RST INSTRUMENTS LTD.

Digital Bus Tilt Meter
Mobile Host Software
Instruction Manual

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1   INTRODUCTION

The Digital Bus Tilt Meter Mobile host software permits operators to view data read from any tilt sensor connected to the common bus. The software is preinstalled on an Ultra-Rugged Field PC^2™ that can withstand the often demanding field conditions.

2   QUICK START INSTRUCTIONS

The following instructions outline the basic steps needed to read data from any instrument connected to the RS485 bus.
1.   The software is preinstalled on Field PC^2™.
2.   Power on the Field PC and connect the supplied RST USB to RS485 adaptor cable to mini-USB port A located on the front side of Field PC™ case.
3.   If a dialog pops-up, enter *ftdi_ser.dll* as a driver name.
4.   From the *Start* menu, choose *Digital Bus Tilt Meter Mobile* to launch the program.
5.   Ensure that *USB* COM port is selected.
6.   Select the address of the desired instrument from pull-down menu or type it in the edit box.
7.   Click on Update to connect to the chosen device and start reading data.

3   READOUT UNIT

The Ultra-Rugged Field PC^2™ is well suited for use in the often demanding field conditions. All connections are conveniently located on the front of the case, after taking readings the cover should be always put back in place to protect connectors.

Figure 1: Ultra-Rugged Field PC^2™ Case

3.1 USING THE ULTRA-RUGGED FIELD PC²™

Once the Ultra-Rugged Field PC²™ is connected to the Datalogger, turn on the power to the Ultra-Rugged Field PC² by pressing the power button (Figure 2).

Figure 2: Overview of the Ultra-Rugged Field PC²™

Front Image		Back Image
1. Elastomer overmold	9. Microphone	17. Speaker
2. Touchscreen	10. Keypad buttons	18. Battery Door
3. Buttons Control	11. LED Indicator	19. Hand Strap
4. Hold-to-Zoom	12. Power button	20. Stylus
5. Pictures and Videos	13. Enter button	21. Stylus Tether
6. Tab button	14. Backspace	
7. Home Screen	15. Context Menu Button	
8. Shift Function	16. Right Soft Key	

Bottom Image

22. USB client (micro USB)

23. Microphone/Headphones jack

24. 12V DC jack

25. USB host (full size USB)

26. 9-pin serial port

Note

DC charging is done through the 12V DC jack (barrel connector, bottom left of the unit).

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4   SYSTEM COMPONENTS

The following pictures show components of the RST Digital Tilt System in two main configurations: Portable System and Bus System.
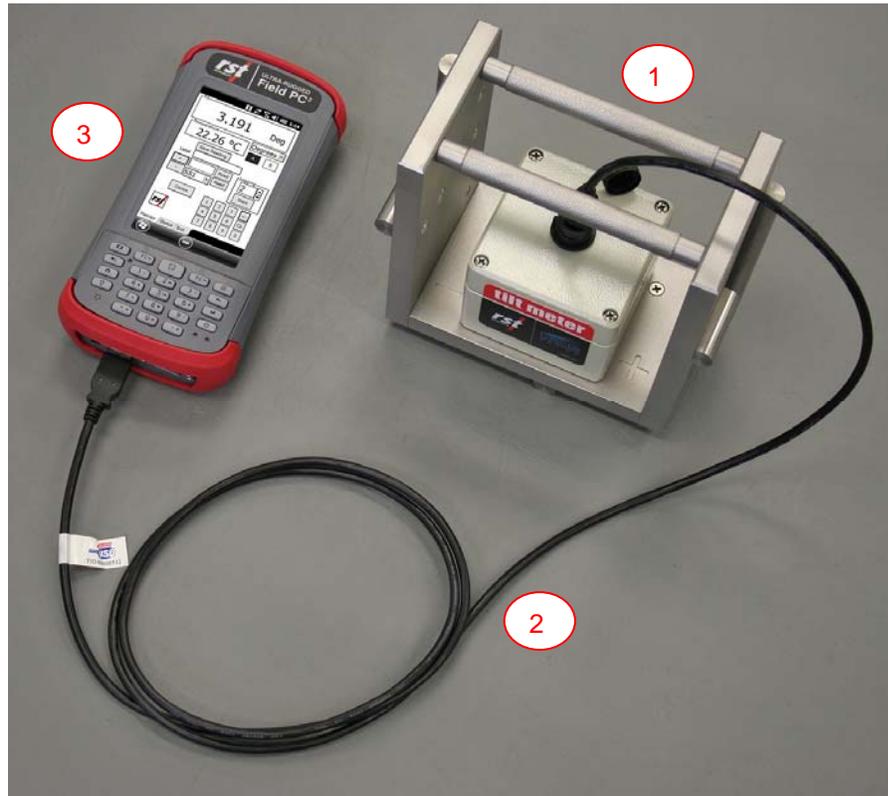
Figure 3 – Portable Digital Tilt System Overview

