VSAT INSTALLATION INSTRUCTIONS

Prepared by ICS Technologies

Contents

1 TOOLS & MATERIALS REQUIRED

You will need the following equipment and software to successfully commission the Satellite Router in the field:

1. Windows Laptop
2. Standard & Metric Socket Sets & Wrenches (Alternatively adjustable wrenches can work)
3. Flat head and Philips Head screwdrivers
4. Hex head/Allen Wrenches; Standard & Metric
5. Wire Ties/Cable Ties
6. LMR-400 Cable prep tool and Crimpers
7. RJ-45 Crimp Tools and CAT5 cable prep tool/strippers
8. Ethernet Patch cable
9. Cisco Console Cable, USB to RJ45 Serial Adapter
10. RJ-45 cross-over cable (May not be necessary but good to have)
11. Ballast: Sandbags or concrete blocks to place on antenna mount. (local site POC may be able to help with this)
12. Satellite Modem Image (if required; modem will arrive with software/firmware pre-installed; evo_x7_rmt-14.0.3.5.pkg)
13. Modem Options File. The iDirect modem options file will be distributed by the NOC prior or at the time of install.
14. Download iperf3 (Windows 32-bit or 64-bit depending on OS) on local laptop inside preferred directory. https://iperf.fr/iperfdownload.php#windows
15. Create iperf3 folder in Root directory. Iperf3 must run from that directory via the command line. No Windows installer required or will load when double clicking .exe file.

Note:

- If installing a wireless only site, ignore instructions regarding thin clients and VoIP phones.
- iDirect recommends disabling the firewall on your laptop to ensure complete functionality.

2 GENERAL INSTALLATION PROCEDURE OVERVIEW

1. Install VSAT antenna, mount, outdoor electronics, cabling and ballast.
2. Install Indoor equipment rack
3. With Trace NOC, Perform Cross-pol and P1dB test using iSite.
4. Verify Receive lock on the iDirect modem.
5. **Disconnect Cat5 Ethernet cable from X7 LAN Port 1 to 2911 GE0/0 until after antenna and modem are commissioned.**
6. Reconnect internal UPS batteries (disconnected for shipment)
   For 9130 see manual Page 19. For 9PX see manual Page 21.
7. Install Thin Clients and cable to 2960-X Switch according to Port Diagram.
8. Install VoIP Phones and cable to the embedded Ethernet switch in the 2911 router.
9. Install Wireless Access Points and cable to the 2960-X Switch.
10. Verify all equipment installed powers up and is ready for verification and validation testing.
11. Execute Commissioning and Test Plan.

3 STEPS AND PROCEDURES

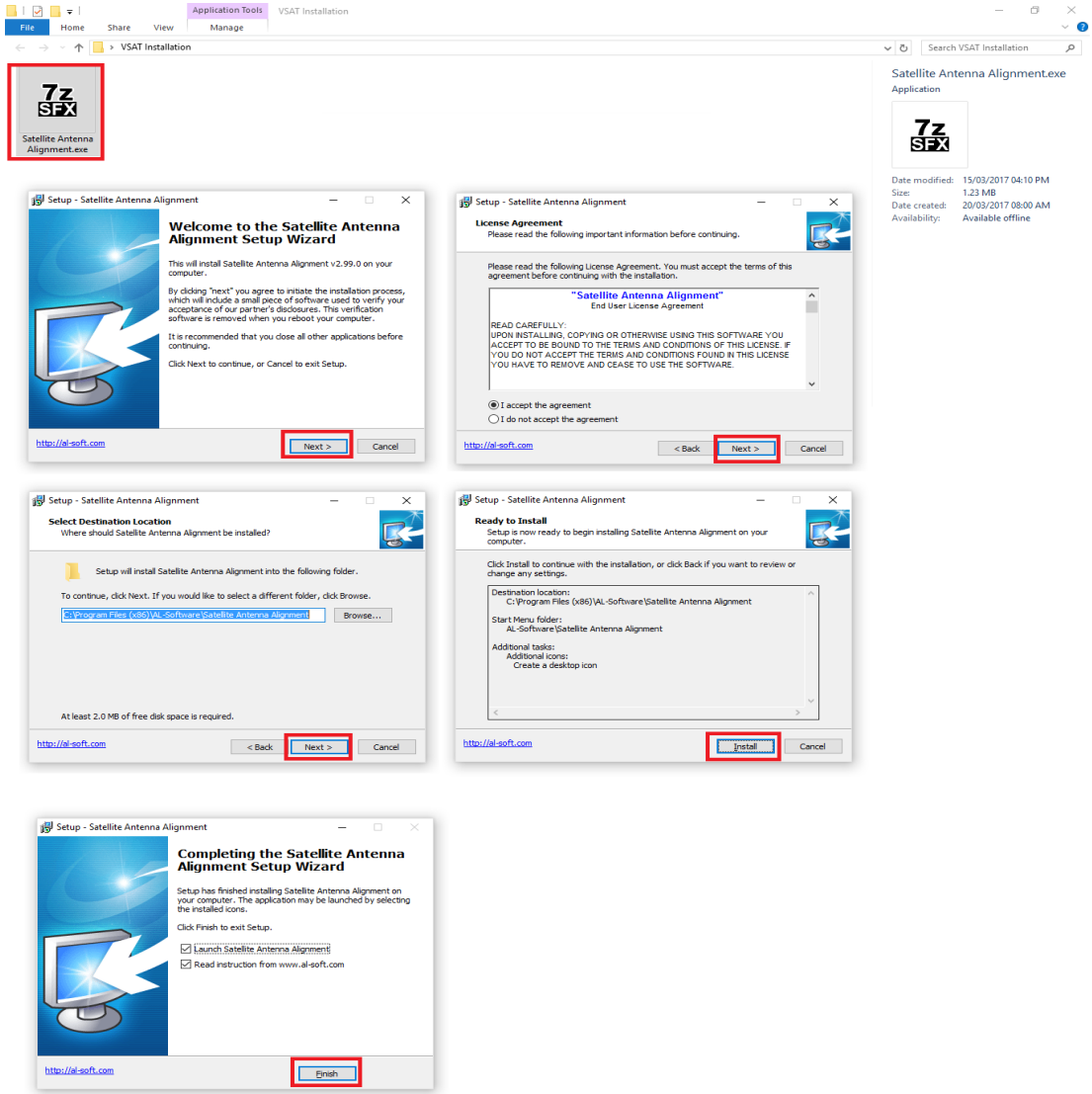
3.1 GETTING THE INITIAL ANTENNA POSITION USING THIRD PARTY PROGRAM

Note: Step 3.1 (Getting the Initial Position) can be done also using multiple alternatives like:

- iDirect iSite Web GUI Angle Calculator.
- http://www.dishpointer.com/
- http://www.satbeams.com/footprints

