT300 to a PC
<input type="checkbox"/>	6. Setup the MLT300	How to Setup the MLT300
<input type="checkbox"/>	7. Be familiar with tool maintenance	Interim Tool Maintenance

Items Required to Operate the MLT300

To be fully operational, the MLT300 will require the installation and or configuration of software, hardware, and computer equipment. Check the list below to ensure all of the required tools are present.

Software

- Canada Tech MLTMod Software
- Canada Tech USB Drivers

Hardware and Accessories

- MLT300 Memory Module
- Any Combination of the RTD, CCL, or Pressure and Flow Modules
- Caged Spinner Assembly
- Battery Pack
- Battery Barrel
- Battery Tester
- Two 2-119 Viton O-Rings per Module
- Two 8-119 Peek Backup O-Rings per Module
- Shipping Case Assembly
- O-Ring Lubricant
- Pressure and Flow Bullnose
- Bullnose
- OR
- Loop-Back Connector

Computer Equipment

- IBM® Compatible Personal Computer (PC) Running Microsoft Windows XP or Newer
- Canada Tech Embedded USB Download Cable

Tools

- Two 1 3/8" Flat Wrenches
- 3/32" Hex Wrench
- Pressure and Flow Module Pulling Tool
- Snap Ring Pliers
- Wax Dental Floss
- Scotch Brite

How to Install the MLTMod Software

The Canada Tech MLTMod software is required to communicate to an MLT300 from a PC. MLTMod has been designed by Canada Tech specifically for use with the MLT300 tools. To install MLTMod, follow these steps:

- The MLTMod software can be downloaded from the Canada Tech website, http://www.iroccorp.com/canadatech/support_downloads.php
- Extract the files and run 'Setup.exe'
- Follow the instructions on the screen. The Setup program will install the MLTMod software and add shortcuts to the Desktop and in the Start menu
- When prompted, click 'Finish' to complete the installation process

How to Install USB Drivers

To connect the MLT300 to a PC, Canada Tech USB Drivers are required. To install the drivers, follow these steps:

- The USB Drivers can be downloaded from the Canada Tech website, http://www.iroccorp.com/canadatech/support_downloads.php
- Extract the files
- Plug the USB Embedded Download Cable into the computer
- Follow all of the on-screen instructions to complete the setup process

To learn more about how to install the USB Drivers, refer to the [USB Driver Installation Guide](#).

NOTE

There are two sets of drivers that need to be installed. This requires running the setup utility twice. Proceed slowly and follow ALL of the instructions on the screen.

Component Assembly

The drawings and steps that follow illustrate the component assembly.

NOTE

Since the Pressure and Flow Module is a component that can be purchased to match the conditions of the environment, the type will vary according to each order. Upon receipt, verify that the package includes all the parts and accessories that were ordered.

All battery packs are shipped separately.

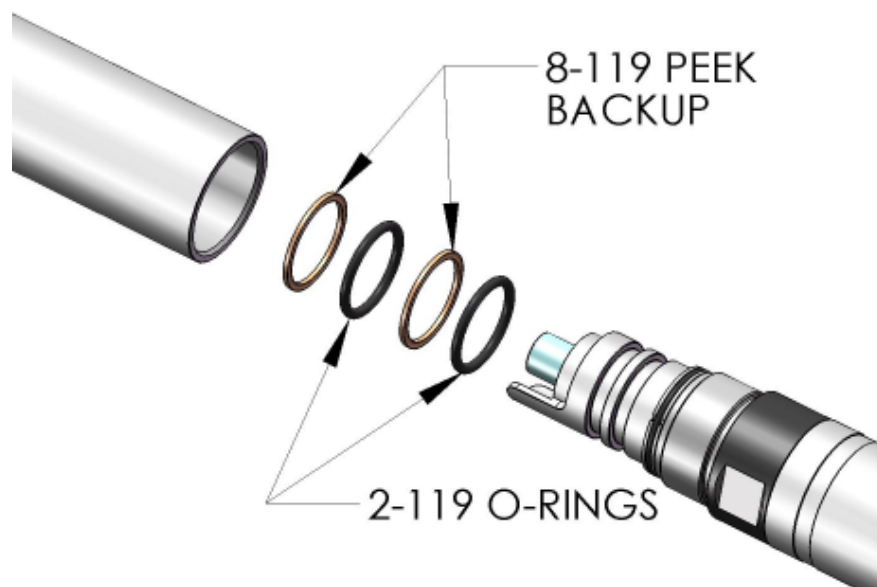
Sensor Assembly

NOTE

It is always a good idea to dry fit parts together without o-rings to ensure that parts go together trouble free.