1.   Digital Tilt Node

2.   Power/Communication Cable

3.   Field PC^2 ™

Figure 4 – Digital Tilt Bus System Overview

1. Digital Tilt Node
2. Power/Communication Cable
3. RS485 Digital Sensor Interface
4. Field PC^2 ™

The same software interface is used for all configurations.

5 SOFTWARE OVERVIEW

Turn on the power to the Field PC^2 ™ by pressing the power button once the RST. Ensure that the USB to RS485 adaptor cable is connected to the Field PC^{2TM}.

If a dialog pops-up, enter **ftdi_ser.dll** as a driver name.

Use the stylus to navigate through the operating environment. If you are unfamiliar with the *Windows Mobile* operating environment, please refer to the "*Getting Started Guide*" which is supplied on CD-ROM with the Field PC^{2TM}.

From the *Start* menu, choose *Digital Bus Tilt Meter Mobile* to launch the Digital Bus Tilt Meter Host Software. The program menu appears when the program is initially launched. The menu contains three tabs: *Monitor, Status* and *Exit*. Each tab option is explained in detail below.

5.1 MONITOR

The Monitor screen contains tilt and temperature display regions and device management and selection controls. Desired instrument address can be either typed into the *Current Address* edit box or selected from pull down menu. After selecting device, click on *Read* button to connect to the device and read values. New devices can be added or existing removed using appropriate buttons. Alternatively, device addresses can be added manually following instructions in Section 8.

Upon pressing the *Read* button, the software will establish connection to the selected device and start displaying tilt and temperature data. When using biaxial tilt devices, choose axis A or B using radio buttons. Tilt values are displayed as a sinus of the angle by default. Choose *Degrees* from pull down menu to change tilt display units. For troubleshooting, see Section 6.

To save displayed values into data file, click *Save Reading* button. Add optional comment if necessary.

The logging feature is available for recording date and time, tilt angle and temperature readings in predetermined intervals. The logger needs to establish a data connection and display tilt value before starting any data logging. Recorded data will be appended to the CSV formatted data file in following directory:

/My Documents/DigitalTilt/

By default, the data file is named:
RST_DigitalTilt_LOG.csv

Log file can be viewed using Microsoft Excel or text editor.
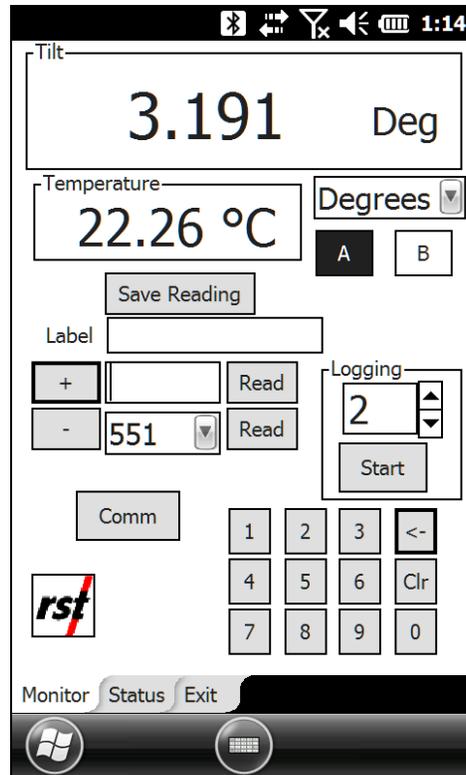
Figure 5 – Monitor Screen

Data file will be saved in CSV format with following column headers:

Serial, Date, Temp, Axis A, Axis B, Units

The following image shows sample data file.