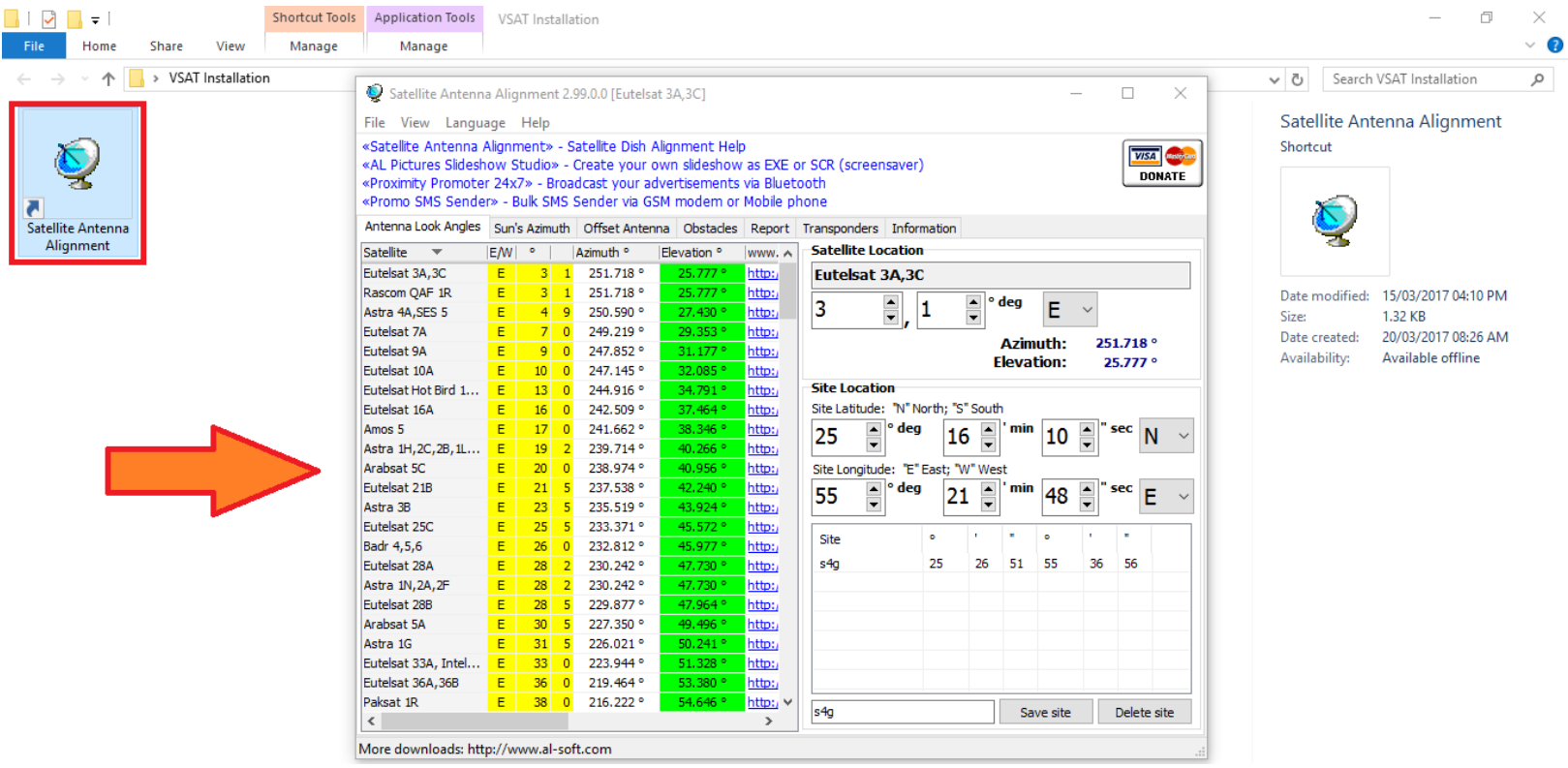
3.1.1 Install Satellite Antenna Alignment Program

Install Satellite Antenna Alignment program and follow the wizard until installation is completed.



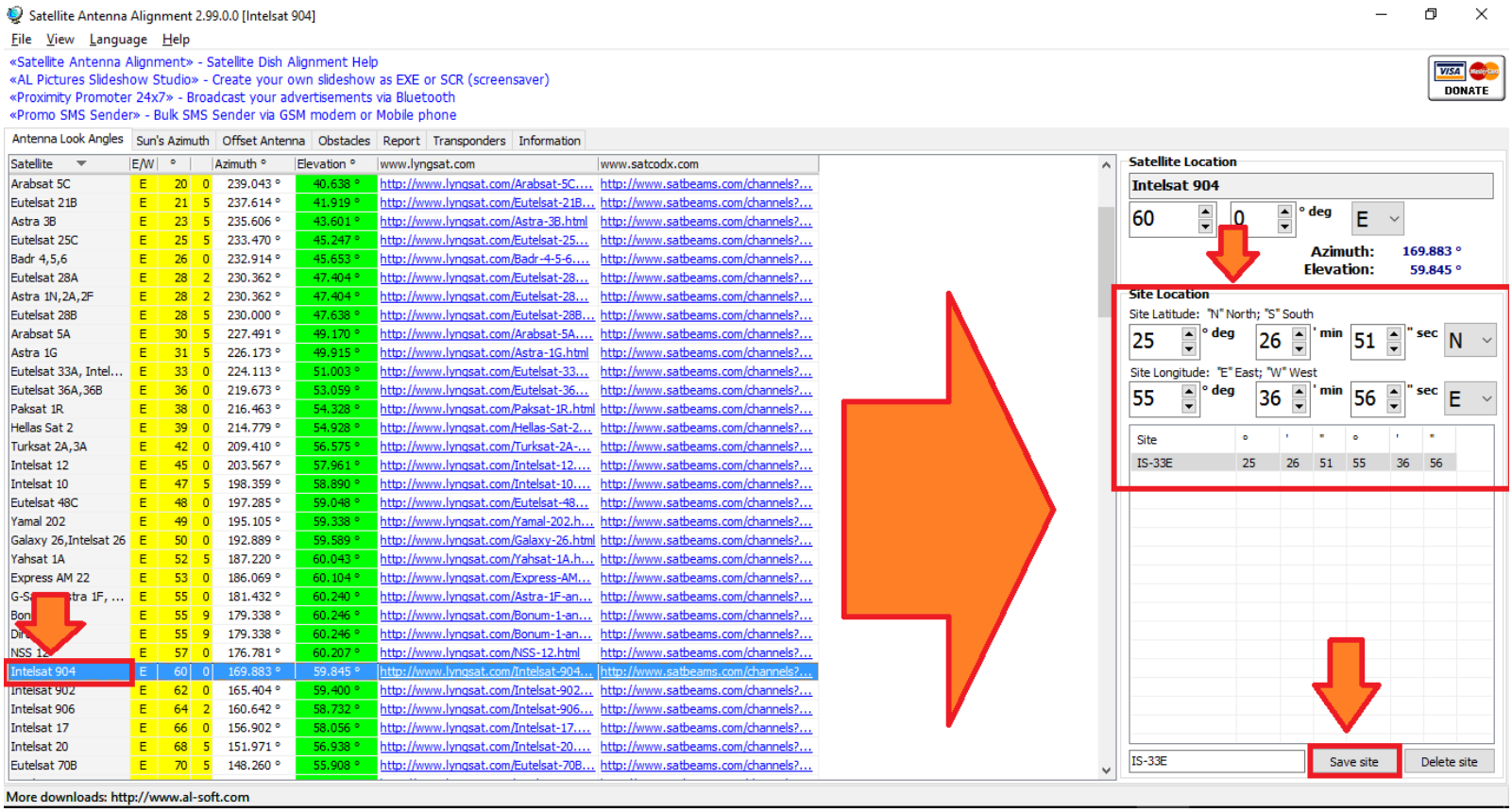
3.1.2 Open Satellite Antenna Alignment

Open the installed program by double clicking the icon shown below:



3.1.3 Selecting the Satellite

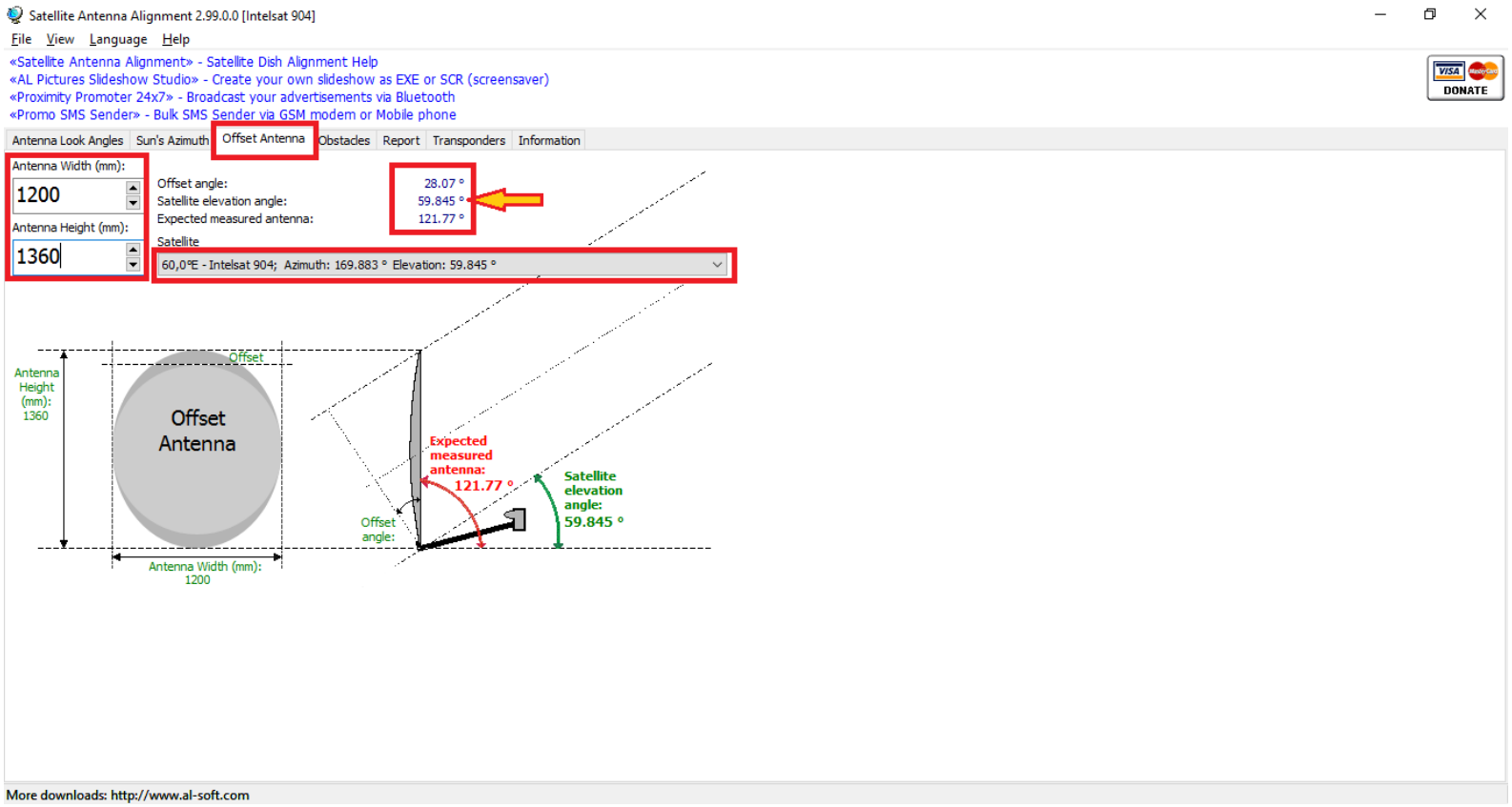
Select the Satellite named 60E INTELSAT 33E (IS-33E) | INTELSAT 904 (IS-904). 60 degrees East Longitude from the list and enter the site location as shown below:



3.1.4 Calculating the Offset Angle

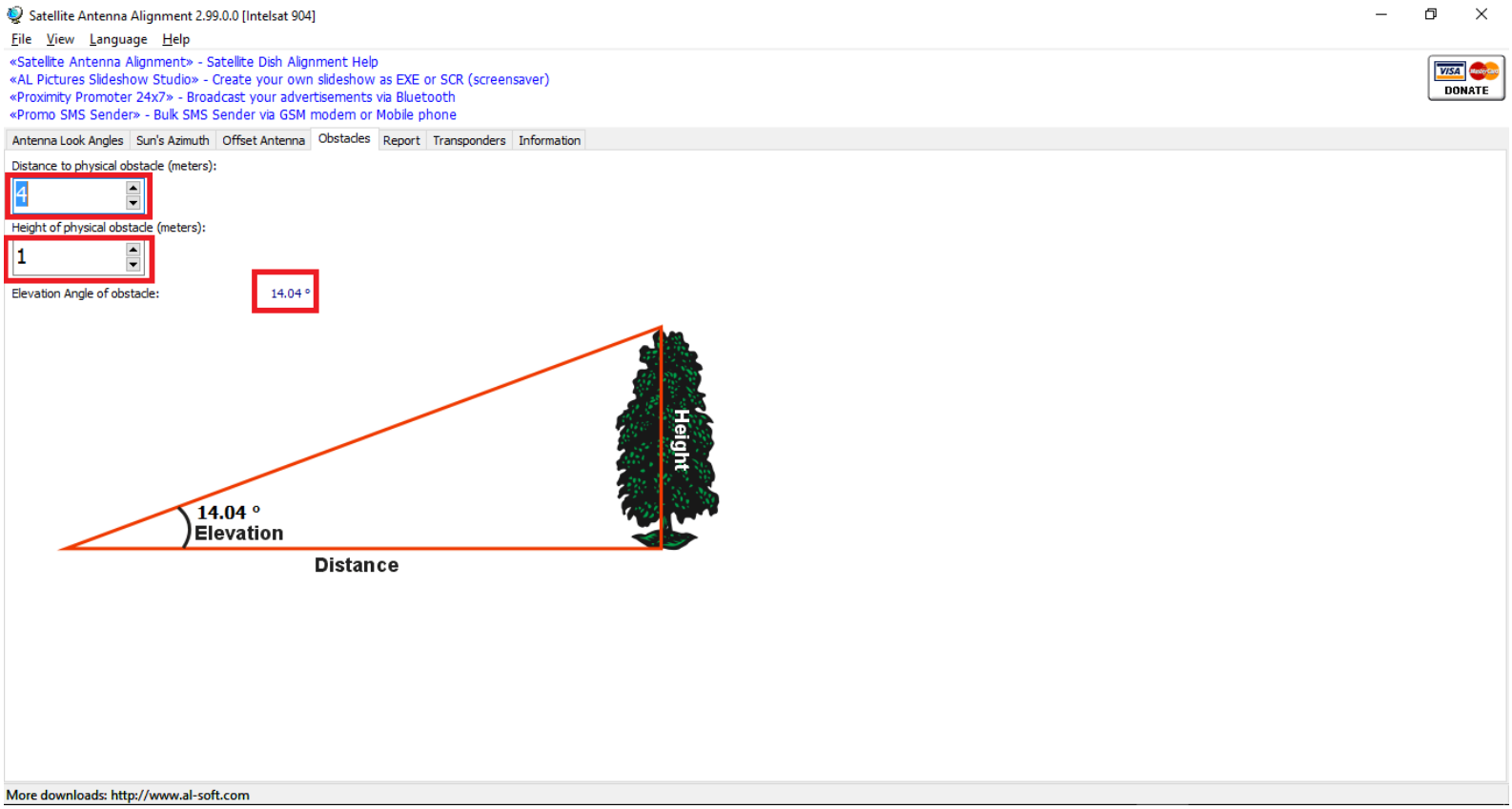
1. Click on Offset Antenna tab
2. Double check the Satellite name is INTELSAT 904 (IS-904) from the drop down menu
3. Enter the Antenna Width and Height in mm
4. The Program will calculate the Offset and Elevation angles as shown below.

