OPERATIONS MANUAL

CHAPTER 5 SURFACE EQUIPMENT

REV A: 2013 July7

XFLD0005

Table of Contents

1. XTR & XRT

The Initial Setup involves preparing the 2 boxes that will be used on the surface at the well site. The 2 x Boxes are the Extreme Remote Terminal (XRT) & the Extreme Telemetry Receiver (XTR).

The XTR contains hardware for receiving the data from the XEM MWD, processing the data so that it can be decoded.

The XRT contains a Laptop that has the software which decodes the signal, displays the signal and communicates with other devices over the network. The XRT and XTR are normally sent in black pelican cases. A new version of the XRT called the "Azonix" Remote terminal is now available.

1.1. OPENING THE XRT AND THE XTR

1. Open the pelican cases containing the XRT and XTR. The pelican cases should be 'green tagged' indicating that they are in good working condition. An XTR or XRT that has been in service in the field for an extended period of time should be sent to the R&M facility periodically for maintenance.

2. The XRT and XTR need to be placed in protective pelican cases when not in use, to prevent damage from impact or direct exposure to water/excessive moisture.

Figure 1 XRT and XTR in pelican cases

3. Place the XRT and XTR on a work bench. The XRT and XRT cases should preferably be placed at a location where there is less chance of water impact. The XRT and XTR cases should NEVER be opened in the field.

1.2. XRT DESCRIPTION
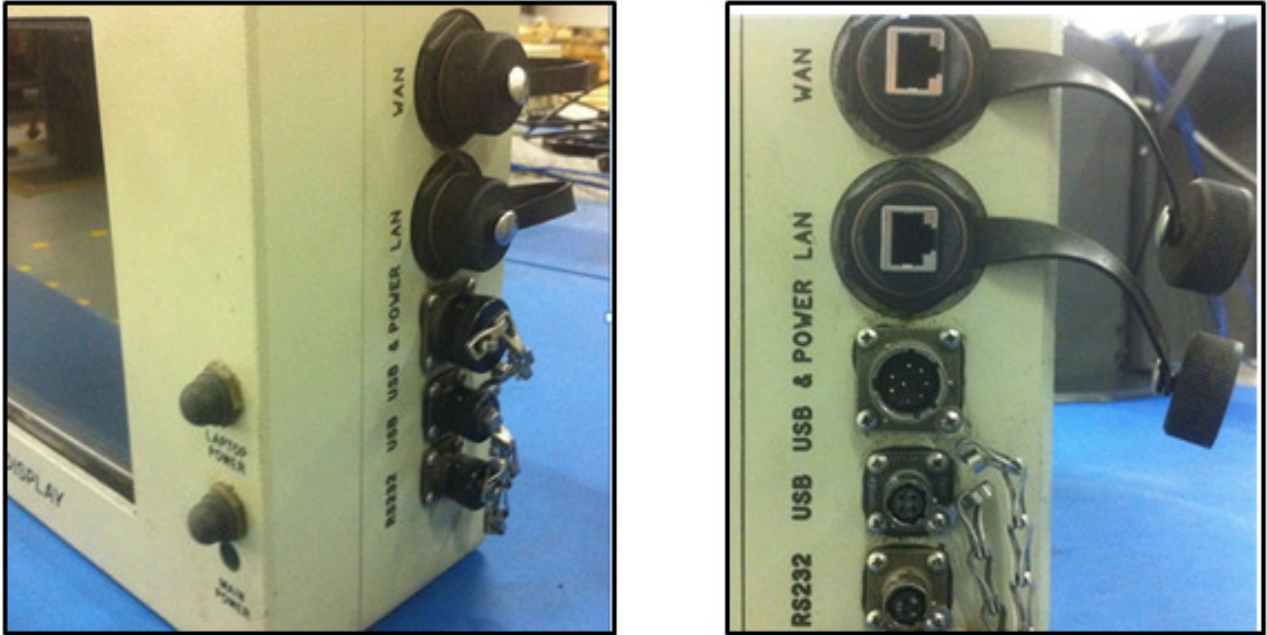
Figure 2 XRT Right

4. On the right side of the XRT, there are 5 ports for connections:

*   WAN-Wide area Network port connected to the router for connectivity to a wide Area Network.

*   LAN-Local Area Network port connected to the router for connectivity to a Local Area Network.

*   USB & Power used to route power and signal from the XRT.

*   USB is connected to the Laptop inside the XTR: An external USB Hub and a keyboard can be connected to the XRT from this port.

Figure 3 XRT Top

5. The top of the XRT is used for establishing Wireless Internet connectivity. Once the XRT is online it will automatically connect to Extreme's Virtual Private Network (VPN). The Command Center will be able to view and control the XRT, assisting with trouble shooting and enabling 'man less' operation on site. There are 2 x Ports on the top of the XRT:

• The **802.11 B/G port** is used for connecting a magnetic mounted antenna with the router build inside the XRT. This is used to provide Wi-Fi and has a maximum outdoor range of 140m (460ft).

• The **CELLULAR ANTENNA** connector port can be used for establishing an internet connection via an air card inbuilt into the XRT. This option is usually not available, as most XRT do not have air cards installed.

1.3. XTR DESCRIPTION

6. The XTR has 8 x green LEDs on Top. 4 x LEDS show the status of power supplies in the XRT;

- The **+12V, - 12V** and **+5V LEDs** light up when the XTR has power.

- The **TOOL LED** will not light up unless the XRT is supplying power to the XEM tool or individual probe. When the XEM tool is NOT physically connected to the XTR, it can only be powered by the batteries. When the XEM tool is physically connected to the XTR you can supply power to the XEM Tool with the XTR, thereby saving battery life.

- The **TX +** and **TX – LEDs** alternate between ON and OFF as the hardware receives the raw signal from the tool, this indicates the XTR is receiving signal from the XEM tool.

- The **EM LOAD LED** and **DEPASSIVATE LED** are no longer in use.

Figure 4 XTR Top

7. The XTR has the following ports on the left

- **Laptop:** Provides power and data from the XTR to the XRT.

- **WITS**: Provides serial communication with WITS protocol to other devices.

- **120V AC:** Provides 120V to the XTR through an AC Power cord. (Some of the XTRs in the fleet are equipped with hardware to take in power from 220V supply; if the XTR is not designed to utilize 220V it will damage the hardware and will need to be returned to the repair center.
    - o   The power requirement of the XTR can be identified as follows:

o   120VAC – labeled as 120VAC and has a 3-pin connector

o   220VAC – labelled as 220VAC and has a 4-pin connector

- **ON/OFF**: This is used for both turning the XTR ON and OFF.

Figure 5 XTR Left

8. The XTR has the following ports on the right side:

- **HH ROTC** Hand Held Rotatable connector used to connect the XTR to the XEM tool in order to program, test, or retrieve data from the tool after the run.

- **EM LOAD**: This is used to place a load onto the tool for testing purposes. This process must only be done by trained R&M Staff.

- **DEPASSIVATE:** This is used to prepare Lithium batteries for operation after the cell batteries are installed into the Be-Cu housing. (This process must only be done by trained R&M Staff).

Figure 6 XTR Right

- **BOP:** This is used to connect the XTR to the Rig Blow out preventer with a cable to decode the Signal from the tool down hole.

- **ANT:** This is used to connect the XTR to the Ground Antenna with a cable to decode the signal from the tool down hole.

- The **ANT** and **BOP** (2 pin circular female connector) ports are used to connect to low noise cabling in order to read the voltage drop between the grounding antenna and the blow out preventer and the ports/cables can be swapped /interchanged.

- It does not matter if the Cable that is connected to the BOP clamp is placed into the BOP connection or the ANT connection or vice versa.

Figure 7 ANT, BOP port
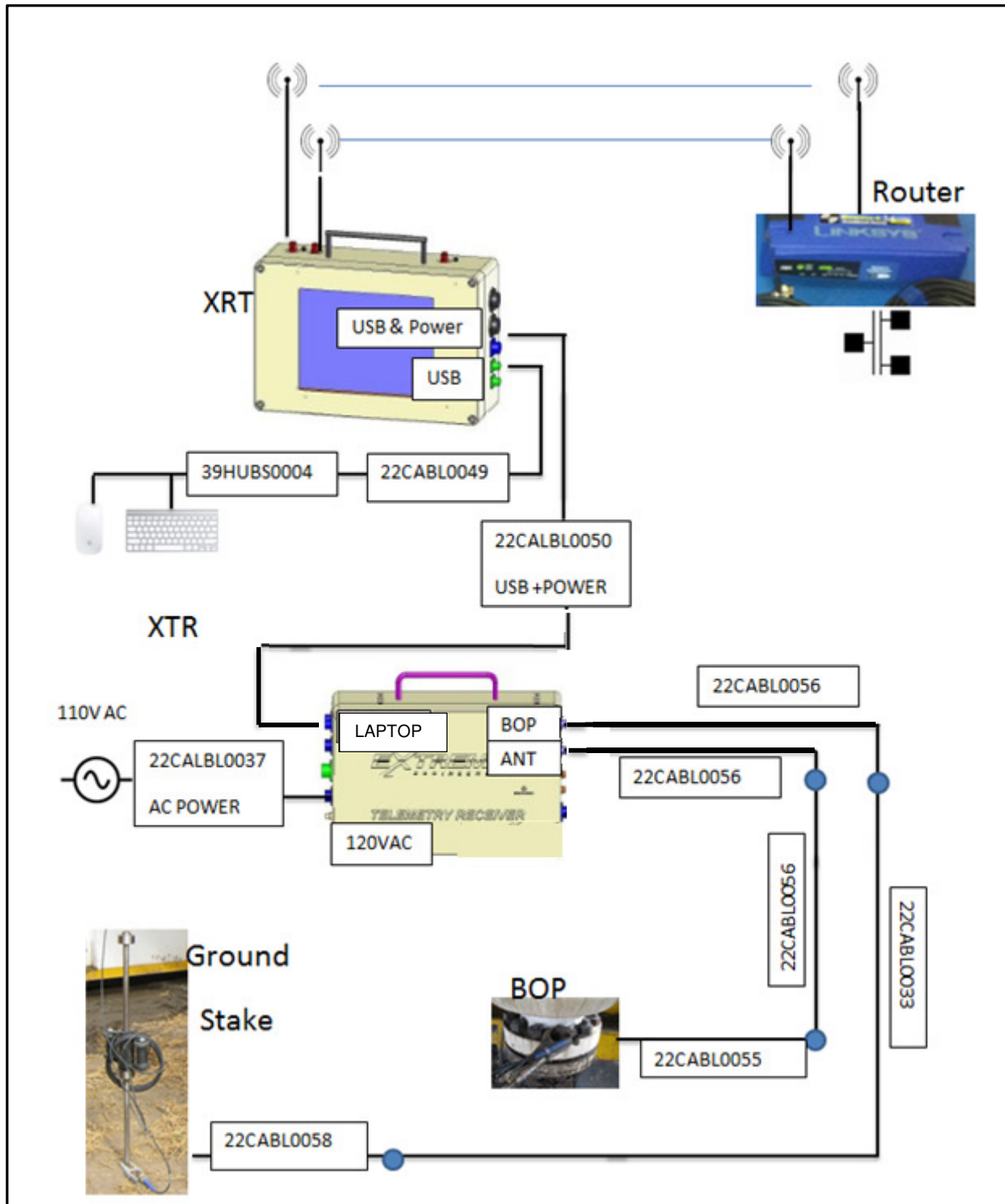
2. SET UP

Figure 8 Summary Description of the XEM Well site surface system

3. SET UP DETAIL

3.1. 22CABL0050

1. The cable 22CABL0050 has to be connected between the XTR and the XRT; this cable has a blue color, whereas other cables are typically black with blue end connectors. This cable is used to communicate data and power from the XTR to the XRT. This cable has an 8 x pin male circular connector on one end and an 8 x pin circular female connector on the other end.
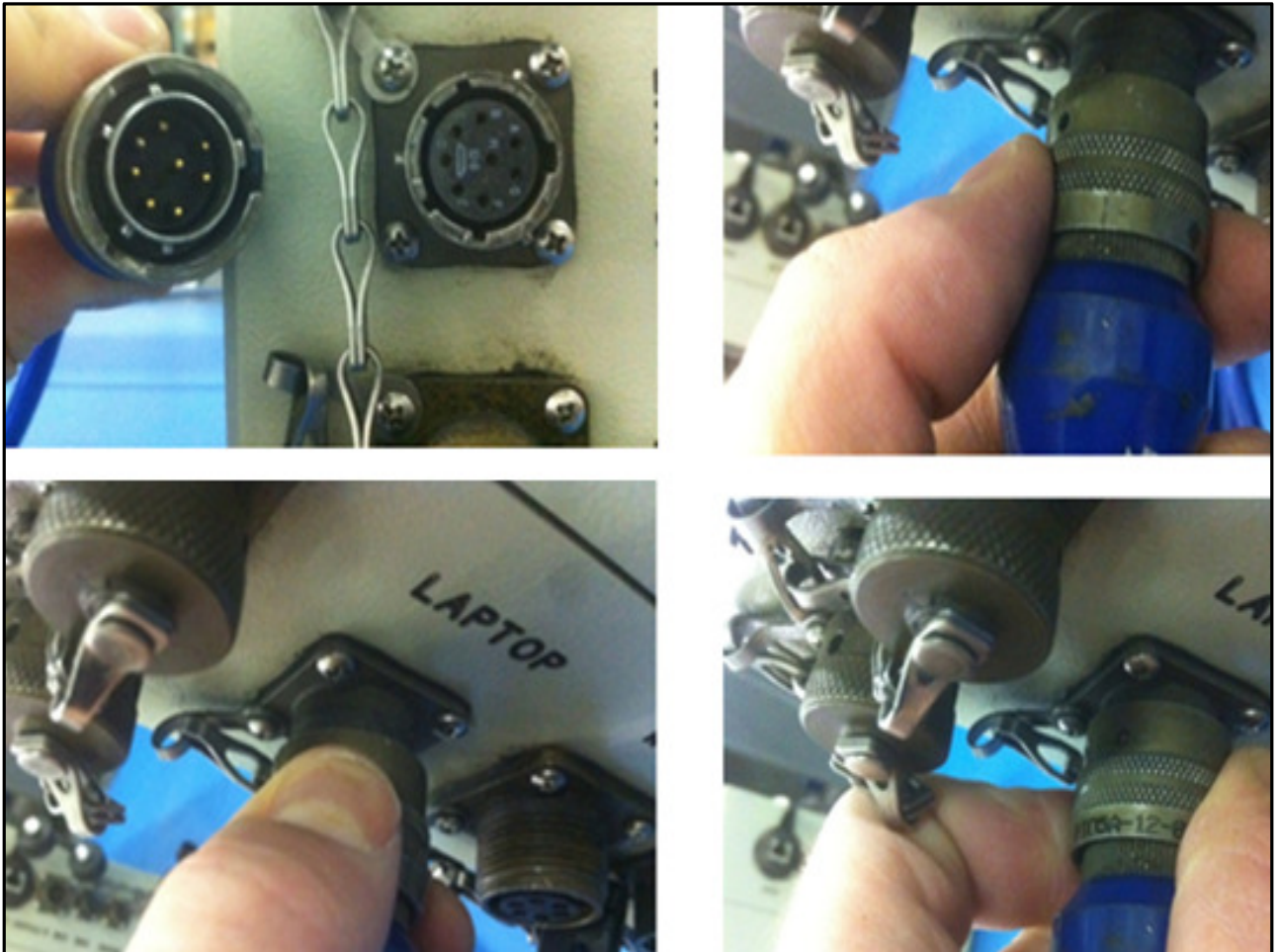

Figure 9   22CABL0050

Figure 10   22CABL0050

2. Connect the 8 x pin male circular connector on the 22CABL0050 cable with the 8 x pin circular female LAPTOP connector on the XTR.

    The cable has slots that have to be aligned to corresponding grooves on the connector.

    Once aligned the cable is placed on the connector and turned clockwise to secure the connection. The cable end has a small hole, and the connector has a corresponding pin. The cable is twisted until these are aligned.

Figure 11   22CABL0050 connected with the XTR

The 22CABL0050 cable is now connected with the female Laptop connector on the XTR. The other end of this cable now has to be connected with the XRT.

3. Connect the 8 x pin circular female connector on the 22CABL0050 cable with the 8 x pin male circular USB & POWER connector on the XRT.
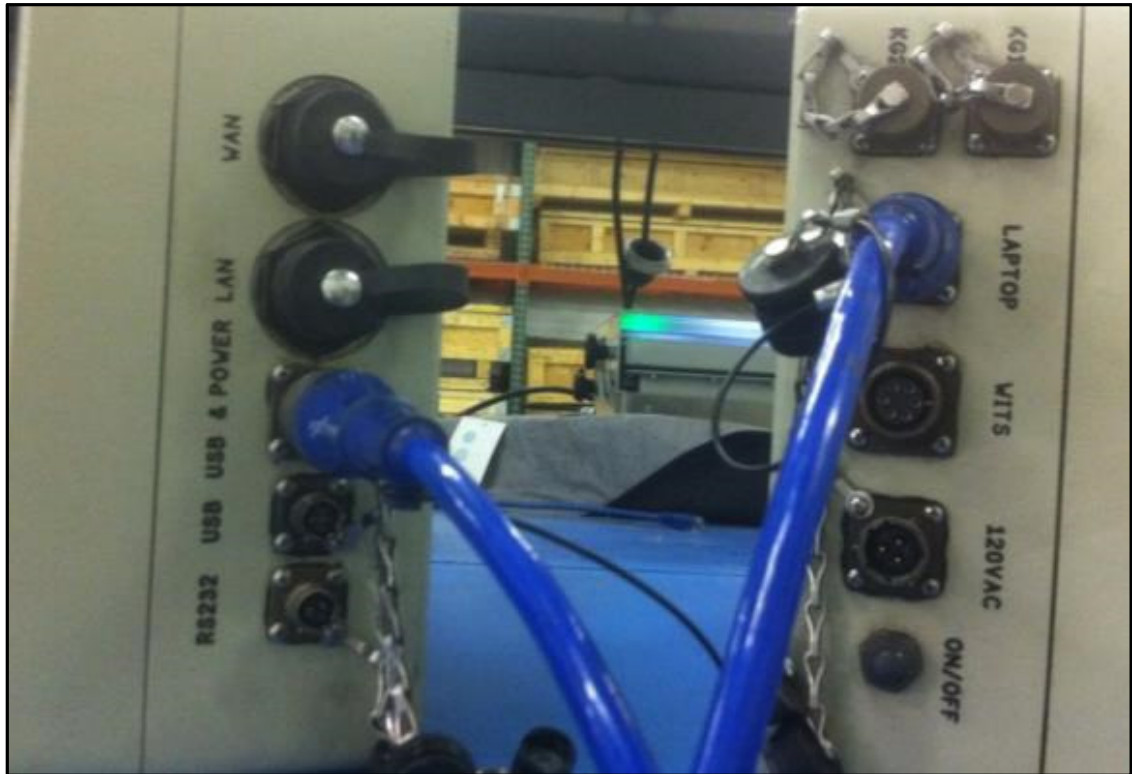
    The cable has slots that have to be aligned with corresponding grooves on the connector.

    Once aligned the cable is placed on the connector and turned clockwise to secure the connection. The cable end has a small hole, and the connector has a corresponding pin; the Cable is twisted until these are aligned.

Figure 12 22-CABL-0050 connected with the XRT

The XRT (USB +Power port) and the XTR (Laptop port) are now connected with the 22CABL0050.

Figure 13 XTR and XRT

The XRT does not have its own dedicated power input and takes power from the XTR.

Figure 14 22CABL0037 120V power supply cable

3.2. 22CABL0037

The XTR has to be connected to a 120V AC power supply; this will be with the 22CABL0037.

4. Connect the 3 x pin female circular connector on the 22CABL0037 with the 3 x pin male circular 120VAC connector on the XTR. The cable has slots that have to be aligned to corresponding grooves on the connector. Once aligned the cable is placed on the connector and turned clockwise to secure the connection. The cable end has a small hole, and the connector has a corresponding pin; the cable is twisted until these are aligned.
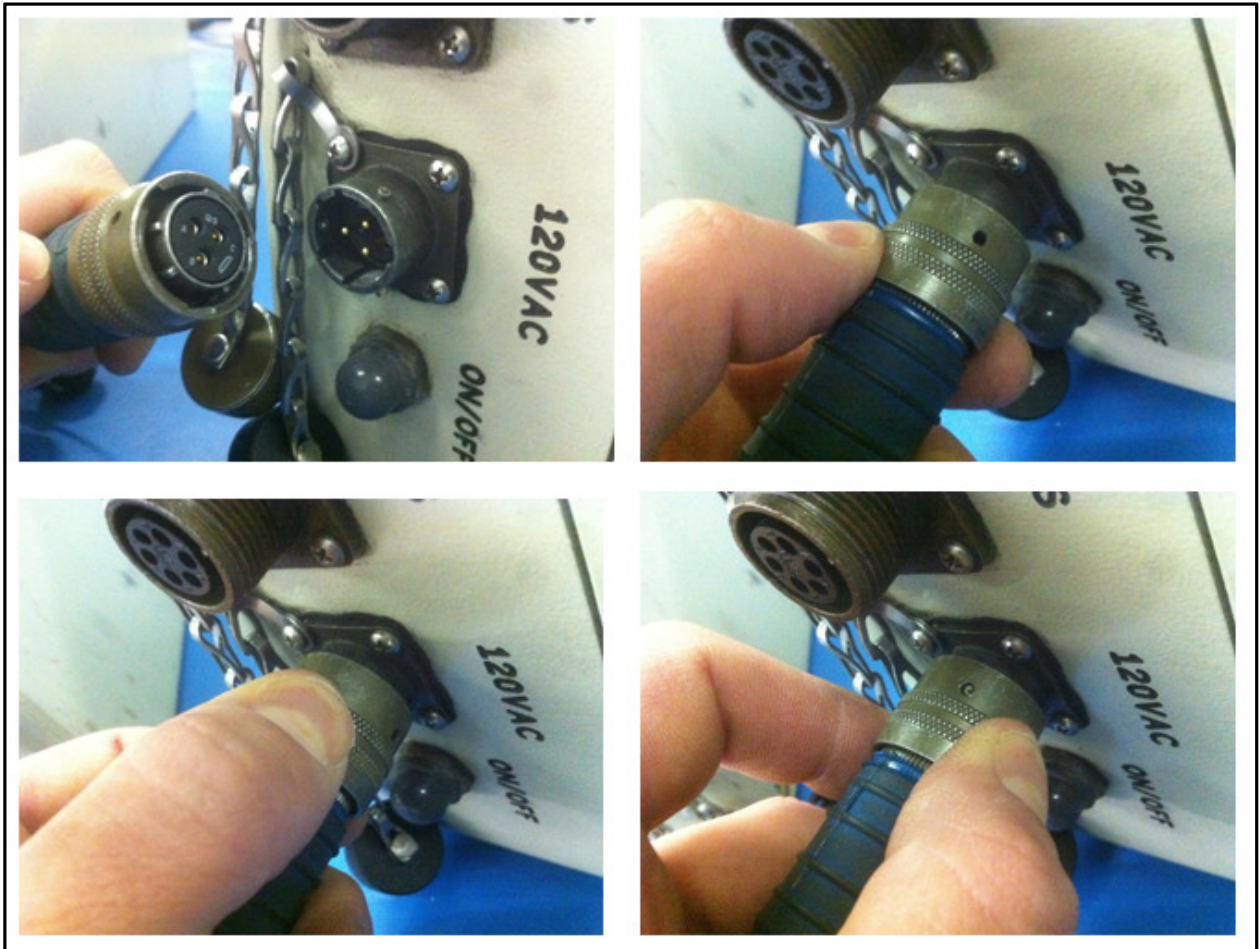
Figure 15   22CABL0035 connected to 120V AC on the XTR

The other end has standard 120V AC power socket and can be connected to the power supply. If the Rig power supply is unstable or has noise, the XTR can be connected to the power supply through the Isolation Transformer 02X-EM0006.

