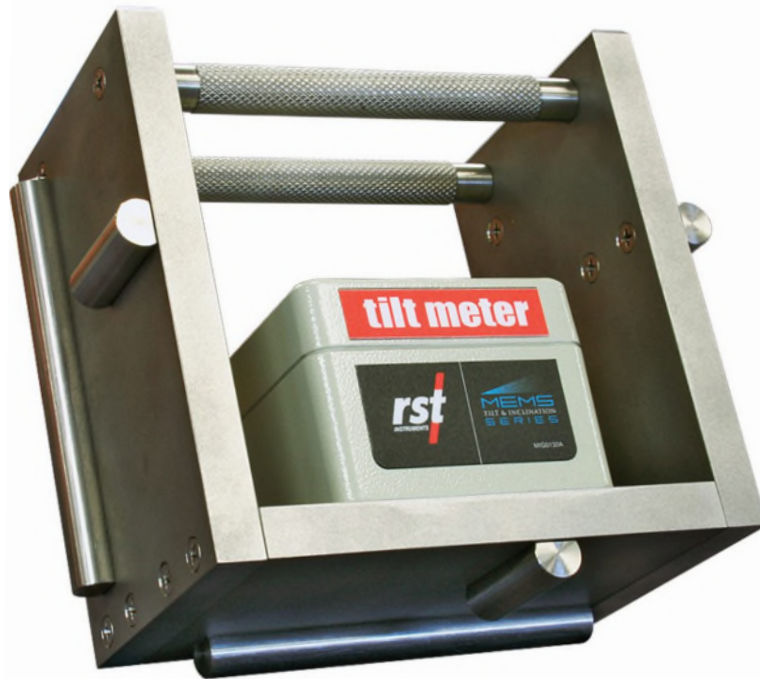




Monitor
with
Confidence



Portable MEMS Tilt Meter Mobile Host Software Instruction Manual

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RST Instruments LTD.
11545 Kingston St.,
Maple Ridge, BC
Canada V2X 0Z5

SALES + SERVICE +MANUFACTURING

604-540-1100 | info@rstinstruments.com
Toll Free (USA & Canada) 1-800-665-5599

www.rstinstruments.com

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REVISION HISTORY

Rev.	Revision History	Date	Prepared By	Approved By
A	Initial Release	27 April 2023	Peter Lesny	Peter Lesny
B	Updated the Procedures	31 May 2023	Peter Lesny	Guillaume Larose

1 OVERVIEW

The Portable Tiltmeter Mobile Host software allows operators to view data readings from an [RST Portable Tiltmeter](#). The software is pre-installed on an ultra-rugged handheld readout unit or device that can withstand demanding field conditions.

→ **NOTE:** If you need to reinstall the Mobile Host software on the handheld readout unit, see [Reinstall Mobile Host Software on a Handheld Readout Unit](#).

1.1 ABOUT THIS MANUAL

This instruction manual provides set up, installation and troubleshooting information on the Portable Tiltmeter Mobile Host software on a handheld readout unit.

→ **NOTE:** Some features and functions of the handheld device are not discussed in this manual. See the complete manual at https://software.rstinstruments.com/NautizX8/nautiz_x8_manual.pdf

1.2 INTENDED AUDIENCE

This manual is for the personnel using RST's Portable Tiltmeter with the Mobile Host software installed on a handheld device.

1.3 ICONS AND CONVENTIONS USED IN THIS MANUAL

This manual uses the following icons to call attention to valuable information.



WARNING: This icon appears when an operating procedure or practice, if not correctly followed, could result in personal injury or loss of life.



CAUTION: This icon appears when an operating procedure or practice, if not strictly observed, could result in damage to or destruction of equipment.



NOTE: This icon appears to highlight specific non-safety related information.

2 SAFETY



WARNING: Always follow safety precautions and use proper personal protective equipment (PPE) including high-visibility clothing when working in the field with this equipment.

See the manual at https://software.rstinstruments.com/NautizX8/nautiz_x8_manual.pdf for complete safety information.

3 SYSTEM OVERVIEW

3.1 HANDHELD READOUT UNIT

The handheld readout unit used with the RST Portable Tiltmeter's Mobile Host software is a NAUTIZ X8 Terminal. The device has a pocket-sized rugged form factor, designed, and optimized for GIS and field applications where performance and durability are required.



