





OPERATIONS MANUAL CHAPTER 7 XCONNECT PROGRAMMING HIGH SIDE TEST

REV B: 2017 Jan

XFLD-0007



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This chapter of the manual provides instructions on how to program the tool using the XConnect Software and performing the bank test.

Please ensure that the tool and the surface system are connected as per the job preparation section on chapter 6.

1. TEST MODE

The XEM tool can be put in "Test Mode"; this allows the X-Connect software to communicate and the XTR to supply power to the tool thereby saving battery life while configuring the Tool and doing bank test. This is recommended if the Surface tests take time and it is required to save battery life. If the Tool is configured and tested in Test Mode, battery functionality will have to be conformed during the XEM Rx test in Section 8. If the Tool will NOT be configured in test Mode, proceed to Section 2 Programming software.

Please ensure you use the 22-XEM0021 test box when communicating with the tool in Test Mode. Information on using the Test box is given in Section 2.4 of Chapter 6.

1.1. HARDWARE SETUP

- 1. Ensure you have:
- Connected the XRT/Azonix, XTR and the XEM as per instructions in Chapter-6.
- Powered up the XTR and the XRT.
 - On the XTR, the +12 V,-12V and +5V should all be ON.
 - The TOOL LED should be OFF indicating the XEM is NOT in Test Mode.



Figure 1 XTR with Power ON



1.2. XEM RX

1. On the XRT launch "XEM Rx" from the short cut on the desk top.

Or alternatively,

Launch XEM Rx from START> Extreme Engineering > XEM> Rx.



Figure 2 XEM RX launch





1.3. LOAD DATA FILE

On the Load Data File window:

- 2. Select the "StandardDataFile.V10xdf".
- 3. Click "Open".



Figure 3 Select Data file

The Data File contains information about the the number of bits, resolution, error codes for all the data points acquired by the tool.

This file is created by the Operations – Engineering team and updated for each software revision.



1.4. CONFIGURATION FILE

4. The Load Configuration window will appear:

Favorites Date modified Type Desktop 03-01-13_Safety Disabled_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_2Hz_2c_Config_3.V10Cfg 3/1/2013 11:29 PM V10CFG Downloads 03-01-13_Safety Disabled_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_8.V10Cfg 3/1/2013 11:32 PM V10CFG Downloads 03-01-13_Safety Disabled_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_8.V10Cfg 3/1/2013 11:32 PM V10CFG Distraries 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_BPSK_8Hz_2c_Config_5.V10Cfg 3/1/2013 11:32 PM V10CFG Documents 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_1Hz_2c_Config_4.V10Cfg 3/1/2013 11:32 PM V10CFG Documents 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_2Hz_2c_Config_1.V10Cfg 3/1/2013 11:32 PM V10CFG Documents 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_2Hz_2c_Config_1.V10Cfg 3/1/2013 11:32 PM V10CFG Documents 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 3/1/2013 11:32 PM V10CFG Distures 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 3/1/2013 11:32 PM V10CFG Distures 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 3/1/2013 11:32 PM V10CFG Computer Local Disk_(C) 2/21/2013 2:07 PM	Favorites			
Desktop Downloads Recent Places O: 03-01-13_Safety Disabled_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_2Hz_2c_Config_3.V10Cfg 3/1/2013 11:32 PM V10CFG 03-01-13_Safety Disabled_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_6.V10Cfg 3/1/2013 11:32 PM V10CFG 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_BPSK_8Hz_2c_Config_6.V10Cfg 3/1/2013 11:32 PM V10CFG 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_6.V10Cfg 3/1/2013 11:32 PM V10CFG 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_1Hz_2c_Config_6.V10Cfg 3/1/2013 11:31 PM V10CFG 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_1Hz_2c_Config_5.V10Cfg 3/1/2013 11:32 PM V10CFG 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_2Hz_2c_Config_1.V10Cfg 3/1/2013 11:32 PM V10CFG 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 3/1/2013 11:33 PM V10CFG 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 3/1/2013 11:32 PM V10CFG 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 3/1/2013 11:33 PM V10CFG 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 3/1/2013 11:32 PM V10CFG 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_		Name	Date modified	Туре
Downloads Recent Places O 3-01-13_Sefety Disabled_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_8.V10Cfg 3/1/2013 11:34 PM V10CFG O 3-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_BPSK_8Hz_2c_Config_6.V10Cfg 3/1/2013 11:32 PM V10CFG 0 3-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_1Hz_2c_Config_6.V10Cfg 3/1/2013 11:31 PM V10CFG 0 3-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_1Hz_2c_Config_6.V10Cfg 3/1/2013 11:31 PM V10CFG 0 3-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_1Hz_2c_Config_6.V10Cfg 3/1/2013 11:32 PM V10CFG 0 3-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_2Hz_2c_Config_6.V10Cfg 3/1/2013 11:32 PM V10CFG 0 3-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_7.V10Cfg 3/1/2013 11:32 PM V10CFG 0 3-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 2/21/2013 2:07 PM V10CFG 0 4-fault-12Hz-3c-1.V10cfg 2/21/2013 2:07 PM V10CFG 0 4-fault-12Hz-3c-1.V10cfg 1/2013 12:2 PM 1/2013 2:07 P	E Desktop	03-01-13_Safety Disabled_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_2Hz_2c_Config_3.V10Cfg	3/1/2013 11:29 PM	V10CFG F
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¹ 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_BPSK_10Hz_2c_Config_5.V10Cfg ¹ J1/2013 11:31 PM V10CFG ¹ J1/2013 11:30 PM V10CFG ¹ J1/2013 11:30 PM V10CFG ¹ J1/2013 11:30 PM V10CFG ¹ J1/2013 11:32 PM V10CFG ¹ J1/2013 11:24 PM V10CFG ¹ J1/2013 2:07 PM V10CFG ¹ J1/2	3 Recent Places	03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_BPSK_8Hz_2c_Config_6.V10Cfg	3/1/2013 11:32 PM	V10CFG F
Libraries II 0.3-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_1Hz_2c_Config_4.V10Cfg 3/1/2013 11:30 PM V10CFG Documents 0.3-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_2Hz_2c_Config_2.V10Cfg 3/1/2013 11:25 PM V10CFG Music 0.3-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_2Hz_2c_Config_2.V10Cfg 3/1/2013 11:25 PM V10CFG Pictures 0.3-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 3/1/2013 11:24 PM V10CFG 0.3-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 2/21/2013 2:07 PM V10CFG 0.3-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 2/21/2013 2:07 PM V10CFG 0.3-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 2/21/2013 2:07 PM V10CFG 0.3-01-13_XEM_DynamX_ATF 5-3 d		03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_BPSK_10Hz_2c_Config_5.V10Cfg	3/1/2013 11:31 PM	V10CFG F
Documents 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_2Hz_2c_Config_2.V10Cfg 3/1/2013 11:25 PM V10CFG Music 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_4Hz_2c_Config_1.V10Cfg 3/1/2013 11:33 PM V10CFG Pictures 03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 3/1/2013 11:24 PM V10CFG Os-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 3/1/2013 11:24 PM V10CFG Os-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 3/1/2013 11:24 PM V10CFG Os-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 3/1/2013 11:24 PM V10CFG Computer default-12Hz-3c-1.V10cfg 2/21/2013 2:07 PM V10CFG EXTREME (E:) x XPulseSOC (\\vfv - m	😹 Libraries	03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_1Hz_2c_Config_4.V10Cfg	3/1/2013 11:30 PM	V10CFG
Music 03-01-13 XEM DynamX ATE 5-3 deg Gamma QPSK 4Hz 2c Config 7.V10Cfg 3/1/2013 11:33 PM V10CFG Pictures 03-01-13 XEM_DynamX_ATE 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 3/1/2013 11:24 PM V10CFG Videos 03-01-13 XEM_DynamX_ATE 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg 3/1/2013 11:24 PM V10CFG Computer 04-01+12 Hz-3c-1.V10cfg 2/21/2013 2:07 PM V10CFG Extraction Disk (C:) EXTREME (E:)	Documents	03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_2Hz_2c_Config_2.V10Cfg	3/1/2013 11:25 PM	V10CFG
	J Music	03-01-13 XEM DynamX ATE 5-3 deg Gamma QPSK 4Hz 2c Config 7.V10Cfg	3/1/2013 11:33 PM	V10CFG
Image: State of the state	E Pictures	03-01-13_XEM_DynamX_ATF 5-3 deg_Gamma_QPSK_6Hz_2c_Config_1.V10Cfg	3/1/2013 11:24 PM	V10CFG
Computer Local Disk (C:) XPulseSOC (\\nfv - <	Videos	default-12Hz-3c-1.VI0cfg	2/21/2013 2:07 PM	VIOCEG
Local Disk (C:) EXTREME (E:) XPulseSOC (\\rhv + *	Computer			
EXTREME (E:) XPulseSOC (\\xfv + <	Local Disk (C:)			
😴 XPulseSOC (\\dv + 🕜	EXTREME (E:)			
	😪 XPulseSOC (\\xfv +	*C		

Figure 4 Select Configuration file

5. Select ONLY 1 configuration file that the tool will be operating in.

When the operator programs the tool, it should initially start in configuration 1, unless the operator has performed a downlink or changed the configuration file setting in the tool using X-connect.

6. Click "Open".



1.5. SURFACE BOX

- 7. The XEM Receiver will launch displaying the "Capture" tab.
- 8. Click on the "Surface Box" tab.

Enable Editing (Warning: Turn off	unless editing.)	Troubleshoot	True North - Mag Dec: 0.0 Dell Offset: 0.0 German Sector: 1.0 -15 15
D&I: Inclination	D&I: Azimuth	D&I: GTotal	Gamma Offset: 0.0 -30 30 45
-	-	-	-60 60
D&I: MTotal	D&I: Gravity TF	D&I: Magnetic TF	-75
-			(L) -90 (R
			-105 105
D&I: Temperature	D&I: Auto TF-F	D&I: Auto TF	
	-	-	-120
			135
Gamma: Gamma CPS	Telemetry: Motor Voltage	Telemetry: Motor Current	-165 180 165
-			WITS Data
-			Bit Depth(ft) ROP(ft/h) Pump Press (PSI)
ClassD: Meas. Load Cur.	ClassD: Scale Current	:	Hole Depth(t) TPO (GPM) Torque (KFLB)
-	-		Vaiting for long header
			Total Gain = 2*10*5*1 = 100
DynamX: Shk Lat Level	DynamX: StickSlip Level	DynamX: Reverse	a second second in the start of the second
	-	-	่อ∧−รองโรโรโรโรก รรมอน รรมอนไปไปไปเป็นทระไหม่อน เรื่องไปได้ได้ได้ได้ได้ได้

Figure 5 XEM Rx Capture Tab



- 9. On the Surface Box tab
- 10. Click on "Test Mode"

Data Graphic Signals	Signals FFT Logging (Configuration Surface Box Decoder Page Communication Stat Page
		Firmware Version: V0.0.1.26
Gain Control		
Auto Gain	- Manual Gain - Cu	urrent Gain
Auto Gain Mode	Manual Gain Mode	Auto Gain Mode GET
	Total Gain	Gain 1 Gain 2 Gain 3 Gain 4
	▼ 2	
	·	· - - -
Bandpass Frequency		Carrier Frequency from Configure
Low Frequency 4.13	Hz	Carrier Frequency 6.0 Hz
High Englightary 7.88		Cycles Per Bit 2
right nequency 17.00	Hz	<u> </u>
GET	SET	Resend to Surface Box
0		
Operation	1	
Pause Data	Resume Data	Test Mode Operation Mode
Transmit Status Transmittir	ng	Working Mode: Operation Mode
Tanana otatao prominina	····	
Surface Box Voltages		
-		
	Volts Get	
+12V Battery	Got	
+12V Battery	Volts	
+12V Battery -12V Battery +5V Battery	Volts	

Figure 6 XEM Rx Surface Box tab



11. The XEM receiver will indicate that the Tool is actually in "Test Mode".

		Firmware Version : V0.0	1.26
Gain Control		Filliware version. vu.u.	1.20
Auto Gain	Manual Gain Cur	rent Gain	
Auto Gain Mode	Manual Gain Mode	uto Gain Mode	GET
	Total Gain	Gain 1 Gain 2	Gain 3 Gain 4
	• 4	10 10	B
Bandpass Frequency		Carrier Frequency from Con	figure
Low Frequency 4.13	Hz	Carrier Frequency	6.0 Hz
High Frequency 7.88	Hz	Cycles Per Bit	2
GET	SET	Resend to Su	Iface Box
Operation			
Pause Data	Resume Data	Test Mode	Operation Mode
Transmit Status Transmitting	····	Working Mode Test Mod	•
Surface Box Voltages			
+12V Battery	Volts Get		
-12V Battery	Volts		
+5V Battery	Volts		

Figure 7 TEST Mode

Now you need to confirm from the XTR that the Tool is in Test Mode.