Figure 6 – Sample Data File

The *Comm* button menu specifies which communication port is used by the Digital Bus Tilt Meter Mobile Host software. For RST USB to RS485 adaptor choose USB port. See Figure 7 for sample screenshot.
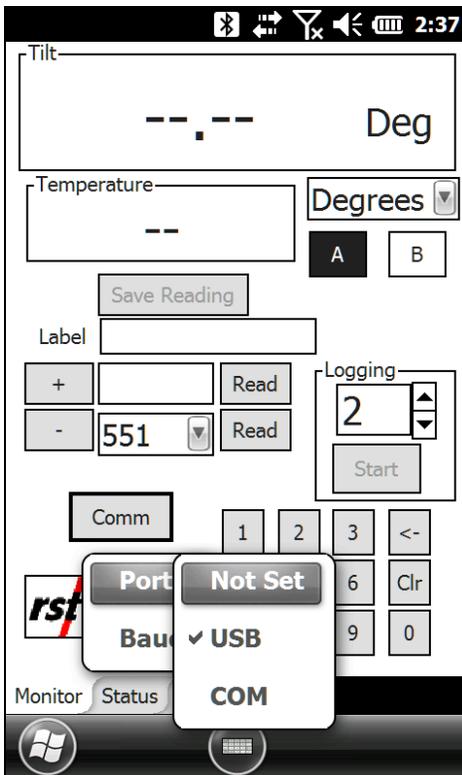
Figure 7 – Communication Port Menu

5.2 STATUS

The status tab allows the user to retrieve and display information recorded in each connected instrument. The following information is available: *Firmware version, Board revision, Serial Number, Model Label and Label.* Type the desired instrument address using the keypad and press *Update* to retrieve the information. To help in troubleshooting and for diagnostic purposes, the connected instrument address retrieval *Get Address* feature is included.

Note
Get Address feature will work only if single instrument is connected to the bus.
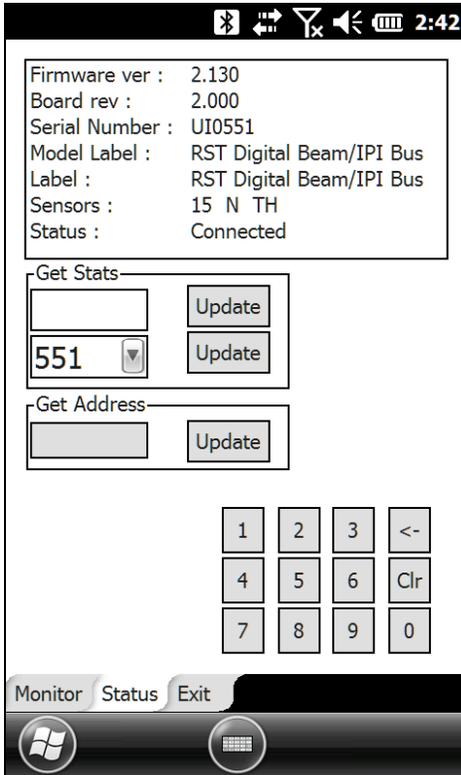
Figure 8 – Status Screen

5.3 EXIT

Pressing the *Exit* tab will close the Digital Bus Tilt Meter Mobile Host program.

6 TROUBLESHOOTING

6.1 CONNECTION PROBLEMS

The following list contains the frequently encountered problems and solutions.

- *RST USB to RS485 adaptor disconnected or drivers missing:*
  Plug the mini-USB A plug into USB port A located in front of Field PC™ unit.
  If a dialog pops-up, enter ***ftdi_ser.dll*** as a driver name.

- *Improper port selected:*
  Ensure that USB port is selected on Monitor screen (Section 5.1).

- *Selected device doesn't exist on the bus:*
  Connect only one device to the bus and use Get Address feature (Section 5.2) to find out its address.

- Connected device is in unknown state:
  Disconnect the RST USB to RS485 cable from Digital Bus Tilt device to reset instrument state. Connect it back.