The XRT(USB +Power port) and the XTR(LAPTOP port) are now connected with 22CABL0050.The XTR (120VAC port) is now connected to the the power supply with 22CABL0037.

Figure 16 XTR /XRT Connected to the power Supply

3.3. POWERING UP THE XTR AND XRT

5. The Power Supply can be turned ON. When powering the sequence has to be as follows:
    - Power up the XTR by pressing the ON/OFF button.
    - Press MAIN POWER on the XRT and you should see the green LED light up.
    - Press and hold down LAPTOP for 1 - 2 seconds and the laptop inside the XRT will begin to power up.
6. Powering UP sequence: Press the ON/OF button on the **XTR.**

Figure 17 XTR Power ON/OFF

When the XRT is powered on, 3 x Green LEDs will light up indicating the XTR is now ON. The +12V, -12V and +5V power will be ON. The TOOL LED will not be ON indicating the probe you are attached to, is being powered by the XTR and not battery power. This will be covered in detail in a later section.

Figure 18 +12V, -12V, +5V LEDs ON, TOOL LED OFF

7. Press the "Main Power" button on the XRT.
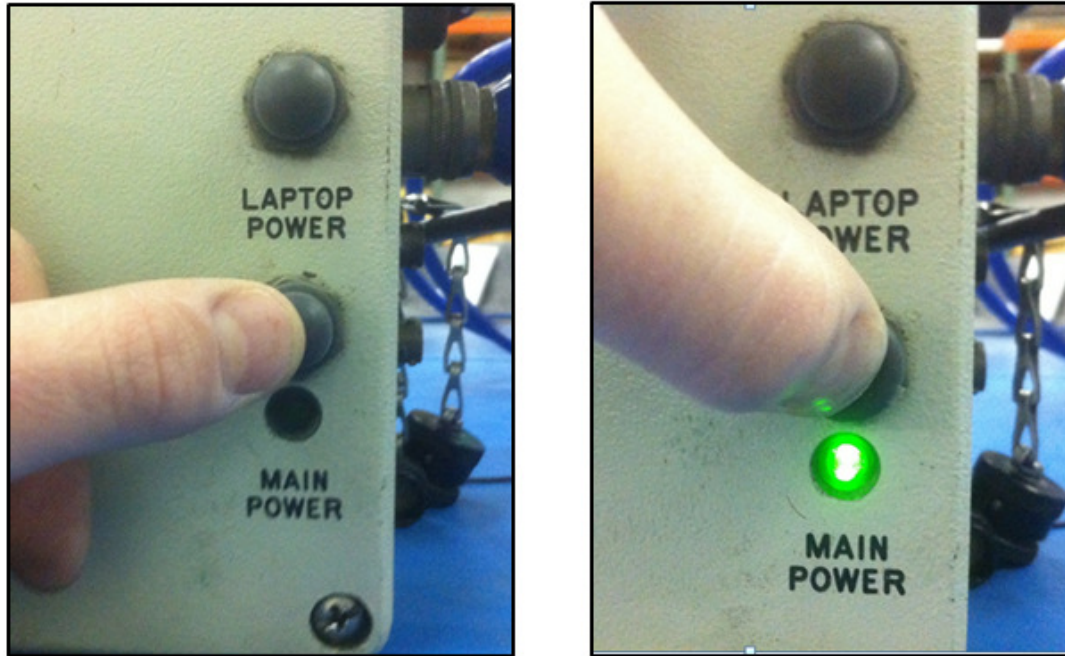
Figure 19 Main power on the XRT

8. Press the LAPTOP power button for 1-2 seconds.

Figure 20 Initiate Lap Top Power

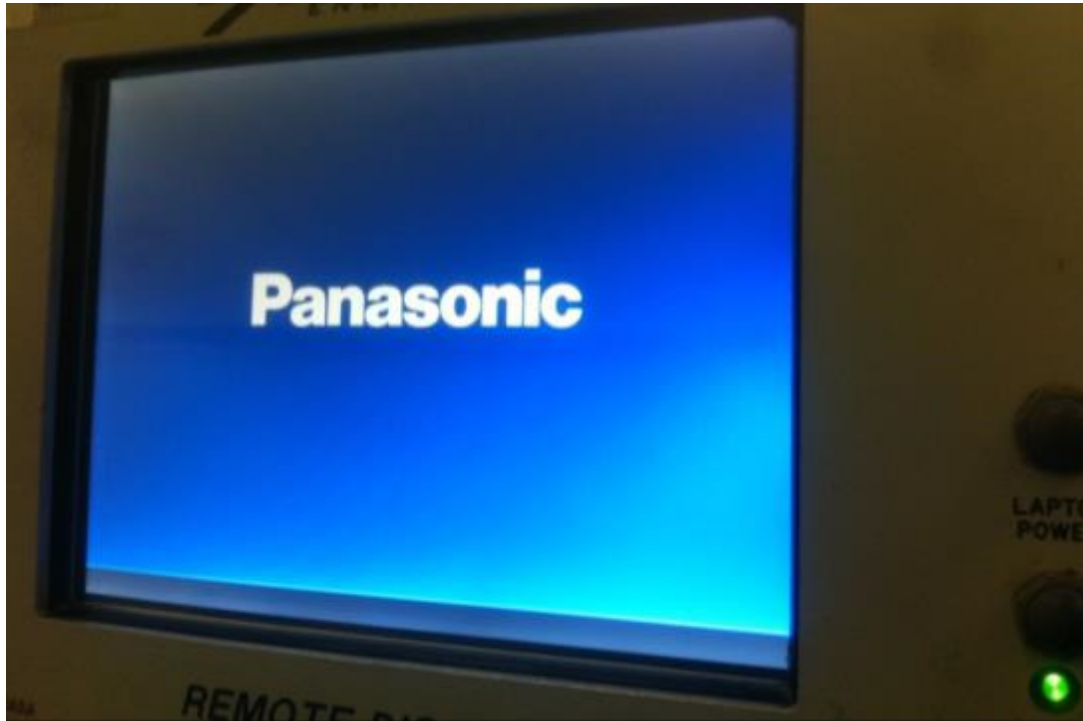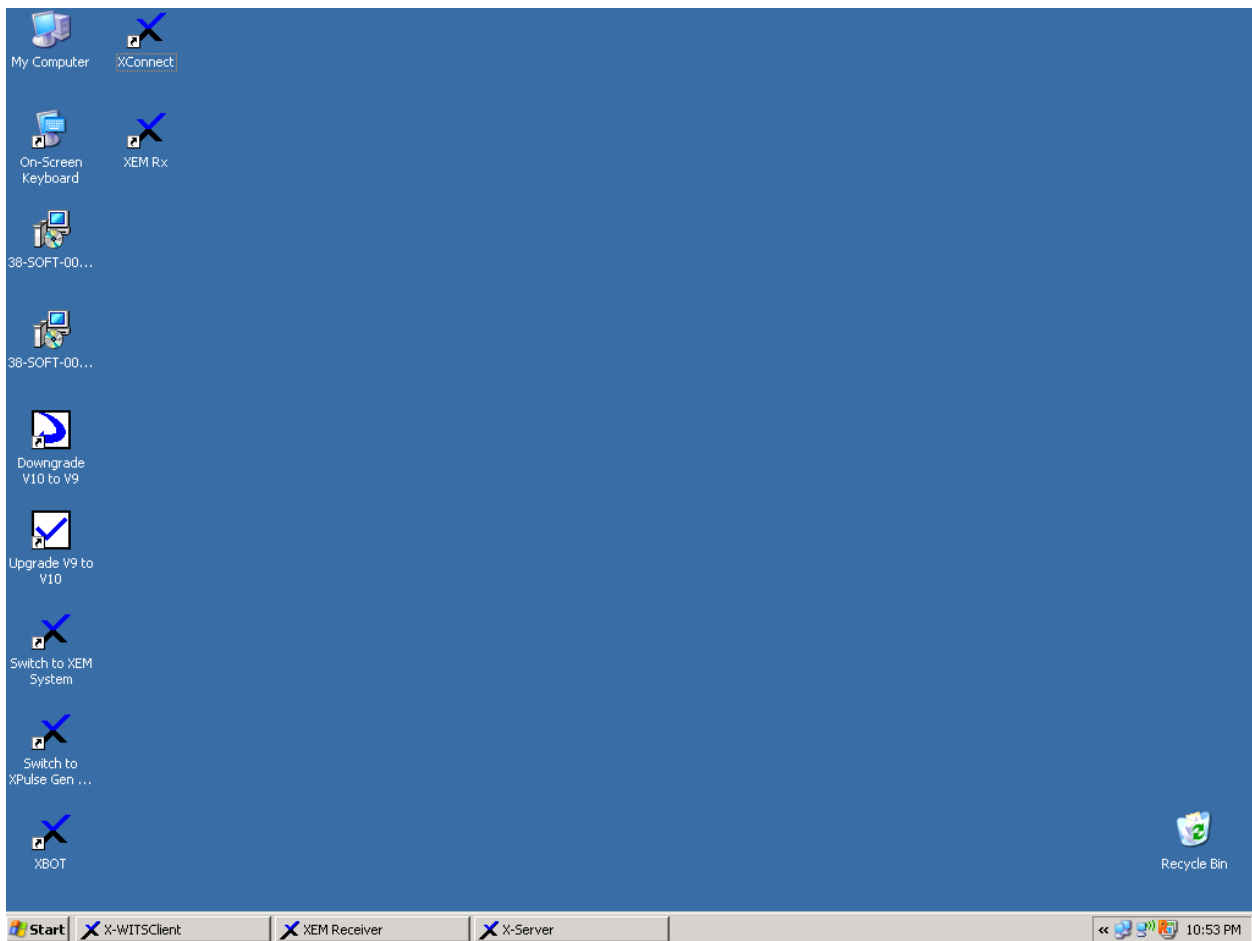9. The XRT will Power up displaying the Panasonic Logo.

Figure 21 XRT Start-up Sequence

Figure 22 XRT Start-up Sequence

10. The XRT will start up with the screen on the desktop.

Figure 23 XRT Screen

The XRT and the XTR are connected.

The XTR is now powered up.

3.4. 22CABL0049

11. Connect the 4 x pin male circular connector on the Cable 22CABL0049 with the 4 x pin female circular connector on the XRT (USB Port). This cable is connected in the same way as the 22CABL0050 and the 22CABL0037.

Figure 24 22CABL0049 Connected to Female USB connection on the XRT

The cable 22CABL0049 is now connected to a female USB connection on the XRT.

Review the Instructions on the following page for connecting the CABL0049 with the XRT

NOTE: The sequence in which the 22CABL0049 and USB devices (Keyboard, Hub, and Mouse) are connected to the XRT is important. Not following the correct sequence will result in damage to the XRT and the USB devices.

THE CORRECT ORDER

1) Power On the XRT

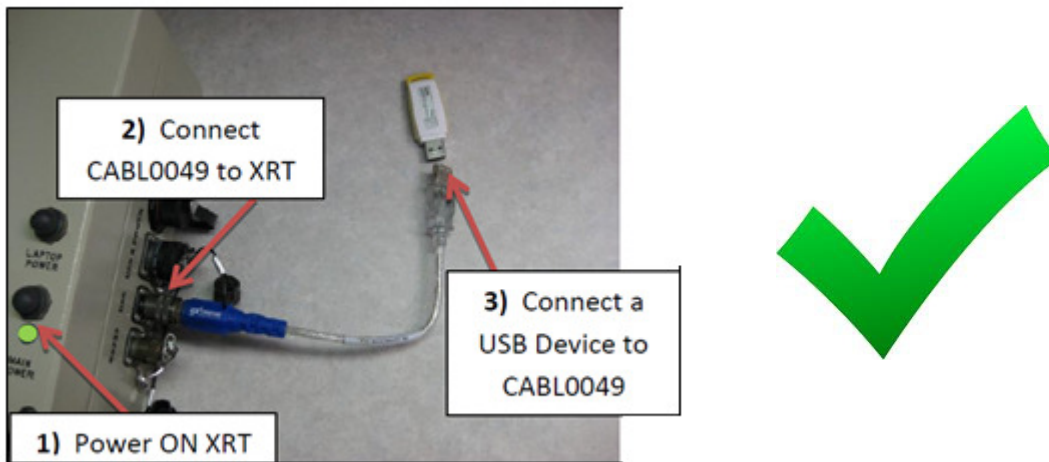2) Connect the 22CABL0049 to the XRT

3) Connect the USB device

Figure 25 22CABL0049 (correct sequence)

DO NOT

1) Connect the USB device or 22CABL0049 if the XRT is powered OFF.

2) Connect the 22CABL0049 if it has USB devices already connected to it.

3) Disconnect 22CABL0049 from the XRT while USB devices are still connected to the cable.

Figure 26 22CABL0049 (Incorrect sequence)

3.5. 39HUBS0004

12. Connect the other end of the cable 22CABL0049 to the USB hub (39HUBS0004). This allows additional devices such as keyboards, mouse and flash drive for installing the software.

Figure 27 22CABL0049 and 39HUBS004 connectors

Figure 28 39HUBS004 connected to the XRT

13. Connect the keyboard key001 to the USB hub.

Figure 29 keyboard and Hub attachment

The keyboard, XRT and XTR are now connected and ready to be connected to the network.

Figure 30 Keyboard connected to the XRT

4. AZONIX
This section is important if you have an Azonix instead of the XRT.

4.1. INTRODUCTION

An upgrade to the XRT is now available and may is being used on some jobs. This is also commonly known as the "Azonix terminal" (Part 92COMP0002). The Azonix terminal decodes information sent from XTR and runs the XEM Receiver software like the XRT. The Azonix terminal:

- Can be used as a Rig floor display (RFD).
- Has a dedicated power supply and does NOT need power from the XTR.
- Supports Ethernet, LAN and WAN communication.
- Has a Wi-Fi adaptor to communicate with the remote connectivity kit.
- Communicates with computer networks for troubleshooting and remote monitoring.

4.2. AZONIXCONTENTS

The Azonix terminal is transported to the well site in a Pelican case with the following items:

- **92COMP0002** Azonix Barracuda terminal
- **22CABL0037**: AC power cable
- **22CABL0104**: Cable providing USB connection to the XRT

A WIFI **04FSTS0013** Antenna Kit is also provided for connectivity.

4.3. AZONIX DESCRIPTION

1. The Azonix terminal is normally sent out to the Rig in a black pelican case.
2. The Azonix terminal has a 15.1" Flat-panel **LCD display** with a touch screen in the front . A number of LEDs and Buttons are located beside the display. These include the following:

- **Green LED** indicates the Power is **ON.**
- Yellow LED indicates the Hard Drive is active
- Blue LED indicates the Azonix computer is ON but the display is not touch sensitive.
- **Power On/off Button** is used to switch the terminal **ON**
- LCD/Touch ON/Off Button allows the LCD to loose sensitivity to touch
- Reset Button is used to reset the system
- Brightness UP/Down Button is used to adjust the brightness of the screen.

Figure 31 Azonix Font display

Buttons	
Icon	**Description**
🙂	LCD/Touch On/Off Button
➕ ☀ ➖	Brightness Up/Down Buttons
🔄	Reset Button
⏻	Power On/Off Button

LEDs		
Icon	**Color**	**Description**
☀	Green	Power ON LED
🖴	Yellow	HDD Active LED
▭	White	UPS Battery ON LED
〰	Orange	Heater ON LED
⊠	Blue	LCD/Touch OFF LED

3. The back side of the side of the terminal has:

- **An Antenna Port (Type N)** to connect to an Antenna for wireless connectivity.
- **8 x Screws sockets** (Size #10-32x.31DP) to mount the terminal with a bracket.
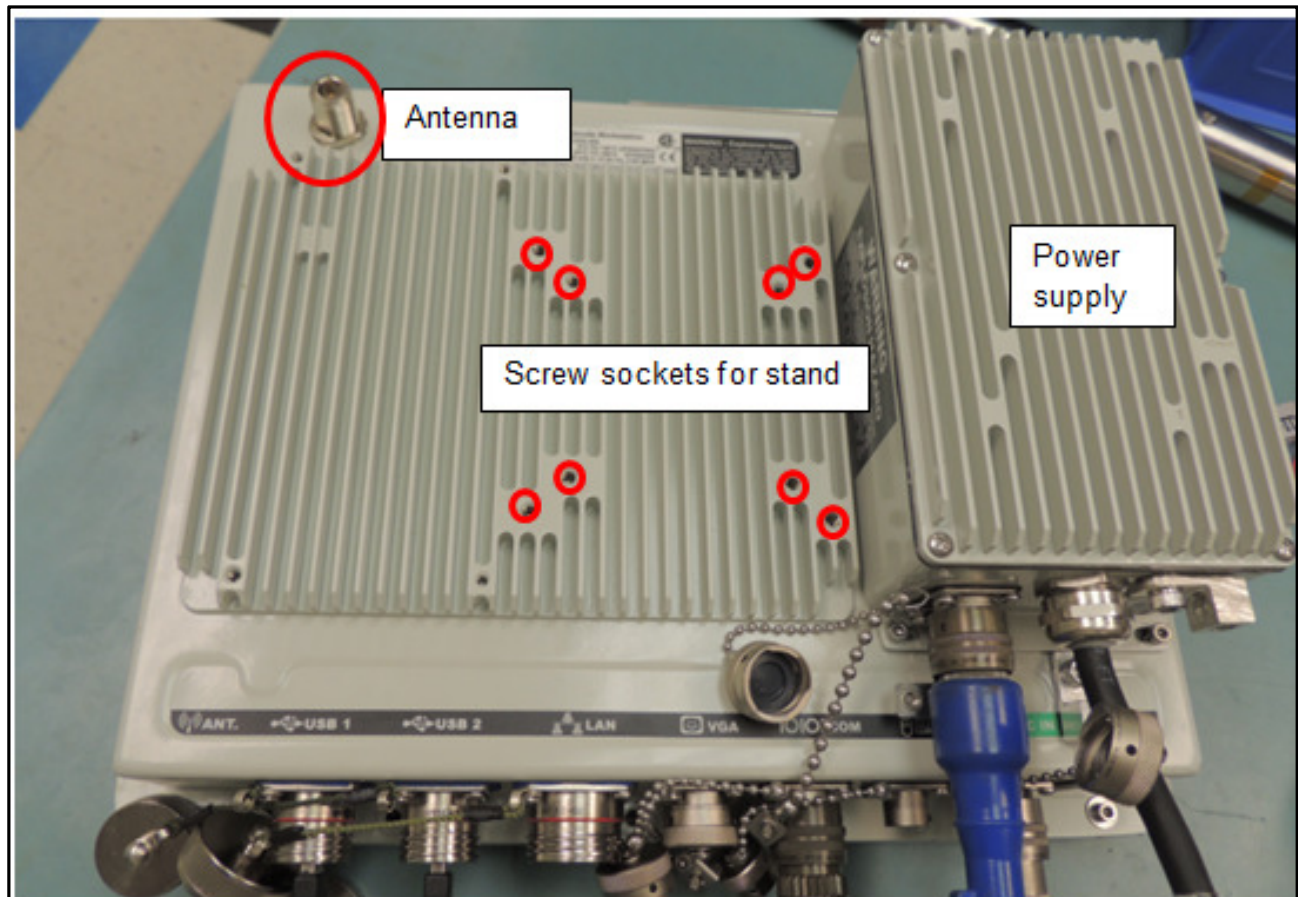