1.6. XTR TOOL LED

12. On the XTR the "TOOL" LED will turn ON confirming the Tool is in Test Mode.



Figure 8 XTR Showing Tool in Test Mode

13. Proceed to the next stage to use the XConnect .



2. PROGRAMMING SOFTWARE

2.1. LAUNCH X-CONNECT

1. Launch the XConnect application by clicking the "XConnect" short cut on the desk top.

Or,

2. Alternatively, launch "X Connect" from START >Extreme Engineering>Common> XConnect.



Figure 9 XConnect launch



XConnect is used to:

- Load configuration files that will be used by the tool during the Job.
- Confirm the firmware used by the different probes.
 - The firmware is actually uploaded using the firmware updater which uses the boot loader application.

CAUTION: When upgrading Firmware or Software on the XEM hardware, ensure that the tools are not disconnected from power. Loss of power may cause the updates to fail, resulting in potentially permanent damage to the equipment.

- Erase the memory in the flash drive.
- Monitor data from the different nodes in the tool.

2.2. LOAD DATA FILE

The Load Data file window will appear:

- 3. Select the "StandardDataFile.V10xdf".
- 4. Click "Open".

🗙 Load Data File				_	x
💮 🕞 - 🕌 « Local Dis	sk (C:) + ExtremeEngineering + DataFile	▼ ⁴ 7	Search DataFile		۶
Organize 👻 New fold	ler		⊫ •		9
🔆 Favorites	Name	Date modified	Туре	Size	
Desktop	StandardDataFile.V10xdf	3/1/2013 10:17 PM	V10XDF File	7	71 KE
Downloads Recent Places					
 □ Libraries □ Documents □ Music □ Pictures □ Videos 					
🖳 Computer					
🕌 Local Disk (C:)					
EXTREME (E:)	•				•
File n	name: Maxed	- E	treme Data File (*.*xdf)	•	•
		E	Open 🖣 🖸	ancel	





2.3. XCONNECT

- 5. The XConnect application will start.
- 6. At the bottom left on the Window Tab, "Reading CAN...." will appear.

This means the XConnect is looking for Nodes on the CAN BUS.

The CAN BUS is used for communicating information between different nodes in the tool.

XConnect_3.3.6-r6 - XEM System		<u> </u>
Data File		1
C:\ExtremeEngineering\DataFile\StandardDataFile.V10xdf		Load
Nodes Software Version, Config #	. [System Override
Telemetry	 Download Config	C XPulse
Flow Switch		C XEM
DPG	Flow Status:	
D and I	0n Off	Refresh
Gamma		
BmgrA	- Hotation	
BmgrB	0n Off	Status:
BmgrC		
XHOP	Suspend Deepsleep Reset All	Advanced
DynamX		
ClassD	Config Downlink	
	Set	Exit
Reading CAN		

Figure 11 Reading CAN



If the Nodes do not appear, inspect all the connections in the Cables and probe.
 Check the TOOL LED on the XRT to ensure that the Tool is powered ON.



Figure 12 XEM XConnect Console - Reading CAN



8. If a Node is not appearing, click on the 'refresh'.

This refreshes the list of active nodes.

C:\ExtremeEngineering	\DataFile\StandardDataFile.V10xdf			Load
Nodes	Software Version, Config #			System Override
Telemetry	SV: 0.1.9.27 Cfg: 1 of 1	Download	Config	C XPulse
Flow Switch	SV: 0.1.3.6 Cfg: 1 of 1	XEM Target Current: 0.1	Amps, Pwr Lvl 1	XEM
DPG	SV: 0.0.7.1 Cfg: 1 of 1	Flow Status:]
D and I	SV: 0.0.2.31 Cfg: 1 of 1	On	0ff	Refresh
Gamma	SV: 0.0.1.5 Cfg: 1 of 1			┘┖━━━┛
BmgrA	SV: · SV:0.0.3.18 Cfg: 0 of	Rotation	1	
BmgrB		On	0ff	Status:
BmgrC		Advanced		
XHOP		Suspend Deepsleep	Reset All	Advanced
DynamX	SV: 0.0.1.10 Cfg: 1 of 1			
ClassD	\$₹: 0.0.8.29	Config Downlink	Config #:	
		Set		Exit

Figure 13 XConnect "Refresh"

If a particular Node still does not appear, you will have to perform basic troubleshooting which may include checking the hardware; this would involve changing one item at a time.



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2.4. LOW/ HIGH VOLTAGE

The software versions for the nodes should match the standard list of downhole software maintained by the Operations Engineering Team. The list at the time of writing the manual is given in Table-1 below.

- 9. The XTX probe contains the Telemetry, Flow switch and the Class D Nodes.
- 10. Confirm that the XTX probe is a **Low voltage** or a **High voltage probe**.

Low Voltage XTX Probes are currently used in most cases.

The software revision for the Telemetry and the Class D Nodes have the numbers 0.X.X.XX for Low Votage probes.

×x	Connect_3.3.6-r6 -	XEM System			_ 🗆 🗵
гD	ata File				
ſ	C:\ExtremeEngineering	g\DataFile\StandardDataFile.V10xdf			Load
	Nodes	Software Version, Config #		1	System Override
	Telemetry	SV: 0.1.9.27 Cfg: 1 of 1	Download	Config	C XPulse
	Flow Switch	SV: 0.1.3.6 Cfg: 1 of 1	XEM Target Current: ().1 Amps, Pwr Lvl 1	
	DPG	SV: 0.0.7.1 Cfg: 1 of 1	Flow Status:		
	D and I	SV: 0.0.2.31 Cfg: 1 of 1	On	0ff	Refresh
	Ganna	SV: 0.0.1.5 Cfg: 1 of 1			
	BagrA	SV: SV: 0.0.3.18; Cfg: 0 of	Rotation	[Clabus
	BagrB		On	011	310103
	BmgrC		Advanced		
	XHOP		Suspend Deepsleep	Reset All	Advanced
	DynamX	SV: 0.0.1.10 Cfg: 1 of 1			
	ClassD	SV: 0.0.8.29	Config Downlink	Config #:	
			Set		Exit
Read	y .				

The XTX probe in the figure below is a low voltage probe.

Figure 14 XConnect Low voltage software versions



High Voltage: A special configuration of XTX probes allows the gap sub to inject higher power into the formation and is typically used on deep wells with oil based mud drilling environment.

If you have a **high voltage** Telemetry probe the software revisions for both Telemetry and Class D should both begin with the numbers **3.X.X.XX**.

ata File				
:\ExtremeEngineering	\DataFile\StandardDataFile-HV.V10xdf			Load
Nodes	Software Version, Config #	Configuration File		Load an XDF
Telemetry	SV: 3.1.9.36 Cfg: 1 of 1	Download	Upload Current	NPulse
Flow Switch	SV: 0.1.3.6 Cfg: 1 of 1			⊗ ×EM
DPG		Flow		
		5(a(us:		
D and I		On	Off	Refresh
Gamma				
		Rotation		
BmgrA				Status:
BmgrB		On	Off	
BmgrC		Advanced		
VHOD				
AHOP		Test Mode	Reset All	Logging
DynamX				
61 D		Downlink		
CIASSD	Sv: 3.1.0.48 CIG: 1 OF 1		Config #:	Exit
		Set		

Figure 15 XConnect High Voltage



The software versions for all the Nodes should match the current software list maintained by the Ops Engineering team. Table -1 provides the list of the current software versions at the time of writing this manual.

VExtremeEngineering	\DataFile\StandardDataFile.V10xdf			Load
lodes	Software Version, Config #		1	System Override
Telemetry	SV: 0.1.9.27 Cfg: 1 of 1	Download	Config	C >0Pulse
Flow Switch	SV: 0.1.3.6 Cfg: 1 of 1	XEM Target Current:	0.1 Amps, Pwr Lvl 1	(* XEM
DPG	SV: 0.0.7.1 Cfg: 1 of 1	Status:		
D and I	SV: 0.0.2.31 Cfg: 1 of 1	Ûn	011	Refresh
Gama	SV: 0.0.1.5 Cfg: 1 of 1			
BagrA	SV: 0.0.3.18 Cfg: 1 of 1	Rotation	1	
BagrB		Ûn	011	Statut:
BmgrC		Advanced		
XHOP		Suspend Deepsleep	Reset All	Advanced
DynanX	SV: 0.0.1.10 Cfg: 1 of 1			-
ClassD	57: 0.0.8.29	Config Downlink	Config #	
		Sat		Exit

Figure 16 Software Versions for Nodes

NODE	LOW VOLTAGE	HIGH VOLTAGE
Telemetry	0.1.9.27	3.1.9.35 or 3.1.9.36
Flow switch	0.1.3.6	
DPG	0.0.7.1	
D&I	0.0.2.31	
Gamma	0.0.15	
BMGR	0.0.3.18	
DYNAMX	0.0.1.10	
IDIX	0.1.1.4	
Class D	0.0.8.29	3.1.0.45 or 3.1.0.46
ХНОР	0.0.06	

only for HVTX 001-003 rev A Table-1 Software Versions for Probes



2.5. DOWNLOAD CONFIGURATION

- 11. Click on "Download configuration".
- 12. For each job there is a specific configuration which provides information to the Tool on the type of information that is to be transmitted up-hole along with the power level.