Note: On the Skyware Antenna there is an elevation angle scale on the AZ/EL mount. This scale is for the beam center of the offset antenna, so if set for actual elevation angle, you do not need to calculate for the offset angle.



3.1.5 Checking the Obstacles

1. Click on Obstacles tab.
2. Enter the Distance and the Height of the Obstacle from the Elevation angle in meter
3. The Program will calculate the Elevation angle of Obstacle as shown below.



3.2 SATELLITE ANTENNA AND MOUNT

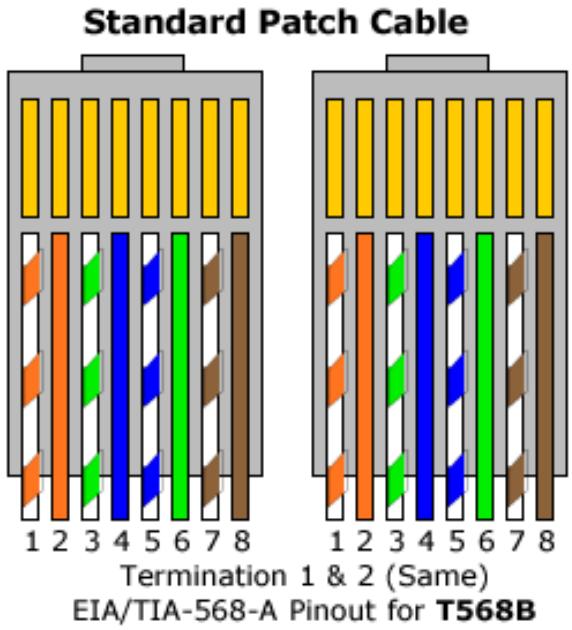
1. Assemble non-penetrating antenna mount.
2. Orient the mount roughly toward the satellite according to the provided azimuth heading in the café IDP.
3. Apply ballast to the antenna mount (Sandbags or concrete blocks).
4. Place Az/EL mounting assembly on the mount pole. The elevation scale on the AZ/EL is for the bore sight. The offset angle is included in this scale. Set elevation for actual value.
5. Attach reflector to Az/EL mount
6. Install feed support arms and lower feed boom arm
7. Attached BUC and LNB to the feed assembly
8. Install feed assembly with BUC and LNC to the feed mounting bracket on the antenna system.
9. Install coax cable from the BUC and LNB to the TX (BUC) and RX (LNB) ports on the iDirect modem installed with the indoor equipment.
10. Connect laptop to the iDirect modem to begin the antenna pointing process.

Note: Full band LNB is provided. (L) 10.7-11.7GHz L.O. 9750MHz;
(H) 11.7-12.75GHz L.O. 10600MHz. NOC will provide site specific setting for LNB.

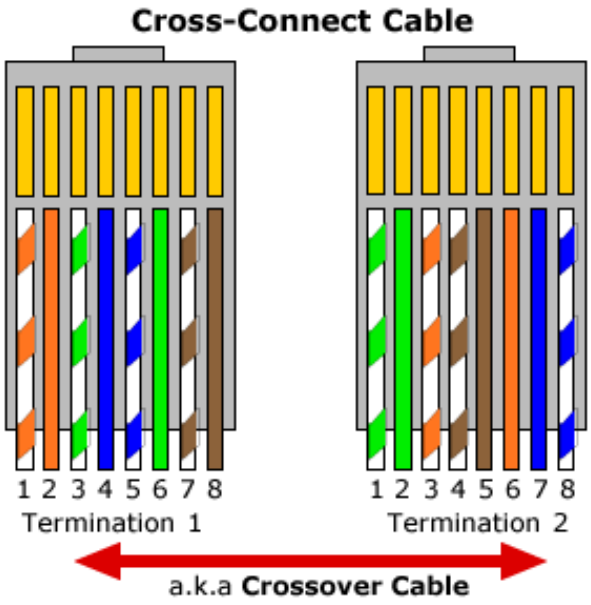
3.3 MODEM CONNECTION AND CONNECTION TESTING

3.3.1 RJ45 Wiring Conventions

a) Patch Cable (Straight-through)