To assemble an MLT300, follow these steps:

- Before assembly, inspect all of the threads to ensure that there are no nicks, scratches or defects, and that all of the threads are clean and free of burrs or contamination
- Apply lubricant to the two 2-119 o-rings and install them onto the o-ring glands as shown below



- For ease of installation, use thick waxed dental floss or a length of small insulated wire to pull the o-rings onto the glands
- Apply lubricant the two 8-119 peek backup and install them onto the o-ring glands as shown above, with concave side towards o-ring
- When attaching the MLT300 Sensor Modules, it is important to pay special attention to the orientation of the MAIN KEYWAY
- Hand-tighten the desired Sensor Modules together
- Using the two 1 3/8" flat wrenches, tighten the Sensor Module connections to 40 ft-lb

CAUTION

Over-tightening will not aid in sealing and may damage the threads.

assembly/1

ASSEMBLY INSTRUCTIONS:

1. REMOVE SNAP RING FROM PULLING TOOL, AND REMOVE NUT FROM STEM
2. THREAD STEM INTO GAUGE
3. ALIGN CONNECTOR AND HOUSING, AND PUSH GAUGE INTO HOUSING UNTIL O-RINGS ENGAGE
4. SLIDE NUT OVER STEM, AND THREAD INTO HOUSING USING 2 1-3/8" WRENCHES. TIGHTEN NUT INTO HOUSING TO SEAT GAUGE
5. REMOVE NUT FROM HOUSING
6. REMOVE STEM FROM GAUGE
7. REMOVE STEM FROM GAUGE
8. INSTALL INTERNAL SNAP RING TO SECURE GAUGE

DISASSEMBLY INSTRUCTIONS:

1. REMOVE SNAP RING FROM ASSEMBLY TO RELEASE GAUGE
2. REMOVE SNAP RING FROM PULLING TOOL, AND REMOVE NUT FROM STEM
3. THREAD STEM INTO GAUGE
4. SLIDE NUT OVER STEM, AND THREAD INTO HOUSING, INSTALL SNAP RING BACK ONTO STEM TO SECURE NUT TO STEM
5. USING 2 1-3/8" WRENCHES, BACK NUT OUT OF HOUSING TO REMOVE GAUGE

ASSEMBLING DETAILS

CONNECTOR MAIN KEY
GUIDING KEY WAY

DRAWN	MIRT	JAYLOR		Canada Tech
CHECKED				
STATUS	DESIGN	TESTED	REVISION	
DATE	DATE	DATE	NO.	
<p>The information contained in this drawing is the sole property of Canada Tech Corp. Any reproduction without the written consent of Canada Tech Corp. is prohibited.</p>				
NOT TO SCALE			SHEET 2 OF 3	REV.
			SIZE / PART NO.	DRAWING NO.
			A 106174	D0000851
				-

Bullnose Assembly*Running the MLT300 without a Caged Spinner Assembly*

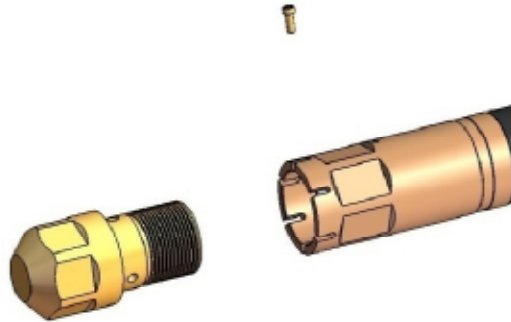
When running a Pressure and Flow Module without a Caged Spinner Assembly, the Pressure and Flow Bullnose must be used.

- Before assembly, inspect all of the threads to ensure that there are no nicks, and that all of the threads are clean and free of burs or contamination
- Apply lubricant to the threads
- Hand-tighten the Bullnose and the Pressure and Flow Module connection
- Ensure that the holes line up with the slots on box end

NOTE

The two 1 3/8" flat wrenches may be required to properly align the Bullnose.