Figure 32 Back of the Azonix Terminal

Figure 33Type N Antenna Connector

4. On the bottom of the Azonix there are a number of connectors:

A. Power Port provides 120/220V AC power.

B. Local area Network Port provides Ethernet network connection.

C. USB-1 Communication Port: Connected to the XTR to get MWD signal information.

D. USB-2 communication Port: used to add accessories such as hubs, keyboards and mouse.
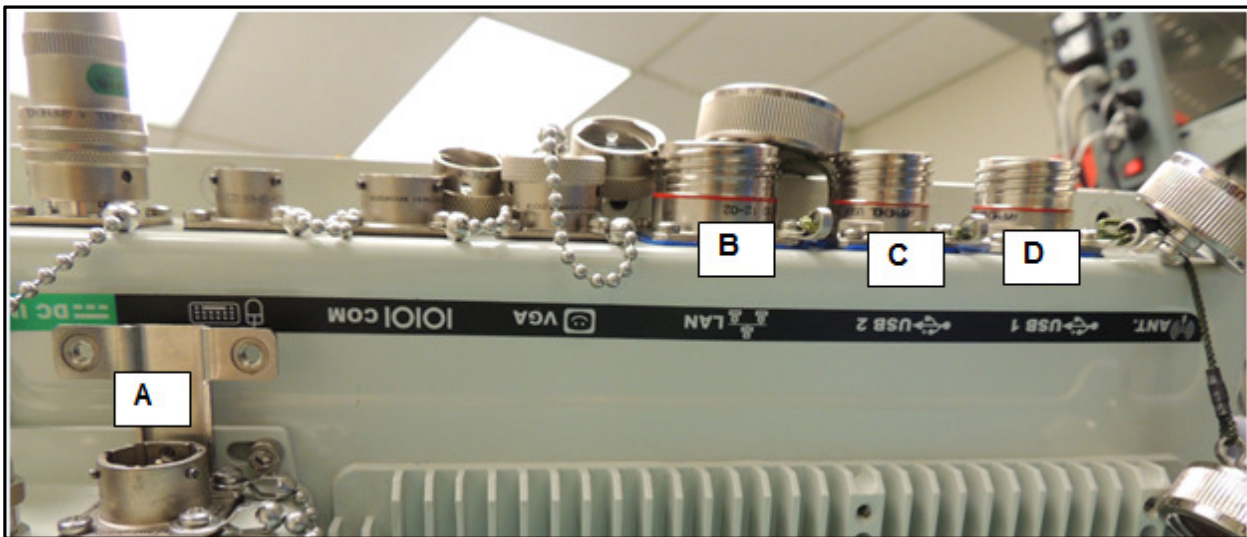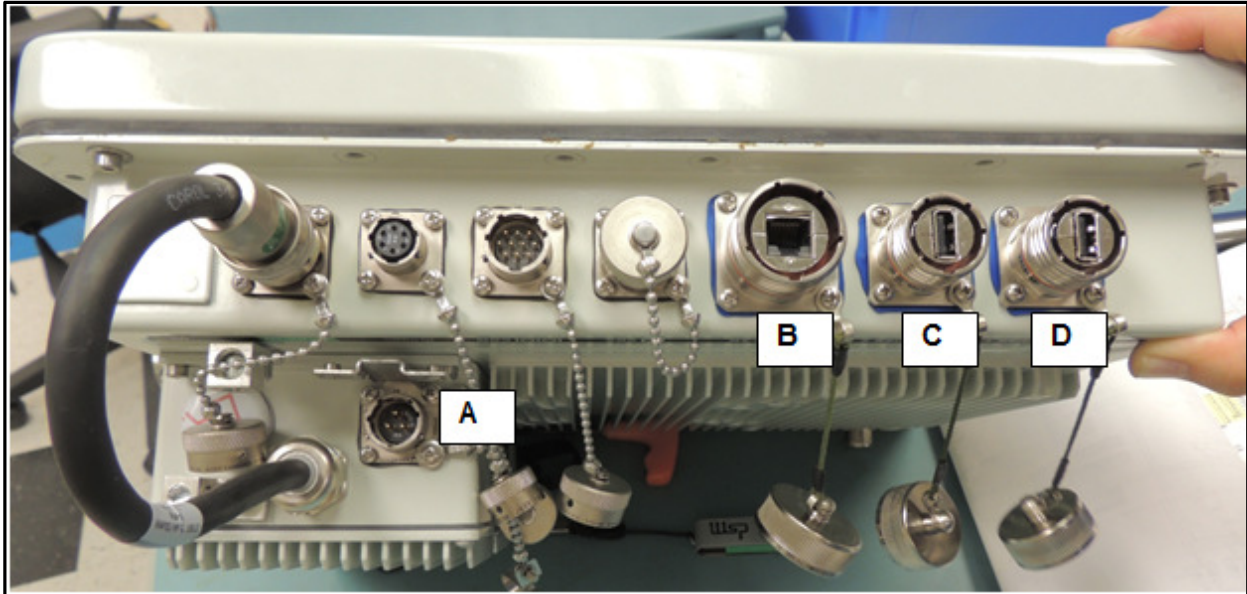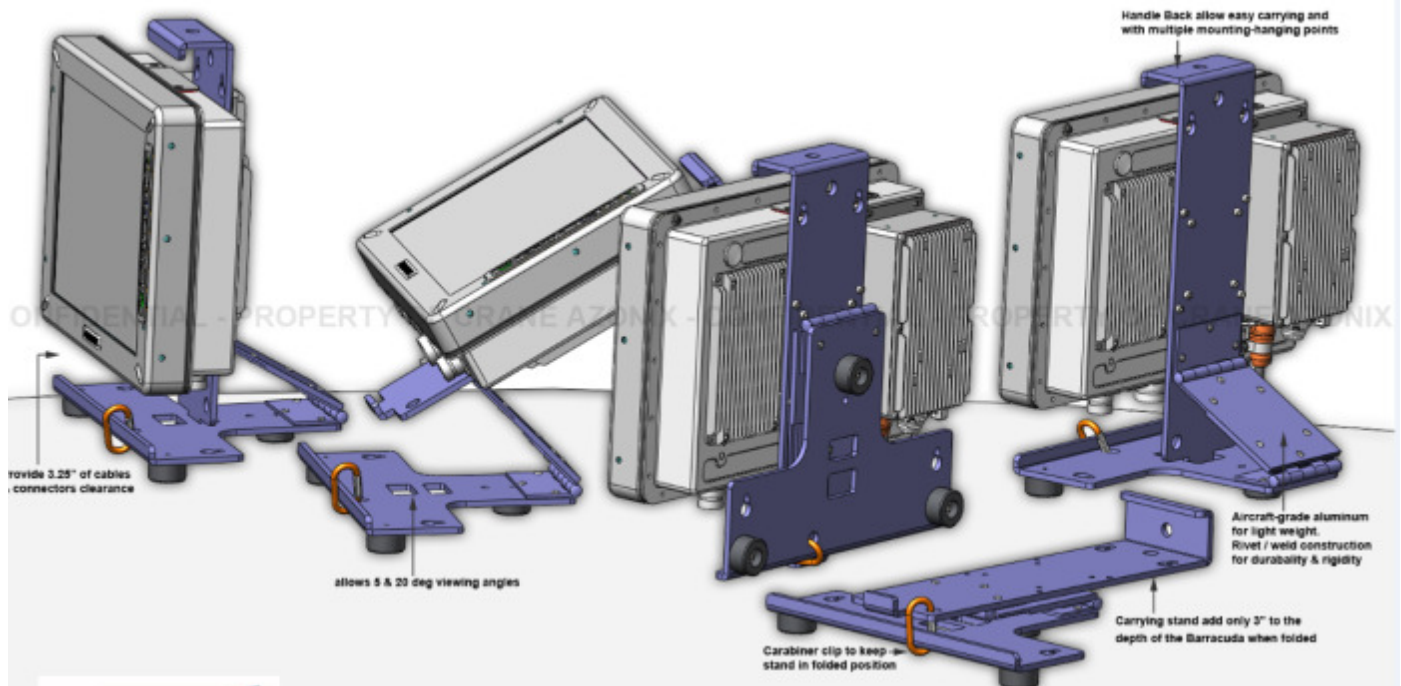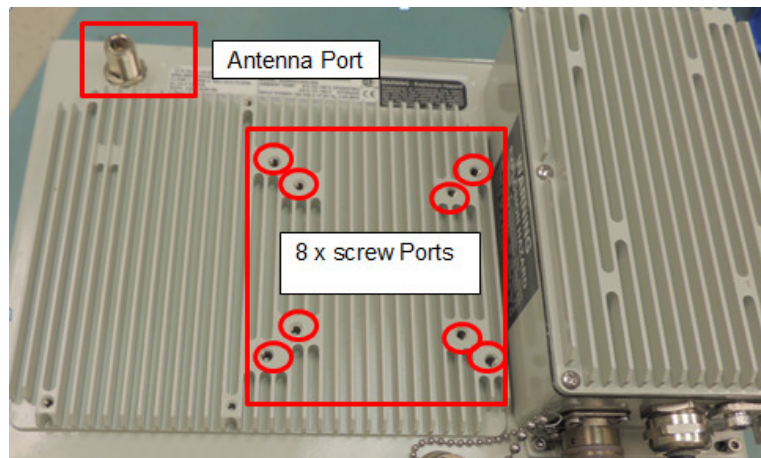

Figure 34 Azonix Terminal

4.4. JOB SETUP

5. Identify the right place for the Azonix terminal. Ensure:

*   Sufficient space is available to provide air circulation necessary for cooling.

*   There is low humidity.

*   Ambient air temperature will not exceed 50 DegC/122 DegF.

*   Ambient air temperature will not be lower than 0 Deg C / 32 Deg F unless using a heater.

*   There is A/C supply nearby and that AC supply cord is properly grounded If the Rig power supply is unstable or has noise, the XTR can be connected to the power supply through the Isolation Transformer 92X-EM0006.

6. Leave all covers in place at all times during operation. The covers protect the user against high voltages inside of the unit and inhibit radio-frequency emissions that may interfere with other devices or equipment. Leaving the covers open or loose will compromise the environmental sealing

7. The Azonix Terminal can come with a bracket or stand such as the figure below, in this case the Stand needs to be placed on a surface.
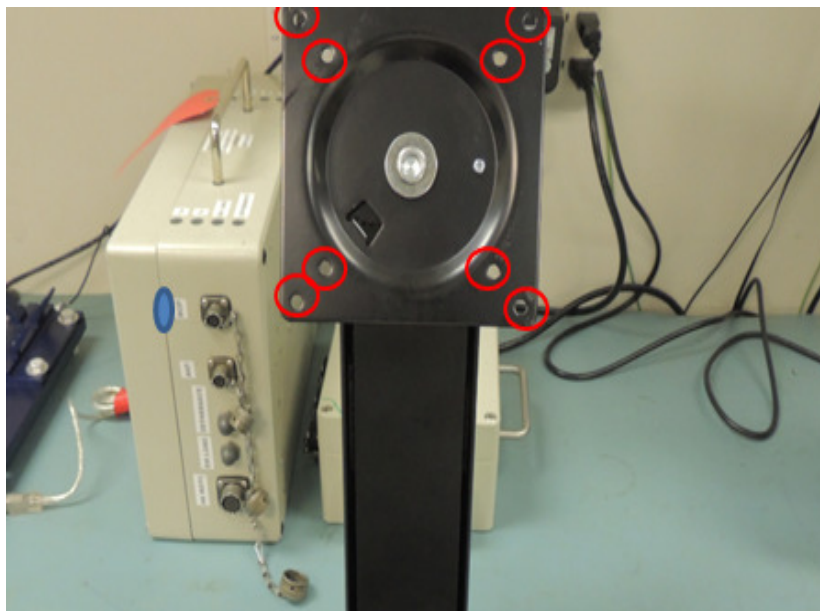

Figure 35 Azonix Terminal with Stand

I. If a bracket is not included the Azonix can be mounted onto a bracket at the well site. The procedure below demonstrates how to attach the Azonix to a VESA100mm/VESA75mm stand. If you do not have a stand, or an option to mount the Azonix at the well site, the terminal may be placed on wooden blocks in a secure place with less vibration.

II. Identify the 8 screw sockets at the back of the terminal.

Figure 36 Screw Ports on the Azonix Terminal

III. Locate the holes in the Mounting bracket. Either the 4 inner or 4 outer Holes are ok.

Figure 37 Mounting Stand for the Azonix Terminal

IV. Find 8 x 10-32 ½" or equivalent screws and a 1/8" Hex head Allen key.

Figure 38 Hex Allen Key 1/8 & size 10 -32 screws

V.   Place the Azonix terminal on a flat surface with the display facing down. Place the rectangular bracket such the screw sockets on the Azonix terminal align with holes in the bracket.

VI.   Install the Screws (4 inner or 4 outer) to fasten the Azonix terminal on to the bracket.
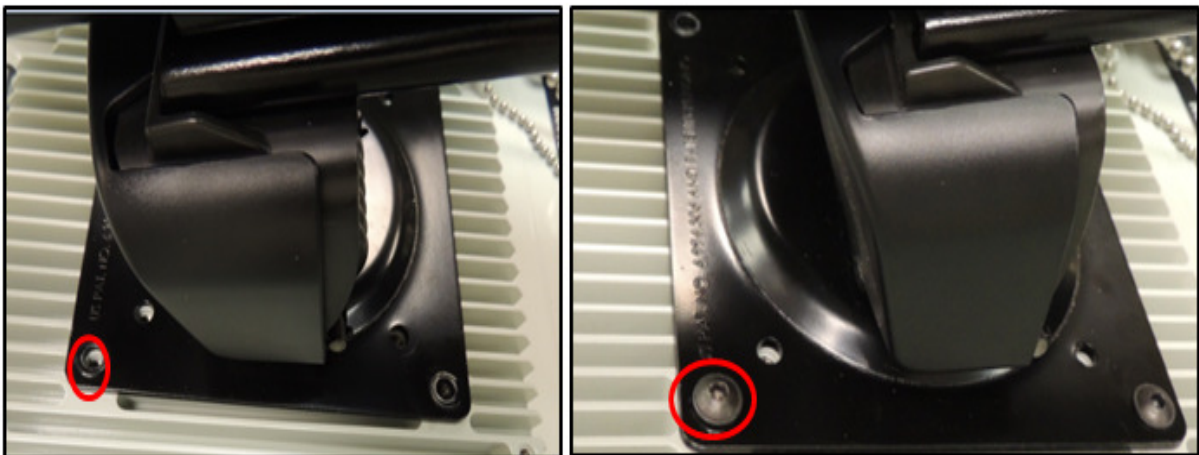
Figure 39 Bracket and Azonix aligned, Screws installed

8.   Secure the Azonix such that the Screen is vertical position.

9.   It is preferable to have less mechanical vibration or direct water spray associated with Rig Operations.

Figure 40 Azonix upright position

10. Find the Antenna and attach it to the N type connector on the back of the Azonix.

Figure 41 Antenna

11. Screw the antenna on to the antenna port on the Azonix terminal till it is secure. You will need to turn the connector clockwise.
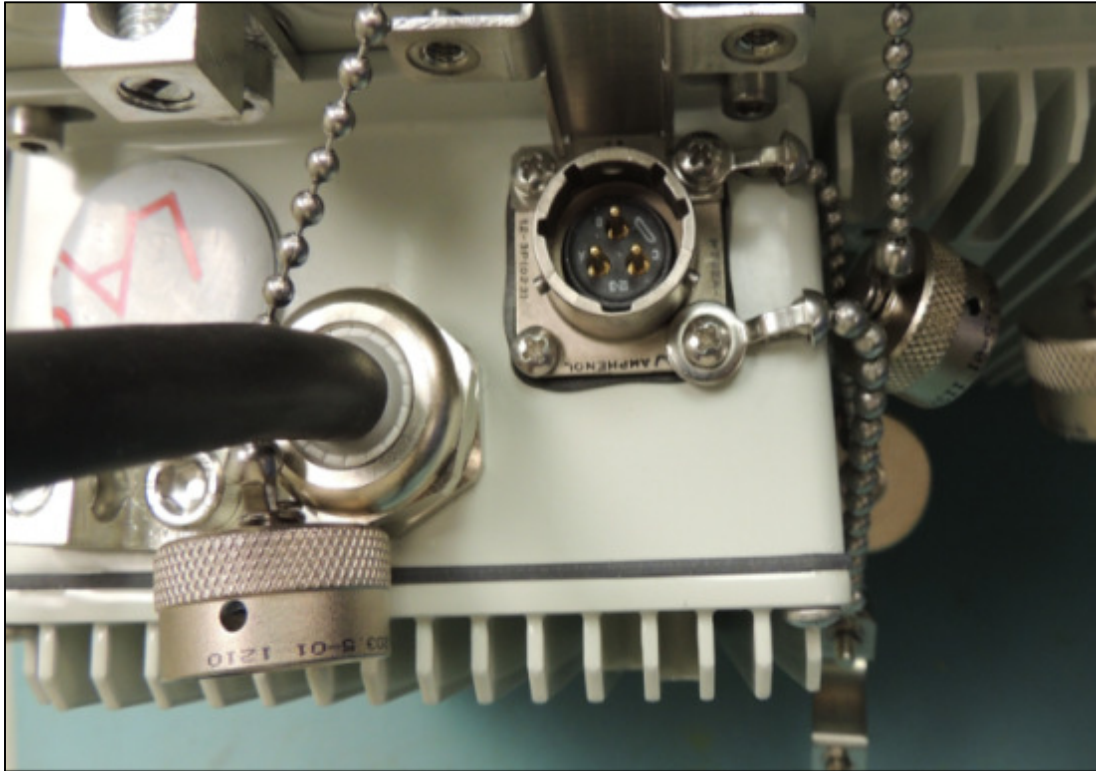

Figure 42 antenna screwed on the antenna Port

12. Find the power cable **(22CABL0037**) with an AC power socket connector on one end and a female connector on the other end.

Figure 43 22CABL0037 Power cable

13. Identify the male power connector port on the bottom of the Azonix terminal.

Figure 44 Power Connector

14. Connect the 3 x pin circular female connector with the 3 x pin male circular power connector on the Azonix. This is made up in the same way as the connectors on the XRT.

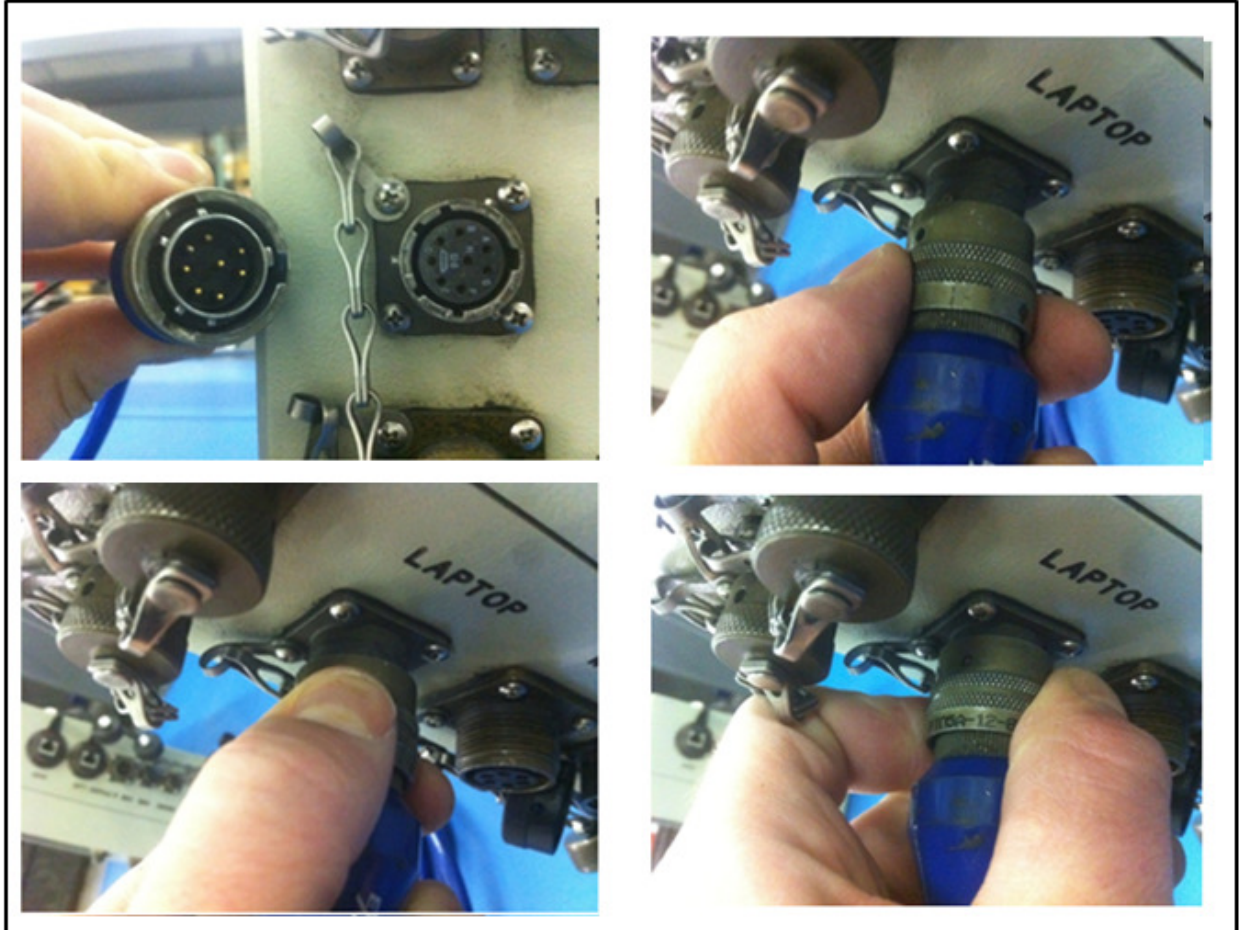**Figure 45 Power cable connected to the Azonix**

15. Connect the Power socket to an AC 110/220V power supply socket.

16. Identify the **22CABL0104** cable with a USB connector on 1 x end and a male connector on the other end. This is used to connect the USB port on the Azonix to the XTR.

17. Connect the USB end of 22CABL0104 on to the USB Port 1 or 2.

Insert the USB connector on to the USB Port and turn the cable connector clockwise with your thumb till the "Red line" on the Azonix USB connector is no longer visible.