Figure 1: NAUTIZ X8 Handheld Readout Unit

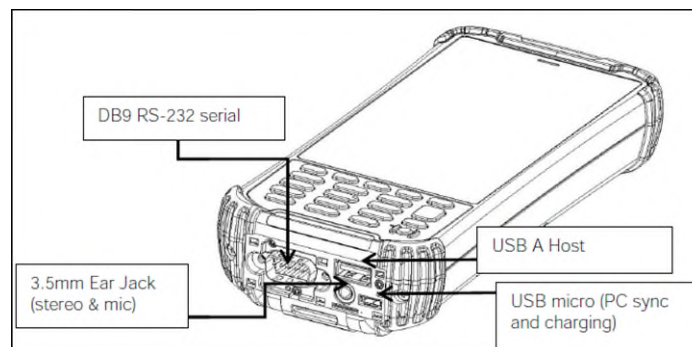


Figure 2: Bottom Panel Layout

The USB A host port supports high-speed USB 2.0 communication of up to 480 Mbps. You can use the USB micro port to charge the handheld readout unit or synchronize it to a PC. You can also charge the handheld readout unit using the supplied 12V DC charger. The 3.5 mm ear jack supports stereo and microphone.

3.2 SYSTEM COMPONENTS

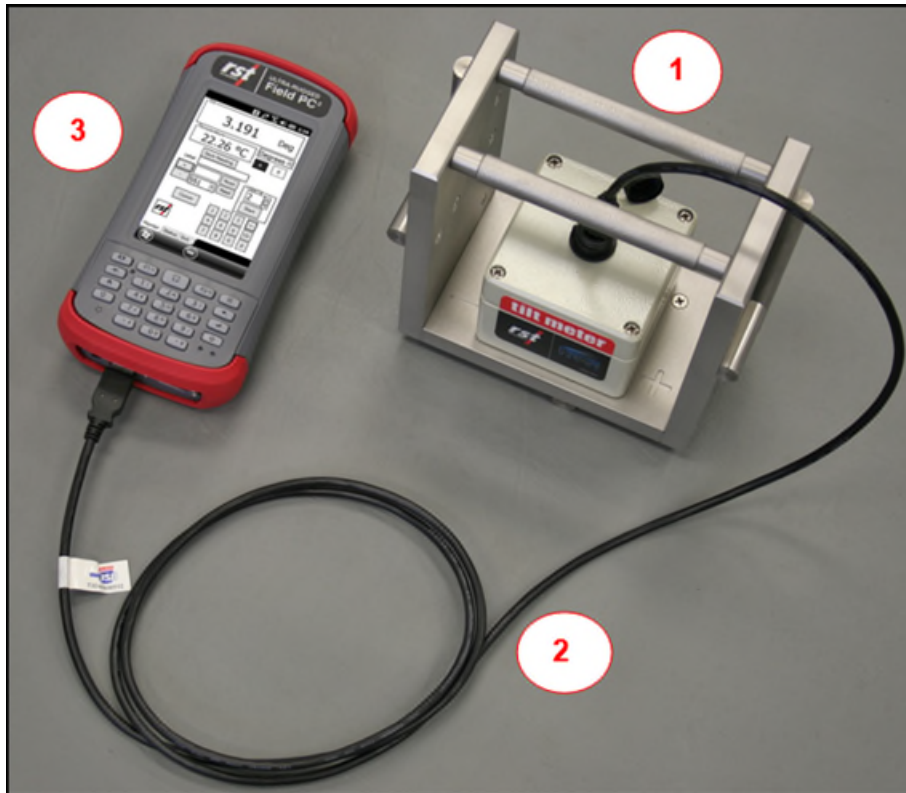


Figure 3: Portable Tiltmeter and Handheld Readout Unit System Overview

The system or solution includes the following (as shown in a Figure 3):

1. Portable Tiltmeter
2. Power and communication cable
3. Handheld readout unit

4 PROCEDURES

Software setup file and data files can be transferred to handheld storage using either USB flash memory or direct USB cable connection to desktop or laptop PC.

USB flash memory transfer is recommended for users without admin rights on their computer, since direct USB cable connection requires installation of additional software and drivers on host desktop or laptop computer.

Refer to chapter **Error! Reference source not found.** for instructions on installing Windows Mobile Device Center™ (WMDC) if you prefer direct USB cable connection.