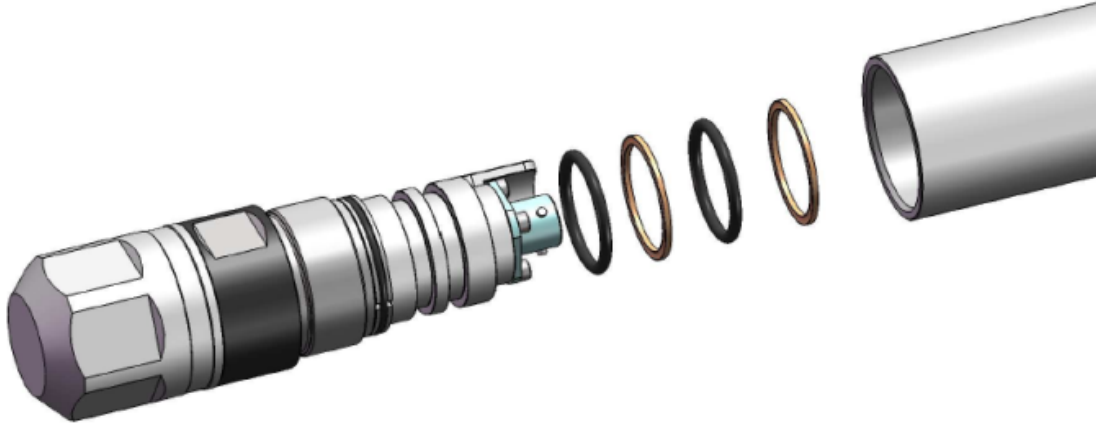
- Thread the set screw into one of the holes as shown below
- Tighten the set screw using a 3/32" hex wrench



Running the MLT300 without a Pressure and Flow Module

When running the MLT300 without a Pressure and Flow Module, a different Bullnose is required.

- Before assembly, inspect all of the threads to ensure that there are no nicks, and that all of the threads are clean and free of burrs or contamination
- Apply lubricant to the two 2-119 o-rings and install them onto the o-ring glands as shown below



- For ease of installation, use thick waxed dental floss or a length of small insulated wire to pull the o-rings onto the glands
- Apply lubricant the two 8-119 peek backup and install them onto the o-ring glands as shown above, with concave side towards o-ring.
- It is important to pay special attention to the orientation of the MAIN KEYWAY
- Hand-tighten the desired Sensor Modules together
- Using the two 1 3/8" flat wrenches, tighten the Sensor Module connections to 40 ft-lb

CAUTION

Over-tightening will not aid in sealing and may damage the threads.