Figure 46 USB Connector on 22CABL0104 connected to USB #1

18. Connect the other end (8x pin male circular connector) of the **22CABL0104** with the 8 x pin circular Female LAPTOP connector on the XTR.

Figure 47 22CABL0104 connected to the LAPTOP port on the XTR

Note the updated version of the 22CABL0104 has "RED color connectors"

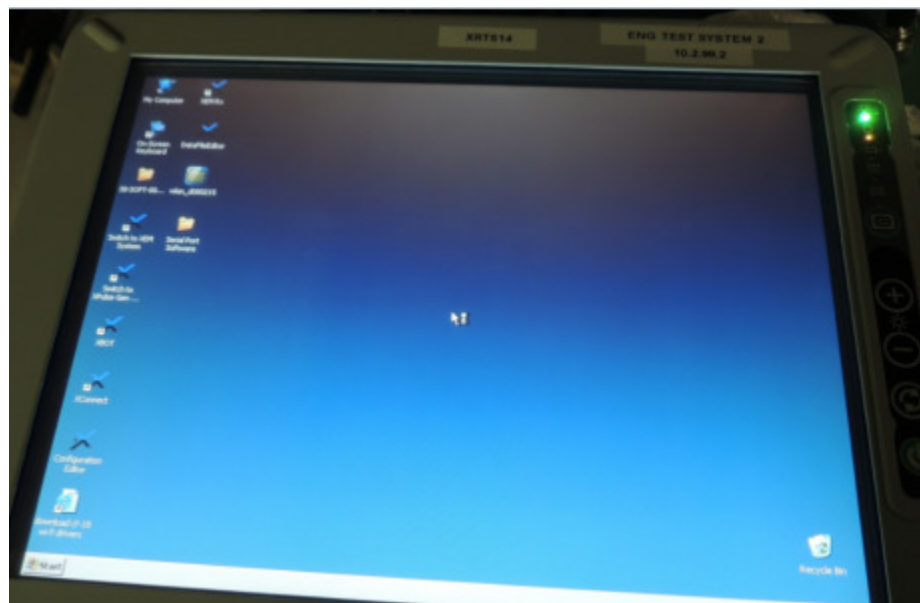19. You have now connected the Azonix terminal to:

• The Power Supply with 22CABL0037

• The XTR with 22CABL00104

20. Turn the Power "ON" the Azonix.

21. Click the Green Power ON Button. The Green Power "LED" and the HDD "Yellow" LED will light up and the "Start Up" sequence will initiate.

Figure 48 Azonix Start Up Sequence

Figure 49 Azonix Start Up in progress

When the Start UP sequence is completed the Same Desktop will appear as the XRT.

Proceed to SECTION to connect the Azonix terminal to the Network. The Instructions for the XRT are also applicable to Azonix.

4.5. SOFTWARE IMAGE

The Azonix Image is normally loaded in the Shop as per procedure. The Image is contained in a Flash drive 92IMAGE002. If needed the procedure for loading the Image are explained in Extreme 07-PROC-0731-A.

4.6. REFERENCE DOCUMENTATION

Instructions on troubleshooting are provided in the19-101973 Rev D Barracuda15 Manual. It is however recommended that you call the Command center if there are any issues with the functionality of the Azonix terminal.

5. REMOTE CONNECTIVITY KIT

5.1. INTRODUCTION

The purpose of the Remote connectivity kit is to provide a wireless interface network from an Ethernet connection Indoor.

The remote connectivity kit is normally transported to the Rig in an orange pelican case.

The pelican case contains two documents

- 07-OPDC-0020-00-A1-satellite-connectivity-procedure
- 07-OPDC-0026-00-A3-satalite-connect-kit-inventory

Figure 50 Remote Connectivity Kit

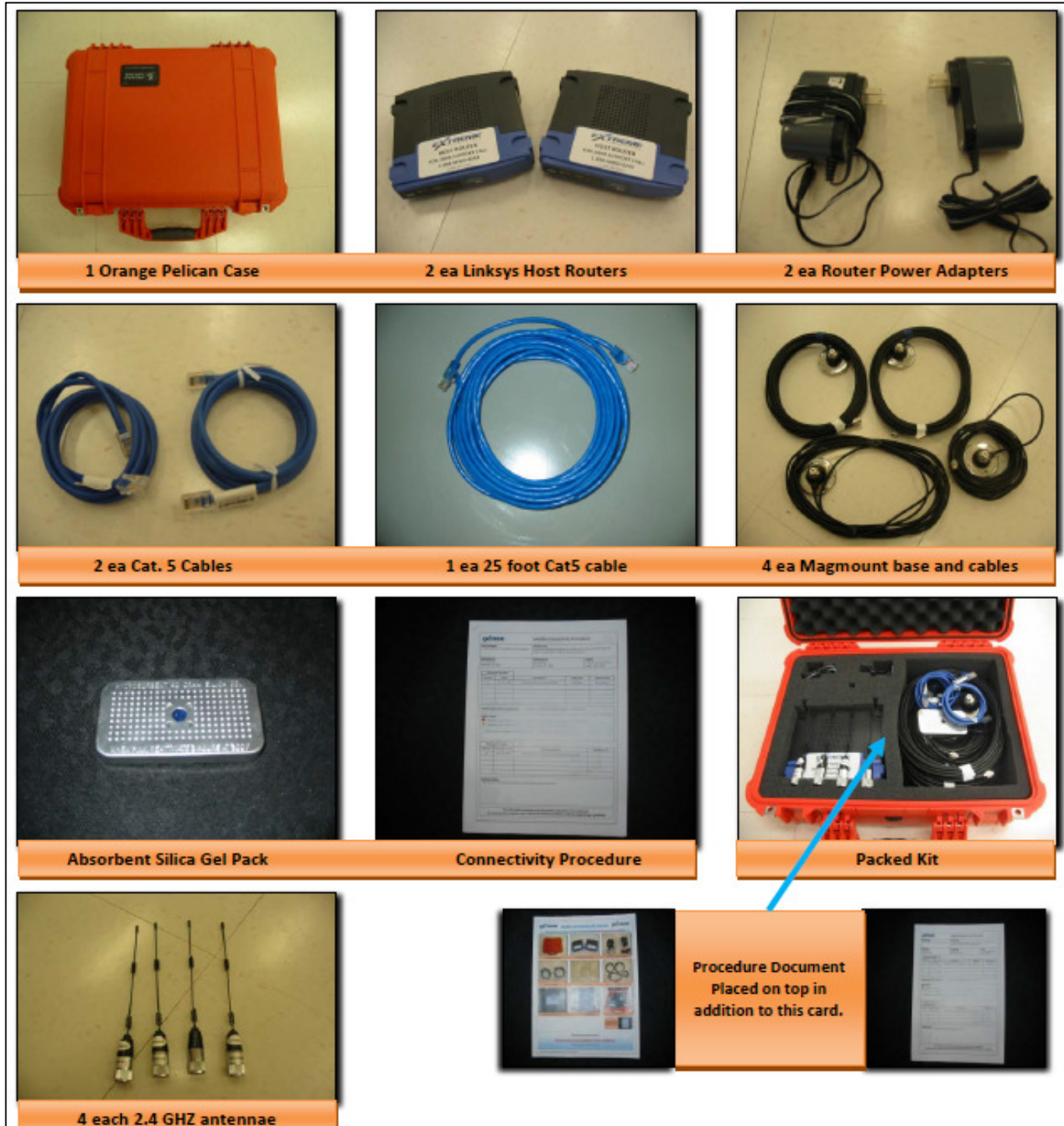## 5.2. REMOTE CONNECTIVITY KIT

1. Identify the contents in the Kit:

1 Orange Pelican Case	2 ea Linksys Host Routers	2 ea Router Power Adapters
2 ea Cat. 5 Cables	1 ea 25 foot Cat5 cable	4 ea Magmount base and cables
Absorbent Silica Gel Pack	Connectivity Procedure	Packed Kit
4 each 2.4 GHZ antennae	Procedure Document Placed on top in addition to this card.	

Figure 51 Remote Connectivity kit contents

The description, quantity for each Item is given below:

ITEM	DESCRIPTION PART NUMBER　　　REVISION	QTY
	Orange 1520 Pelican Case c/w foam insert **20-BOXP-0009-A**	1 each
	Linksys Routers c/w power adapters (model # WRT54GL) **22-NETW-0002-A**	2 each
	6 foot CAT 5 cables **12-CABL-0001-A**	2 each
	25 foot Cat 5 Cable **12-CABL-0002-A**	1 each
	Magmount Base c/w cable **92-ANTA-0006-00A1**	4 each
	Magmount Antenna 802 11B/G 2.4GHZ 7DBI **92-ANTA-0005-00A**	4 each
	Re-Usable Silica Pack **15-PACK-0001-A**	1 each
	Extended Connectivity Procedure **07-OPDC-0020-00-A1-satellite-connectivity-proc**	1 each
	Extended Connectivity Kit Inventory card **07-OPDC-0026-00-A3-extend-connect-kit-inventory**	1 each

Figure 52 RCK Inventory

2. Layout the kit items on a flat surface:

   2 x routers are included in the kit however only 1 x router is used.

Figure 53 Azonix Kit Contents displayed

5.3. ROUTER SETUP

3. Place 1 x Linksys host router in the location where there is a good Ethernet network and AC power.
4. Connect the blue Ethernet connector from the 25 foot CAT 5 cable on to the Linksys router.
5. The other end of the cable should be connected to a reliable internet connection, on a Rig this is typically from a satellite located in the Tool Pusher shack or the Company Man shack.
6. Add the power adaptor and connect the DC cable from the adaptor to the router.

Figure 54 Linksys Router with Ethernet and DC Power Supply Connected

7. Find 2 x magnetic base and cables with the 2.4 GHZ antenna.

Figure 55 Magnetic base and cables with Antenna

8. Make up the 2 x 2.4GHz antenna with the base.
9. Connect the 2 magnetic base and cables with the 2.4 GHZ antennae to the Linksys host router.
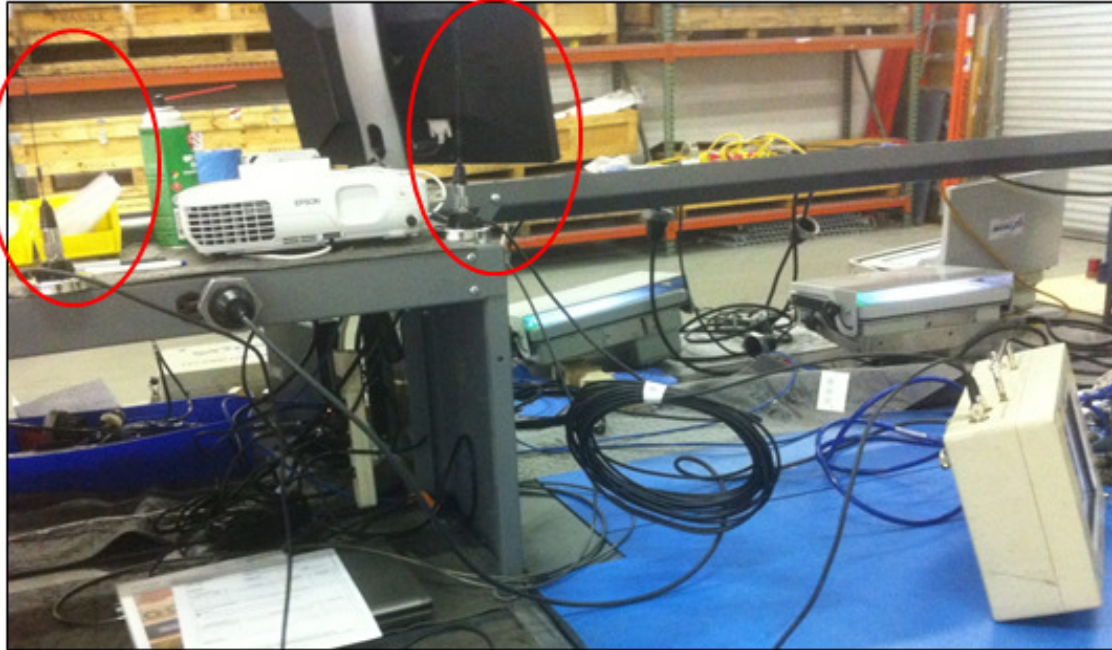
Figure 56 Antenna connected to Router

10. Ensure the 2x Antennas are standing straight up and ideally on top (outside) of the structure containing the router (i.e. the Company Man shack).


Figure 57 2 x Antenna standing straight outside the structure with the router

11. Connect the 2 Magnetic base and cables with the 2.4 GHZ antenna to the XRT.

Figure 58 2 x Antenna Connected to the XRT

12. The 2 x Antennas connected to the XRT and the 2 Antennas connected to the Linksys Host router should preferably have a line of sight to one another. It is recommended to remove obstacles between then 4 x Antennas. Connectivity should be established as long as the distance between is 140m (460ft).
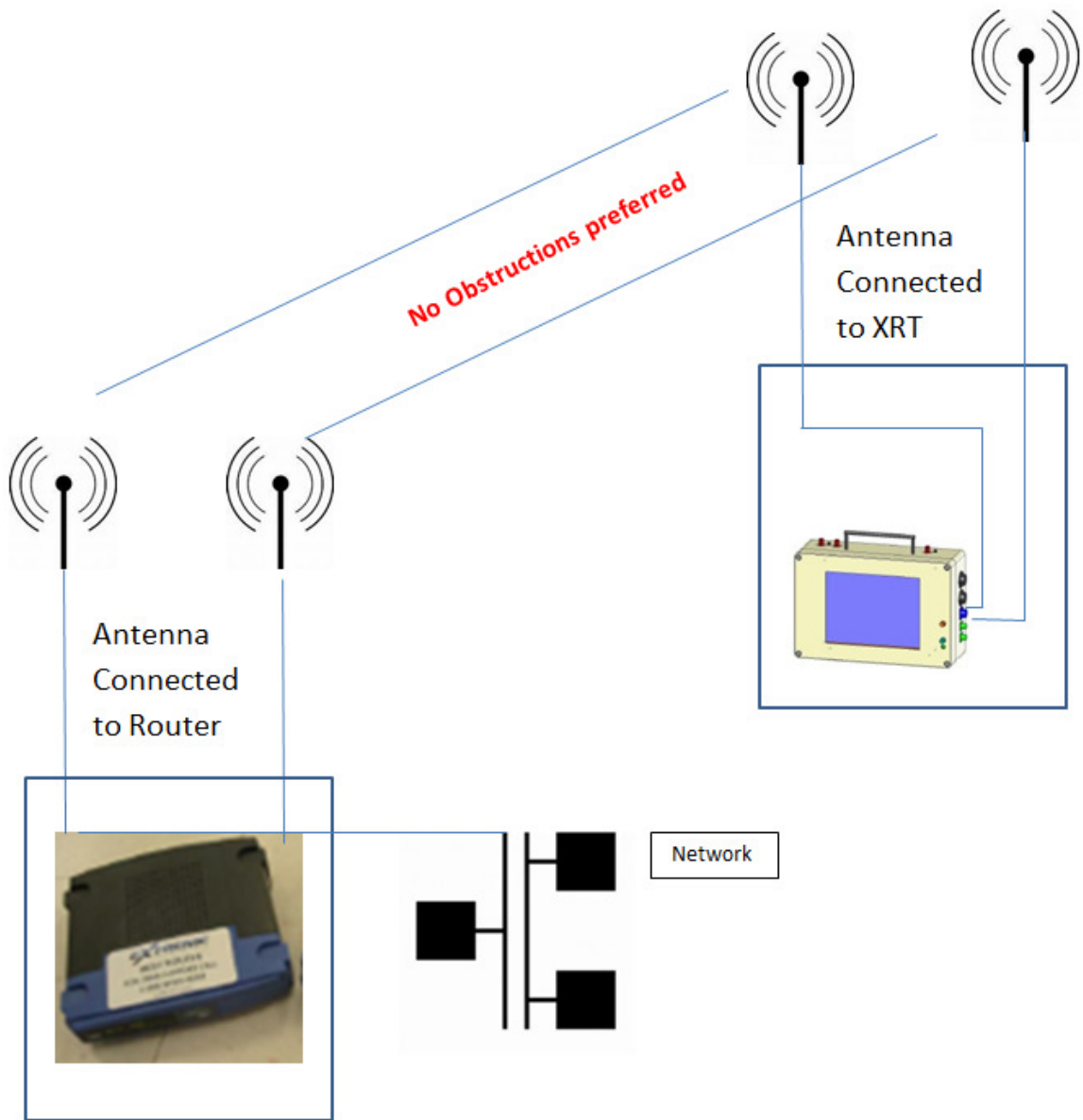
Figure 59 Communication between the Antennas connected to the XRT and Antennas connected to the Router

13. Once the remote connectivity kit setup is complete.

14. The XRT will automatically connect to the Extreme Net. A message will pop up and the Network logo will also appear on the desktop.

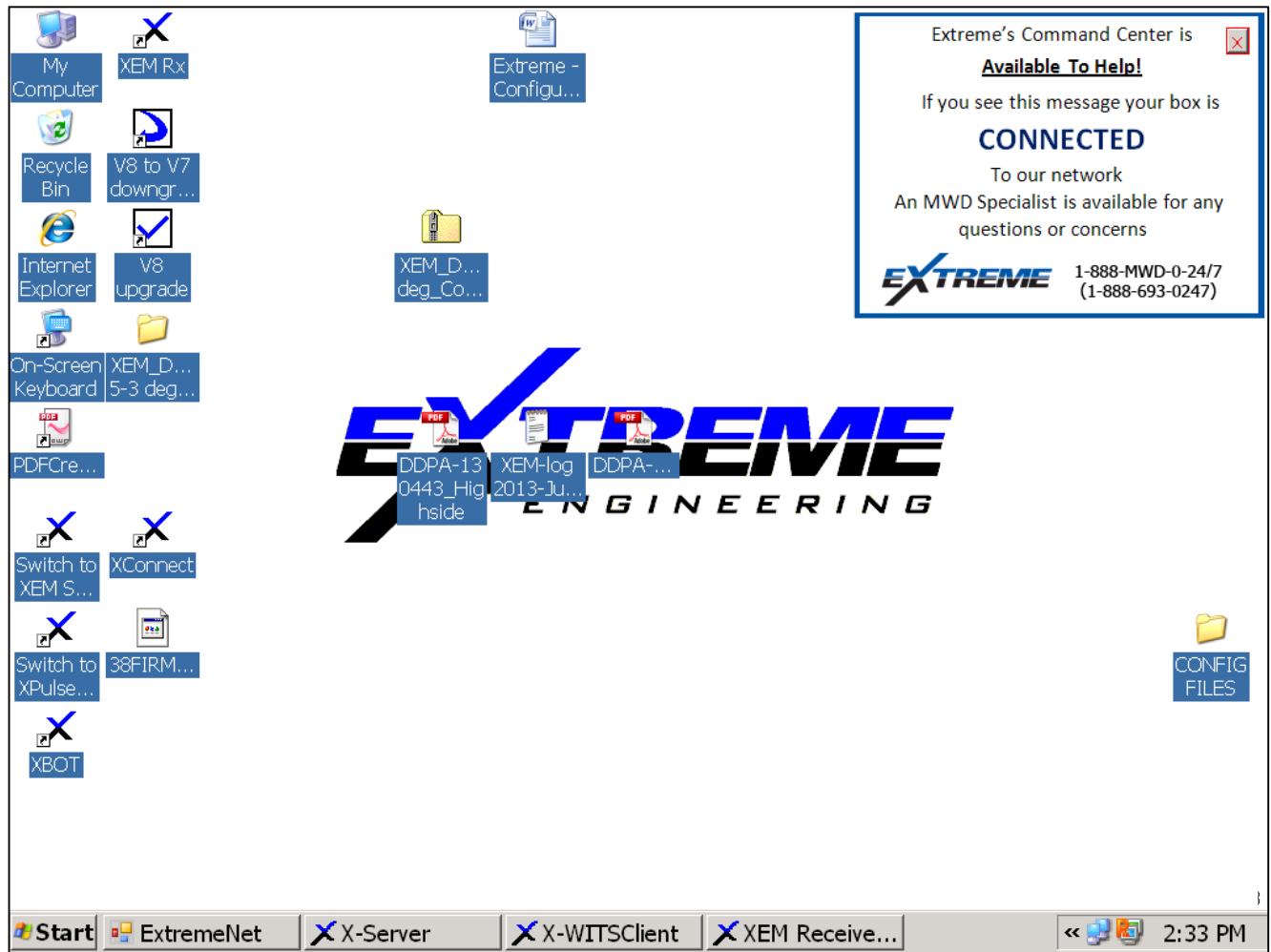15. The XRT is now connected to the Extreme's Command center. The command center can see the XRT Box.

Figure 60 XRT with Network Connected

16. If the the software attempt to connect via the air card which is not required.

   Click " Cancel".

Figure 61 Error dialing to Air service provider

At the end of this section you should have the following:

The XRT or Azonix is connected to the XTR.

The XRT or Azonix is connected to the Network through the remote Connectivity Kit.

6. WITS COMMUNICATION SETUP

Data is transferred from the XRT to PASON, DIGIDRILL, RX5 Pathfinder, and Maxwell SLB D&M through WITS. There is a unique WITS ID for each type of Data.

6.1. WITS ID

 The WITS Code for the data points that can be transmitted from the tools are listed below.