××	Connect_3.3.6-r6 -	XEM System			X
	C:\ExtremeEngineering	\DataFile\StandardDataFile.V10xdf			Load
	Nodes	Software Version, Config #			System Override
	Telemetry	SV: 0.1.9.27 Cfg: 1 of 1	Download	l Config	C XPulse
	Flow Switch	SV: 0.1.3.6 Cfg: 1 of 1	XEM Target Current:	0.1 Amps, Pwr Lvl 1	© XEM
	DPG	SV: 0.0.7.1 Cfg: 1 of 1	Flow Status:]
	D and I	SV: 0.0.2.31 Cfg: 1 of 1	Ûn	Off	Refresh
	Gamma	SV: 0.0.1.5 Cfg: 1 of 1			
	BngrA	s ⊮: 0.0.3.18 Cfg: 1 of 1	Rotation	[Chahua
	BmgrB		On	Off	Status:
	BmgrC		Advanced		
	XHOP		Suspend Deepsleep	Reset All	Advanced
	DynamX	SV: 0.0.1.10 Cfg: 1 of 1			
	ClassD	5⊽: 0.0.8.29	Config Downlink	Config #:	Test
			Set		Exit
				,	
Read	y				

Figure 17 Download Configuration

- 13. A window will appear and ask you to confirm the time is accurate, as this is the time the tool will store internally and correlate all recorded data to.
- 14. If the time is not set correctly there can be a mismatch between the data acquired while drilling on surface versus the data recorded in the tool.



			Loau
odes	Software Version, Config #	_	System Override
Telemetry	SV: 0.1.9.27 Cfg: 1 of 1	Download Config	C XPulse
Flow Switch	SV: 0.1.3.6 Cfg: 1 of 1	XEM Target Current: 0.0 Amps, Pwr LvI 0	I ⊙ ×EM
DPG	SV: 0.0.7.1 Cfg: 1 of 1	Flow Status: Off (Flow Switch)]
D and I	SV: 0.0.2.31 Cfg: 1 of 1	0n Off	Refresh
Gamma	Please ensure that your PC system time is co	rrect prior to downloading configs: Jul 10, 2013	10:29:30 AM
BmgrA	Click OK to download, or Cancel to exit.	n occ prior to downloading conings, sai 10, 2010	
BmarB	ОК	Cancel	
BmgrC		Advanced	
EmgrC XHOP		Advanced Suspend Deepsleep Reset All	Advanced
BmgrC XHOP DynamX	SV: 0.0.1.10 Cfg: 1 of 1	Advanced Suspend Deepsleep Reset All	Advanced
BmgrC XHOP DynamX ClassD	SV: 0.0.1.10 Cfg: 1 of 1 SV: 0.0.8.29	Advanced Suspend Reset All Deepsleep Config Downlink	Advanced

Figure 18 Time synchronization

- 15. Click "OK" if the computer time is correct.
- 16. If the time is not correct or the same as the EDR click cancel, change the time on the computer and repeat the steps above.



When prompted

- 17. Select "ALL" the configuration files that need to go into the tool
- 18. Click "Open"



Figure 19 Open configuration files

NOTE:

A maximum of 8 configuration files can be loaded into the tool. The file which ends in Config_1 will be used first by the tool.

The tool will use the 02-04-13_XEM_DynamX_ATF 5-3deg_Gamma_QPSK_4Hz_2c_Config_1

In this file

- 02-04-13 is the date configuration file was created.
- XEM refers to the XEM tool.
- DynamX indicates there is a DynamX Probe with Directional, Shock, rpm, Stick& slip sensors.
- ATF5_3 indicates the tool will switch to GTF at 5 degrees and back to MTF at 3 degrees.
- Gamma indicates this probe has a gamma sensor.
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- QPSK is the Tool Modulation type. (This can either be BPSK or QPSK).
- 4 Hz refers to the number of Cycles per second.
- 2 C shows that 2 cycles contain the same data for redundancy.
- Config_1: shows this is the First configuration

The configuration files with "Safety Disabled" are typically used to bypass the safety barrier where the tool needs to see a pressure of 100psi to work.

This is used when there is a bore pressure sensor failure down hole.

• 02-04-13_safetyDisabled_XEM_DynamX_ATF 5-3deg_Gamma_QPSK_4Hz_2c_Config_1

More information about the structure of the configuration files is given in the Theory chapter.



- 19. It will take a few minutes to download the configuration into each probe. If a Download error appears, it could indicate a number of different things,
- The configuration file is incorrect.
- There are communication issues.
- Or
- The firmware in Firmware in 1 or more of the probes needs to be upgraded.
- 20. Stop the process by Clicking "OK".
- 21. Check the connections and retry the steps 11 through 19.
- 22. If you have the same error message at the same probe there is a high possibility of a firmware mismatch.

XConnect Download Downloading status, Telemetry SV: 0.1.9.13 Flow Switch SV: 0.1.3.6 DPE SV: 0.0.7 1					
XConnect	×	XEM System			_ _ ×
Error found when downloading for node 85: Transfer CRC_rcv =0x41e != 0x41e = CRC_in file	Error Code : 0xf0,	\DataFile\StandardDataFile.V10xdf Software Version, Config #			Load System Override
	OK	SV: 0.1.9.13 Cfg: 1 of 1	Download	l Config	XPulse
	Flow Switch	SV: 0.1.3.6 Cfg: 1 of 1	XEM Target Current:		XEM
Mask	DPG	SV: 0.0.7.1 Cfg: 1 of 1	Flow Status:		
	D and I	SV: 0.0.2.31 Cfg: 3 of 3	On	Off	Refresh
Switch to XPulse G	Gamma	SV: 0.0.1.5 Cfg: 6 of 8			
	BmgrA	SV: 0.0.3.17 Cfg: 2 of 7	Rotation		
VROT	BmgrB		On	Off	Status:
	BmgrC		Advanced		
X	XHOP		Suspend Deepsleep	Reset All	Advanced
Z XConnect	DynamX	SV: 0.0.1.6 Cfg: 3 of 3			
	ClassD	SV: 0.0.8.22	Config Downlink	Config #:	
XEM Rx			Set		Exit
	Downloading cfg file(s	;)			

Figure 20 Error while downloading the configuration file

- 23. Proceed to SECTION-3 to check and upload the firmware versions of all the probes.
- 24. Once the firmware is upadated you will need to start from the beginning of this section and Load the configuration files again.

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25. The XEM Target Current Window will appear.

XEM Target Current	×
Select Amps	
• 0.1	
C 0.3	
C 1.0	
C 2.0	
C 3.5	
C 5.0	
ок	

Figure 21 Target Current

26. If the XTX is a Low Voltage probe the information on the XEM Target window is correct.

- There are 6 x Power Levels.
- Power levels increase with increasing Amps.

27. If the XTX is a high voltage probe proceed to step 10.

Power Level 1	0.100 Amps
Power Level 2	0.300 Amps
Power Level 3	1.000 Amps
Power Level 4	2.000 Amps
Power Level 5	3.500 Amps
Power Level 6	5.000 Amps

Figure 22 Power levels low voltage probe

28. Select the initial value to be used on the job, this value will be provided by the District Engineer after reviewing the signal strength model for the job.

29. Click "ok"



- 30. If the XTX is a High Voltage probe the information on XEM Target window is not correct.
- There are 4 x Power Levels.
- The Actual Ampere settings for the Power levels are given in the table below.

Power Level 1	0.500 Amps (Low Voltage)
Power Level 2	0.100 Amps (High Voltage)
Power Level 3	0.400 Amps (High Voltage)
Power Level 4	No Transmit (Power Off)

Figure 23 Power level High Voltage probe

On the XEM Target window

- Power Level 1 corresponds to 0.1 Amps.
- Power Level 2 corresponds to 0.3 Amps.
- Power Level 3 corresponds to 1.0 Amps.
- Power Level 4 corresponds to 2.0 Amps.

XEM Target Current	×
Select Amps	
0.1 Power level 1	
0.3	
O 1.0	
C 2.0 Power level 4	
C 3.5	
C 5.0	
ок	

Figure 24 XEM target Current

31. For testing the HV tool on surface select Power Level-1.



32. Click OK.

- 33. It will take a few minutes to download all the configurations into the different nodes.
- 34. If the download was successful the XConnect Download Window will show:
- The total number of configurations.
- The current configuration file used by the tool.

35. Click on "Next":

X	Connect Download	×
	download BMGR_A download Dynamx	_
	# 6 Summary: # tools downloaded = 7, # tools in file = 11	
	Setting total number of configurations to 6.	
	Setting current configuration to file # 1.	
	Resetting and scanning nodes for status.	
	Download is done. IIPlease remember to erase all flash (T	elemetry, B
	RTC set for Telemetry.	
	RTC set for Battery A.	
	RTC set for DynamX.	-
		Next

Figure 25 Successful configuration download



- 36. The "Download is Done" a confirmation message will appear.
- 37. Click "Done" to return to the XConnect main window.

X	Connect Download
	# 6 Summary: # tools downloaded = 7, # tools in file = 11
	Setting total number of configurations to 6.
	Setting current configuration to file # 1.
	Resetting and scanning nodes for status.
	Download is done. IIPlease remember to erase all flash (Telemetry, B
	RTC set for Telemetry.
	RTC set for Battery A.
	RTC set for DynamX. Target Current: 0.1 Amps, Power Level 1
	Done

Figure 26 Configuration file Download Complete



- 38. After downloading the configuration file "cfg: 1 of 6" will appear beside each node on the XConnect window.
- 39. This indicates Configuration 1(the first file is in use) and there are 6 Configurations downloaded in to the tool.
- 40. Up to 8 configuration files can be downloaded.

ve wretnee ngineening	watar lie totariuaruD atari	ie. v roxul			LUau
lodes	Software Version, Co	nfig #		[System Override
Telemetry	SV: 0.1.9.27	Cfg: 1 of 6	Download	l Config	C XPulse
Flow Switch	SV: 0.1.3.6	Cfg: 1 of 6	XEM Target Current:	0.1 Amps, Pwr Lvl 1	○ XEM
DPG	SV: 0.0.7.1	Cfg: 1 of 6	Flow Status:		[
D and I	SV: 0.0.2.31	Cfg: 1 of 6	On	0ff	Refresh
Ganna	SV: 0.0.1.5	Cfg: 1 of 6			
BugrA	sv: 0.0.3.18	Cfg: 1 of 6	Rotation	[Chabury
BngrB			On	0ff	oratus:
BngrC			Advanced		
XHOP			Suspend Deepsleep	Reset All	Advanced
DynamX	SV: 0.0.1.10	Cfg: 1 of 6			
ClassD		SV: 0.0.8.29	Config Downlink	Config #:	
			Set		Exit

Figure 27 XConnect Configurations in the probes



2.6. SUSPEND DEEP SLEEP

The Deep sleep utility is provided in the tool to conserve battery by switching off at preset Inclination and temperature values. If configuration files are included that are designed for Deep Sleep, they are IDLE configurations and will have IDLE in the name, if so Deep Sleep has to be suspended in order to test the tool.