The connection problems are most often caused by malfunctioning communication link.

6.2 SOFTWARE MAINTENANCE

In certain situations, the Digital Bus Tilt Meter Mobile software might be erased from Field PC^2™. This will happen during hardware malfunction or if the Clean Boot (set to factory defaults) was performed. The Digital Bus Tilt Meter Mobile Host software can be reinstalled from original installation media using procedure outlined in next section.

6.3 INSTALLATION OF THE DIGITAL BUS TILT METER MOBILE HOST SOFTWARE.

Use the following steps to reinstall the RST Digital Bus Tilt Meter Mobile Host Program:
1. Establish a connection to the Ultra-Rugged Field PC^2™ using Microsoft ActiveSync™.
2. Using Windows Explorer, copy the file "RST_Digital_Bus_Tilt_Meter_X.XX.CAB" to the folder on the Ultra-Rugged Field PC^2™ (My Documents for example). The "X.XX" will mean the software version.
3. On Ultra-Rugged Field PC^2™, select *Start* and then *File Explorer* from pull down menu.
4. Navigate to the folder where the file "RST_Digital_Bus_Tilt_Meter_X.XX.CAB" was copied to.
5. Click on the "RST_Digital_Bus_Tilt_Meter_X.XX.CAB" file to begin installation.
6. Run the program by choosing *Digital Bus Tilt Meter Mobile* from *Start* menu.

7   DOWNLOADING DATA TO A DESKTOP PC

The software used to transfer data will depend on the version of Microsoft Windows installed on a desktop PC.

For Windows XP versions, ActiveSync™ is required. Windows Vista and Windows 7 have a build-in Mobile Device Center. It is highly recommended to download and install the newest updates from Microsoft website.

7.1   INSTALLING MICROSOFT ACTIVESYNC™ ON WINDOWS XP

In order to communicate between the Ultra-Rugged Field PC^2 and a desktop PC or laptop, Microsoft's ActiveSync™ software is required and is included with the Digital Bus Tilt Meter Mobile System. Communication between the two devices is achieved through an USB connection.

Note
Microsoft's ActiveSync™ software can be freely downloaded from Microsoft's website.

Important
Don't connect the USB cable before installing ActiveSync™ software. Doing so will result in installation of generic Windows USB drivers which will not work with Ultra-Rugged Field PC^2.

To install Microsoft ActiveSync™:

1. Insert the Ultra-Rugged Field PC^2 Companion CD into the CD-ROM drive. On most systems, Windows will automatically launch the setup program. Minimum system requirements are outlined in the jacket of the CD-ROM. Once the CD is up and running, a graphical window will open. Press the *play* icon on this window.

2. Click the link marked *Start Here.*

3. Click *Install ActiveSync.* Note: When prompted to download the file, select *Run this program from its current location.* Installing Microsoft Outlook is **not** necessary, for the Digital Bus Tilt Meter Mobile System to function. If you wish to use the Ultra-Rugged Field PC^2 for e-mail, install Outlook.

4. Follow the on-screen instructions until you reach the screen shown below, and then continue with Step 5.
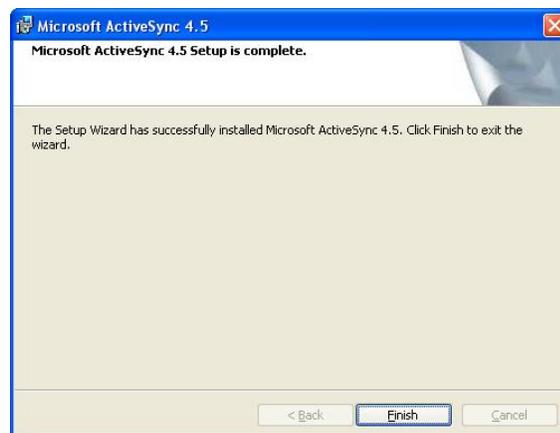
Figure 9 – ActiveSync Connection Screen

5. Click Finish button.

6. Insert the AC Adapter plug into an electrical outlet (item 12, Figure 2). Connect the AC connector barrel connection on the base of the Ultra-Rugged Field PC^2 (Figure 2).