Data Name	Units	WITS	Data Name	Units	WITS	Data Name	Units	WITS
Flow Status		8912	Differential Pr	psi	8818	Batt Current	A	8614
Downlink Status	#	8812	Annular Temp	Deg C	8816	Batt Current	A	8621
Gamma CPS	CPS	824	Bore Temp	Deg C	8817	Batt Current	A	8628
Cs AX	g	9025	Flow	ON/OFF	8912	Shk Lat Tot	count	8918
Cs MX	Gauss	9026	Downlink Status	#	8812	Shk Lat Max	g	8919
Cs Inclination	Deg	9028	PD1 Azimuth	Deg	8719	Shk Axl Tot	count	8920
Cs Azimuth	Deg	9027	PD1 GTotal	g	8720	Shk Axl Max	g	8921
Inclination	Deg	713	PD1 RTSTAT		8723	StickSlip Level		8922
Azimuth	Deg	715	PD1 TFDS Dmd Tf	Deg	8725	Shk Lat Level		8914
Gravity TF	Deg	8917	PD1 TF_HI	Deg	8727	RPM	RPM	8932
Magnetic TF	Deg	8916	PD0 LTRPM	RPM	8731	Rotation Flag	flag	8923
Auto TF-F		9015	PD1 LTRPM	RPM	8731	Reverse		8924
Auto TF	Deg	8913	PD1 SHKRSK ShRs		8729	My Dyn Range	ATD level	8925
GTotal	g	9017	PD1 STKSLP		8730	Mz Dyn Range	ATD level	8926
MTotal	Gauss	9016	PD1 Gamma Ave	CPS	8713	Shk Lat Tot %	%	8928
AX	g	9022	PD1 Gamma Up	CPS	8714	Shk Axl Tot %	%	8929
AY	g	9023	PD1 Gamma Left	CPS	8715	Cs Inc Srf	Deg	9029
AZ	g	9024	PD1 Gamma Down	CPS	8716	PD0 Inc.	Deg	8718
MX	Gauss	9019	PD1 Gamma Right	CPS	8717	PD0 Azimuth	Deg	8719
MY	Gauss	9020	Temperature	Deg C	8608	PD0 GTotal	g	8720
MZ	Gauss	9021	Amp Hours	AH	8609	PD0 RTSTAT		8723
Temperature	Deg C	9018	Amp Hrs Remain	AH	8611	PD0 STEER		8724
MAG Dip Angle	Deg	9014	Batt Voltage	V	8610	PD0 TFDS Dmd Tf	Deg	8725
Config File#	#	8910	Bus Voltage	V	8612	PD0 PRDS Dmd Pr	% Steer	8726
Temperature	Deg C	8908	Temperature	Deg C	8615	PD0 TF_HI	Deg	8727
RTC	Code	8911	Amp Hours	AH	8616	PD0 SHKRSK ShRs		8729
Xeos time	ms	8909	Amp Hrs Remain	AH	8618	PD0 STKSLP		8730
Batt Voltage	Volt	8813	Batt Voltage	V	8617	PD0 Gamma Ave	CPS	8713
Batt Current	Amp	8814	Bus Voltage	V	8619	PD0 Gamma Left	CPS	8715
Amp Hrs Remain	AH	8815	Temperature	Deg C	8622	PD0 Gamma Down	CPS	8716
Meas. Load Cur.	A	8819	Amp Hours	AH	8623	PD0 Gamma Right	CPS	8717
Scale Current	%	8820	Amp Hrs Remain	AH	8625	PD0 TargetInc	Deg	8722
Annular Pressur	psi	922	Batt Voltage	V	8624			
Bore Pressure	psi	914	Bus Voltage	V	8626			

Table 1 WITS IDs for data points

Only the data points that are included in the configuration file in the Tool will be transmitted. You will have to ensure that the 3rd party uses the same codes for the data that is being transferred. The WITs data is transmitted from the XRT at Baud Rate of 9600 however the update is limited by how fast the data is received from the Tool down hole.

The WITS IDs are transferred by the **X-WITS Clients** program through the **X-Server** application. Both programs run automatically on the Desk Top Screen as shown below. As long as the hard ware is set up correctly and both the X-WITS clients and X –Server application are running WITS information should update automatically.
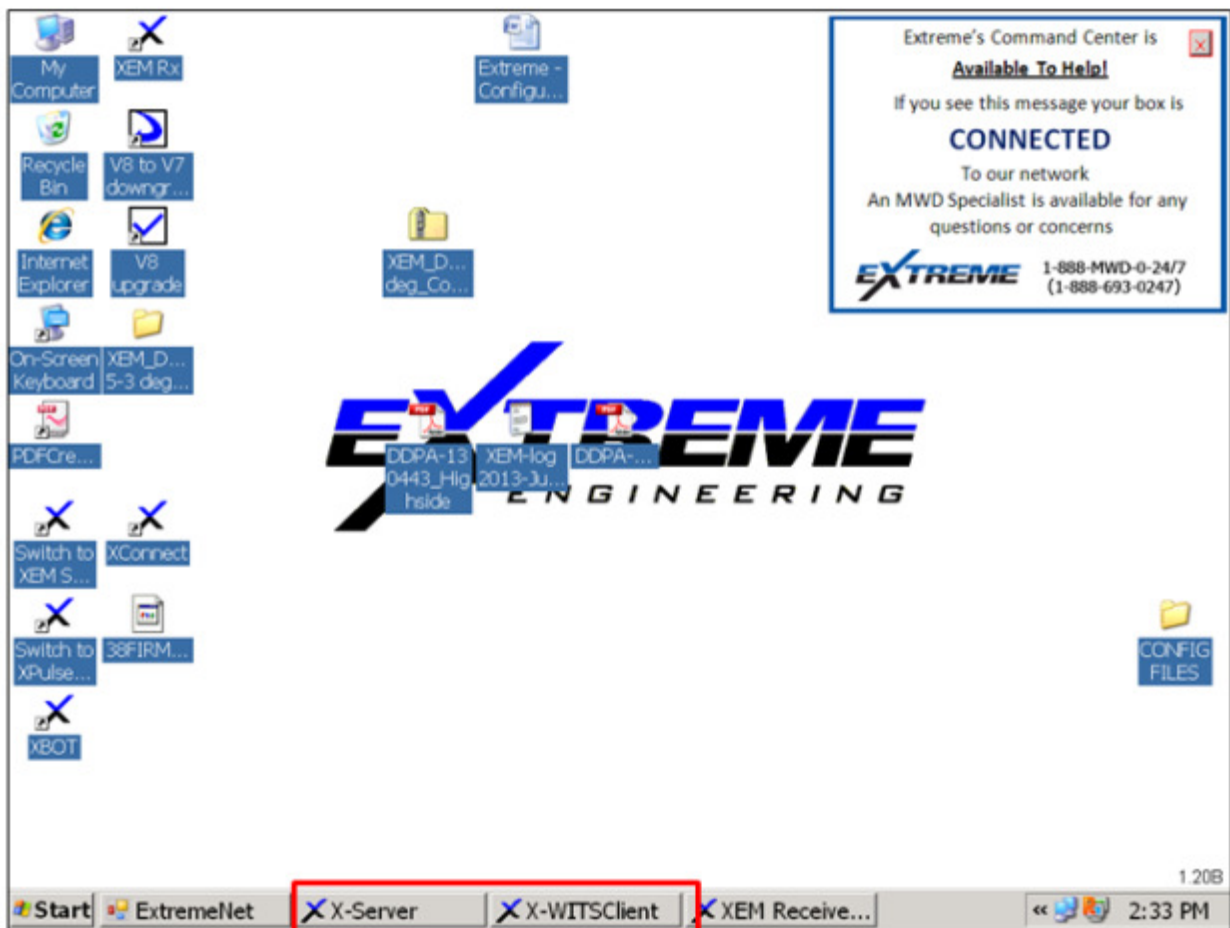
Figure 62 X Server and X WITS Client program running in the background

6.2. WITS HARDWARE SETUP

This section provides information on how to setup the hardware for WITS.

1. Find the **22CABL0054**. This has a DB-9 Female Connector on 1 end and a male connector on the other end.

Figure 63 22CAL0054

2. Connect the 6x pin circular male cable connector to the 6 x pin female WITS connector on the XTR.

Figure 64 6 x pin Male Connector 22CABL0054

Figure 65 22CABL0054 connected to WITS (XTR)

The WITS connector is connected slightly different from other connectors. The slot on the WITS Connector is aligned to the groove on the cable connector and the connector is pushed all the way. The connector is turned clockwise all the way to connect.

3. Find the **DB9 RS232 Series Null Modem** that has a DB-9 male to male connection on both sides.

Figure 66 Null Modem Adaptor

The XTR sends data using the RS232 serial interface through the 22CABL0054.

4. If the 3rd party computer is located close to the XTR and accepts **data through the RS232 serial interface** (As is the case with the Pathfinder RX5 Surface system placed next to the XTR). The connection will be as per the figure below.
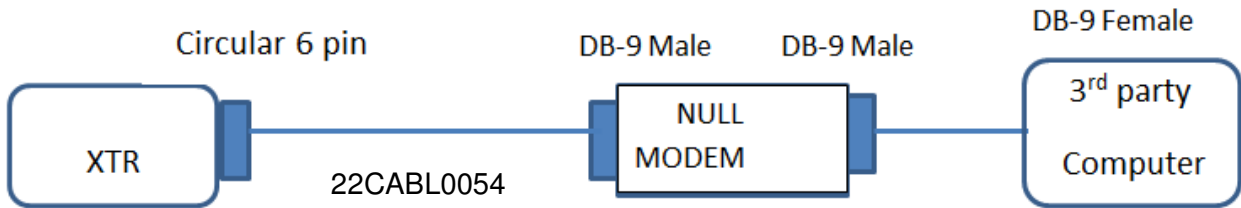
Figure 67   **WITS Using RS 232 Interface**

5. Connect the 22CABL0054 female DB-9 connector to the Null Modem.
6. Connect the other side of the Null Modem to a female DB-9 connector on the 3rd Party computer. This will complete the Hardware setup and allow data to be send from the XTR to the third party computer.
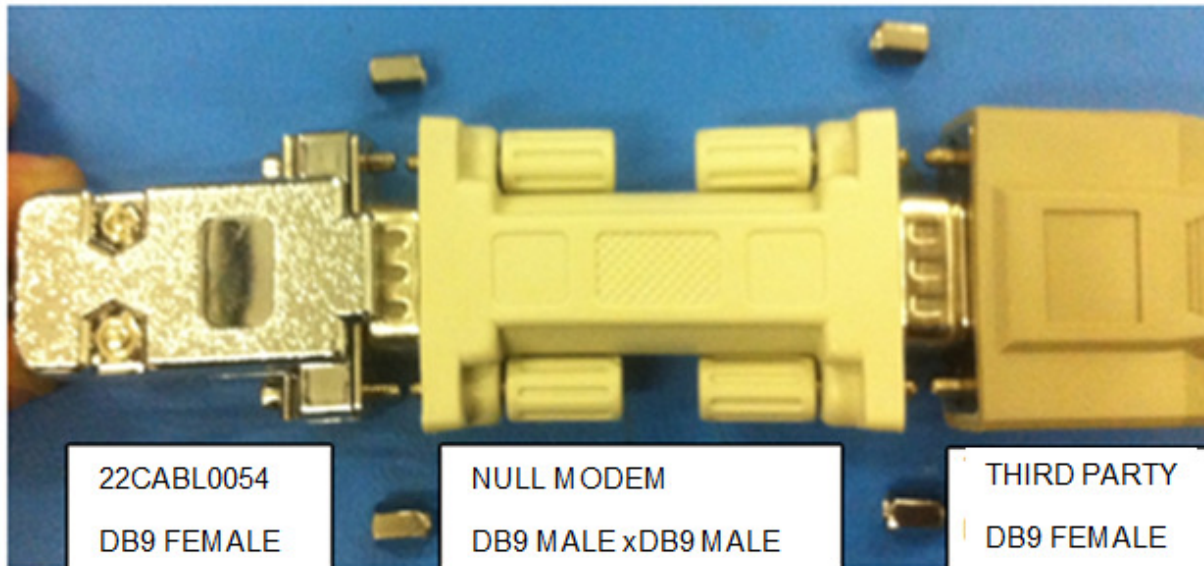
Figure 68   RS232 WITS connection 22CABL0054

7. the 3rd party computer is located at a distance and needs data with to be transferred with RS422 interface you will need to connect the Null Modem in the previous step to a COMM22 (92 WITS0001 Box) and a 92WITS0001 cable from the COM22 Box to the 3rd party computer system.
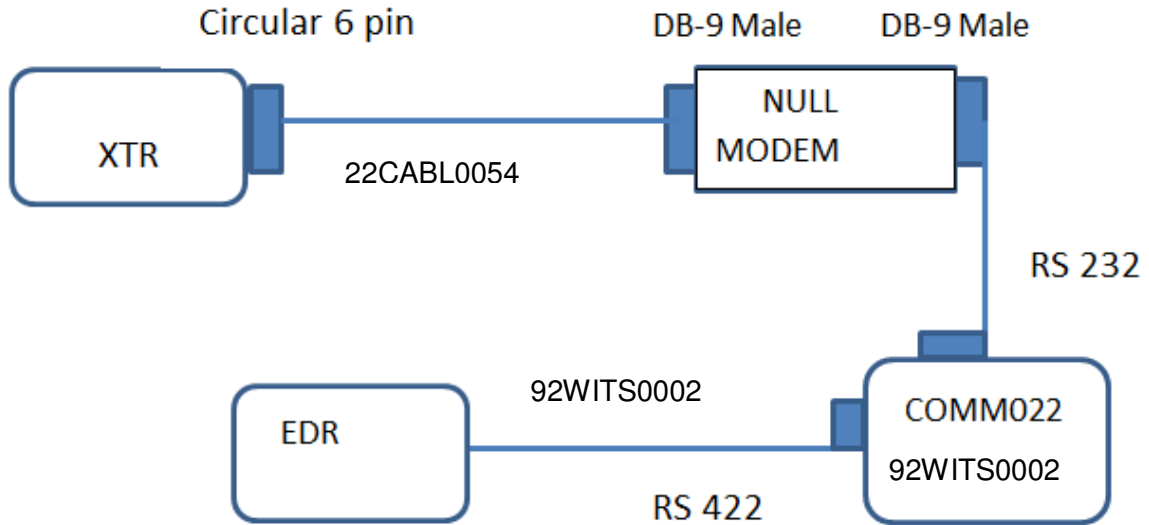
Figure 69 WITS Communication through RS 422

8. Find the **(COMM022) 92 WITS0002** Box with cable interface and Power adaptor.
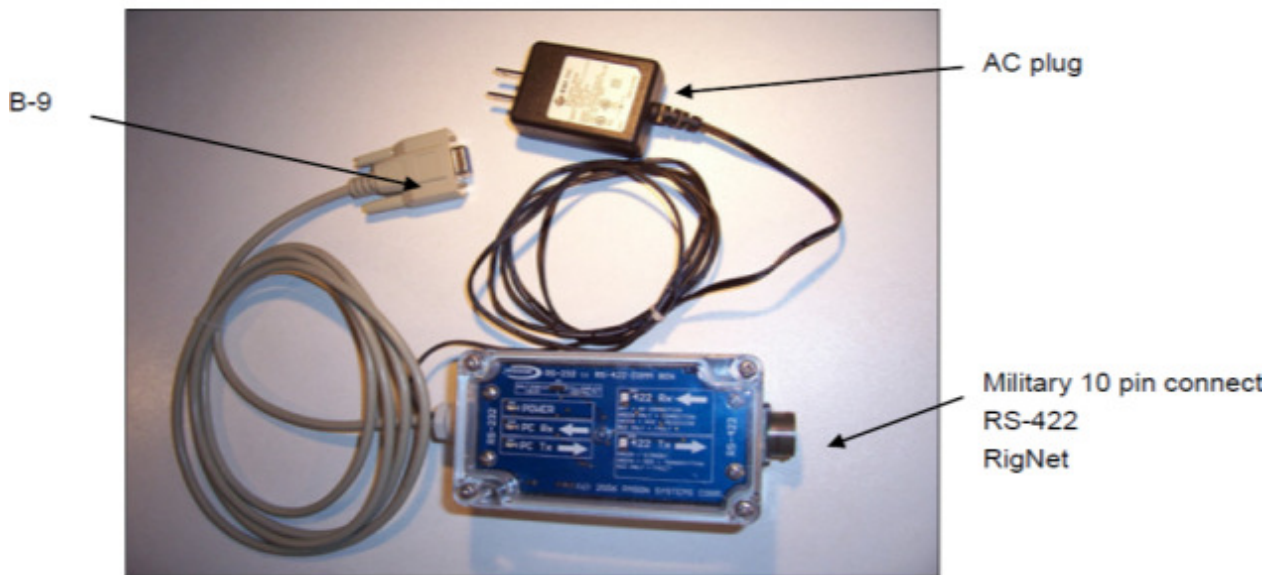
Figure 70 92 WITS0002 Box

9. Connect 22CABL0054 DB-9 Female connector to the DB-9 male connector on the Null Modem.

10. Connect the 92WITS0002 box to the other DB-9Male connector on the Null Modem.

22CABL0054	NULL MODEM	FEMALE DB-9
DB9 FEMALE	DB9 MALE xDB9 MALE	92 WITS 002
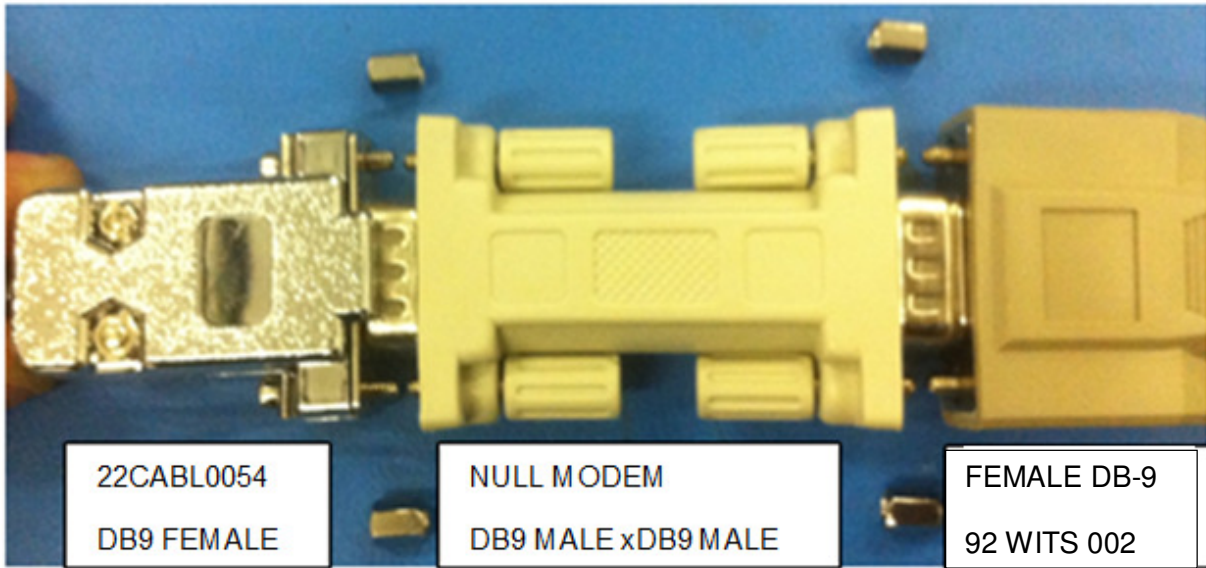
Figure 71   22CABL0054-NULL MODEM 92WITS0002

11. Connect the 92WITS0002 to power.

Figure 72 92WITS0002 with Power

12. Find the **92WITS0001** cable.

13. Connect the 10 x Pin male circular connector on the 92WITS0001 cable to the 10x Pin circular female connector on the 92WITS0002 box.

Figure 73 92WITS0001 cable connected to 92WITS0002 Box

14. The other End of the 92WITS0001 cable can be connected to the EDR or Other 3rd party system.

15. Once the connection is complete you should be able to transfer data through WITS.

6.3. WITS SOFTWARE SETUP

16. Confirm the XRT is on the Network. The Message "Extreme's Command center is Available to Help" should appear on the right Corner of the Desk top.