4.1 INSTALL PORTABLE TILTMETER FROM USB FLASH DRIVE

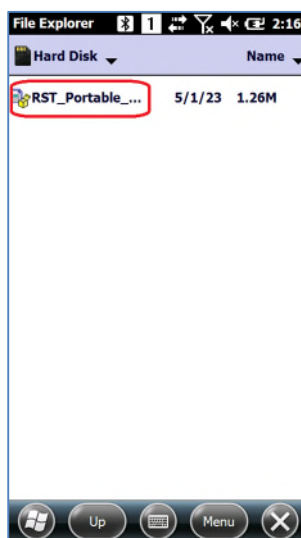
To install or upgrade the portable tilt meter's software, complete the following steps:

1. Copy the installation cab file "RST Portable Tilt Mobile_X.XX.CAB" to a USB memory flash drive.
2. Disconnect the USB flash drive from your computer and insert into a USB port in the handheld readout unit.
3. Open File Explorer in the handheld readout unit and locate the software set-up file.

The USB flash memory drive appears as "Hard Disk".



4. Tap the set-up file and follow the prompts to install the software.



4.2 TAKE A READING

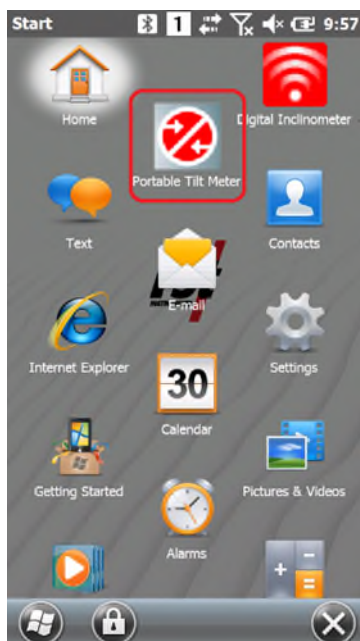
To take a reading with the handheld readout unit, complete the following steps:

1. Press the power button once on the handheld readout unit to turn it on.

If the Unidentified USB Device pop-up appears, enter “ftdi_ser.dll” as a driver name.



2. Ensure that the USB cable is connected to the handheld readout unit and tilt meter.
3. Tap **Start** and then select **Portable Tilt Meter Mobile**.



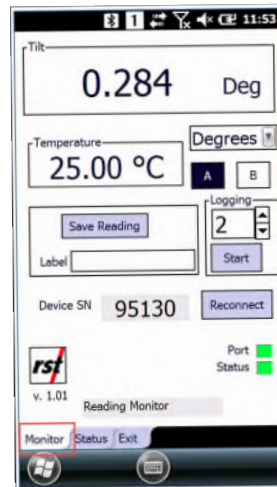
The Mobile Host software opens. The Monitor tab appears by default.

4.3 DISPLAY OR CHANGE TILT VALUE AND SAVE READING

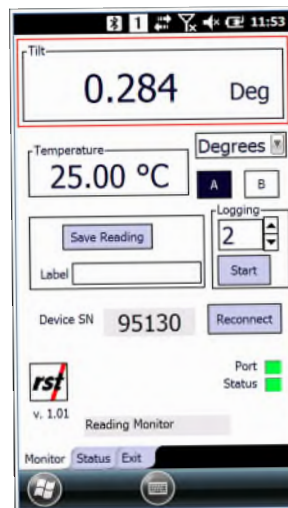
Tilt values appear as a sinus of the angle by default.

To display or change the tilt value or save a reading, complete the following steps:

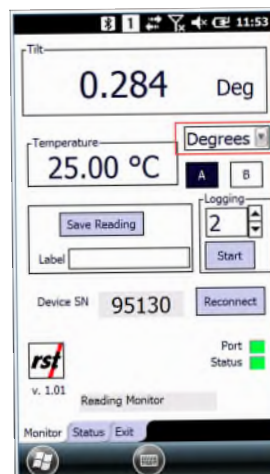
1. From the main screen on the handheld readout unit, tap the **Monitor** tab.



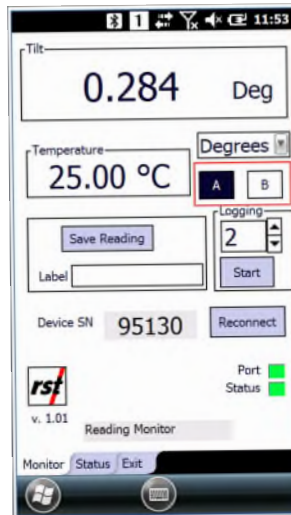
The degree of tilt appears in the **Tilt** field.