7. If you have not already done so, connect the mini USB connector to the connector on the base of the rugged case and the USB connector to the USB port on either the front or back of your personal computer.

Note
ActiveSync will automatically detect the Ultra-Rugged Field PC^2 connection.

8. Continue to follow the ActiveSync instructions to establish a partnership. Eventually you will come to a screen like the one below:

Figure 10 – Setting Up a Partnership

In order to synchronize the data in real-time between the Ultra-Rugged Field PC^2 and the desktop PC, you must set up a *sync partnership.* If you do not wish to synchronize data and simply use Windows Explorer to copy files to and from the Ultra-Rugged Field PC^2, click Cancel to leave the connection as *Guest Partnership* and skip the remaining instructions.

1. To set up a *sync partnership,* press *Next.*

2. Uncheck the option for synchronizing with Microsoft Exchange Server, press *Next.*

3. Decide what type of information you would like synchronized with the desktop computer. If you are only using the Ultra-Rugged Field PC^2 for the purposes of transferring Digital Bus Tilt Meter information, uncheck all the options and place a check mark next to the *Files Folder* (see below).

Figure 11 – Synchronization Settings

The software will notify you that it will create a folder on the desktop which links directly to the Ultra-Rugged Field PC[2] (*press OK*). Click Next, and then Next on following dialog, then Finish the installation. Once the partnership is established, the PC will recognize and automatically synchronize to the Ultra-Rugged Field PC each time it is connected with the USB cable.
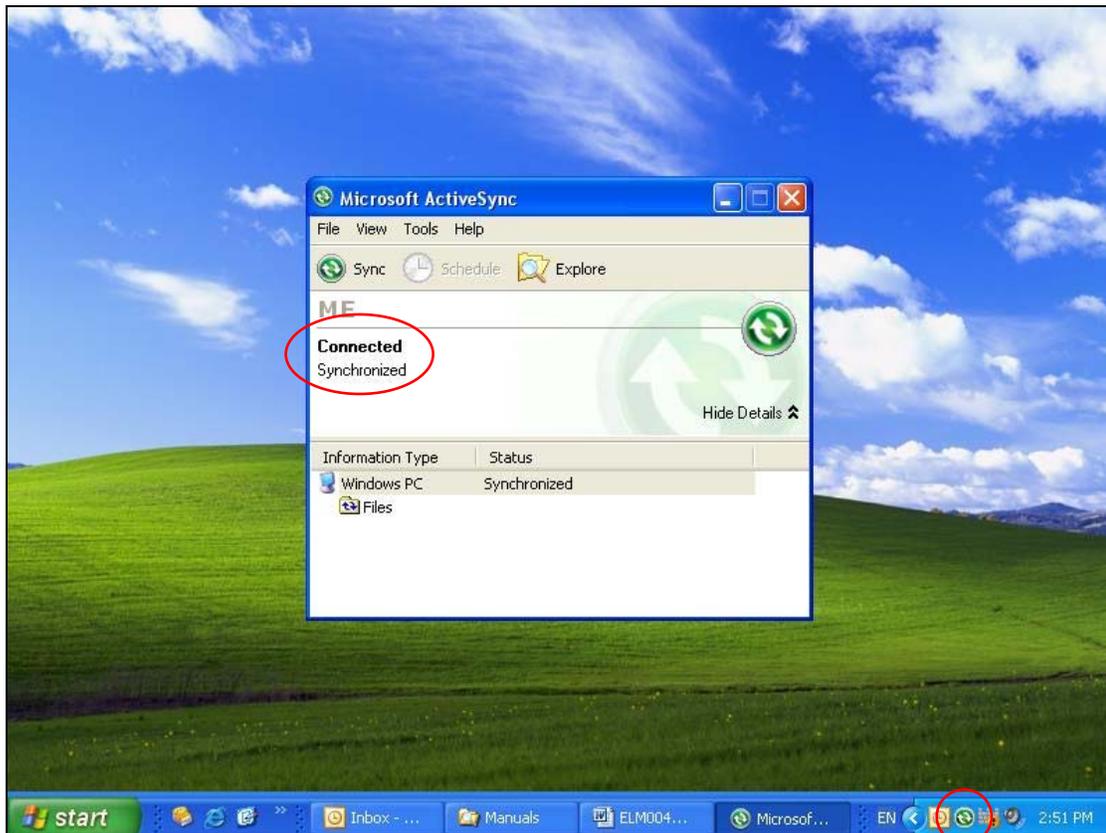
Figure 12 – ActiveSync Screen