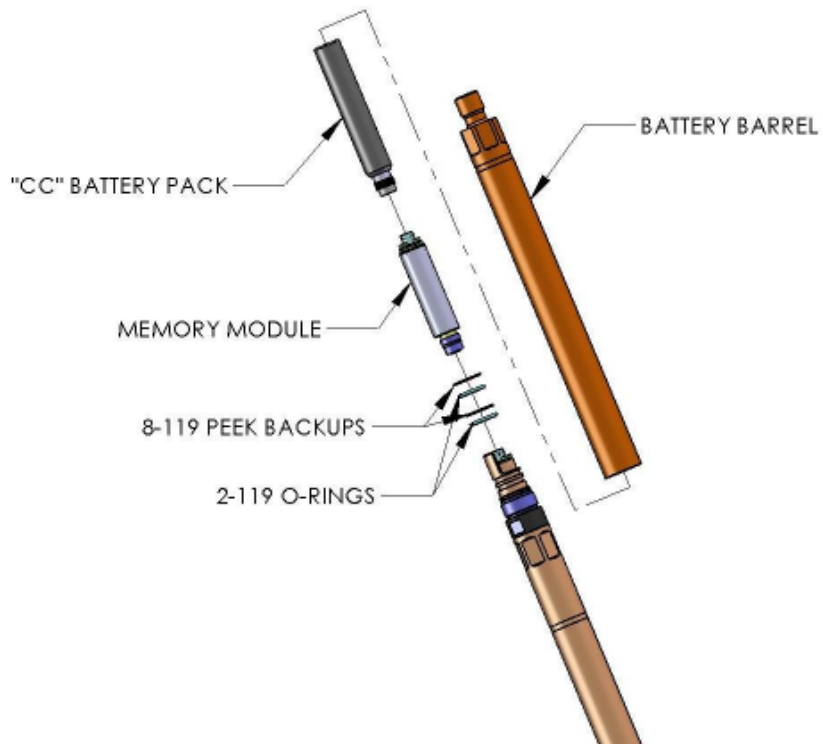
Memory Module and Battery Assembly

The Battery Pack comes equipped with a built-in LED that will flash exactly thirty times when connected to the fully assembled tool string. This indicates that the Memory and Sensor Modules are properly functioning.

CAUTION

The battery must be installed LAST in order to avoid damage to the tool string.

- Before assembly, inspect all of the threads to ensure that there are no nicks, and that all of the threads are clean and free of burrs or contamination
- Apply lubricant to the two 2-119 o-rings and install them onto the o-ring glands as shown below



- For ease of installation, use thick waxed dental floss or a length of small insulated wire to pull the o-rings onto the glands
- Apply lubricant the two 8-119 PEEK backup o-rings and install them onto the o-ring glands as shown above, with the concave side toward the o-ring.
- Align the connectors between Memory Module and the Sensor Module
- Slide the Memory Module onto the Sensor Module and twist the connector to lock
- Attach the Battery Pack in exactly the same manner
- Slide the Battery Barrel over the Battery and Memory Module
- Hand-tighten the Battery Barrel connection
- Using the two 1 3/8" flat wrenches, tighten the Battery Barrel connection to 40 ft-lb

CAUTION

Over-tightening will not aid in sealing and may damage the threads.

How to Connect the MLT300 to a PC

The Embedded USB Download Cable uses the same connector as the Battery Pack. The purpose of the USB download cable is to bridge communication between the MLT300 and the USB port on a PC. To connect the MLT300 to a PC, follow these steps:

- Remove the Battery Barrel and Battery Pack if either are installed
- Connect the Loop-Back Connector to the MLT300 unless a Pressure and Flow Module is at the bottom of the tool chain
- Connect the Embedded USB Download Cable to a USB port on the PC
- Connect the other end of the Embedded USB Download Cable to the MLT300
- Once joined, the MLT300 is in 'communication mode' and no longer in 'data collection' mode
- From the PC, run the MLTMod software
- In the 'Tool Info' window, set the 'Com Port' detection to 'Auto' and click 'Connect'
- The tool information will be filled in automatically

WARNING

This process may take some time. Always allow the process to complete. Disconnecting the MLT300 from the computer during the connection process may damage the tool.

How to Setup the MLT300

The rate at which data is sampled must be properly setup before running the MLT300 downhole. To set the sample rate, follow these steps:

- Connect to the MLT300 as described in the [How to Connect the MLT300 to a PC](#) section
- Navigate to the 'Program' window
- Enter the sample rates and interval duration as desired
- Click 'Program Tool' and wait for the process to complete
- Verify that the program now appears as entered

To learn more about how to setup the MLT300, refer to the MLTMod User Manual.

How to Sample from the MLT300

Data can be read from the MLT300 while it is connected to a PC. This is designed for testing purposes and can be used to verify that all of the attached modules are functioning properly. To sample from the MLT300, follow these steps:

- Connect to the MLT300 as described in the [How to Connect the MLT300 to a PC](#) section
- Navigate to the 'Sample' window
- In the 'Sample Format' box select 'Real Values'

NOTE

Calibration files should be saved to the Memory Module before running it downhole. If sensors are being tested without a Memory Module, the calibration files should be saved to the PC. For more information on calibration files and sampling, refer to the MLTMod User Manual.