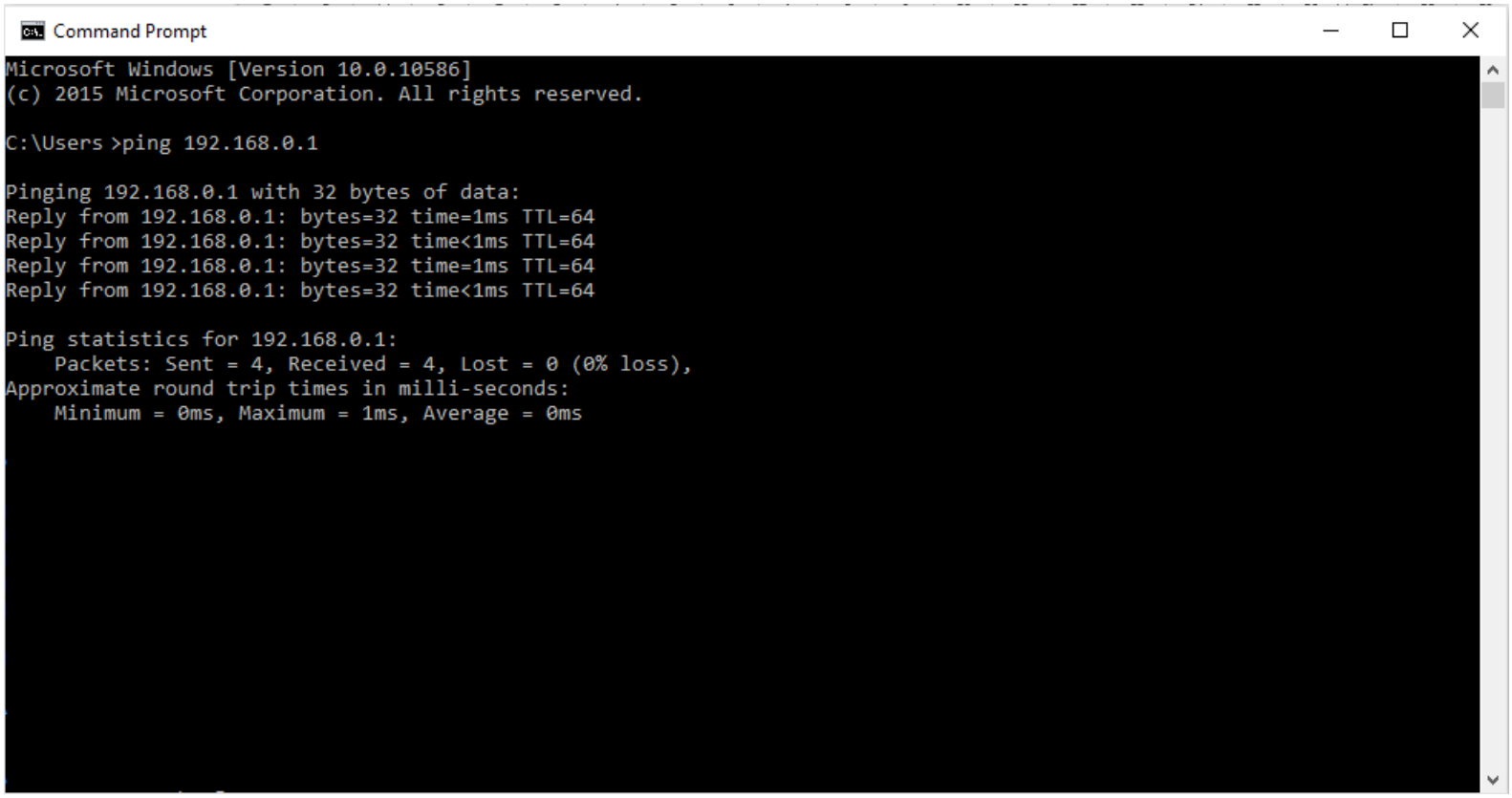
b) Crossover



3.3.2 Testing the Modem Connection

1. Open a command window by using Start.
2. Run and enter cmd.
3. At the Command window prompt enter ping and the modem IP gateway 192.168.0.1

Note:
If you can reach the modem, you should get a reply similar to the following
Pinging 192.168.0.1 with 21 bytes of data:
Reply from 192.168.0.1: bytes=32 time<1ms TTL=128
If you cannot reach the switch, you should get a reply similar to the following:
Pinging 192.168.0.1 with 21 bytes of data:
Request timed out.

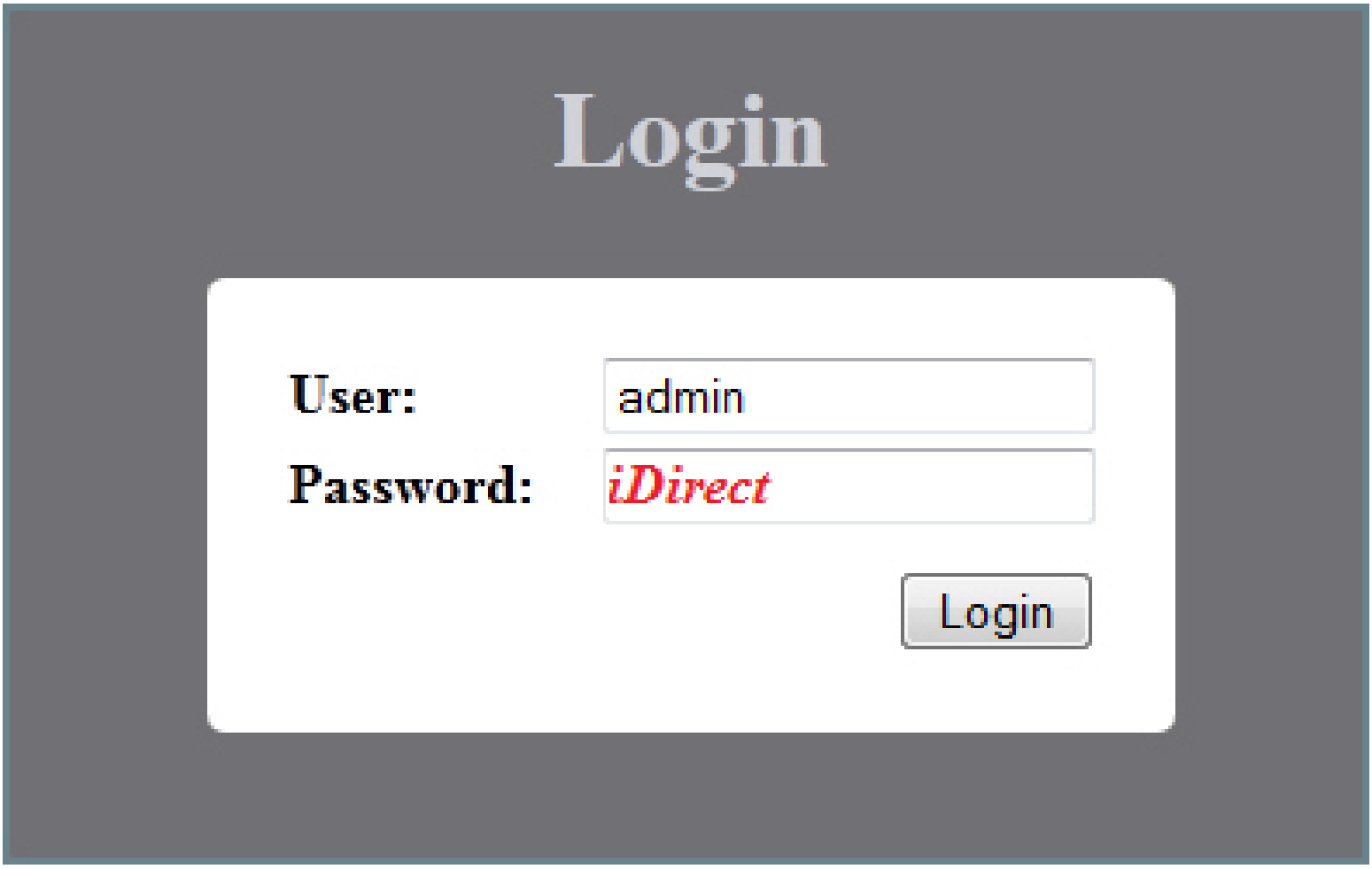


3.4 ANTENNA SETUP & POINTING USING ISITE WEB GUI (X7 ONLY)

3.4.1 Connect laptop to LAN port. A single DHCP address is issued to the laptop for commissioning purposes. (Test the connection with the Modem as shown in step 3.3.2)