17. Confirm the X-WITS Client and the X-Server application are Open

The X-Server and the X-WITS Client Tabs should appear at the Bottom of the screen.
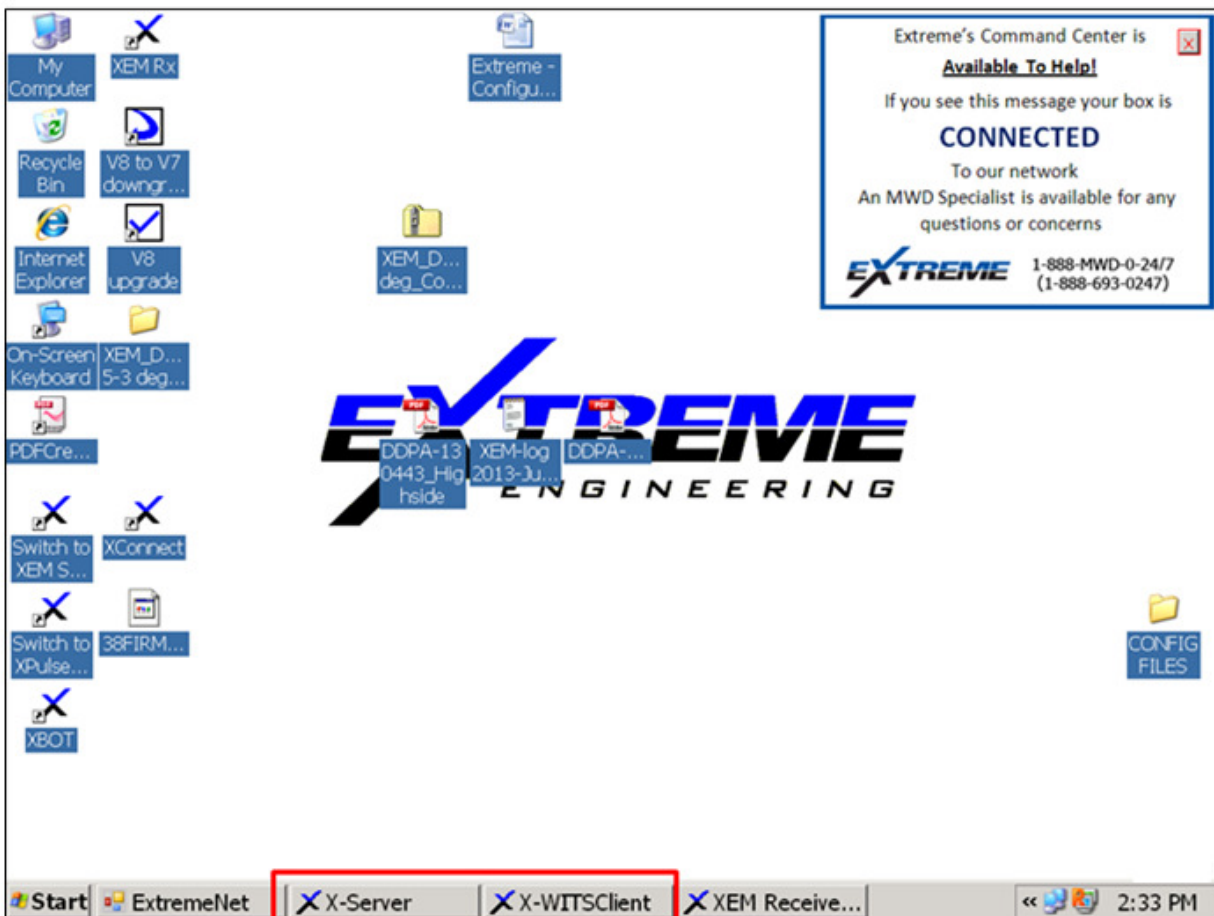
Figure 74 XRT Desktop X Server and X WITS X-Client application

18. If the X-Server and the X-WITS application do not appear, they can be turned ON from the Start
Menu. They are are located in START>Extreme Engineering> Common.
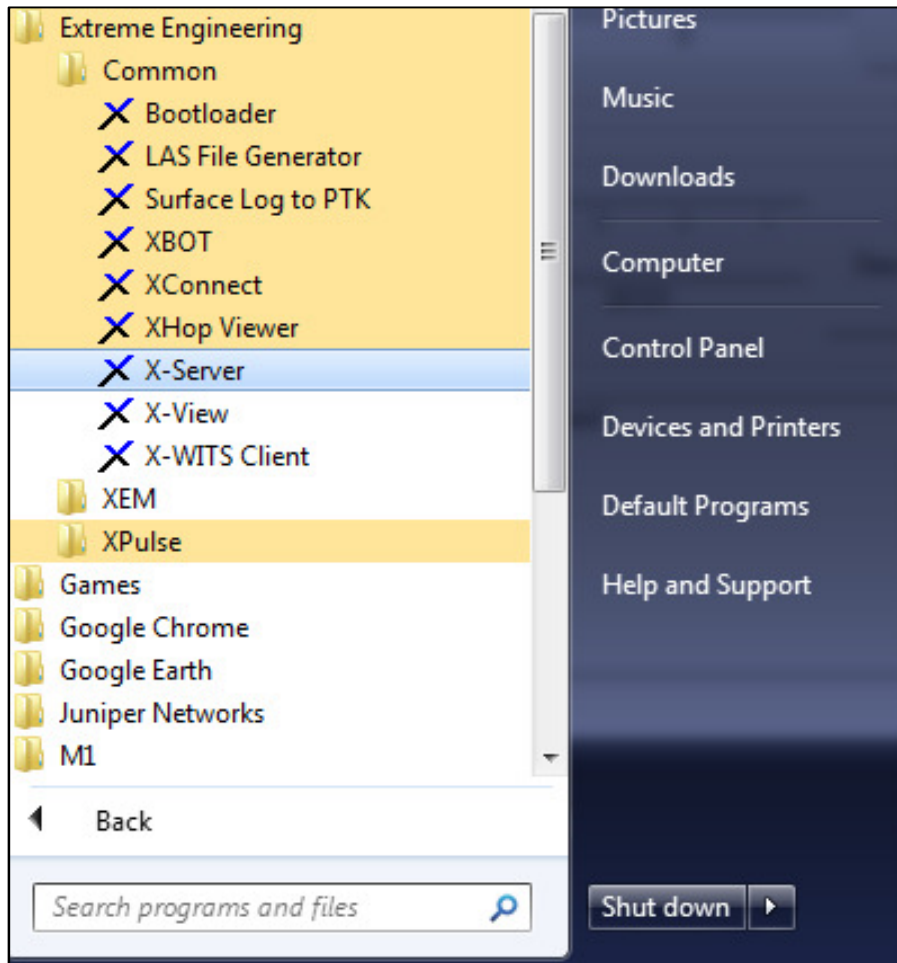
Figure 75 X WITS Client and X-Server Client application

19. START the X-Server Application from either the START Menu or from the Desktop

On the Window confirm the incoming data at the bottom of the stream. The Information in the Red Box in the figure below indicates incoming and outgoing data transfer:

- Incoming Bytes 166917 KB
- Outgoing Bytes 495KB

The information in the Blue Box shows:

- Connected Date: June 26 2013 03:50:39
- Client: 127.0.01:1034 WITS (XEM RX)
- IP Address: 127.0.0.1
- If the "Time" is the same as the time on the computer, it indicates the X-WITS application is transmitting information through the X-Server application.
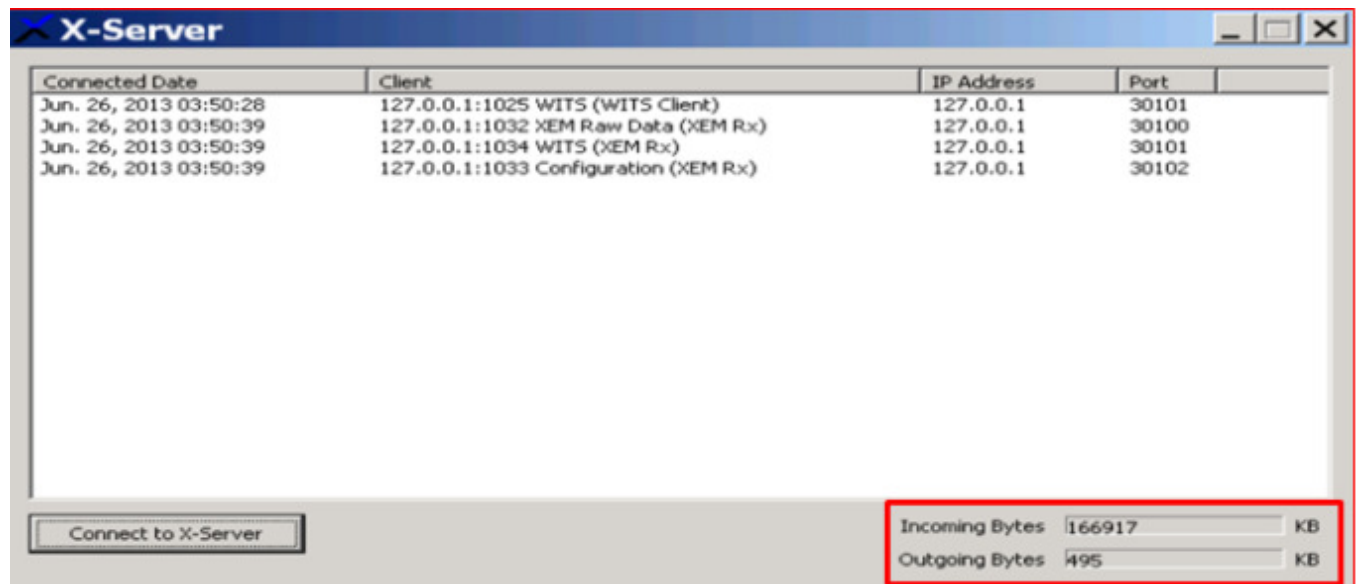
Figure 76 X-Server application

If the data should appear as above updating, if not connected further investigation is required:

- Checking the hardware to see if all the connections are fine.
- Checking the "X-WITS" Client application.

20. START the X-WITS Client Application from either the START Menu or from the Desktop. If the hardware is correctly setup you should see:

- A "green" for the WITS communication.
- A "green" for the X-Server communication.
- The Port for communication is the COMM-1 or WITS Port.
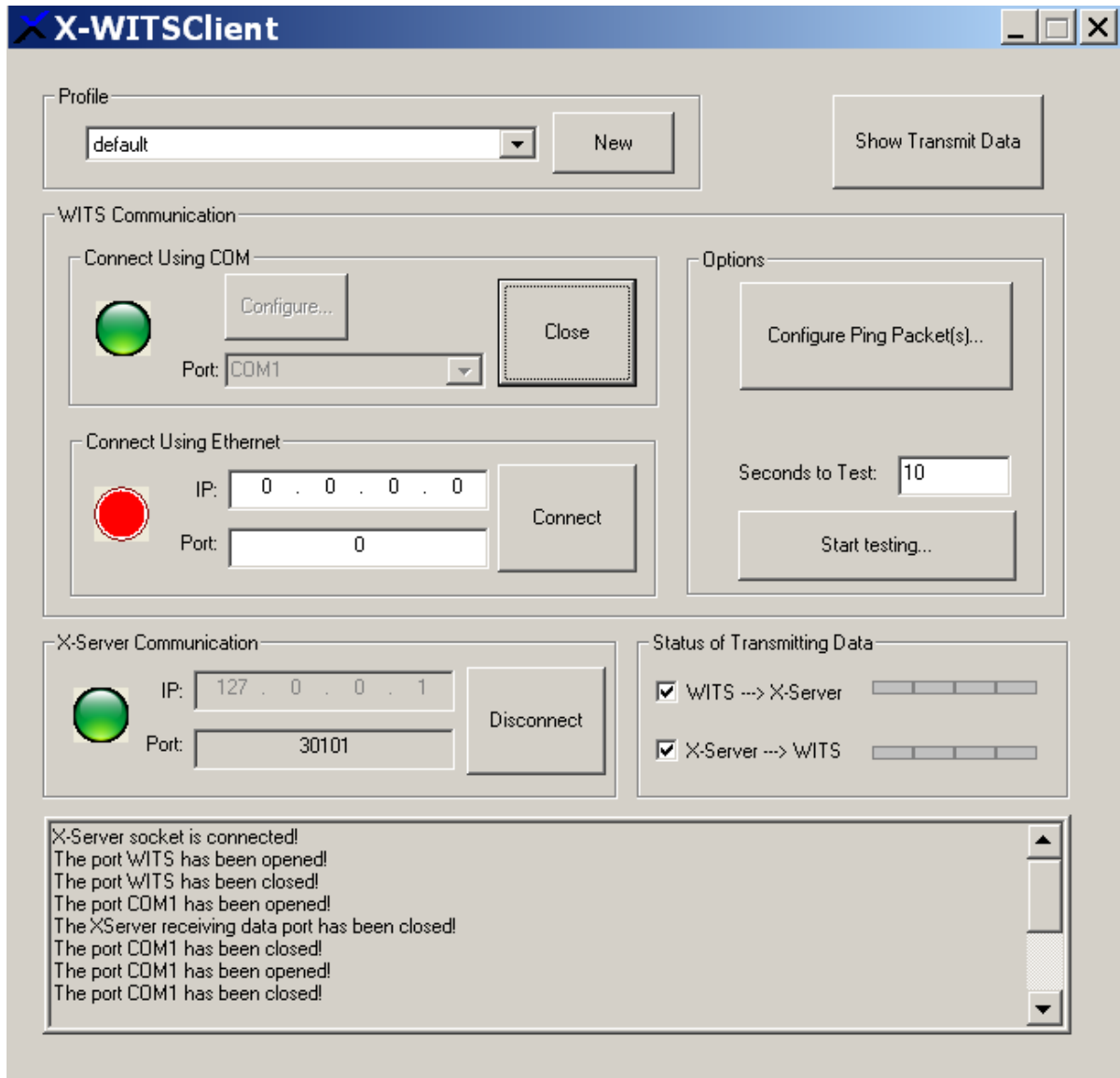
Figure 77 X- WITS Clients

21. The WITS Data on the XEM Receiver Capture Tab will show the WITS data updating from the EDR has the information. This shows that the XEM Receiver is getting data from WITS.
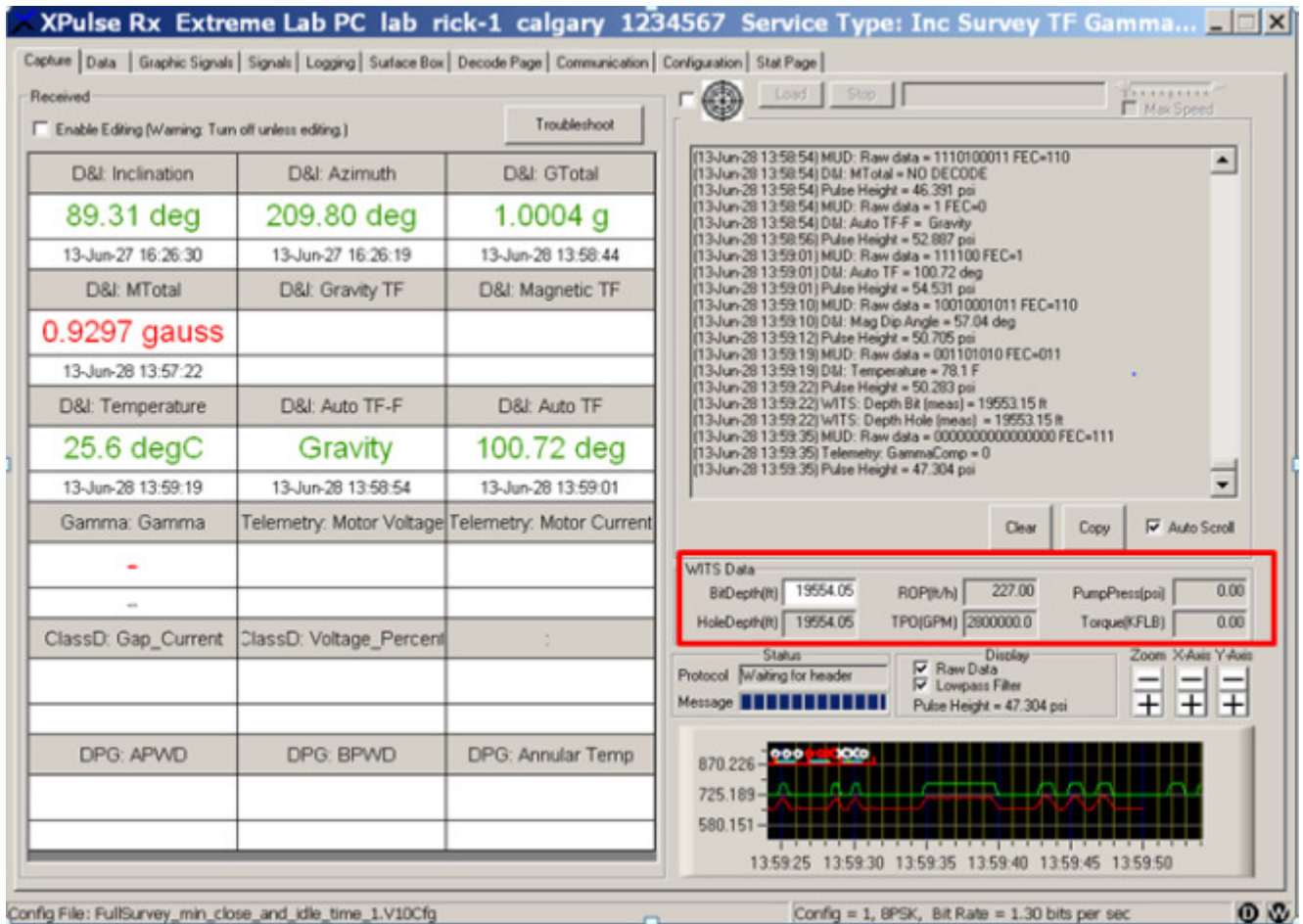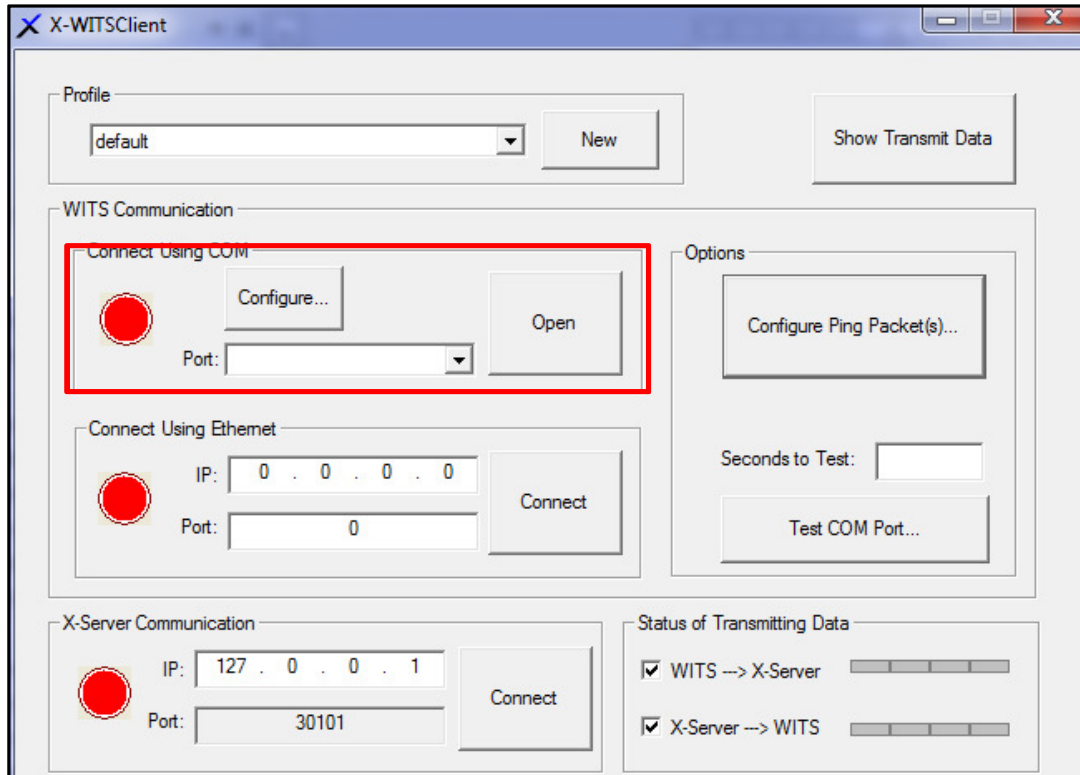

Figure 78 WITs DATA XEM capture screen

The WITS utility has now been configured, if there are no issues you can proceed to section 7 to complete the External rig up.

Some issues with the WITS are discussed on the next pages.

22. The WITS Port may not be "enabled".

Figure 79 Select the COMM

Click Start>Control Panel > Device Manager
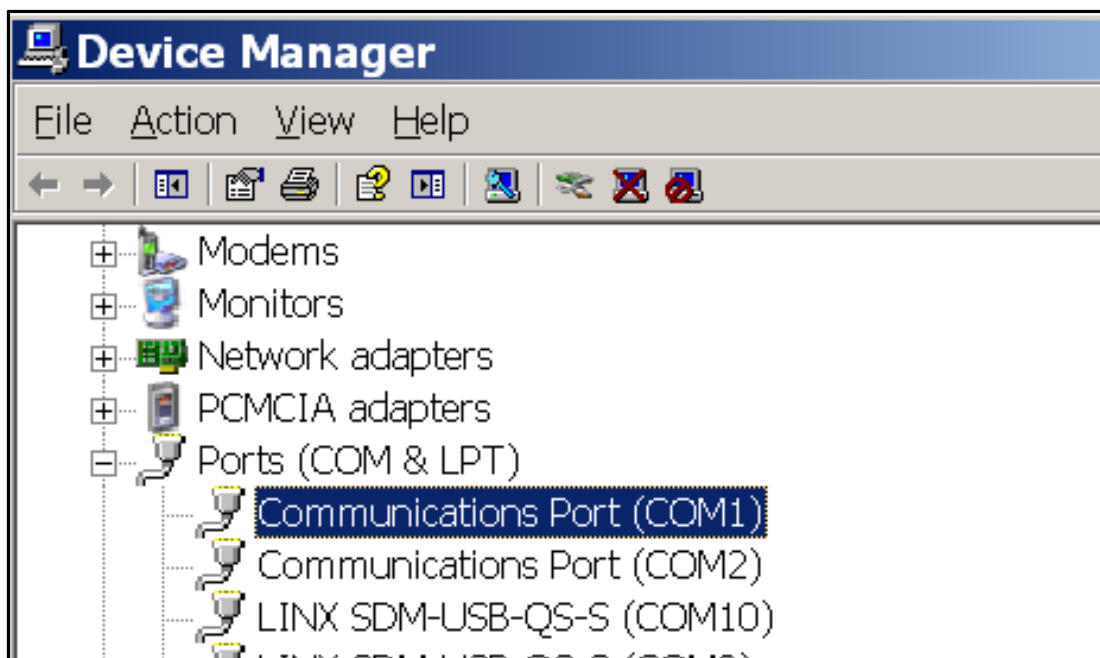
Figure 80 Device Manager

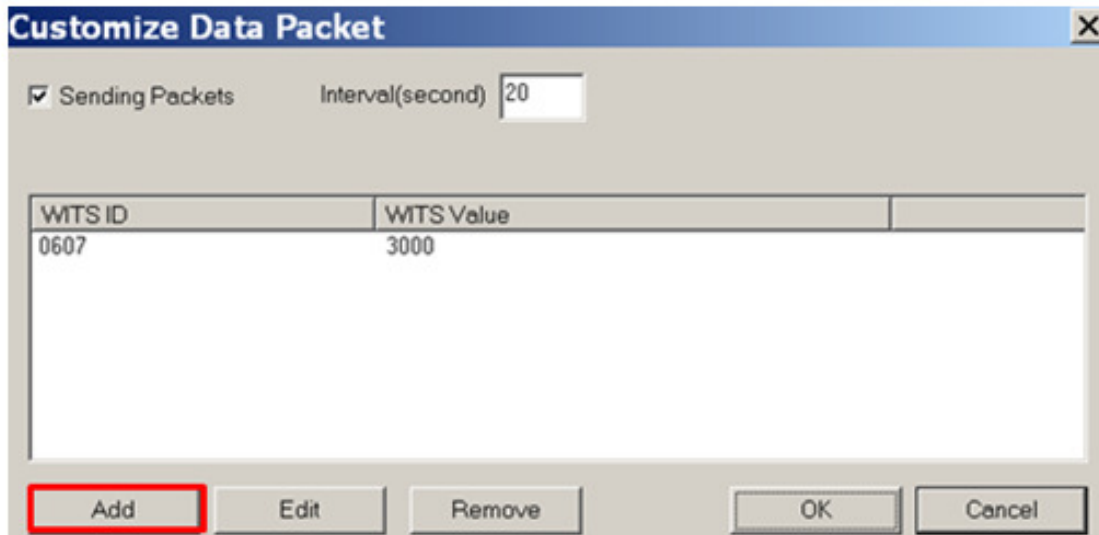Ensure that COM1 is enabled and physically corresponds to the COM Port selected.