- Click 'Start' to begin sampling
- New data should be displayed to the screen once every second

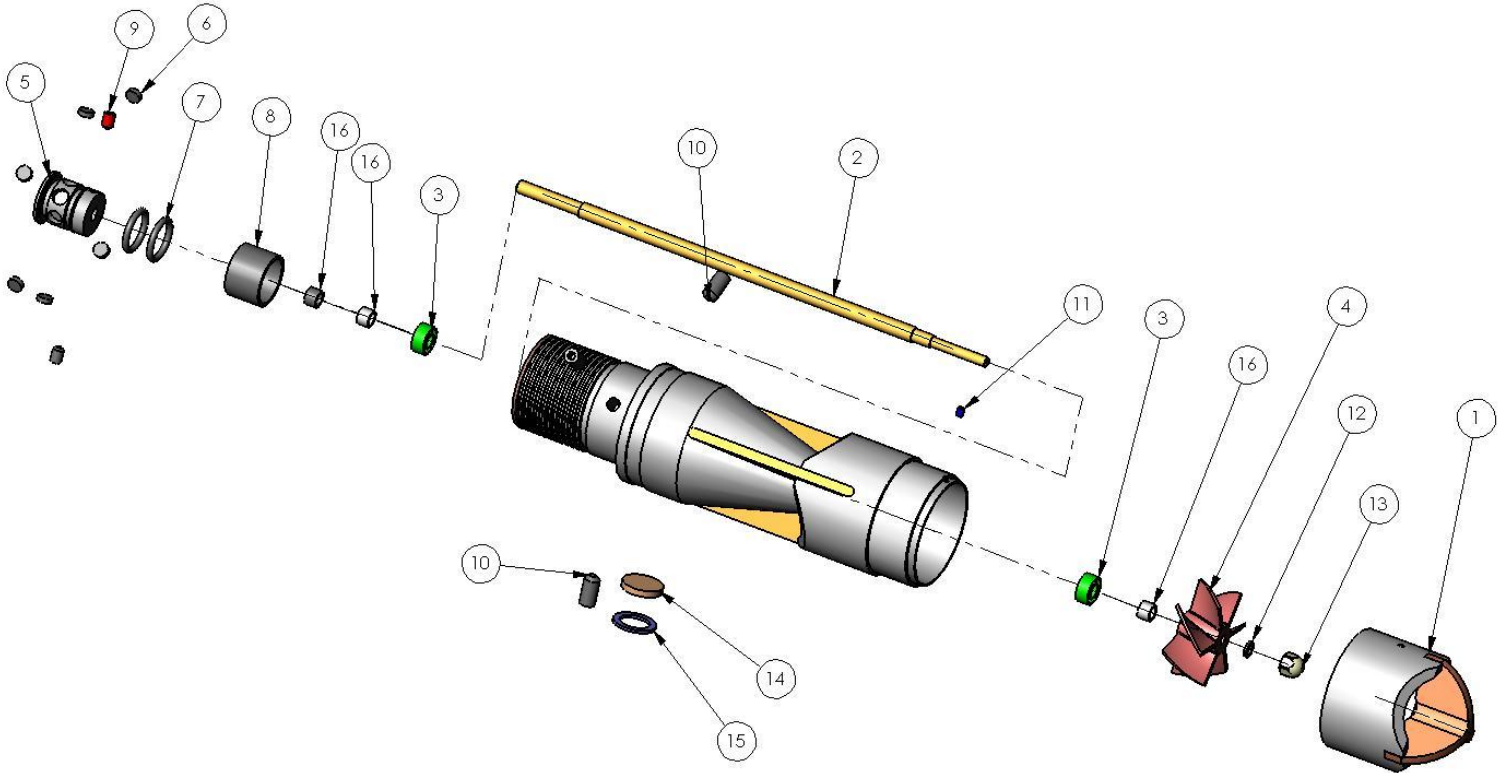
Interim Tool Maintenance

Prior to storing the MLT300 for an extended period, such as in between jobs, it is important to protect the tool and its warranty by performing the following maintenance activities:

- Unscrew the Battery Barrel, remove the Battery Pack, and store it safely. Follow the MSDS instructions provide by the battery manufacturer.
- Clean off any grease and well fluid residue
- Clean the threads and ensure that they are not damaged or worn before storing the tool
- Replace the primary o-rings
- Peek Backup o-rings can be reused, but should be thoroughly inspected
- Place all parts back in the shipping container and store it in a safe place

NOTE

If the MLT300 has been damaged, make arrangements for servicing, as explained in the [Repair Policy and Procedures for Returning Parts](#) section.



Caged Spinner Rebuild

The Caged Spinner requires regular maintenance in order to ensure reliable operation. Please see [Consumables](#) section for redress kits for caged spinner.