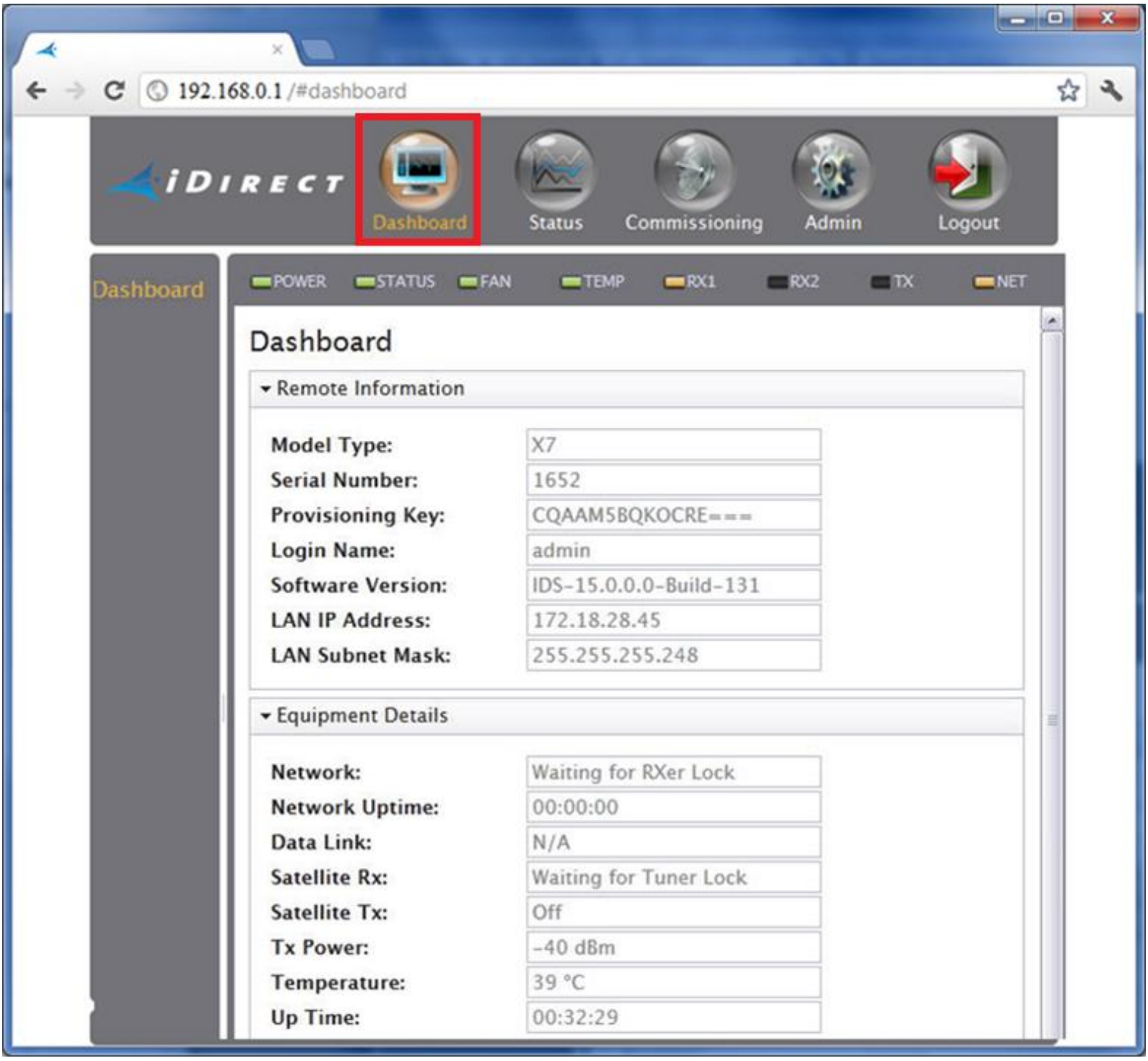
3.4.2 Launch a Web browser of your choice and go to https://192.168.0.1
Note: (Factory default address is: https://192.168.0.1)

3.4.3 Login using:
User: admin
Password: iDirect



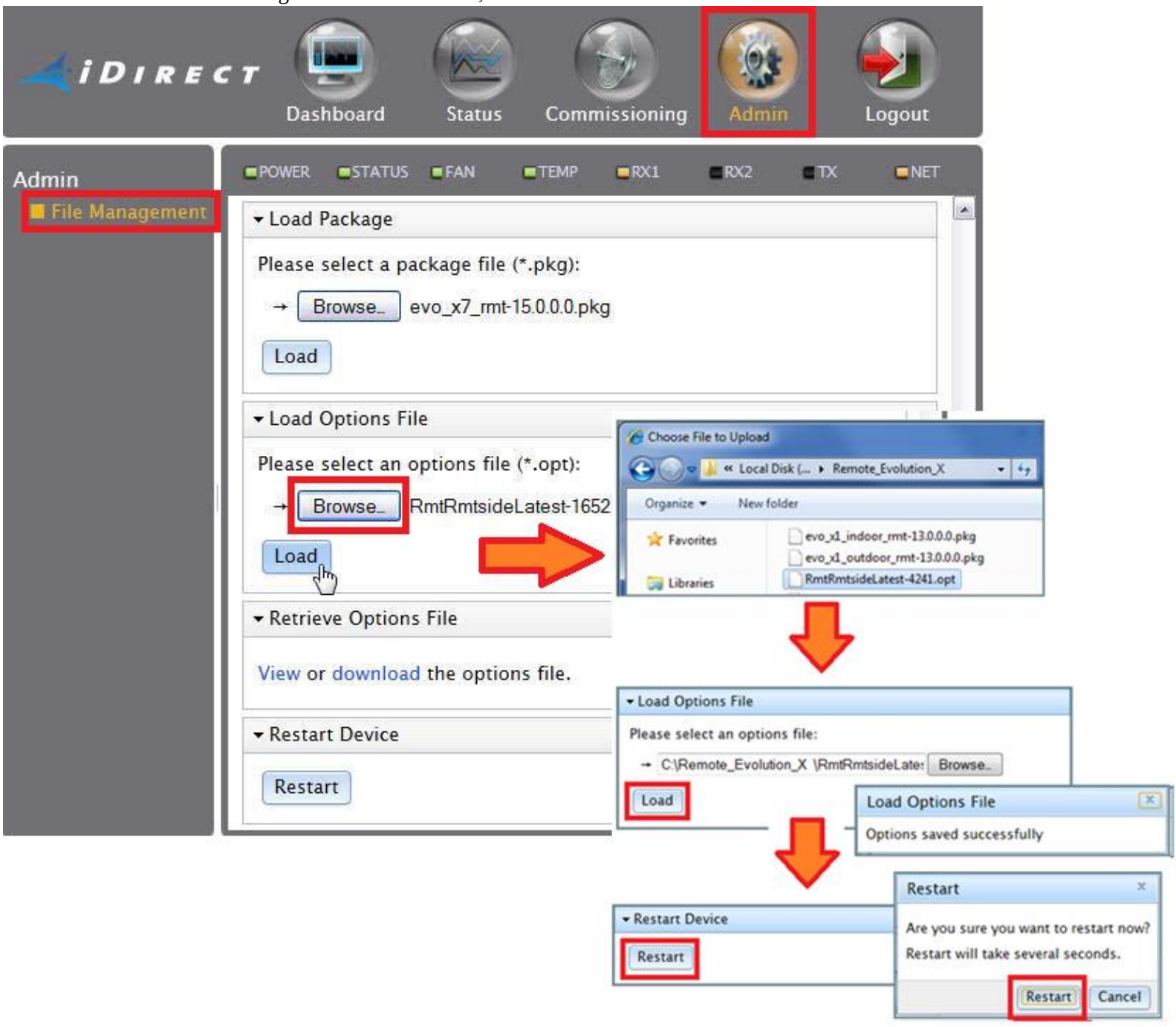
3.4.4 Dashboard

Navigate to Remote Information page to verify serial number and Software version with NOC.