<div style="border: 1px solid black; padding: 10px;">

Important

It is extremely important that the user realizes that the synchronized folder created on the desktop is an **active** link to the Ultra-Rugged Field PC^2. Any changes you make in that folder will be reflected on the Ultra-Rugged Field PC^2. For example, if you delete a file in the folder, the same file will be deleted on the Ultra-Rugged Field PC^2. If the Ultra-Rugged Field PC^2 happens to be disconnected at the time, as soon as it is re-connected it will automatically see the missing file in the folder and the file will be deleted during the connection. It is therefore important to exercise good data management. Once the data is synchronized to the PC, move the Digital Bus Tilt Meter files to a safe location (i.e. a network server or hard drive).

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For further instructions regarding synchronizing data between a PC and the Ultra-Rugged Field PC^2, please refer to the supplied documentation and software which comes with the Ultra-Rugged Field PC^2 (CD-ROM).

7.2 SETTING UP MOBILE DEVICE CENTER ON WINDOWS VISTA, WINDOWS 7 OR WINDOWS 8

Before connecting to Ultra-Rugged Field PC[2], it should be verified that desktop PC or laptop contains current version of Microsoft Mobile Device Center™. Communication between the two devices is achieved through an USB connection.

Note
Microsoft's Mobile Device Center™ software can be freely downloaded from Microsoft's website. Choose 32 bit or 64 bit version depending on Windows Vista™, Windows 7 or Windows 8 operating system.

After Mobile Device Center™ is installed, connect the Ultra-Rugged Field PC[2] to desktop or laptop computer using USB cable provided with the Digital Bus Tilt Meter System. Windows should detect new connection and display following dialog box.

Figure 13 – Mobile device Center Screen

In order to synchronize the data in real-time between the Ultra-Rugged Field PC[2] and the desktop PC, you must click on *Set up your device.* If you do not wish to synchronize data and simply use Windows Explorer to copy files to and from the Ultra-Rugged Field PC[2], click *Connect without setting up your device.* Data files can be copied from Ultra-Rugged Field PC[2] using File Management, as shown on Figure 15.
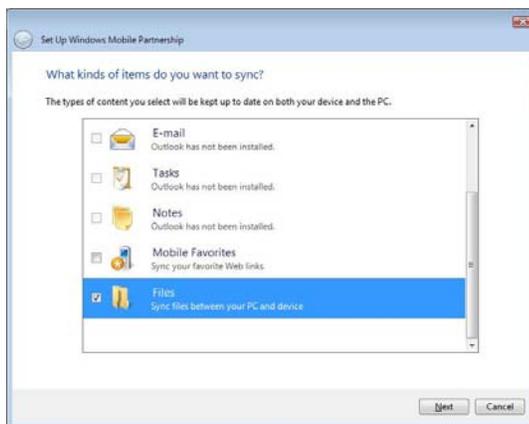
Figure 14 – Synchronization Settings on Windows Vista™, Windows 7or Windows 8™

If synchronizing files, decide what type of information you would like synchronized with the desktop computer. If you are only using the Ultra-Rugged Field PC^2 for the purposes of transferring Digital Bus Tilt Meter information, uncheck all the options and place a check mark next to the *Files* (see above).

Figure 15 – Accessing Files on Windows Vista, Windows 7 or Windows 8

Important
It is extremely important that the user realizes that the synchronized folder created on the desktop is an **active** link to the Ultra-Rugged Field PC^2. Any changes you make in that folder will be reflected on the Ultra-Rugged Field PC^2. For example, if you delete a file in the folder, the same file will be deleted on the Ultra-Rugged Field PC. If the Ultra-Rugged Field PC^2 happens to be disconnected at the time, as soon as it is re-connected it will automatically see the missing file in the folder and the file will be deleted during the connection. It is therefore important to exercise good data management. Once the data is synchronized to the PC, move the Digital Bus Tilt Meter files to a safe location (i.e. a network server or hard drive).