41. Click on the "Suspend Deep Sleep button".

a ware neurigineering	ter avail vie to tan adal alera (all lile, v	i unul			
lodes	Software Version, Config	*		[System Override
Telemetry	SV: 0.1.9.27 C	fg: 1 of 6	Download	l Config	C XPulse
Flow Switch	SV: 0.1.3.6 Cf	g: 1 of 6	XEM Target Current:	0.1 Amps, Pwr Lvl 1	○ XEM
DPG	SV: 0.0.7.1 Cf	g: 1 of 6	Flow Status:		[
D and I	SV: 0.0.2.31 C:	fg: 1 of 6	Ûn	Off	Refresh
Ganna	SV: 0.0.1.5 Cf	g: 1 of 6			
BagrA	s⊽: 0.0.3.18 C	fg: 1 of 6	Rotation	1	Statue
BagrB			On	0ff	510044
BagrC			Advanced ,		
XHOP			Suspend Deepsleep	Reset All	Advanced
DynamX	SV: 0.0.1.10 C	fg: 1 of 6			
ClassD	SV	: 0.0.8.29	Config Downlink	Config #:	
			Set		Exit

Figure 28 Suspend Deep Sleep



The Suspend Deep Sleep window will appear:

42. Set the time to 59:00 min

Suspend Deep Sleep	11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	×
Setting Intervals		
59:00	mm:ss	Set
		Get
Query Result		
Directional	mm:ss	Clear
Telemetry	mm:ss	
Bmgr A	mm:ss	Done
Bmgr B	mm:ss	
Bmgr C	mm:ss	

Figure 29 Set Deep Sleep Time 1/2

43. Click 'Set'.

44. Click 'Done'.

Suspend Deep S	leep		100.00	X
Setting Interv	als			Set
59:00		*	mm:ss	
				Get
Query Result				
Directional	59:00		mm:ss	Clear
Telemetry	59:00		mm:ss	
Bmgr A	59:00		mm:ss	Done
Bmgr B			mm:ss	
Bmgr C			mm:ss	

Figure 30 Suspend Deep Sleep 2/2

This will allow you to perform tests without the tool switching OFF.



a o programmig

3. FIRMWARE UPGRADE

This section is **ONLY** needed if.

- You have had issues downloading the configuration file.
- There is a requirement to upgrade the firmware version in your tool. The firmware is referred to as the **software version** beside the node name on the X Connect main window.

Proceed to Section 4 if an upgrade is not required.

To upgrade the firmware:

- Click on the "Upgrade V9 to V10" shortcut. If you need to upgrade the tool firmware from Version 9 to Version10.
- 2. If the probes have Version 8, they will first have to be upgraded to Version 9.



Figure 31 Upgrade to V-10



- 3. Ensure none of the node is in the Boot loader Mode, The Boot loader is a software application used to update the software versions in the probes.
- 4. If any of the nodes is in the Boot loader mode then close it right away.
- 5. Click "Ok".

Results - Stri	ig/Probe To V10		X
	Start: 17:54:07 E	ind:	
Line #	Pass/Fail Message/Errors/Subheader	Interval	Value
34	******* Software Versions Section *******		
41	XBootloader SW revision		3.0.1
45	XConnect SW revision		3.3.€
49	Flash2CSV SW revision		2.3.2
ХВОТ	AN ALL ADDRESS OF ALL		×)
	lease make sure no tool is in Bootloader Mode. If any pleas or update to normal.	se remove it	
		ОК	

Figure 32 Boot Loader

- 6. The Boot loader will go through this process of updating the firmware for every node that needs to be updated.
- 7. Answer "YES" to the prompts as they appear.



🔳 Re	esults - Stri	ing/Probe To \	/10					×
				Start:	17:54:07	End	:	
	Line #	Pass/Fail	Message/Errors/Subhea	der			Interval	Vali
	34		******* Software Vers	ions Sec	tion *******			
	41		XBootloader SW revision	n				3.0
	45		XConnect SW revision					3.3
	49		Flash2CSV SW revision					2.3
	(P)	The Firmware update?	e on the DynamX node	is not u	p to date. Do	you	want to	
l					Yes]	No	
			m					,

Figure 33 Prompt to Update DynamX window

8. The Status window will provide updates for each node.

	Don	е
Programming Status for DYNAMX		
In bootloader mode. Start erasing Erased flash successfully. Start programming Programmed flash successfully. Start verifying Verifying by blocks		





× Bootloader			_ _ X
PROGRAM		REFRESH	
	Node Selected: I	DYNAMX	
	Battery A	Rev: 0.0.3.17	^
	Class D Amp	Rev: 0.0.8.22	
VERIFY	D and I	Rev: 0.0.2.31	
	DPG	Rev: 0.0.7.1	=
	DYNAMX	Rev: 0.0.1.6	
	Flow Switch	Rev: 0.1.3.6	
	Gamma	Rev: 0.0.1.5	
Done	Telemetry	Rev: 0.1.9.13	.
	,		

Figure 35 DYNAMX node updated

9. Once the Boot-loader is finished the script will verify that the probes have the firmware that is compatible with Version 10.

Line # Pass/Fail Me 356 WARNING Dyn 374 PASSED Loa 385 PASSED Up 396 XHi 458 WARNING Cla 477 PASSED Loa 489 PASSED Up	Start: 17:54:07 End: 18:34:31 essage/Errors/Subheader Interval mamX Firmware version ad 38FIRM0014-0.0.1.10 DynamX App.hex Success vidated DynamX Firmware version Success Success IOP node not found assD Firmware version Success ad 38FIRM0011-0.0.8.29 Class D.hex Success
Line # Pass/Fail Me 356 WARNING Dyn 374 PASSED Loz 385 PASSED Up 396 XHi 458 WARNING Cla 477 PASSED Loz 489 PASSED Up 536 WARNING Cla	essage/Errors/Subheader Interval mamX Firmware version ad 38FIRM0014-0.0.1.10 DynamX App.hex Success adated DynamX Firmware version IOP node not found assD Firmware version ad 38FIRM0011-0.0.8.29 Class D.hex Success
356 WARNING Dyn 374 PASSED Loz 385 PASSED Up 396 XH 458 WARNING Cla 477 PASSED Loz 489 PASSED Loz 489 PASSED Up	namX Firmware version ad 38FIRM0014-0.0.1.10 DynamX App.hex Success odated DynamX Firmware version IOP node not found assD Firmware version ad 38FIRM0011-0.0.8.29 Class D.hex Success
374 PASSED Loa 385 PASSED Up 396 XH 458 WARNING Cla 477 PASSED Loa 489 PASSED Up 536 WARNING VP	ad 38FIRM0014-0.0.1.10 DynamX App.hex Success adated DynamX Firmware version IOP node not found assD Firmware version ad 38FIRM0011-0.0.8.29 Class D.hex Success
385 PASSED Up 396 XH 458 WARNING Cla 477 PASSED Loz 489 PASSED Up 536 WARNING XH	dated DynamX Firmware version IOP node not found assD Firmware version ad 38FIRM0011-0.0.8.29 Class D.hex Success
396 XH 458 WARNING Cla 477 PASSED Loz 489 PASSED Up 536 WARNING XH	IOP node not found assD Firmware version ad 38FIRM0011-0.0.8.29 Class D.hex Success
458 WARNING Cla 477 PASSED Loa 489 PASSED Up	assD Firmware version ad 38FIRM0011-0.0.8.29 Class D.hex Success
477 PASSED Loa 489 PASSED Up	ad 38FIRM0011-0.0.8.29 Class D.hex Success
489 PASSED Up	
536 WADNING VE	dated ClassD Firmware version
JJO WARNING ALI	M Telemetry Firmware version
555 PASSED Loa	ad 38FIRM0005-0.1.9.27_xem_telemetry Success
566 PASSED Up	dated XEM Telemetry Firmware version
679 WARNING Bat	ttery A Firmware version
705 PASSED Loa	ad 38FIRM0004-0.0.3.18-Bmgr Firmware Success
712 PASSED Up	dated Battery A Firmware version
722 Bat	ttery B node not found.
772 Bat	ttery C node not found.
831 PASSED **	**** Overall Script PASS *****
•	III

Figure 36 Firmware Updated Successfully



10. A PDF file will automatically be generated with the details of the upgrade.

Job #: --UUT: String/Probe UUT Serial #: Personality Serial #: NA Main Board Serial #: NA Work Order #: Date-Time: Fri, Mar 08, 2013 @ 18:34:31 User Name: Test Script Revision: 2013.01.16 Software Version: 1.0.1.5 Overall Result: PASS

TEST RESULTS

******* Software Versions Section *******			
XBootloader SW revision	3.0.14.0		
XConnect SW revision	3.3.6.3		
Flash2CSV SW revision	2.3.22.11		
XEM-RX SW revision	4.1.22.15		
MP-RX SW revision	4.1.11.18		
	4.1.11.10		
******* Upgrade Firmware Section	*****		

PASSED	XBUS APS D&I Firmware version		0.0.2.31
PASSED	Gamma Firmware version		0.0.1.5
PASSED	DPG Firmware version		0.0.7.1
PASSED	Flow Switch Firmware version		0.1.3.6
WARNING	DynamX Firmware version		0.0.1.6
PASSED	Load 38FIRM0014-0.0.1.10 DynamX App.hex	Success	
PASSED	Updated DynamX Firmware version		0.0.1.10
	XHOP node not found		
WARNING	ClassD Firmware version		0.0.8.22
PASSED	Load 38FIRM0011-0.0.8.29_Class_D.hex	Success	
PASSED	Updated ClassD Firmware version		0.0.8.29
WARNING	XEM Telemetry Firmware version		0.1.9.13
PASSED	Load 38FIRM0005-0.1.9.27_xem_telemetry	Success	

Figure 37 PDF report

11. Save the "PDF Report".


4. ERASE FLASH

- 1. The Flash Memory needs to be erased prior to the job to make space for New Data that will be recorded during the job. This does not erase the Configuration file for the job which is stored separately in the memory.
- 2. On the XConnect Window click on the "Telemetry Node".

XConnect_3.3.6-r6 -	XEM System		
Data File	\DataFile\StandardDataFile V10xdf		Load
10. 2			
Nodes	Software Version, Config #		System Override
Telemetry	SV: 0.1.9.27 Cfg: 1 of 6	Download Config	C XPulse
Flow Switch	SV: 0.1.3.6 Cfg: 1 of 6	XEM Target Current: 0.1 Amps, Pwr L	√1 © XEM
DPG	SV: 0.0.7.1 Cfg: 1 of 6	Flow Status:	
D and I	SV: 0.0.2.31 Cfg: 1 of 6	0n Off	Refresh
Ganna	SV: 0.0.1.5 Cfg: 1 of 6		
BugrA	sv: 0.0.3.18 Cfg: 1 of 6	Rotation	1
BngrB		0n Off	Status:
BngrC		Advanced	
XHOP	,	Suspend Deepsleep Reset Al	L1 Advanced
DynamX	SV: 0.0.1.10 Cfg: 1 of 6		
ClassD	SV: 0.0.8.29	Config Downlink Config #:	
		Set	Exit
lu .			