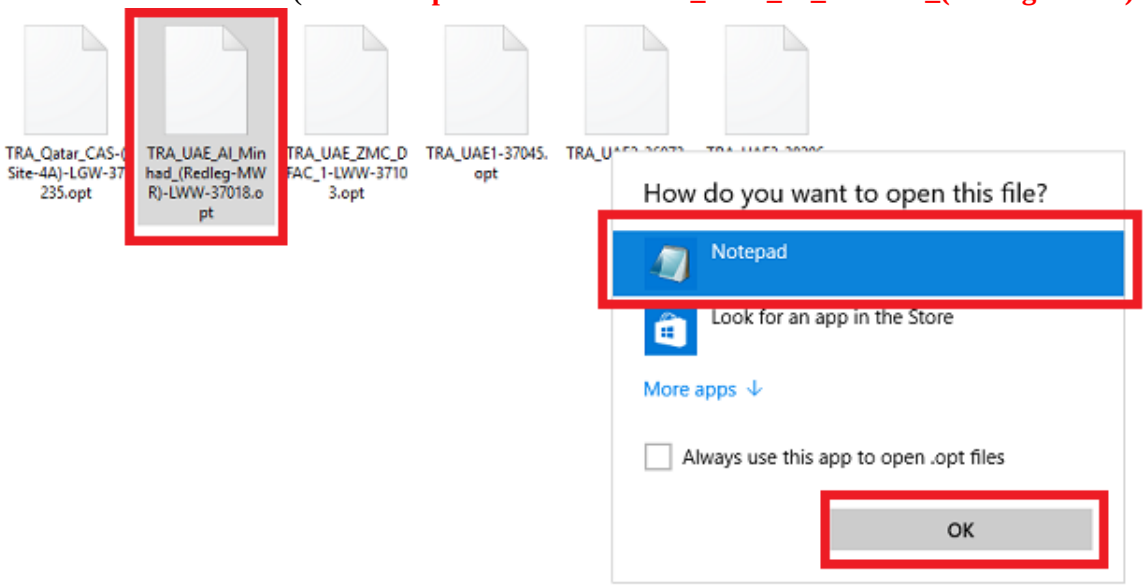


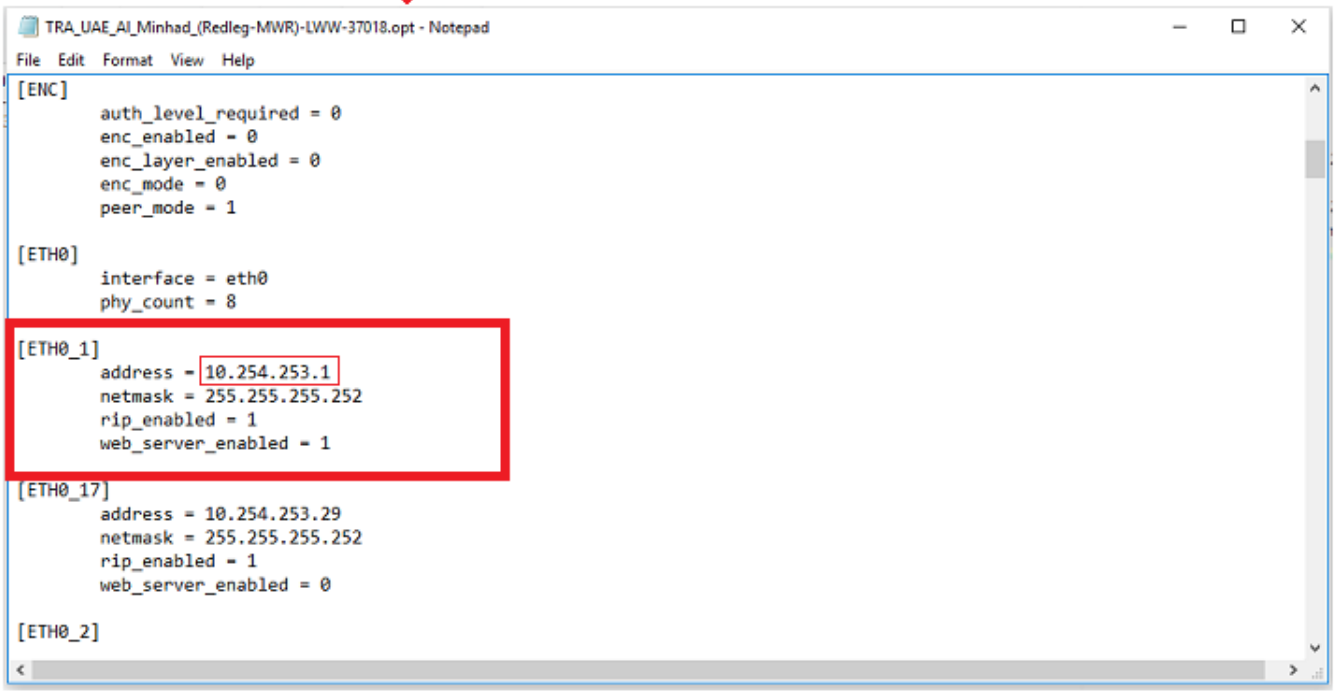
3.4.5 Loading Option File

1. Click on File Management on the Admin Tab.
2. On Load Options File Tab click on Browse.
3. Locate the Option file in your PC.
4. Click **Load** to load the options file.
5. Wait for message saying the options file was saved successfully.
6. Navigate to **Restart Device**, then click **Restart.**