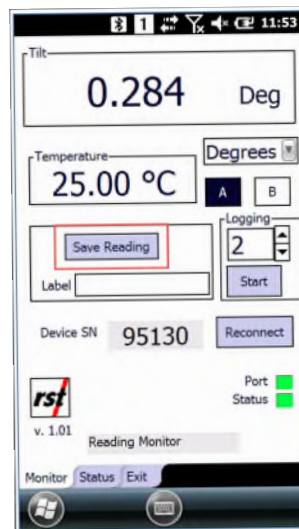
2. Tap the **Degrees** drop-down and then select the unit to display.



3. Tap the **A** or **B** using radio buttons to choose the axis, if using biaxial tilt devices.

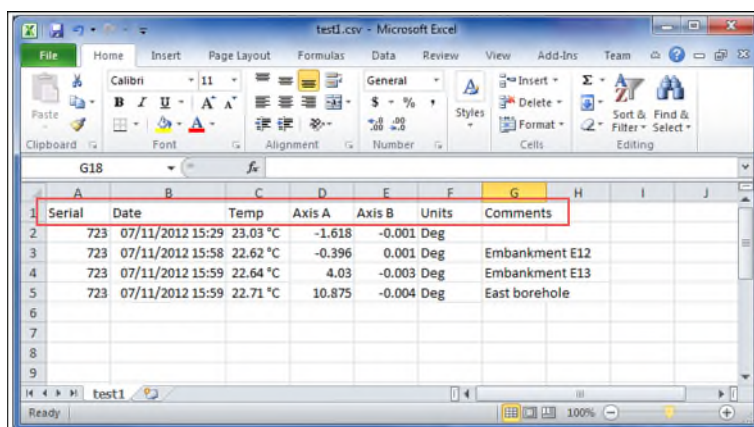


4. Tap **Save Reading** to export the reading in a CSV file.



You can view the file in Microsoft Excel or a text editor. Reading is saved as a CSV file in the directory “/My Documents/DigitalTilt/” with the default file name “RST_DigitalTilt_LOG.csv.” The file will have following column headers:

- Serial,
- Date,
- Temp,
- Axis A,
- Axis B,
- Units,
- Comments.



Serial	Date	Temp	Axis A	Axis B	Units	Comments
723	07/11/2012 15:29	23.03 °C	-1.618	-0.001	Deg	
723	07/11/2012 15:58	22.62 °C	-0.396	0.001	Deg	Embankment E12
723	07/11/2012 15:59	22.64 °C	4.03	-0.003	Deg	Embankment E13
723	07/11/2012 15:59	22.71 °C	10.875	-0.004	Deg	East borehole

Figure 4: Sample Reading File

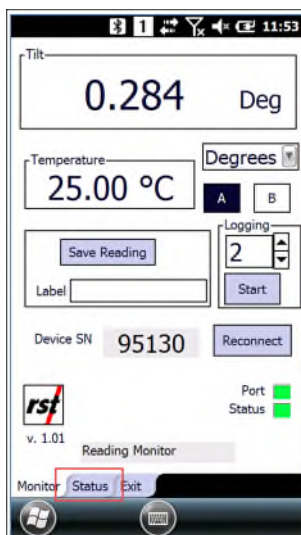
4.4 CHECK DEVICE CONNECTION STATUS

The Status tab allows you to retrieve and display the following information about a connected tilt meter:

- Firmware version,
- Board revision,
- Serial number.

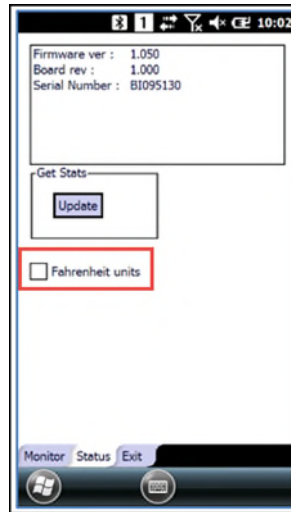
To check the device connection status, complete the following steps:

1. From the main screen on the handheld readout unit, tap the **Status** tab.



2. Check the **Status** field to see the device connection status.
3. Tap **Update** to see the sensor's firmware version, board revision and serial number.
 - If applicable, tap **Fahrenheit units** to display sensor temperature in Fahrenheit.