Disassembly:

1. Remove spring pin(11) that holds body end, using a small punch.
2. Remove body end(1) by unthreading it.
3. Remove set screws(9) from magnet retainer(5), and remove magnet retainer by unthreading it.
4. Remove acorn nut(13) from impeller shaft(2) to allow removal of impeller(4).
5. Thread acorn nut back onto end of shaft after removing impeller.
6. Gently tap acorn nut with a small hammer to loosen bearing(3) on magnet retainer end

7. Remove bearing from magnet retainer end.
8. Thread magnet retainer onto shaft, and gently tap with a small hammer to loosen bearing on impeller end.
9. Remove bearing on impeller end.
10. Using snap ring pliers, remove retaining ring(15), and remove filter(14) from side of body.
11. Remove cover(8)from magnet retainer to expose magnets(6) and o-rings(7).
12. Remove magnets and o-rings.

Assembly:

1. Install new magnets(6) and o-rings(7) onto magnet retainer. A small amount of grease can be used to
2. hold the magnets in if necessary.
3. Slide magnet retainer cover(8) over magnet retainer. Ensure that chamfered end goes on first, so as
4. not to cut the o-rings.
5. Inset new filter (14) into body, and secure with retaining ring (15)
6. Slide bearing (3) onto magnet retaining end, followed by 2 spacers (16)
7. Thread magnet retainer onto shaft, and slideshaft into housing.
8. Slide bearing(3) onto shaft from impeller end, followed by spacer(16).
9. Gently press bearing into housing.
10. Place lock washer(12) onto end of shaft, followed by acorn nut (13).
11. Tighten acorn nut to 40 in-lbs.
12. Thread body end(1) onto body, and line up holes to insert spring pin (11).
13. Insert spring pin into housing, and cut off excess using a cut off wheel.

Lithium Battery Performance Enhancement

For the best battery performance and to enhance longevity, follow these guidelines:

- Store batteries in a secure, well ventilated, dry, temperature-controlled environment at a constant temperature between 0 and 22°C. Storage at high temperatures for extended periods degrades battery performance.
- For cells that will be stored for extended periods of time, apply a periodical small resistive load to break down the solid electrolyte interphase that may form on the anode
- Avoid constant power application
- If possible, keep batteries in their original shipping containers. Otherwise, store cells separately, and pack them securely in a non-conductive material.
- Avoid direct contact between cells. If terminals are allowed to make contact, it can cause a short circuit and battery performance will be compromised. This can be extremely dangerous.
- Use cells in applications that closely match the rated performance criteria for each cell. To prevent the permanent effects of cathode freeze-over, avoid drawing a larger than recommended current from a cell.
- Protect the tabs that may protrude from the cell, they are somewhat fragile. These electrical contact points connect to the cell below the visible surface and rough handling could cause tabs to break or tear. Although the battery could still carry a charge, a broken tab would make the battery useless for work purposes as it would no longer offer a contact point.
- All physical contact/handling of these cells must be done with non-conductive materials. Any physical measuring required must be done with plastic calipers. Metal calipers could cause a short to occur.
- An open circuit voltage (OCV) test may be performed with a standard voltmeter. Any type of load test can influence the future performance of the battery. It is best to consult with the battery manufacturer before performing such tests.
- If cells have been configured as battery packs, the insulating shrink wrap used to protect the cell during shipping must be removed. Care must be taken to prevent the contact tab, located at the top of the cell, from coming into contact with the cell can. The polarity of the tab can depend on the type of cell.

Lithium Battery Discarding Instructions

Please dispose of cells in accordance with any local and federal hazardous waste regulations.

Pay special attention to the MSDS disposal instructions and respect all procedures stated for the handling of hot cells and damaged cells. The most recent MSDS can be found at <http://www.electrochemsolutions.com/support/safety.aspx>.

MLT Gauge Calibration Requirements

Calibration of Canada Tech gauges is necessary to ensure accurate pressure and temperature readings, as well as proper functionality of a gauge. Time, use and environmental conditions can negatively affect the accuracy of a gauge and can be corrected for by calibrating the gauge.