For further instructions regarding synchronizing data between a PC and the Ultra-Rugged Field PC^2, please refer to the supplied documentation and software which comes with the Ultra-Rugged Field PC^2 (CD-ROM).

8   EDITING DEVICE ADDRESS LIST

Digital Bus Tilt Meter Mobile Host software comes preinstalled on Field PC^2™ unit with CSV formatted file containing all device addresses to be used by the operator. This file can be modified using text editor (i.e. Notepad) or spreadsheet software (i.e. Microsoft Excel™). Follow the procedure below to edit address list file.

- Exit the Digital Bus Tilt Meter Mobile Host software using *Exit* tab if open.

- Establish connection between desktop PC and Field PC^2™. For communication software installation, see Section 7.

- Copy the original file **PoolAddresses.csv** from Field PC^2™ folder:
  \My Documents\DigitalTilt
  to some known location on desktop PC (i.e. My Documents)

- Open **PoolAddresses.csv** file using Notepad, Microsoft Excel or any other text editor.

- Add or remove entries keeping the existing format
  - Leave first line *Address Pool File* intact.
  - One address per line only.

- Save the file using the same filename and CSV format.

- Copy the saved file to the Field PC^2™ folder:
  \My Documents\DigitalTilt
  overwriting the existing file.

- Upon next launch, Digital Bus Tilt Meter Mobile Host Software will read and use modified address file.

9   INSTALLATION THE RST DIGITAL TILT PROGRAM

Use the following steps to reinstall the RST Digital Tilt Program:
7. Establish a connection to the Ultra-Rugged Field PC^2 using Microsoft ActiveSync.
8. Using Windows Explorer, copy the file "Digital Tilt X.XX.CAB" to the folder on the Ultra-Rugged Field PC^2 (My Documents for example). The "X.XX" will mean the software version.
9. On Ultra-Rugged Field PC^2, select *Start* and then *File Explorer* from pull down menu.
10. Navigate to the folder where the file "Digital Tilt X.XX.CAB" was copied to.
11. Click on the "Digital Tilt X.XX.CAB" file to begin installation.

Note
If an older version of the RST Digital Tilt Software is already present, uninstall the previous version by going to *Start*, then *Settings* and tapping on *Remove Programs* located in *System* tab. Highlight the program to be removed and tap *Remove*.

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10 SYSTEM SPECIFICATIONS

Ultra-Rugged Field PC^2	
Water Proof	IP68
Rugged Case	1.5 m or 5' 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	1.0GHz ARM Cortex A8 i.MX53 processor
Memory	512 MB DDR2 RAM
Internal Flash Disk	8 GB
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 (English, French, Spanish, German, Portuguese) Adobe Reader® LE
Battery	Intelligent Li-Ion battery 3.7VDC @ 10600mAh,38.7Whr 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, 2.1 +EDR, Class 1.5, range greater than 100 feet (30m) Wi-Fi® 802.11b/g/n with extended range
Certifications and Standards	FCC Class B CE Marking (applicable EMC, R&TTE, and LVD directives) Industry Canada EN60950 Safety

Table 1: Ultra-Rugged FiledPC^2 Specifications

11 CARE AND MAINTENANCE

11.1 READOUT UNIT

To keep the Ultra-Rugged Field PC^2 in good condition and working properly, please adhere to the following guidelines:

- Keep the Ultra-Rugged Field PC^2 away from excessive moisture and extreme temperatures. Do not expose the Ultra-Rugged Field PC 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 Ultra-Rugged Field PC^2 to prevent damage to the screen.

- Clean the unit by wiping the screen and the exterior with a soft, damp cloth moistened only with water.

- Avoid exposing the Ultra-Rugged Field PC^2 to direct sunlight or strong ultraviolet light for extended periods of time. Also avoid scratching the surface of the screen and banging it against hard objects.

- Only use the Ultra-Rugged Field PC^2 stylus to prevent scratching the screen.

For further reference please see the supplied manufacturer's manuals for the Ultra-Rugged Field PC^2.

12 CONTACT US

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