Figure 38 Telemetry Node



3. On the Telemetry window click on the "Flash" Button.

Telemetry								
Get All								
Once	Stop Upd	lating	Time Span(s): 2			Close	
Reset	VCOM		Flash		RTC		Advanced Options	
Data	Name(Units)	Value		1		Get		Set
	# Bits sent ()	199531		1	Get			
	#Events()	1.0000	0	<u> </u>	Get			
	# Timers ()	10.00			Get			
	#Timers ()	-0.0000	0	l l	Get			
AHrs_R	emain (AHrs)	29.72		Ī	Get			
Ba	att Current (A)	0.00			Get			
Bus	s_Voltage (V)	14.30		Ē	Get			
Conf	ig_Number()				Get			
Ga	ammaComp ()	00,00	, 95 , 77		Get	_		
Idle	Temp Flag ()				Get			
Ma	ax#Events()	14.000	00		Get			
м	ax# Timers ()	19.000	00		Get			
	RTC ()				Get			
S	afety_Error ()	OFF			Get			
	Telem Flow ()				Get			
Tele	emetry Error ()				Get			
Tempe	rature (degC)				Get			
XTX	TC_Level ()				Get		Set	
×	eos time (ms)				Get			

Figure 39 Flash Button



- 4. The Flash Window will appear showing the Memory size.
- 5. The Memory size depends on the data stored.
- 6. Click on "Erase".

Telemetry Flash
Memory Size : 1.5 MB
Actual Bytes : 1,569,739
Options
Upload
Progress
Upload progress
Done

Figure 40 Telemetry Flash

7. Click "Yes" to erase the flash?



Figure 41 Erase flash



- 8. The Message "Flash is now erased" will appear.
- 9. Click "OK".



Figure 42 Flash is erased

- 10. The Telemetry Flash Memory appears indicating size is now Zero.
- 11. Click "Done" to return to the XConnect Main screen.

Telemetry Flash	— X
Memory S	ize : Zero
Actual By	tes : Zero
Options	
Upload	Erase
Progress	
Upload progress	
	Done

Figure 43 Zero Memory Size

- 12. Click "Done" to return to the Telemetry window
- 13. Click "Close" to return to the XConnect main window.



14. Erase the flash for the following nodes using the procedure described above.

- a. Telemetry
- b. Bmgr A, Bmgr B & Bmgr C

In the XConnect snapshot below only Bmgr A is connected.

c. DynamX (if available)

You will have to click on each node on XConnect to access the flash.

The Gamma and directional information is stored in the Telemetry.

XEonnect_3.3.6-r6 - X	KEM System			×
	DataFile\StandardDataFile.V10xdf			Load
Nodes	Software Version, Config #			System Override
Telemetry	SV: 0.1.9.27 Cfg: 1 of 6	Download	d Config	C XPulse
Flow Switch	SV: 0.1.3.6 Cfg: 1 of 6	XEM Target Current:	0.1 Amps, Pwr Lvl 1	
DPG	SV: 0.0.7.1 Cfg: 1 of 6	Flow Status:		
D and I	SV: 0.0.2.31 Cfg: 1 of 6	On	OFF	Refresh
Ganna	SV: 0.0.1.5 Cfg: 1 of 6			
BugrA	sv: 0.0.3.18 Cfg: 1 of 6	Rotation	[[
BagrB		On	011	Status:
BmgrC		Advanced		
XHOP		Suspend Deepsleep	Reset All	Advanced
DynamX	SV: 0.0.1.10 Cfg: 1 of 6			
ClassD	\$₹: 0.0.8.29	Config Downlink	Config #:	
		Set		Exit
Ready				

Figure 44 XConnect window showing Nodes with flash



5. MONITORING WITH XCONNECT

This section is required only if you intend to confirm the functionality of the probes using XConnect.

Probe functionality can also be confirmed using the information in the High side in (SECTION 6) of this chapter and an automatic online script utility.

XConnect_3.3.6-r6	i - XEM System				_ 🗆 🗵
Data File					
C:\ExtremeEngineeri	ng\DataFile\StandardDataFile.V10xdf				Load
Nodes	Software Version, Config #	. F			System Override
Telemetry	SV: 0.1.9.27 Cfg: 1 of 6	А	Downloa	d Config	C XPulse
Flow Switch	SV: 0.1.3.6 Cfg: 1 of 6	В	EM Target Current:	0.1 Amps, Pwr Lvl 1	I ×EM
DPG	SV: 0.0.7.1 Cfg: 1 of 6	С	ow tatus:		
D and I	SV: 0.0.2.31 Cfg: 1 of (D	On	0ff	Refresh
Ganna	SV: 0.0.1.5 Cfg: 1 of 6	E			
BugrA	sv: 0.0.3.18 Cfg: 1 of 6	F	otation		Status:
BugrB			0n	0ff	
BmgrC			dvanced		
XHOP			Suspend Deepsleep	Reset All	Advanced
DynamX	SV: 0.0.1.10 Cfg: 1 of 6				
ClassD	SV: 0.0.8.29		Config Downlink	Config #:	
			Set		Exit
Ready					

Figure 45 X Connect Window Node showing Nodes that are Monitored



5.1. MONITORING TELEMETRY

15. Click on the Telemetry node on XConnect.

- The Bus voltage should be approximately 14V with new batteries but should not be less than 8.5V even with old batteries.
- The Temperature should read the ambient temperature. (25DegC in the figure below).
- The RTC clock time and should match the time on the XRT, Computer task bar at the bottom right corner.
- Click on continuous.

Telemetry			×
Get All			
Once Continu	Jous Time Span(s): 2		Close
Reset VCOM	Flash	RTC	Advanced Options
Data Name(Units)	Value	Get	Set
# Bits sent ()	0	Get	
# Events ()	1.00000	Get	
# Timers ()	10.00	Get	
#Timers ()	0.00000	Get	
AHrs_Remain (AHrs)	0.00	Get	
Batt Current (A)	0.00	Get	
Bus_Voltage (V)	14.40	Get	
Config_Number ()	00,00,00,01	Get	
GammaComp ()	00,00,00,00	Get	
Idle Temp Flag ()	OFF	Get	
Max# Events ()	4.00000	Get	
Max# Timers ()	18.00000	Get	
RTC ()	10:39:12 10 Jul-2013	Get	
Safety_Error ()	OFF	Get	
Telem Flow ()	OFF	Get	
Telemetry Error ()	85,01,00,00	Get	
Temperature (degC)	25.0	Get	
XTX_TC_Level ()	00,00,00,01	Get	Set
Xeos time (ms)	163000	Get	

Figure 46 XConnect Telemetry Window



16. The # of Bits sent should keep increasing indicating communication through the telemetry node.

Telemetry			>
Get All			
Once Stop Up	dating Time Span(s): 2		Close
Reset VCDM	Flash	RTC	Advanced Options
Data Name(Unite)	Value	L Get	اليوع الم
# Bits sent ()	199531	Get	
# Events ()	1.00000	Get	
# Timers ()	10.00	Get	
#Timers ()	-0.00000	Get	
AHrs_Remain (AHrs)	29.72	Get	
Batt Current (A)	0.00	Get	
Bus_Voltage (V)	14.30	Get	
Config_Number ()		Get	
GammaComp ()	00,00,95,77	Get	
Idle Temp Flag ()		Get	
Max# Events ()	14.00000	Get	
Max# Timers ()	19.00000	Get	
RTC()		Get	
Safety_Error ()	OFF	Get	
Telem Flow ()		Get	
Telemetry Error ()		Get	
Temperature (degC)		Get	
XTX_TC_Level ()		Get	Set
Xeos time (ms)		Get	

Figure 47 XConnect Telemetry Window



5.2. MONITORING FLOW SWITCH

17. On XConnect click on the "Flow switch" node.

Click on "Continuous".

- The Flow Status should be OFF unless Pressure is applied or a safety Bypass is applied or has been turned on ON the X Connect window.
- Click on "Get" beside "Downlink Status" to see the Number of times you have downlinked). This is not necessary now but may be required while monitoring the tool after the Run.
- Click on "Close" to exit the Window.

Once	Continu	Jous	Time Span(s)	2	Close
Reset	VCOM		Flash	RTC	Advanced Options
Data	Name(Units)	Value		6	et S
	(Vm) xA	9.7752		Get	
	Ay (mV)	29.3256		Get	
Down	ink Status (#)	00,00,0	00,05	Get	Set
	Flow Status []	off		Get	
Flow Sv	Error (Code)			Get	

Figure 48 flow Switch Window





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5.3. MONITORING DPG

18. On the XConnect window, Click on the "DPG" node.

Click on "Continuous".

 Monitor the Annular/ Bore pressure. This should be from 0-30psi. If 100 psi Pressure is applied on the Bore pressure sensor with a Hand Pump latter in the test, the pressure should be within 85-115psi.

It is important for the Bore or Annular pressure sensor to be working as this is a safety prerequisite for the Tool to Work.

- Monitor the Annular/ Bore Temperature: This should be reading the ambient temperature.
- Click on "Close" to Exit the Window.

et All Once	Continu	ious Time Span(s)	2	Close
Reset	VCOM	Flash	RTC	Advanced Options
Data	Name(Units)	Value	Get	
Annular	Pressur (psi)	14.00	Get	
Annular T	emp (Deg C)	20.30	Get)
Bore F	ressure (psi)	148.00	Get)
Bore T	emp (Dea C)	20.300	Get	
DPG	Error (Code)	90,03,00,F0	Get)
Differ	ential Pr (psi)	133.00	Get	
Downli	nk Status (#)	00,00,00,05	Get	Set
EDT H	lours (Hours)	0	Get	
Flo	w (ON/OFF)	ON	Get)
Flow H	lours (Hours)	702	Get	
lo	le (ON/OFF)	OFF	Get	1
Run H	lours (Hours)	1524	Get	

Figure 49 DPG Window



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5.4. MONITORING D&I

19. On XConnect click on the "D&I" node.

Click on "Continuous".

The Raw Survey Sensor values can be monitored on this window.

The Raw Sensors are the 3 x accelerometers: Ax, Ay & Az and 3 x Magnetometers Mx, My & Mz. The High Side Wizard can be run from this application.

Ay, Az, My & Mz will keep changing when the probe is rotated.

Ax and Mx will not change when the probe is rotated.

More explanation on running the High side wizard is given in Section 6.

and I					
iet Al		_			· · · · · · · · · · · · · · · · · · ·
Dince	Continu	ous	Time Span(s	s); 5	Close
Reset	VCOM	1	Flash	BTC	Highside
Data N	ame(Units)	Value		1	Get Set
	AX (g)	0.0038		Get	8:
	AY (g)	0.6208		Get	
	AZ (g)	-0.7817		Get	la contra c
Auto	o TF (Deg)	316.40		Get	
A	uto TF-F ()	Gravity		Get	
Azir	muth (Deg)	8.70		Get	
	Co AX (g)	0.00360		Get	
Cs Azir	muth (Deg)			Get	
Cs Inv	c Srf (Deg)		-	Get	
Cs Inclina	stion (Deg)	89.79		Get	
Cs M	(K (Gauss)	0.22478		Get	
D&I E	rror (Code)	91,00,	00,00	Get	2
	GTotal (g)	0.9982		Get	
Gravity	y TF (Deg)	316.40		Get	Si
	Identity ()	APS		Get	
Idle Angle Flag	(ON/OFF)	off		Get	8
Incline	ation (Deg)	89.80		Get	
MAG Dip A	ngle (Deg)	60.86		Get	in .
MTo	tal (Gauss)	0.4752		Get	
M	(K (Gauss)	0.2299	10	Get	
M	fY (Gauss)	0.2851		Get	
M	(Z (Gauss)	-0.3026		Get	
Magnetic	c TF (Deg)	131.60		Get	<u> </u>
Temperatu	re (Deg C)	20.5		Get	No. 1

Figure 50 D&I Window

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5.5. MONITORING GAMMA

20. On XConnect click on the Gamma Node.

- Monitor the raw counts detected by the probe (CPS). These should be Low counts typically within 0-15 CPS.
- Check the internal API correction to insure that it is not set to a default value (1.00). If it is, contact the Command center in order to obtain the correct factor value and have it programmed into the probe prior to going down hole.