The Canada Tech Calibration Laboratory certifies that all of its gauge calibrations are valid for 1 year. Canada Tech recommends that gauges should be recalibrated once per year. There are certain conditions of use that can shorten the 1 year suggested recalibration period. Some of these conditions are, but are not limited to:

Temperature

- If the temperature cycles that the gauge is exposed to exceed or come close to the maximum rated temperature of the gauge for an extended amount of time or on repeated occasions, then a re-verification/recalibration of the gauge would be warranted.

Pressure

- If the pressure cycles that the gauge is exposed to exceed or come close to the maximum rated pressure of the gauge for an extended amount of time or on repeated occasions, then a re-verification/recalibration of the gauge would be warranted.

Vibration

- A single or multiple excessive vibrations (exceeding 10g's) could damage internal electrical components and the gauge should be returned for recalibration.

Fluid Consistency

- If the gauge experiences repeated or extended exposure to hazardous fluids or gasses, this can cause invasion through the o-ring seals. If the gauge has experienced such exposure, then the seals should be checked and any internal seals should be serviced as soon as possible.

Handling

- Damage to the transducer foil by foreign objects will cause the gauge calibration to become unreliable. If damage is visible the gauge should be returned for recalibration. If it is undetermined that the foil is damaged or not, a verification can be requested.

Troubleshooting – USB Communication

Problem There is a miscommunication between the MLT300 and the MLTMod software.
Solution 1. Ensure that the MLT300 is connected to the computer properly. Check for loose connections on both ends of the Embedded USB Download Cable. 2. Ensure that MLTMod is communicating with the MLT300 on the correct Com Port. Select 'Auto' as the Com Port detection method.
Problem Another program has control of the Canada Tech USB device.
Solution Reboot the PC and make sure there are no programs that could be

using the Com Port assigned to the Canada Tech USB device. Follow the troubleshooting instructions found in the [USB Driver Installation Guide](#).

Problem

There is no communication using a USB interface or when using a USB Serial Port Adaptor for my laptop.

Solution

USB download adapter drivers may be corrupt and may need to be reinstalled. Follow the instructions provided in the [USB Driver Installation Guide](#).

Repair Policy and Procedures for Returning Parts

All applicable policies and required forms and instructions are available directly from Canada Tech's web site at http://www.iroccorp.com/canadatech/Repair_returns.php.

General Concepts

- Canada Tech's preferred carrier is FedEx®
- Canada Tech will not be responsible for any non-Canada-Tech equipment included in a return shipment
- Customers are responsible for all expenses incurred in returning Canada Tech materials, including insurance, except that Canada Tech will pay return-to-customer shipping costs for units repaired under warranty
- If there are any questions or concerns regarding service please send an e-mail at repairs@canadatech.com, call at 1+ 403 232 1400, or call toll-free at 1+ 866 815 3421

Return Materials Authorization Form

To obtain the Return Materials Authorization (RMA) number, call or e-mail at repairs@canadatech.com, 1+ 403 232 1400, or toll-free at 1+ 866 815 3421. The [RMA Form](#) can be downloaded from http://www.iroccorp.com/canadatech/Support_and_Downloads/RMA_Form.pdf.

Failure Report Form

The [Failure Report](#) form can be downloaded from http://www.iroccorp.com/canadatech/Support_and_Downloads/Failure_Report.pdf.

About Downloadable Forms

Downloadable forms are in PDF format and meant to be filled out electronically and then emailed directly to Canada Tech.

NOTE

The 'Submit by Email' command on these forms sends only the data that the form contains, not the form itself. It is not possible to save a copy of the completed form as an electronic document; therefore, printing the document using the 'Print Form' button is recommended BEFORE using the 'Submit by Email' command. This printed copy can be saved for reference purposes at a later date.

Ordering Replacement Parts

To ensure timely deliveries, minimal processing delays, and that the correct replacement parts are shipped, please follow these guidelines:

- Use the Canada Tech [Parts Order Form](#). It can be downloaded from http://www.iroccorp.com/canadatech/Support_and_Downloads/Parts_Order_Form.pdf
 - Fill in description, part number, and specify quantity of each item
 - Complete the 'Well Conditions' section indicating full information for temperature, pressure, H₂S ppm, and job duration
 - Specify the shipping method
- e-mail at info@canadatech.com or print and fax the completed form to Canada Tech at 1+ 403 232 1401. A confirmation of the order will be sent at the earliest opportunity.