23. You may need to Ping WITS data to test that you can send and receive data from the PASON EDR/ 3rd party systems.

Click on"Configure PING Packet(s)".
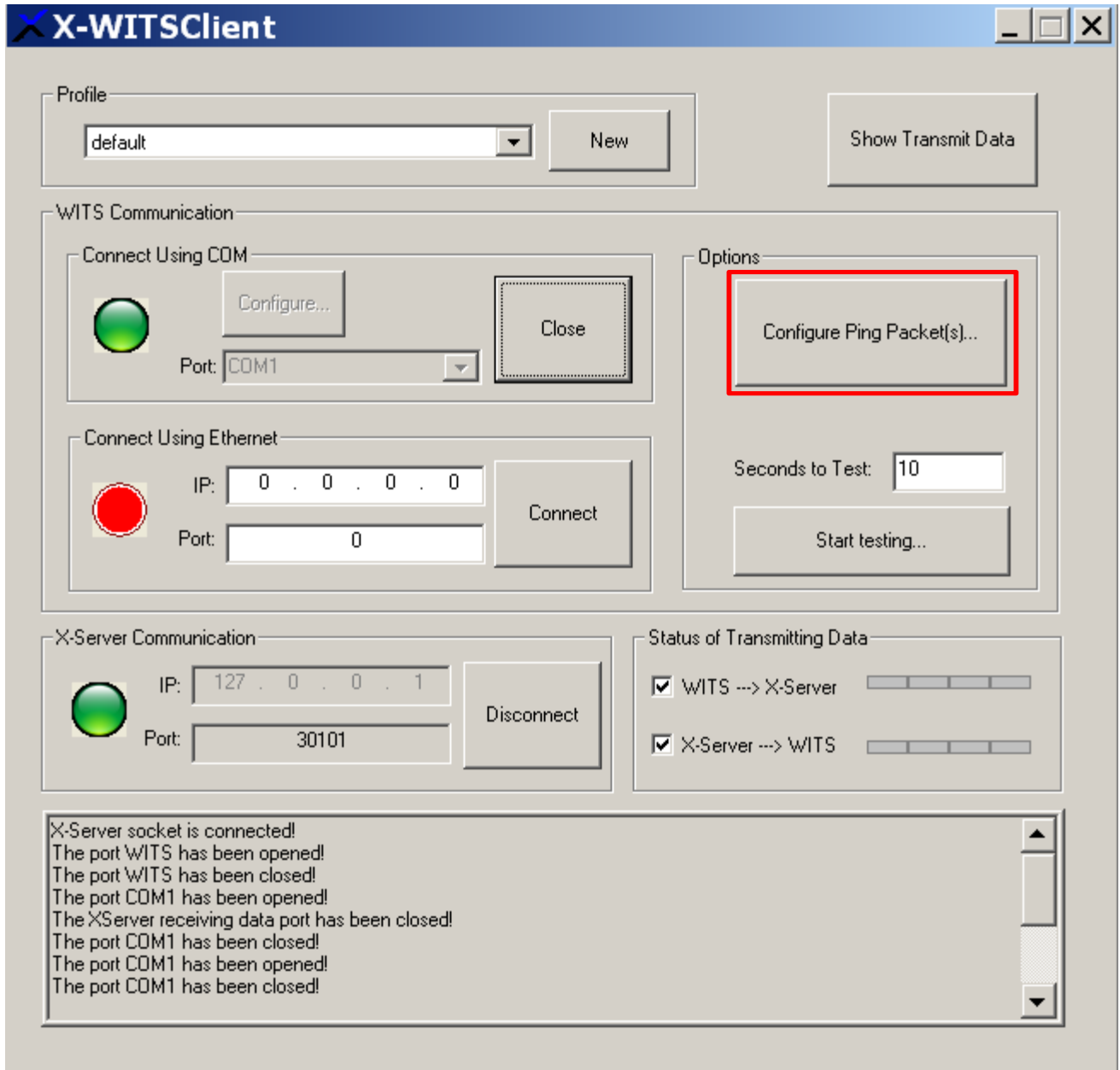
Figure 81 Ping Packets

24. Click on" Add" in the Customize Data Packet Window
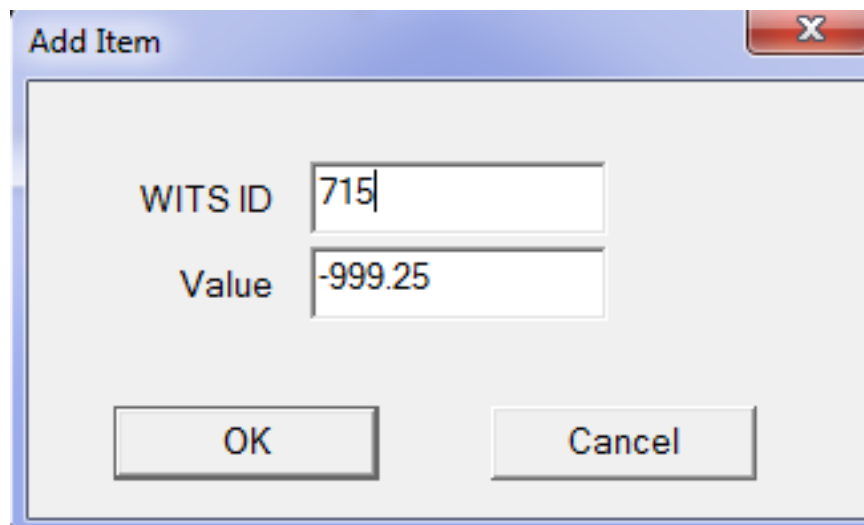
Figure 82 Adding data packet

25. Type the WITS ID from Table-1 and value for the parameter you want to Ping.

As an example If we wanted to Ping the Azimuth

The WITS ID for Azimuth is 715

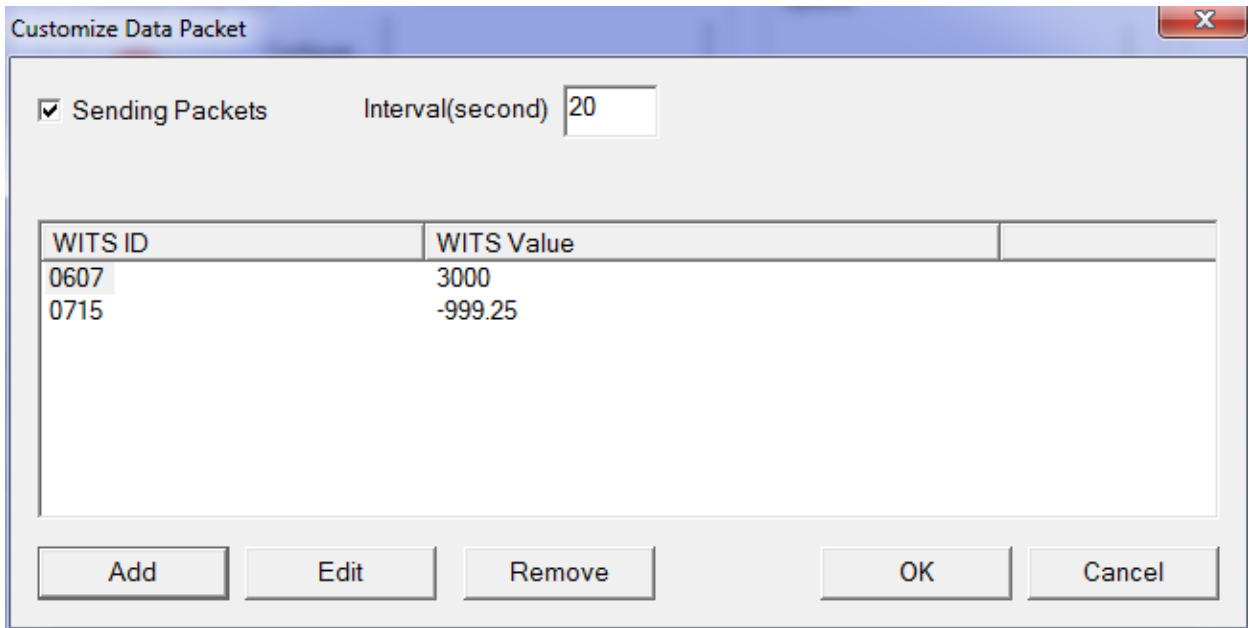Type the WITS ID = 715

Type the value of =-999.25

Figure 83 Add WITS ID to ping

26. Click "OK" to return to the Data Packet Window
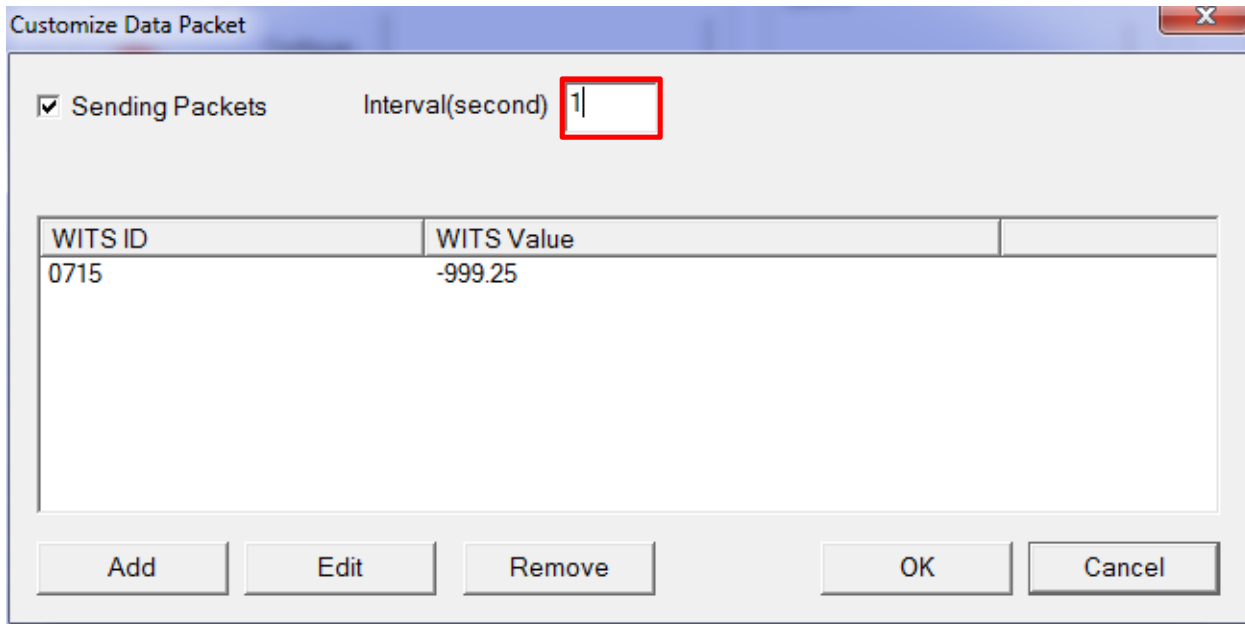27. Select the WITS ID 0607
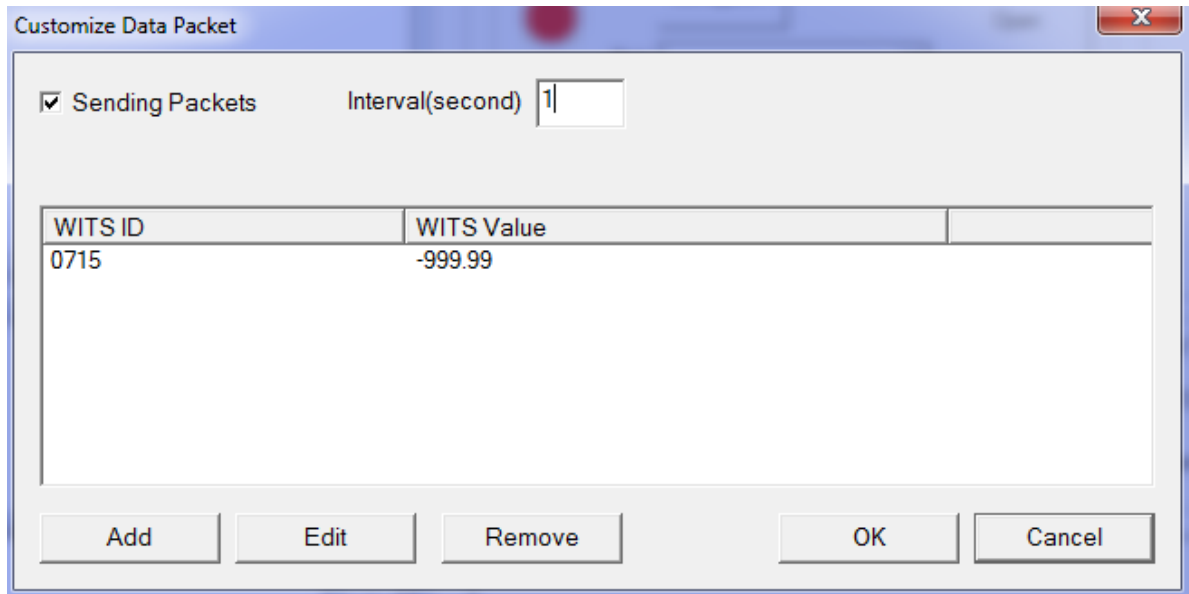
Figure 84 Remove WITS ID

   Click "Remove".

28. Click On the Interval (Second) box:

Figure 85 Interval for sending packets

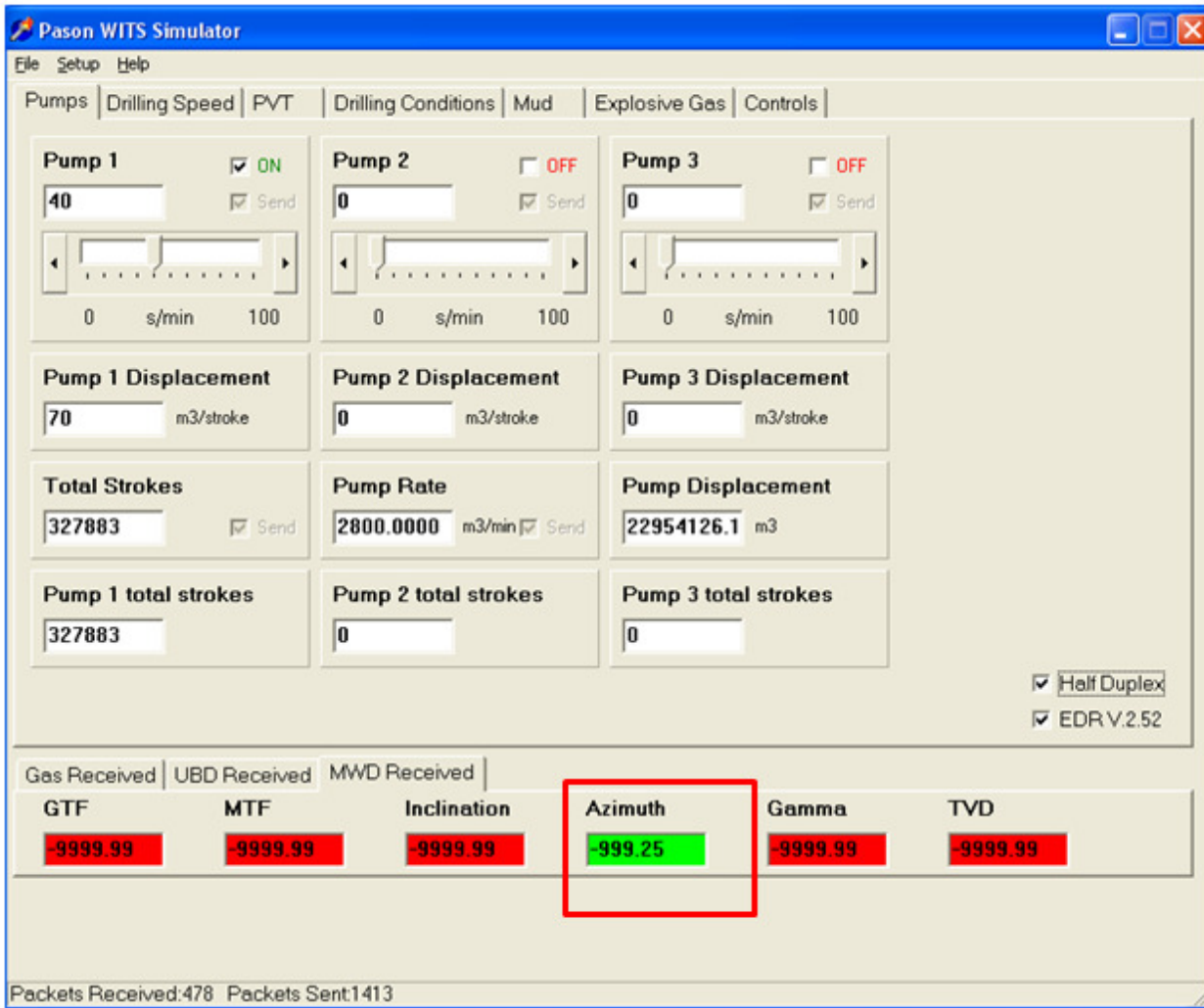29. Change the Interval to "1 second".

Figure 86 Changing the Interval to 1 second

30. Click "OK"

31. Return to the XWITS Client

    You now need to check if this value is being received by the EDR.

32. You will have to go to the EDR computer and observe the Screen.

In the case below the Azimuth = -999.25 is being received by the EDR.

Figure 87 Azimuth Value received by EDR

This confirms that the EDR is receiving the values.

Now you need to confirm that you are receiving the data back from the EDR.
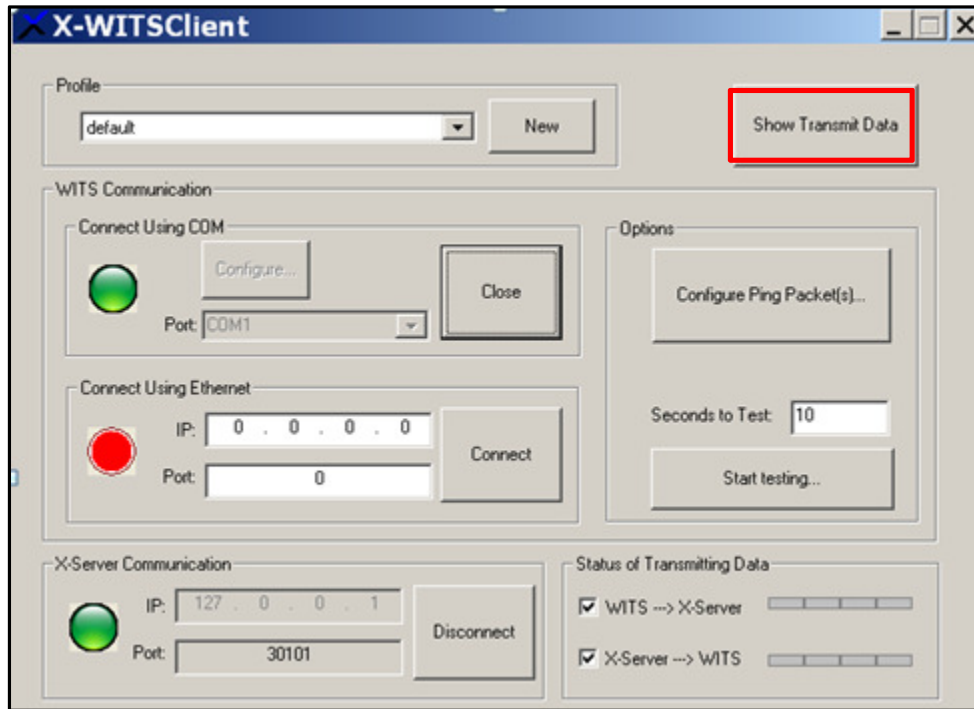
33. On the X WITS Client Click on "Show Transmit Data"

Figure 88 XWITS Client

34. On the Incoming and Outgoing Data window

The X-Server-->WITS window shows -999.25 for (715) Azimuth sent to the WITS Computer.