Once	Continuous	Time Span(s):	11	Close
Reset	VCOM	Flash	RTC	Advanced Options
Data	Name(Units) Value		G	et S
C API	Correction () 0.200	>	Get	Set
Gamm	a CPS (CPS) 7.2	5	Get	
Gam	ma Count (#)		Get	
Gamma	Error (Code) 92.0	0,00,F0	Get	
Gar	nma Time (S)	annana 1	Get	



If there is a gamma ray blanket or thorium welding rod place it on the Gamma Sensor. The Gamma Probe is 54" Long.

The Gamma sensor is located at approximately 34" from the top of the Gamma ray probe. With the gamma source on top of the sensor the Gamma ray values will be much higher.



- 5.6. MONITORING BATTERY MANAGER
- 21. On XConnect click on the BmgrA node.

Monitor the values in the BmgrA window:

- Battery type : This will indicate if a Lithium or alkaline battery is in use.
- Bus voltage: This should be 14V for a new battery but greater than 8.5V.
- Each battery pack has 2 battery banks connected in parallel.
- Cell 1 voltage = Battery Bank 1 voltage should be close to the Bus voltage.
- Cell 2 voltage = Battery Bank 2 voltage should be close to the Bus voltage.

BmgrA			×
Get All			
Once Contin	uous Time Span(s): 0		Close
Reset	Flash	RTC	Options
Data Name(Units)	Value	Get	Set 🔺
Amp Hours (AH)	0.00	Get	
Amp Hrs Remain (AH)	50.00	Get	
Batt Current (A)	0.00000	Get	ĵ 🛛 🗍
Batt Hours (Hrs)	25553	Get)
Batt Voltage (V)	14.40	Get	
Battery Enabled (ON/OFF)	ON	Get	
Battery Type (Code)	LITHIUM	Get	
Bus Voltage (V)	14.20	Get	
Cell 1 Voltage (V)	14.30	Get	
Cell 2 Voltage (V)	14.40	Get	
EDT Hours (Hours)	0	Get	
Error Bank 1 (ON/OFF)	OFF	Get)
Error Bank 2 (ON/OFF)	OFF	Get)
Flow Hours (Hours)	535	Get)
Help Lock Mode (ON/OFF)	OFF	Get)
Help Mode (ON/OFF)	OFF	Get	
Manual Mode (ON/OFF)	OFF	Get)
Master (ON/OFF)	ON	Get	
Need Help (ON/OFF)	OFF	Get	•
	III		4

Figure 52 BmgrA



6. HIGH SIDE

The High side test allows testing the tool functionality on surface.

6.1. D&I NODE

- 1. The tool has to be referenced to the High Side so that tool faces values can be provided correctly.
- 2. On XConnect click on the "D&I" Node.

XConnect_3.3.6-r6 - X	KEM System			_
C:\ExtremeEngineering\	DataFile\StandardDataFile.V10xdf			Load
Nodes	Software Version, Config #			System Override
Telemetry	SV: 0.1.9.27 Cfg: 1 of 6	Download	i Config	C XPulse
Flow Switch	SV: 0.1.3.6 Cfg: 1 of 6	XEM Target Current:	0.1 Amps, Pwr Lvl 1	(≥ XEM
DPG	SV: 0.0.7.1 Cfg: 1 of 6	Flow Status:]
D and I	SV: 0.0.2.31 Cfg: 1 of 6	0n	011	Refresh
Ganna	SV: 0.0.1.5 Cfg: 1 of 6			
BugrA	sv: 0.0.3.18 Cfg: 1 of 6	Rotation		
BugrB		Ûn	0ff	Status:
BugrC		Advanced		
XHOP		Suspend Deepsleep	Reset All	Advanced
DynamX	SV: 0.0.1.10 Cfg: 1 of 6			
ClassD	SV: 0.0.8.29	Config Downlink	Config #:	
		Set		Exit
Ready				

Figure 53 X Connect D&I Node



6.2. HIGH SIDE

3. On the D&I Window, Click on the "High Side" button.

D and I			×
Get All			
Once Contin	uous Time Span(s): 5		Close
Reset VCOM	Rash	RTC	Highside
Data Name(Units)	Value	Get	Set ^
AX (g)		Get	
AY (g)		Get	
AZ (g)		Get	
Auto TF (Deg)		Get	
Auto TF-F ()		Get	
Azimuth (Deg)		Get	
Cs AX (g)	0.00000	Get	E
Cs Azimuth (Deg)		Get	
Cs Inc Srf (Deg)		Get	
Cs Inclination (Deg)	0.00	Get	
Cs MX (Gauss)	0.0000	Get	
D&I Error (Code)	91,00,00,00	Get	
GTotal (g)		Get	
Gravity TF (Deg)		Get	
Identity ()	APS	Get	
Idle Angle Flag (ON/OFF)	off	Get	
Inclination (Deg)		Get	
MAG Dip Angle (Deg)		Get	
< MTotal (Cause)		Get	•

Figure 54 High side

4. The D&I Advanced Options Window will appear.

D and I Advanced Option	ns	×
Tool Face Offset Settin	gs	
Current TF Offset:	248,40 deg	
Last Set Time:	14-Feb-2013 15:31:28	
Job Input	Get Wizard	
Ok		Done

Figure 105 D& I Advanced Options

5. Click On "Job Input".



6.3. JOB INFORMATION

6. The Configure Job information appears as below. The Records will appear Blank and need to be completed.

Configure Job Information			
Latitude [-90, 90]:	1	Box S/N:	
Longtitude [-180, 180]:		Directional S/N:	
Client:		LandingSub S/N:	
Rig:		Collar S/N:	
Run Number:		Extreme Job number examp	ole: TX-SLB-0001
Surface Kit S/N:		Extreme Job Number:	
Operator Name:		3rd Party Job Number:	
Location:			
User Name/Login Name:			
			OK Cancel

Figure 55 Configure Job Information blank

- 7. Enter the Job Information.
- The information related to the Equipment S/N (Serial Number) should be available in the Manifest Load out papers.
- The "Latitude" and "Longitude" information should be provided by the Directional Driller.



Configure Job Information			
Latitude [-90, 90]:	46.466667	Box S/N:	USA-KB-001
Longtitude [-180, 180]:	16.555555	Directional S/N:	D0155
Client:	Example	LandingSub S/N:	LSB0001
Rig:	Rig 4	Collar S/N:	NMDC00001
Run Number:	1	Extreme Job number exam	ple: TX-SLB-0001
Surface Kit S/N:	XTR 137, XRT 100	Extreme Job Number:	EXABC0001
Operator Name:	Operator	3rd Party Job Number:	EX. 1234
Location:	Local		
User Name/Login Name:	User		
			OK Cancel

Figure 56 Configure Job Information Complete

8. Click on "Ok" when the information is completed.

D and I Advanced Optio	ns	×
Tool Face Offset Settir	ngs	
Current TF Offset:	248.40 deg	
Last Set Time:	14-Feb-2013 15:31:28	
Job Input	Get Wizard	
Ok		Done



9. Click on "Wizard".



6.4. HIGH SIDE WIZARD (STEPS 1-10)

Follow the 10 STEP high side wizard procedures.

STEP 1

DO NOT CLICK ON START IN THE WIZARD BEFORE PLACING THE TOOL ON THE HIGH SIDE.

TF		deg	Start
ncl		deg	
Azim		deg	Cander
Mtot		gauss	
Gtot		g	
Toolface Offset Settings Current TF Offset Last Set Time Guide Thanks for us	deg ing highside wizard.		
Step 1: Please high side pos If you have no or enter the jo Click 'Start' to Click 'Cancel'	e prepare the tool, connect it to the p ition. t enter any input information, you car b information. establish '0' GTF, previous stored to any time to cancel current job.	ower supply, connect it to n go back to the previous olface offset and clock wi	PC, and power on. Set the tool i screen and click 'Input' to review ill be erased.

Figure 58 D&I Advanced options

- 10. Physically place the tool on High Side.
- 11. Locate the Landing Spider on the DPG Probe.



Figure 59 DPG Landing spider

12. Rotate the tool such that the Key Slot on the Landing spider is facing up.



Figure 60DPG Landing Spider with key slot up

THE KEY SLOT MUST FACE UP.

CONFIRM ALL CONNECTIONS ON THE TOOL STRING ARE TORQUED.



13. Place a Level on the Landing Spider in the DPG Probe to ensure that the XEM is horizontal.

14. Ensure the Key slot on the "Landing Spider" aligns with the key slot at the bottom of the Level.



Figure 61 Placing the Level on the spider

15. Make the Tool Level using the Bubble. The bubble should be between the Black lines on the Level.



Figure 62 Tool Level

16. Ensure the tool is locked by Barrel Wrenches and is not free to turn.





Figure 63 Landing Spider Key slot at high side

After confirming the tool is in High Side.

17. Click on START in the High Side Wizard Window.

lighside Wi	izard						×
Step	1: High	side the	tool.				
TF				de	∋g	Start	
Incl				de	eg		
Azim				de	eg	Cancel	
Mtot				ga	auss	_	
Gtot				g		_	
Toolface Current1 Last Se	Offset Settings TF Offset	3	deg				
Guide	Thanks for Step 1: Ple high side p If you have or enter the Click 'Start Click 'Cane	r using highsi position. e not enter an e job informa t' to establish cel' any time i	de wizard. the tool, connect r input information tion. '0' GTF, previour to cancel current	t it to the power su on, you can go bac s stored toolface o t job.	upply, connect it to ck to the previous offset and clock wi	PC, and power on. Set the t screen and click 'Input' to re Il be erased.	tool in wiew



This will establish the value of the Internal Correction used in the Tool throughout the Run. Private. Copyright © Extreme Engineering 2012. Unpublished Work. All rights reserved.



When prompted,

18. Click "Confirm" to confirm the value of the Tool face correction.

F	267.30	deg	Confirm
ncl	89.80	deg	_
Azim	166.30	deg	Cancel
Vitot	0.4530	gauss	_
Gtot	0.9992	g	_
Toolface Offset Setting	\$		
Current TF Offset	0.00 deg		
Last Set Time	11-Mar-2013 10:45:12		

Figure 65 Confirm"0" tool face

In the Example above 267° is the value of the Internal Tool Face Correction between the Directional Sensor and the Landing Spider key slot.

This value will be different each time the tool is assembled.

The G Total value should be within the range G reference +/- 0.0025.

The M Total value will be M reference +/- 0.003 Gauss; however it is difficult to get an accurately value due to Interference from Metallic Objects nearby.



The Value of the Tool Face from the tool should now be 0° .

19. Physically Rotate the Tool 90°.



Figure 66 Key slot at 90°

20. Click "Next".

TF	0.00	deg	Next
Incl	89.80	deg	
Azim	166.30	deg	Cancel
Mtot	0.4530	gauss	_
Gtot	0.9992	g	_
Toolface Offset Settin	gs		
Current TF Offset	267.30 deg		
Last Set Time	11-Mar-2013 10:46:37		

Figure 67 Roll at 90°

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You can rotate the tool Back and forth till the tool face value is between 87.5 and 92.5°.