By default, sensor temperature uses Centigrade units.



5 MAINTENANCE

5.1 SYNCHRONIZE DATA BETWEEN THE HANDHELD READOUT UNIT AND DESKTOP PC OR LAPTOP

To synchronize data between the handheld readout unit and desktop or laptop computer, complete the following steps:

1. Verify that the desktop PC or laptop contains current version of Microsoft Mobile Device Center™ (WMDC).

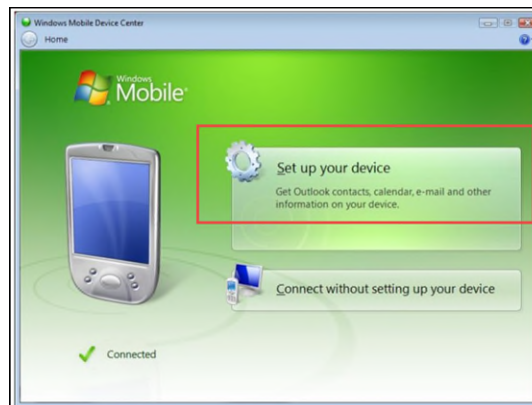


NOTE: You can download Microsoft's Mobile Device Center™ software for free from Microsoft's website or from <https://software.rstinstruments.com/WMDC/Mobile-Device-Center-for-Windows-Vista-and-later.zip>. Select between 32-bit or 64-bit version, depending on the operating system.

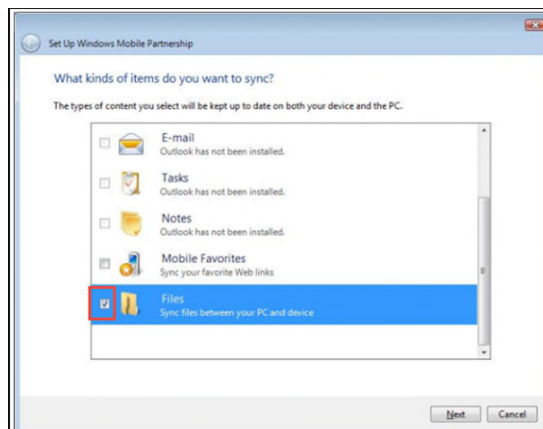
2. After installing Microsoft Windows Mobile Device Center in the Microsoft Windows 10 operating system, run the WMDC fixes for Windows 10 utility from <https://software.rstinstruments.com/WMDC/WMDC-fixes-for-Win10.zip>.
3. Connect the handheld readout unit to the desktop or laptop computer using the USB cable provided with the Digital Inclinator System.
 - Microsoft Windows™ should detect the new connection and the Microsoft Windows Mobile Device Center dialog box appears showing **Connected**.



4. Click on **Set up your device**.



- If you do not need to synchronize data and just want to use Windows Explorer to copy files to and from the handheld readout unit, click **Connect without setting up your device** and then follow the prompts in the succeeding screens.
5. Select the type of information you want to synchronize with the desktop or laptop computer.
- If you are only using the handheld readout unit to transfer information, deselect all the options and select **Files**.





NOTE: The synchronized folder created on the desktop is an active link to the handheld readout unit. Any changes you make in the folder will be reflected on the handheld readout unit. For example, if you delete a file in the folder, that file will be deleted from the handheld readout unit. If the handheld readout unit is disconnected when a file is deleted from the folder, that file will be deleted from the handheld readout unit when it is reconnected to the desktop or laptop computer.

6. Once the data is synchronized to the desktop or laptop computer, move the inclinometer files to a safe location such as a network drive or hard drive.
-



NOTE: For additional information on synchronizing data between a desktop or laptop computer and the handheld readout unit, go to https://software.rstinstruments.com/NautizX8/nautiz_x8_manual.pdf.

5.2 HANDHELD READOUT UNIT

To keep the handheld readout unit in good condition and working properly, observe the following guidelines:

- Keep the handheld readout unit away from excessive moisture and extreme temperatures.
- Do not expose the handheld readout unit to liquids or precipitation.
- Provided all the plugs are closed, the supplied rugged case meets the IP54 standard for water and dust resistance, as well as being impact-resistant if dropped up to four feet from the ground. The plug covers are made of special material which allows the wireless features of the unit to function even when they are closed.
- Do not place anything on top of the handheld readout unit to prevent damage to the screen.
- Clean the handheld readout unit by wiping the screen and the exterior with a soft, damp cloth moistened only with water.
- Avoid exposing the handheld readout unit to direct sunlight or strong ultraviolet light for extended periods of time.
- Avoid scratching the surface of the screen and banging it against hard objects.
- Only use the handheld readout unit stylus to prevent scratching the screen.
- For additional care and maintenance information, see the handheld readout unit manufacturer's manual at https://software.rstinstruments.com/NautizX8/nautiz_x8_manual.pdf.