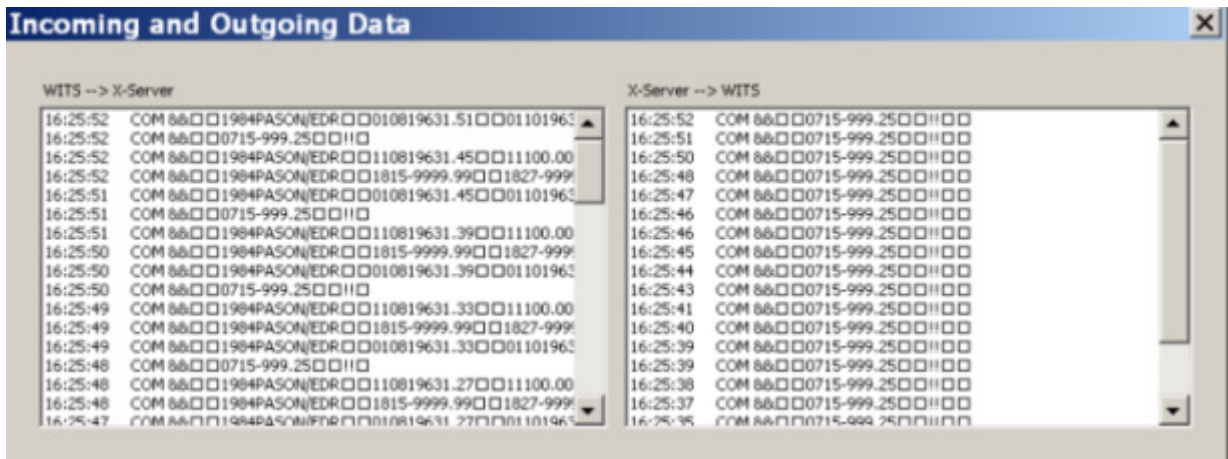The WITS--> X Server window shows -999.25 for Azimuth received (along with other data).

Figure 89 Incoming and Outgoing data

This confirms the link between the XRT and the EDR is working.

7. GROUND ANTENNA AND BOP

7.1. ITEMS USED

The following Items are required for rigging up the Antenna and BOP Stakes and cables.

Label	Part Number	Qty * Needed	Description
A	02JIGS0008	1*	Ground Antenna
B	22CABL0058	1	Ground stake clamp Cable, 25m
C	02 XEM0088	1	Non-adjustable Ground stake Clamp
D	22CABL0055	1	BOP Clamp Cable, 15m
E	02XEM0087	1	BOP Adjustable pliers
F	22CABL0056	3*	BOP/ANT Extension Cable, 25m
G	22CABL0033	1	BOP/ANT Extension Cable 100m
H	XTR	1	

Table 2 External rig Up Items

*Minimum Quantities are indicated for a typical well site Installation. The kit at the well site will contain more items for redundancy purposes.
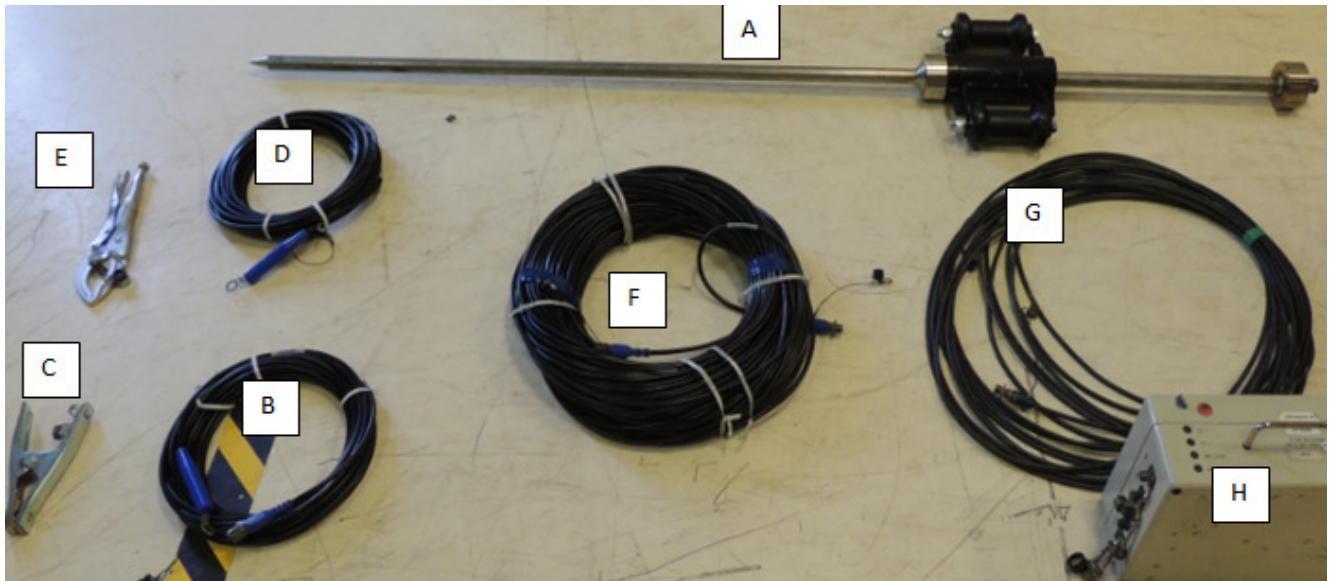

Figure 90 Items for External Rig Up

7.2. 02JIGS008 THE GROUND STAKE

Typically 1 x Ground Stake also referred to as Antenna is used on most jobs, in some cases additional stakes may be used and the ANT cable switched between the stakes to locate a stronger signal.

The Ground Stake has an inbuilt "Slide Hammer" which allows it to be driven in to the ground. The picture below shows how the sliding hammer can be used to drive the Stake into the Ground. The opposite action will be needed to remove the stake from the ground
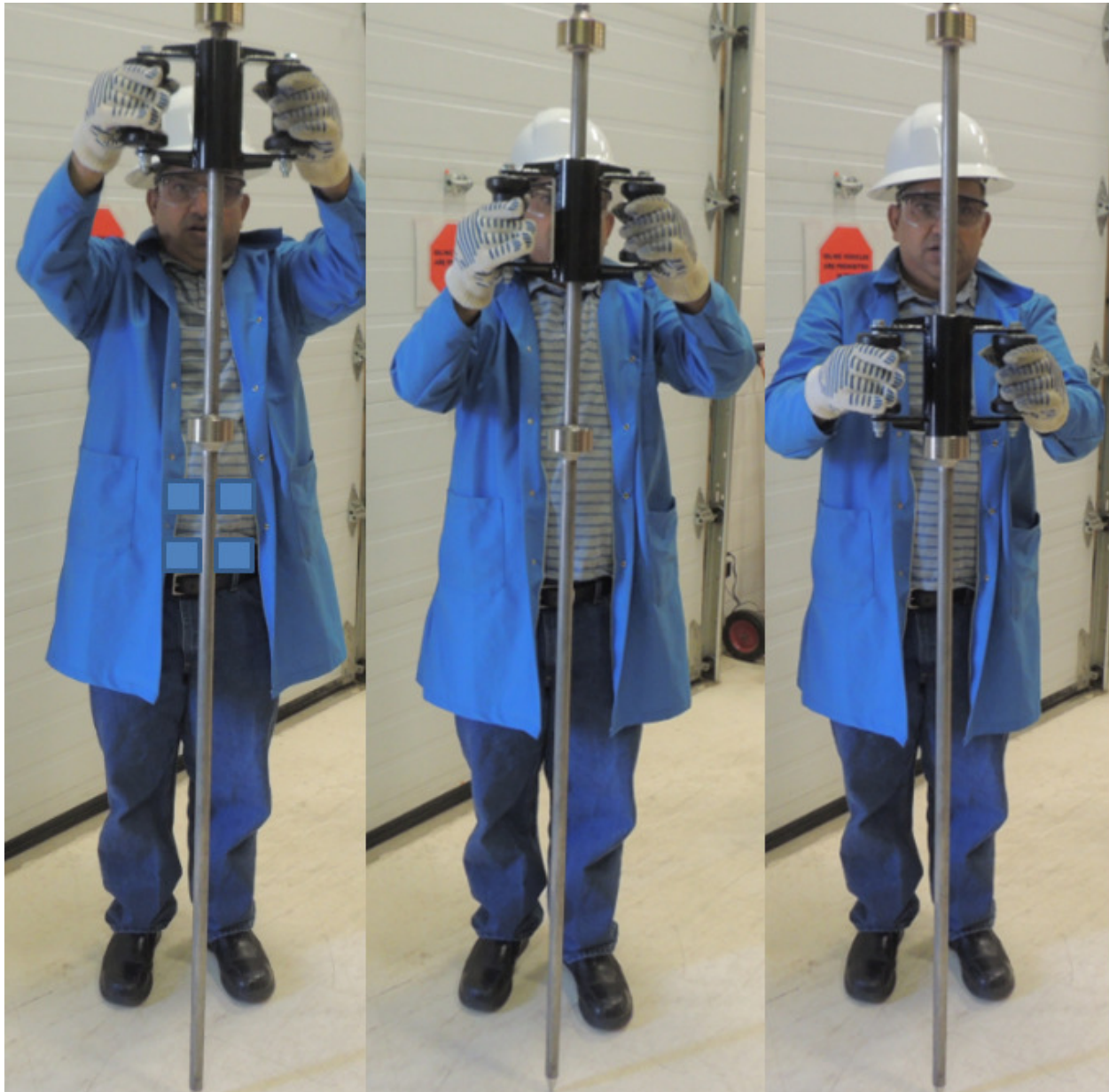
Figure 91 Slide Hammer on Ground stake

1. On the Rig, You need to use the Hammer to drive the Grounding Stake **02JIGS0008** 3ft into the Ground. This location for the stake should be as far away as possible from the BOP and preferably in a moist /wet place. Review the theory chapter for additional Information on where to place the stake.

NOTE: Driving the stake with Slide hammer is a hazardous activity

- **(PPE) Steel Toed Shoes, Coveralls, Gloves must be worn while using the slide hammer on the antenna.**
- **Always Use proper body positioning and warm up per SIPP recommendations.**
- **Ensure that equipment checks are performed as a part of routine Job Safety Analyses.**

2. Find the clamp cable **22CABL0058** to the clamp **02X-EM0088.** The cable 22CABLE0058 has an eye on 1 x end and a 2 pin male connector on the other end.

Figure 92 02X-EM0088 Ground stake Cable Clamp

Figure 93 22CABL0058 Ground stake Clamp Cable

3. Attach the clamp cable 22CABL0058 to the clamp 02X-EM0088.The Eye on one end of the cable can be attached with a bolt on the clamp. Tighten the Bolt all the way and secure the cable on to the clamp with the Ring on the clamp.

Figure 94 Eye on cable attached with bolt to clamp

Figure 95 cable secured on to the clamp

4. Attach the clamp on to the stake and spool up extra length of the cable round the hammer.

5. Ensure the camp contacts are clean and not rusted.

Figure 96 Ground stake 02JIGS008 driven 3 feet into the Ground

Cable 22CABL0058 and Clamp 02X-EM0088 "on to the Ground Stake

6. Find the Cable 22CABL0033. (This is a 100m Long cable and has 2 pin Male Connector on 1 side and a 2 Pin Female Connector on the other side).
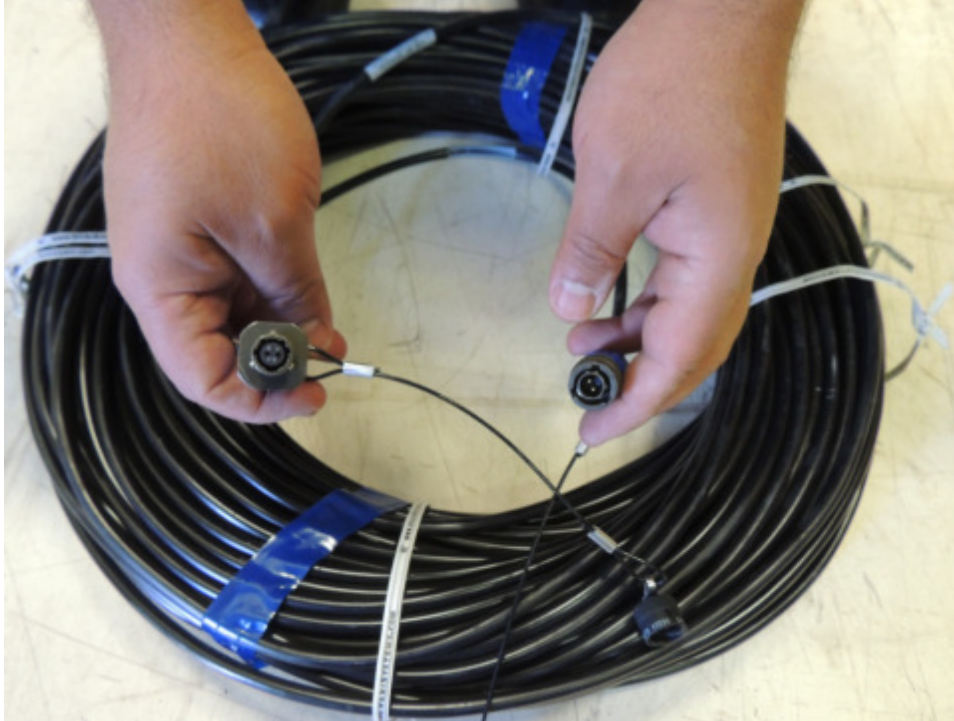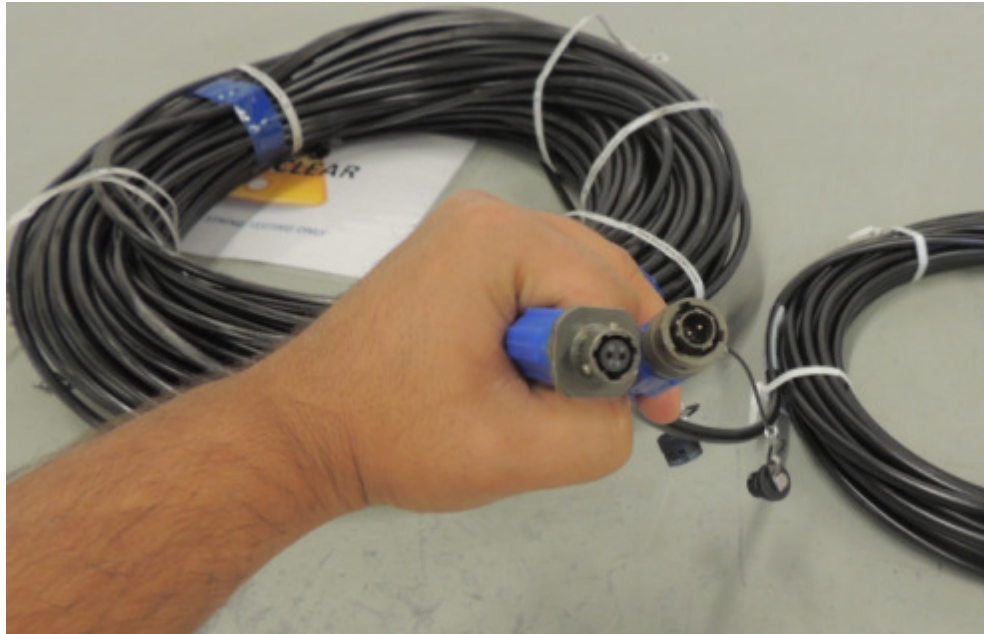

Figure 97 100m Extension cable 22CABL0033

7. Attach the Male connector on the Ground stake Clamp cable **22CABL0058** to the female connector on extension cable **22CABL0033.**

Figure 98 Extension cable 22CABL0033 and Clamp Cable 22CABL0058

Figure 99 Extension cable 22CABL0033 and Clamp Cable 22CABL0058

8. Rout the extension cable 22CABL0033 to the unit where the XTR is located. Lay the cable away from sources of electrical interference and from the path of ongoing moving objects where it could get damaged.

    If the 22CABL0033 is not long enough an additional extension 22CABL0056 (25m long) may be added. Typically it is easier to connect thee 22CABL0056 to the XTR, run it outside the Unit and connect it to the 22CABL0033.

9. Connect the 2xpin male connector on the 22CABL0033 or 22CABL0056 to the female 2 x Pin ANT connector on the XTR.
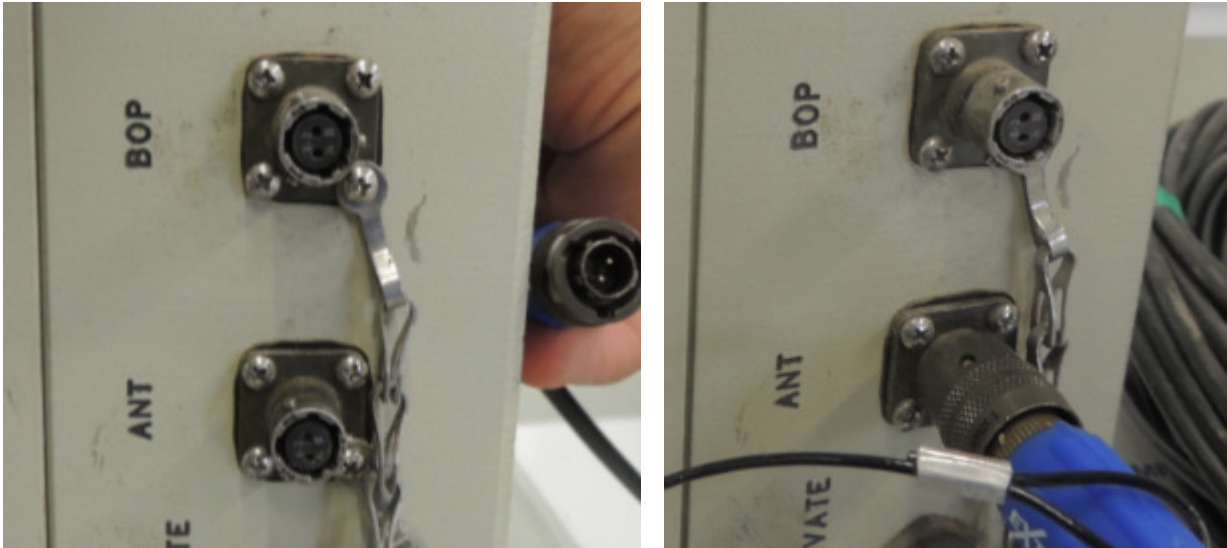

Figure 100 22CABL0056 or 22CABL0033attached to ANT port on the XTR

7.3. BOP STAKE

10. Attach the BOP clamp Cable **22CABL0055** on to the adjustable pliers **02XEM0087** by screwing the cable eye on to the adjustable pliers with a Bolt.

**Figure 101 22CABL055 cable connected to adjustable pliers 02XEM0087**

11. Secure the BOP clamp cable on to the adjustable pliers by tightening the bolt and closing the Ring.

12. Attach the plier on to the BOP firmly so that rig vibration does not result in a loss of the connection.

Figure 102 BOP Clamp cable clamp attached to the BOP

13. The other end of the BOP Clamp cable 22CABL0055 has a 2x pin Male connector.
Attach the 2 x Pin Male connector to the BOP port on the XTR. If Extra length is required add the 25m long extension (22CABL0056) in between. Any number of Extensions can be added.

14. Ensure the contacts are clean.

This completes the Rig up of the Antenna and BOP cables.
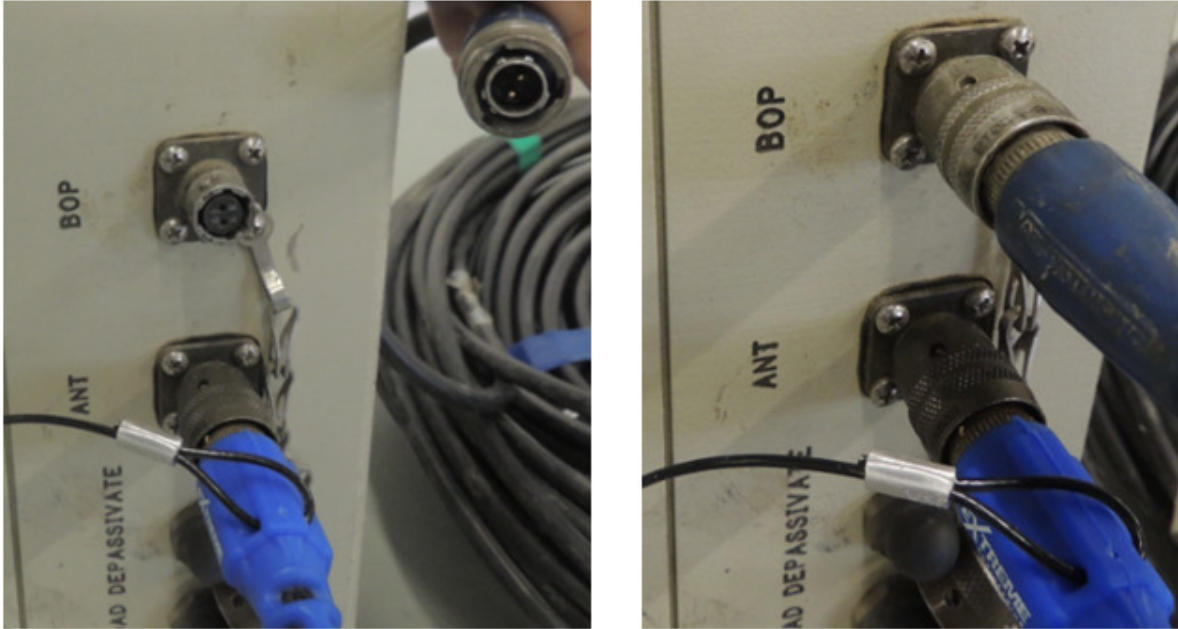
Figure 103 22CABL0056 Cable connected to the BOP Port on the XTR.

15. The Antenna /BOP cables should be coiled up, routed away from path of people and machinery and run where there is a lesser possibility of EM Interference.

Figure 104 Rig up at the Well site

8. REFERENCES

1. XEM Course Materials
2. XEM Operations Manual (07-MANL-0005-00-A2) - Extreme engineering
3. XEM_Operating_Manual_for_MaxWell_1.0_21-May-2012 -Schlumberger
4. 19-101973 Rev D Barracuda1 5Manual - Azonix
5. 07-OPDC-0026-00-A3-satalite-connect-kit-inventory
6. 07-OPDC-0020-00-A1-satellite-connectivity-procedure
7. 07-SPEC-0244-A Data file description and information

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8. XEM Training material: Dan Bukovec.
9. External Rig up information: Sean Ruddy
10. WITS information: Barry Buternowsky
11. EDR information: Brian Hu
12. AZONIX: Li Hong Chen

TECHNICAL REVIEW

13. Erwann Lemenager
14. Michael Bladon
15. Jaroslav Dobos