Once you have the desired reading, wait for 3 seconds for the measurements to stabilize.

21. Click "Accept" when the Button is enabled.

Hi	ghside Wizard			×
	Step 4: Con	firm 90 TF.		
	TF	90.80	deg	Accept
	Incl	89.90	deg	Cancel
	Azim	165.80	deg	
	Mtot	0.4529	gauss	
	Gtot	0.9994	g	
	Toolface Offset Settin	igs		
	Current TF Offset	267.30 deg		
	Last Set Time	11-Mar-2013 10:46:37		
	Guide OK. We Step 4: 1 stabalize	are reading TF, please wait until the 'Accept' b You can roll the tool forth or backward until the ed for 3 seconds, click Accept.	utton is enabled. expected value shown o	n the screen. Wait the value

Figure 68 Accept 90° Tool face



22. Now Rotate the Tool such that the Key slot is physically pointing down and the Tool Face is 180°.



Figure 69 Key slot at 180°

23. Now Click "Next" on the High Side Wizard.

TF	90.70	deg	Next
ncl	89.90	deg	Cancel
Azim	165.90	deg	Cancer
Vitot	0.4528	gauss	_
Gtot	0.9997	g	_
Toolface Offset Settin	, gs		
Current TF Offset	267.30 deg		
Last Set Time	11-Mar-2013 10:46:37		

Figure 70 Roll Test at 180°

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The Tool Face should be between 177.5° and 182.5°.

24. Click "Accept".

TF	180.90 ^{deg}	Accept
Incl	90.00 ^{deg}	Ganad
Azim	166.00 ^{deg}	Cancer
Mtot	0.4512 ^{gau}	SS
Gtot	0.9998 ^g	
Toolface Offset Settin	gs	
Current TF Offset	267.30 deg	
Last Set Time	11-Mar-2013 10:46:37	

Figure 71 Accept Tool Face at 180°





25. Rotate the Key Slot to 270°



Figure 72 rotate the key slot to 270°

Highside Wizard Step 7: Roll to approximately 270 degree. TF 180.80 deg Next 90.00 deg Incl Cancel Azim 166.00 deg Mtot 0.4512 gauss Gtot 0.99989 Toolface Offset Settings Current TF Offset 267.30 deg 11-Mar-2013 10:46:37 Last Set Time Thanks! You have accepted 180 TF. Guide Step 7: Now roll the tool to approximately 270 degree, and click 'Next'.

26. Click Next

Figure 73 Roll to 270°

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The Tool face value should be between 267.5° and 272.5°

27. Click "Accept" to Confirm.

FF	270.40	deg	Accept
ncl	89.90	deg	
Azim	166.70	deg	Cancel
Mtot	0.4501	gauss	-
Gtot	0.9994	g 📕	
Toolface Offset Settin	y gs		
Current TF Offset	267.30 deg		
Last Set Time	11-Mar-2013 10:46:37		

Figure 74 Confirm 270 Tool face

STEP 9

F		
	270.40 ^{deg}	Next
Incl	89.90 ^{deg}	Canad
Azim	166.70 ^{deg}	Cancer
Mtot	0.4502 ^{gauss}	
Gtot	0.9994 ^g	
Toolface Offset Settings		
Current TF Offset 2	267.30 deg	
Last Set Time	11-Mar-2013 10:46:37	

Figure 75 Disconnect

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- 28. Click "Accept" to Confirm.
- 29. If the tool was programmed in test Mode , switch the Tool back to Operations Mode on the Surface TAB in XEM Rx

Gain Control			1		
Auto Gain	Manual Gain	Current Ga	in		
Auto Gain Mode	Manual Gain Mode	Auto Gai	in Mode		GET
	Total Gain	Gain	1 Gain 2	Gain 3	Gain 4
Bandpass Frequency			Carrier Frequency from	Configure	
Low Frequency 4.13	Hz		Carrier Frequence	cy 10.0	Hz
High Frequency 7.88	Hz		Cycles Per E	Bit 2	
GET	SET		Resend	to Surface Box	
Operation					
Pause Data	Resume Data		Test Mode	Оре	eration Mode
Transmit Status Transmitting	g		Working Mode: Oper	ation Mode	
Surface Box Voltages					
+12V Battery	Volts Get				
-12V Battery	Volts	_			
+5V Battery	Volts				

Figure 76 Surface Tab

30. IF the tool was programmed in test Mode, switch the Tool back to Operations Mode on the Surface TAB in the XEM Rx. The Green light on the XRT should go OFF.





Figure 77 XRT

31. Now Disconnect the HHROTC Adapter from the Bottom of the Tool String.



Figure 78 HHROTC at the bottom of the string

32. Remove the HHROTC Connector.



Figure 79 HHROTC being removed

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33. Attach the CAN terminator (If an XHOP will be used, it should be connected instead). The CAN Terminator is also known as the bulkhead.



Figure 80 CAN terminator attached

34. Torque the Can terminator to 350lb force using barrel wrenches as described in the tool preparation chapter.



Figure 81 Can terminator attached

- 35. The XEM tool String is now complete.
- The HHROTC connector can be removed and stored.
 The XConnect cables can be stored away.

Only the XEM Test box will be required.





Figure 82 HHROTC and XConnect cables removed

37. On XConnect a message will pop up indicating that the Bulkhead tightened is confirmed.



TF	270.40	deg	Confirm
Incl	89.90	deg	
Azim	166.70	deg	Cancel
Mtot	0.4502	gauss	_
Gtot	0.9994	g	-
Toolface Offset Settin	gs		
Current TF Offset	267.30 deg		
Last Set Time	11-Mar-2013 10:46:37		

Figure 83 High side wizard Step 10

Since the XConnect Cable is disconnected , you will no longer be able to use the XConnect to get data from the tool.

You have to detect the EM signal the tool transmits and decode them from Antennas(As you would on the Job).

You have to use the XEM Receiver program to get Surveys using the XEM RX program to complete the remaining test.



38. Remove the Programming Cables and store them, Only the XEM Test Box will be needed.



Figure 84 Programming Cables disconnected





Figure 85 Store away all cables; Only the XEM tester will be required

6.5. AIR PUMP

The tool has an in built safety feature and needs to see Pressure >100psi on the Internal or Annular Pressure Port to turn ON.

You will need to apply Pressure using an Air Pump provided in the Kit box to apply pressure.

39. You will need the following equipment

- Pressure Pump
- C- Clamp
- Allen Key
- Soft tip Screw





Figure 86 Equipment to apply pressure on the DPG port

40. Identify the Internal Pressure port on the DPG Probe.




Figure 87 Internal Pressure port on DPG probe

41. Place the Soft Tip Screw on the Internal pressure Port.



Figure 88 Soft tip Screw on the pressure port

42. Attach an Allen Key to the rotate the Screw Anti-Clockwise. This will remove the Peek Insert. Private. Copyright © Extreme Engineering 2012. Unpublished Work. All rights reserved.





Figure 89 Allen key rotated anticlockwise

43. Once the Peek Insert is free and starts to rotate pull the Peek Insert.



Figure 90 Peek insert being removed





Figure 91 Remove peek insert

44. Leave the Insert on the Screw and keep in a safe place



Figure 92 Peek Insert and Soft Tip Screw



45. Attach the Air Pump "Adapter" to the pressure port; Ensure the O-Ring on the tip of the adaptor is in good condition. Lubricate the O-Ring with DC 111.



Figure 93 Air Pump adaptor attached to pressure port



Figure 94 Air pump adaptor attached to port



46. Install the C-Clamp around the Neck area below Spider and the Air pump adaptor.



Figure 95 C-Clamp installation-1



Figure 96 C-Clamp installation-II

47. Tighten the C Clamp with the Screw





Figure 97 Screw tightened

48. The Screw on the C-Clamp needs to be tightened all the way to ensure that the Adaptor/fitting from the Air pump is firmly attached to the DPG probe.

This is important as you will be applying pressure with the Air-Pump.



At this Stage you have connected the Air Pump to the DPG Probe; the setup should appear as the Figure below.



Figure 98 Air pump firmly attached to the DPG probe



6.6. CONNECTING THE XEM RX WITH THE TOOL

You now have to connect the XEM RX (Receiver) to the Tool to complete the High Side tests. This includes the following equipment.

- 2 x Alligator clamps
- 2 x Testing Cables 22CABL0063
- XEM System Tester



Figure 99 Equipment for Surface test with XEM-RX

 $\label{eq:private} Private. \ Copyright @ Extreme Engineering 2012. \ Unpublished Work. \ All \ rights \ reserved.$



49. Connect the 2 x Alligator Cables to the "TO SPIDERS" ports on XEM Test Box. They just need to be inserted. The cables can be interchanged and placed on any of the ports.



Figure 100 Alligator cables connected to the XEM Test Box

- 50. Place 1 x Alligator Clamp on the Spear Point above the Landing Spider.
- 51. Place 1 x Alligator Clamp on the Air Pump Adaptor.



Figure 101 Alligator clamps connected to the test box and probe Private. Copyright © Extreme Engineering 2012. Unpublished Work. All rights reserved.



52. Connect the Male end of the 2 x Test Cables 22CABL0063 to the ANT & BOP ports on the XTR.



Figure 102 test cables connected to the ANT /BOP ports



53. Connect the other ends of the Test Cables 22CABL0063 to the XEM System tester.

Figure 103 Test cables connected





Figure 104 Surface Test Setup Complete Including XTR, Test Cables, XEM System Test Box, and Alligator Clamps connected to the DPG Probe



6.7. ATTACHING THE VIBRATOR

A Survey is taken when the Rig Pumps are switched OFF. The Tool has a "Vibration Sensor" which senses a drop in Vibration when the Flow is switched OFF.

In order for the Tool to take a Survey to complete the High Side tests, you need to attach a Vibrator to the Tool.

54. Attach the Vibrator on the rubber Centralizer below the DPG probe. Use an Allen key to attach the vibrator clamp on to the probe.



Figure 105 Vibrator Attached to Tool

55. Connect the Vibrator to the AC supply.



Figure 106 Vibrator connected with Power Supply



6.8. XEM RECEIVER TESTING

56. Ensure the Tool is secured with Barrel Wrenches to prevent the Tool from rotating.

Place the 2 x Barrel Wrenches on Wooden Blocks: This is important otherwise Current will flow from the Tool to the Ground. This is dangerous for the tool.

57. Ensure the Vibrator is ON.



Figure 107 Tool Secured with Barrel Wrenches

58. Monitor the Pressure Gauge on the Air Pump. It should read the Atmosphere pressure (14 psi).



Figure 108 Air Pump Pressure Gauge reading Atmospheric Pressure



59. Confirm the Tool is on the High Side (Key slot pointing Up).



Figure 109 Probe at High side

REMEMBER: You are about to disable the safety interlock by applying pressure. Do not touch the 2 sides of the Landing spider at the same time. You could get an electrical shock.

Exercise caution if it is raining or the tool is wet; there is a risk of getting a shock.



Figure 110 Shock Hazard



60. Confirm the Tool is On High side with a Tool level.



Figure 111 Level to check the High Side

61. Review the Set-Up



Figure 112 Tool Setup for XEM Receiver



62. Apply Pressure from the Air Pump. This should be > 100psi but < 150psi. Additional pressure will not damage the Probe but could create safety problems.