5.3 REINSTALL MOBILE HOST SOFTWARE ON A HANDHELD READOUT UNIT



NOTE: If the handheld readout unit has an older version of the Mobile Host software installed, you must uninstall the software before installing the latest version.

On the handheld readout unit, tap **Start**, tap **Settings**, and then tap **Remove Programs**. Tap **Mobile Host** and then tap **Remove**.

To reinstall the Mobile Host software on a handheld readout unit, complete the following steps:

1. Connect the handheld readout unit to the workstation using the USB cable.
2. On the workstation, launch Windows Mobile Device Center.
3. On the workstation, launch File Explorer.
4. Copy the file “RST Portable Tilt Mobile_X.XX.CAB” and paste in the folder on the Ultra-Rugged Handheld (My Documents for example). The “X.XX” will mean the software version.
5. On handheld readout unit, tap **Start** and then select **File Explorer** from drop-down menu.
6. Go to the folder where the file “RST Portable Tilt Mobile_X.XX.CAB” was copied to.
7. Tap the “RST Portable Tilt Mobile_X.XX.CAB” file to begin installation.
8. Tap **Start** and then select **Portable Tiltmeter Mobile** to run the program.

6 TROUBLESHOOTING

PORTABLE TILTMETER IS DISCONNECTED OR DRIVER IS MISSING

Plug the USB plug into USB port A located in front of handheld reading unit.

If the Unidentified USB Device pop-up appears, enter “ftdi_ser.dll” as a driver name.



CONNECTED DEVICE IS IN UNKNOWN STATE

Connection problems are most often caused by malfunctioning communication link. Reset the instrument state by disconnecting and reconnecting the portable tilt meter's USB cable.

7 PRODUCT SPECIFICATIONS

Item	Specification
Waterproof	IP67
Rugged Case	1.22 m drops onto concrete
Operating Temperature	Optimized for excellent performance in cold temperatures Operating temperature: –22F to 140F (–30C to 60C) Note: Bluetooth® wireless technology is rated to –4F (–20C)
Processor	1.5 GHz Texas Instruments 4470 dual-core processor
Memory	1 GB DDR2 RAM
Internal Flash Disk	4 GB iNAND
Operating System and Software	Microsoft® Windows Embedded Handheld 6.5.3 Microsoft Office Mobile 2010* (Word Mobile, Excel, Mobile, PowerPoint Mobile, Outlook Mobile) Multiple languages including English, French, Spanish, German, and Portuguese
Battery	Intelligent Li-Ion battery 3.7VDC @ 5200mAh, 19.2 Wh Operates for up to 20 hours on one charge Charges in 2 to 4 hours Battery easily changeable in field
Wireless Connectivity Options	Bluetooth® wireless technology, Class 2, range greater than 30 feet (10m) Wi-Fi® 802.11b/g/n with extended range Cellular Voice and data, 3.8 G GSM HSPA+/HSUPA or CDMA EVDO Rev A
Navigation	Integrated with stand-alone u-blox GPS

8 SERVICE, REPAIR AND CONTACT INFORMATION

This product does not contain any user-serviceable parts. Contact RST for product services or repairs.

- For sales information: sales@rstinstruments.com
- For technical support: support@rstinstruments.com
- Website: www.rstinstruments.com
- Toll free: 1-800-665-5599

RST Canada Office (Head Quarters)

Address: 11545 Kingston Street, Maple Ridge, BC, Canada V2X 0Z5

Telephone: 604-540-1100

Fax: 604-540-1005

Business hours: 7:30 a.m. to 5:00 p.m. (PST) Monday to Friday, except holidays

RST UK Office

Address: Unit 4 Charles Industrial Estate Stowupland Road, Stowmarket
Suffolk, UK, IP14 5AH

Telephone: +44 1449 706680

Business hours: 9:00 a.m. to 6:30 p.m. (GMT) Monday to Friday except holidays