Parts List

Kits and Gauges

MLT300, Inconel 718			
Part Number	Pressure	Kit	Module(s)
106173	25 ksi ³	MLT300, 1.50" KIT, INCONEL 718	Memory, CCL, RTD, and Pressure and Flow Modules
106145	25 ksi	MLT300, CCL, ASSEMBLY, 1.50" OD	CCL Module
106153	25 ksi	MLT300, TEMPERATURE MODULE, 1.50" OD	RTD Module
106174	25 ksi ^{3,4}	MLT300, PRESSURE AND FLOW MODULE, 1.50" OD, INCONEL 718	Pressure and Flow Module

Accessories (Customer-Replaceable Parts)

Description	Part No.
MLT300, MEMORY MODULE	106142
MLT300, PRESSURE AND FLOW GAUGE, INCONEL 718, 6ksi, 120°C	106175
MLT300, PRESSURE AND FLOW GAUGE, INCONEL 718, 10ksi, 120°C	106176
MLT300, PRESSURE AND FLOW GAUGE, INCONEL 718, 15ksi, 120°C	106177
MLT300, PRESSURE AND FLOW GAUGE, INCONEL 718, 20ksi, 120°C	106178
MLT300, PRESSURE AND FLOW GAUGE, INCONEL 718, 25ksi, 120°C	106179
MLT300, PRESSURE AND FLOW GAUGE, INCONEL 718, 6ksi, 177°C	106180
MLT300, PRESSURE AND FLOW GAUGE, INCONEL 718, 10ksi, 177°C	106181
MLT300, PRESSURE AND FLOW GAUGE, INCONEL 718, 15ksi, 177°C	106182
MLT300, PRESSURE AND FLOW GAUGE, INCONEL 718, 20ksi, 177°C	106183
MLT300, PRESSURE AND FLOW GAUGE, INCONEL 718, 25ksi, 177°C	106184
MLT300, PRESSURE AND FLOW GAUGE PULLING TOOL	106168
MLT300, LOOP-BACK CONNECTOR, ASSEMBLY	106491
MLT, 1.5" OD, BULLNOSE, SS 316	100259
MLT300, 1.50" OD, BULLNOSE, ASSEMBLY, NO PRESSURE/FLOW, INCONEL 718	106489
BATTERY TESTER, WITH ADAPTER FOR 4 PIN AERO CONNECTOR	106711
MLT300, TOOL KIT, WRENCHES AND SNAP RING PLIERS	106721
USB, EMBEDDED DOWNLOAD CABLE, 4 PIN AMPHENOL CONNECTOR	105646
MLT300, 1.5" OD, SHIPPING CASE, ASSEMBLY	106500

Consumables

Description	Part No.				
MLT300, 1.50" OD, MODULE O-RING REDRESS KIT, VITON 90 DURO	106712				
MLT300, 1.50" OD, MODULE O-RING REDRESS KIT, FFKM 90 DURO	106713				
MLT300, 1.50" OD, PRESSURE FLOW GAUGE REDRESS KIT, VITON 90 DURO	106714				
MLT300, 1.50" OD, PRESSURE FLOW GAUGE REDRESS KIT, FFKM 90 DURO	106715				
MLT300, 1.50" OD, MODULE CONNECTION NUT REDRESS KIT	106716				
MLT300, CAGED SPINNER, 1.50" OD, BEARING AND SPACER KIT, HIGH TEMP	106717				
MLT300, CAGED SPINNER, 1.50" OD, REDRESS KIT, HIGH TEMP	106718				
MLT300, CAGED SPINNER, 1.50" OD, BEARING AND SPACER KIT, LOW TEMP	106719				
MLT300, CAGED SPINNER, 1.50" OD, REDRESS KIT, LOW TEMP	106720				
GREASE, O-RING, DOW CORNING 55, 150G	100371				
Battery Packs					
Type	Voltage	Capacity	Temp	Chemistry	Part No.
1 x CC	3.67 V	19 Ah	150°C	Lithium	106144
1 x CC	3.67 V	14 Ah	165°C	Lithium	106261
1 x CC	3.67 V	11 Ah	180°C	Lithium	106260

³ Maximum pressure rating is independent of gauge pressure.

⁴ Pressure and flow gauges must be purchased separately from kit or pressure and flow module.