Figure 113 Pressure Gauge

63. Stop the vibrator to simulate a Survey.



64. The XEM Receiver should be Open. Otherwise launch it from the Start Menu or the short cut on the desktop using instructions in Section 1 of this chapter.

65. Click on the Capture Tab on XEM RX.

66. Watch the Survey information populate on the screen. Tool face data will also populate.

Enable Editing (Warning: Turn off	unless editing.)	Troubleshoot	True North - Nag Dec: 0.0 Dill Offset: 0.0 General Factor 1.0 -15 15
D&I: Inclination	D&I: Azimuth	D&I: GTotal	Genma Offset 00 -30 30 45
89.88 Deg	165.78 Deg	0.9992 g	
11:47:08 2013-Mar-11	11:47:11 2013-Mar-11	11:47:14 2013-Mar-11	$1 7 / X \rightarrow X \times $
D&I: MTotal	DPG: Annular Pressur	D&I: MAG Dip Angle	-75
0.4516 Gauss	7.96 psi	H 55.55 Deg	(L) -90 (I
11:47:15 2013-Mar-11			105
Telemetry: Config File#	D&I: Auto TF-F	D&I: Auto TF	
1#	Gravity	0.00 Deg	A -120 120
	11:47:35 2013-Mar-11	12:09:58 2013-Mar-11	-135 135
Gamma: Gamma CPS	Telemetry: Motor Voltage	Telemetry: Motor Current	-165 180 165
5.78 CPS	В		WITS Data
12:09:57 2013-Mar-11	0		Bit Depth(t) ROP(t/h) Pump Press (PSI)
ClassD: Meas. Load Cur.	ClassD: Scale Current	ClassD: Classdtar curr	Hole Depth(t) TPO (GPM) Torque (KFLB)
0.000 A	81.25 %	C 1.016 A	D Toolface Logging
12:09:33 2013-Mar-11	12:09:43 2013-Mar-11		Total Gain = 1 * 10 * 5 * 5 = 250
elemetry: Amp Hrs Remain	Telemetry: Batt Voltage	felemetry: Trans Pow Leve	
	= 13 75 Volt	F 3#	G TV - CA DIAMETER DIAMETER ADDRESS - ADDRES
15.63 AH	L 15.75 VUIL		

Figure 114 Capture Screen

Explanation on how to configure the capture screen is given in Chapter-8. If you need to monitor the values:

A. The Tool face should be 0°.

This will also appear in the rose Bud below





Figure 115 tool face =0

(An explanation of the other directional parameters is given in more detail in step #68 below).

- B. The Gamma counts should be low values unless there is a gamma ray source.
- C. The Scale Current will be a high value close to 80% (Transmission media is air).
- D. Class D target Current should be equal to the initial target current in the configuration file.
- E. The Telemetry Amp hours should be 15 A with a New Alkaline battery and 50 A with a New Lithium battery
- F. The Telemetry Battery Voltage should be close to 14V with a new battery
- G. Telemetry Power level should be as selected in the configuration file.
- H. The Annular pressure should be from 0-30 psi
- I. Telemetry Configuration file should be 1# (First configuration used).
- J. The total Gain should be a small number 500 indicating a strong signal from the tool.



6.9. HIGH SIDE WIZARD (STEPS 11-12)

- 67. Return to the High Side Wizard on XConnect (Only software)
- 68. Confirm that a Survey was taken and the tool face was = 0° (Using the receiver program above)

STEP 11

69. Click Next.

TF	270.40	deg	Next
Incl	89.90	deg	
Azim	166.70	deg	Cancel
Mtot	0.4502	gauss	
Gtot	0.9994	g	
Toolface Offset Settin	gs		
Current TF Offset	267.30 deg		
Last Set Time	11-Mar-2013 10:46:37		

Figure 116 Generate Survey Report

70. The following Highside test report will be generated.





# Toolface offse # Extreme Engi	et: generated by H neering (c) 2011,	IS Wizard 2012					
Client, Rig, Job Number, Run Number, Surface kit S/N, Operator Name Location, Box S/N, Directional S/N, LandingSub S/I Collar S/N,	Example, Rig 4 , EX - ABC 1, XTR137, 3 Operator, Local, USA-KB-0 DO155, N, LSB0001, NMDC000	- 0001. KRT100. 101.					
TF Zero Confirm	ned, OK,	10:46:51 11	-Mar-2013, 267.3				
Raw Roll Surve	y Results		E	F	G	Н	
#time,	Ref (deg),	GTF (deg),	Incl (deg),	Azim (deg),	Mtotal (gauss)	, Gtotal (g),	
10:46:51,	N/A	267.3,	89.8,	166.3,	0.4530,	0.9992,	
10:49:39,	90	90.7,	89.9,	165.9,	0.4528,	0.9997,	
10:01:00,	180	180.8, 270.4	90.0,	100.U, 166.7	0.4512,	0.9998,	
10.00.00,	270	270.4,	00.0,	100.7	0.4002,	0.0001,	
AX (g)	AY (g)	AZ (g)	MX (gauss)	MY (gauss)	MZ (gauss)	Temp. (C)	1
0.0032,	-0.9980,	-0.0473,	-0.2475,	-0.3712,	-0.0782,	20.4,	<u> </u>
0.0011,	-0.0341,	0.9991,	-0.2477,	-0.0752,	0.3715,	20.5,	
0.0001,	0.9994,	0.0331,	-0.2475,	0.3698,	0.0742,	20.7,	
0.0014,	0.0407,	-0.9980,	-0.2480,	0.0739,	-0.3079,	20.5.	
Bulkhead tighte	ned confirmed,	11:05:04 11-M	Mar-2013,				
TF Zero Confirm	ned, 12:11:39 11	I-Mar-2013,	A				
#Modules conn Directional	ected at time of H	IS procedure, fir	mware version	В			
Config file num	ber. 1.6			С			

Client Signature

Extreme Signature

Figure 117 Highs side test Report

71. In the report confirm:

- A. Toolface is Zero
- B. The Directional Module is connected at the time of the test ,

The Firmware version should match the list Table 1(Section 2.4).

C. Config Number 1.6 indicating the tool is now using the first configuration out of 6 configuration.



- D. The toolfaces on the roll should be 90+/- 2.5°, 180 +/- 2.5°, 270 +/- 2.5°.
- E. The Inclination values should be Average value +/-0.25°.
 - a. If the probe is level on ahorizontal surface the average value should be 90°.
- F. The Azimuth should be Average value +/- 1°.
- G. All the M Total values should be Average value +/- 0.003 Gauss.
- H. All The G Total values should be Reference G value +/- 0.0025.
- I. All the 6 axis sensor (Ax,Ay,Az, Mx,My,Mz) are displayed.
 - a. The values of Ax and Mx should not change significantly.
 - b. The values of Ay, Az, My, Mz should keep changing.
- J. The temp should read the ambient temperature value.
- 72. The Document should be signed by the Client Representative and the Extreme representative.

STEP 12

Step 12: Dor	ne		
TF	270.40	deg	Done
Incl	89.90	deg	
Azim	166.70	deg	Cancel
Mtot	0.4502	gauss	_
Gtot	0.9994	g	
Toolface Offset Settin	l gs	1	
Current TF Offset	267.30 deg		
Last Set Time	11-Mar-2013 10:46:37		

Figure 118 Complete the High Side Wizard



73. Click "Done" to exit the Wizard.

Tool Face Offset Setting	gs		
Current TF Offset:	248.40	deg	
Last Set Time:	11-Mar-2 10:44:21	013	
Job Input	Get	Wizard	
Ok			

Figure 119 Exit D and I advanced Options

74. Exit the D&I Window by clicking "close".

iet All			
Once Continu	Time Span(s):	5	Close
Reset VCOM	Rash	RTC	Highside
Data Name(Units)	Value	Get	Set
AX (g)		Get]
AY (g)		Get]
AZ (g)		Get]
Auto TF (Deg)		Get	
Auto TF-F ()		Get]
Azimuth (Deg)		Get	
Cs AX (g)	0.00300	Get	J
Cs Azimuth (Deg)		Get	J
Cs Inc Srf (Deg)		Get	Į –
Cs Inclination (Deg)	89.83	Get	
Cs MX (Gauss)	-0.2476	Get	
D&I Error (Code)	91,00,00,00	Get	
GTotal (g)		Get	1
Gravity TF (Deg)		Get	1
Identity ()	APS	Get	1
Idle Angle Flag (ON/OFF)	off	Get	
Inclination (Deg)		Get	
MAG Dip Angle (Deg)		Get	1
MTotal (Gause)		Get	· · · ·

Figure 120 D&I Window



- 75. Click Exit on the XConnect program.
- 76. This will close the the XConnect application.

XConnect_3.3.6-r6 - XEM System			
Data File			
C:\ExtremeEngineering\DataFile\StandardDataFile.V10xdf			Load
Nodes Software Version, Config #			System Override
Telemetry	Download	l Config	C XPulse
Flow Switch			© XEM
DPG	Flow Status:		
D and I	On	Off	Refresh
Ganna			
BmgrA	Rotation	1	
BngrB	On	0ff	Status:
BmgrC	Advanced		
ХНОР	Suspend Deepsleep	Reset All	Advanced
DynamX			
ClassD	Config Downlink	Config #:	
	Set		Exit

Figure 121 Exit the X Connect window



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6.10. DISCONNECT ACCESSORIES FROM THE TOOL

77. Bleed the pressure in the Air Pump.

- 78. Loosen the crew on the C-clamp to remove the Air pump adaptor.
- 79. Insert the Peek Insert screw in the bore pressure port.
- 80. Tighten the peek Insert screw with the Allen Key.
- 81. Remove A/C Power from the Vibrator.
- 82. Remove the Vibrator from the Tool.
- 83. Remove the Level from the tool.
- 84. Remove the 2 x Alligator clamps from the Tool and the XYM Tester
- 85. Remove and Spool 2 x Testing cable 22CABL0063 from the XEM Tester
- 86. Remove and spool the 22CABL0016 from the XEM tester
- 87. Disconnect 22CABL0030 from the XEM system tester and the HHROTC port on the XTR
- 88. Spool the 22CABL0030
- 89. Remove the 2 x Barrel Wrench from the tool.



90. The tool string should now be complete

If 2 batteries are used the typical configuration includes the DPG, XTX, Battery, DynamX, Battery 2, XGM, Can Terminator (Bulkhead)

If an XHOP is used the typical configuration will involve the DPG, XTX, Battery, DynamX, Battery 2, XGM, XHOP

In the figure below only 1 x battery is used and the configuration includes the DPG, XTX, Battery, DynamX, XGM, Can terminator

The tool is now ready to be picked and placed in the collar.

Chapter 8 provides instructions on how to configure the XEM RX to decode signals for a typical job. Chapter 9 provides instructions on how to pick up the tool and load into the collar.





Figure 122 XEM Tool String DPG, XTX, Battery, DynamX. XGM, Can term



7. REFERENCES

TECHNICAL REVIEW

Hoan Chau

Rick Zheng

REFERENCES

- V-10 High voltage guide Ryan Kirby
- FST Training Material courtesy Dan Bukovec