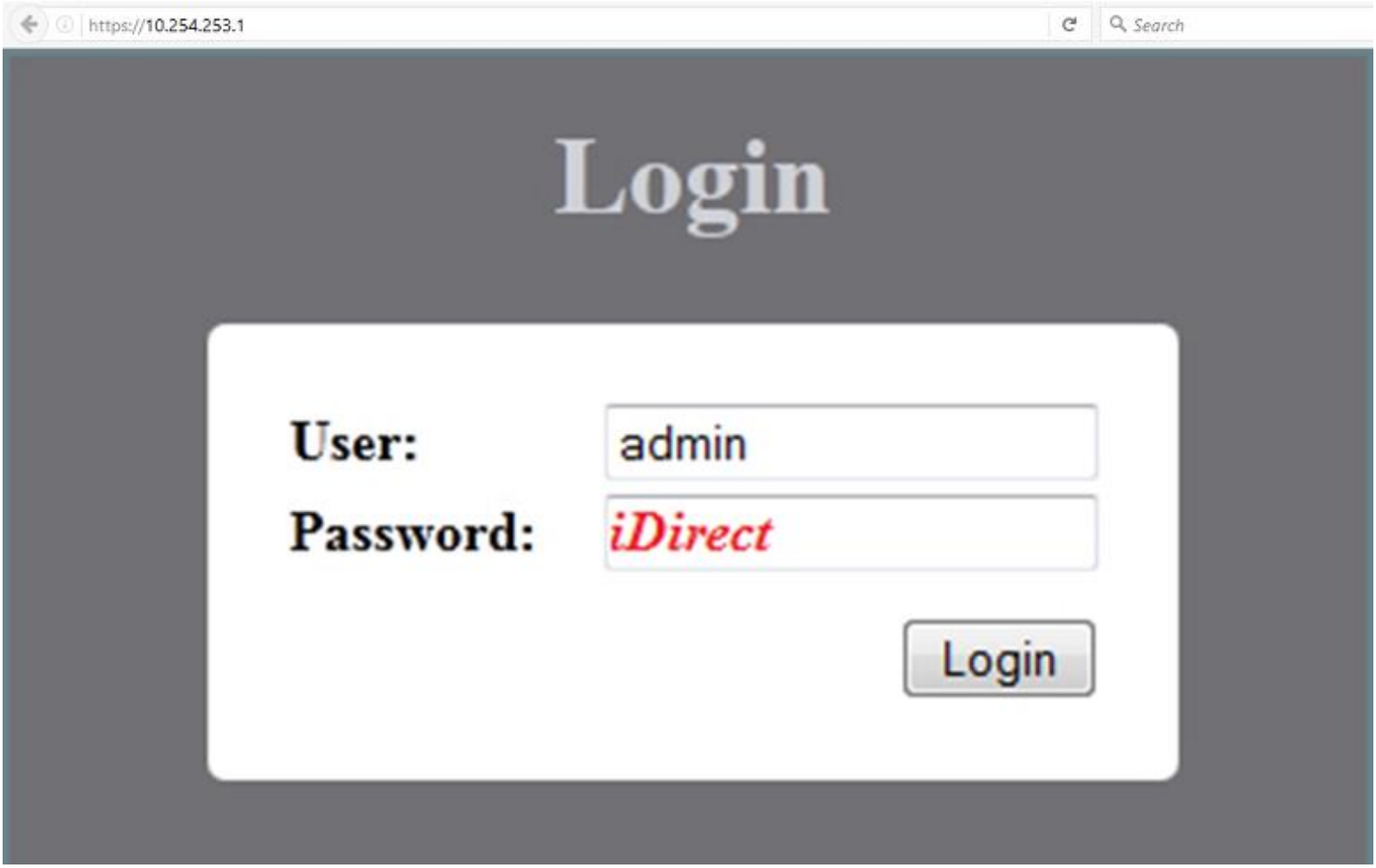


7. Open the Option file with Notepad for the Site you are working on and find the new IP in ETH0_1 (**The Example below is for TRA_UAE_Al_Minhad_(Redleg-MWR)-LWW-37018.opt**).



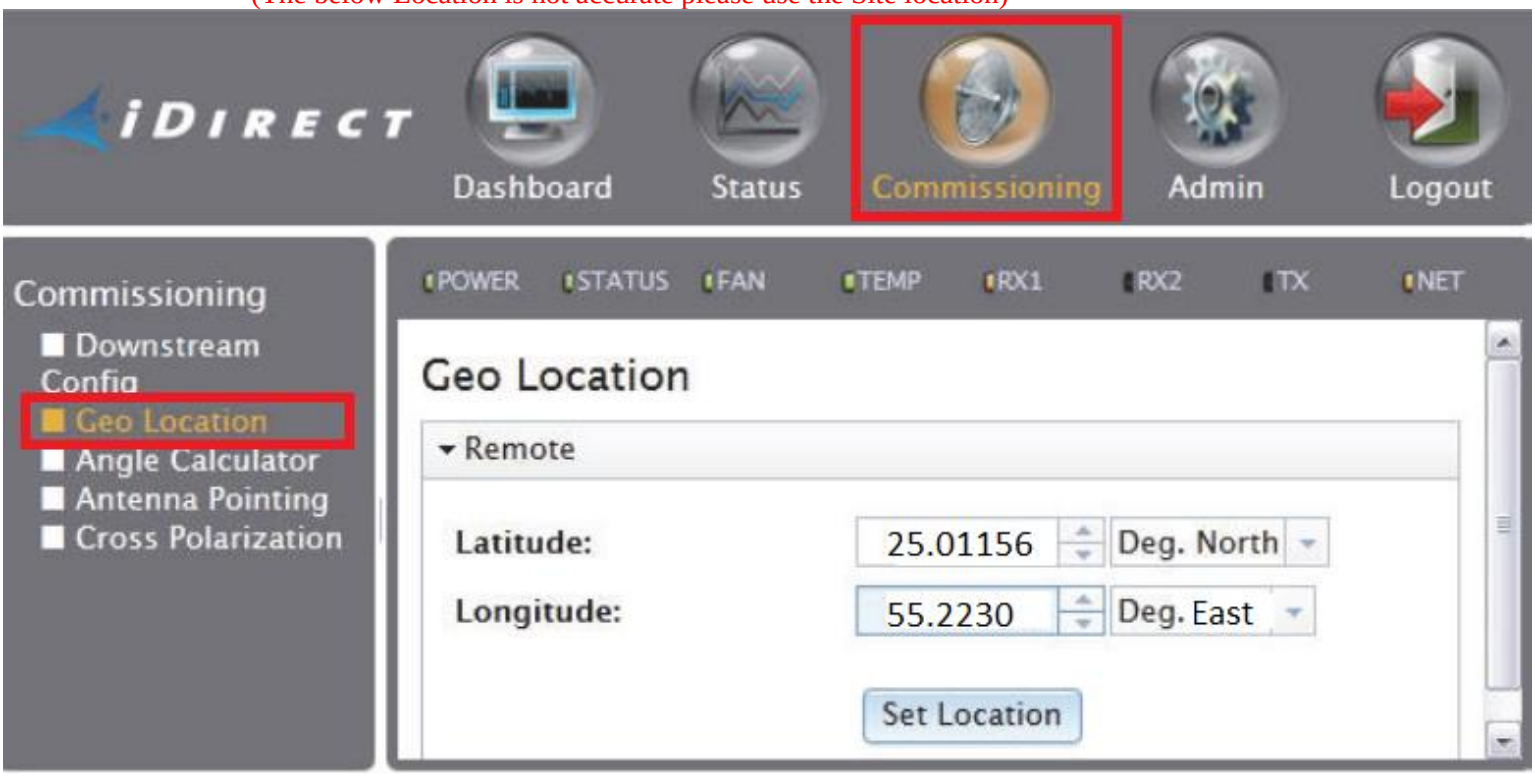


8. Open the Web browser and go to https://10.254.253.1 as highlighted in the Option File
9. Login using:
   User: admin
   Password: iDirect



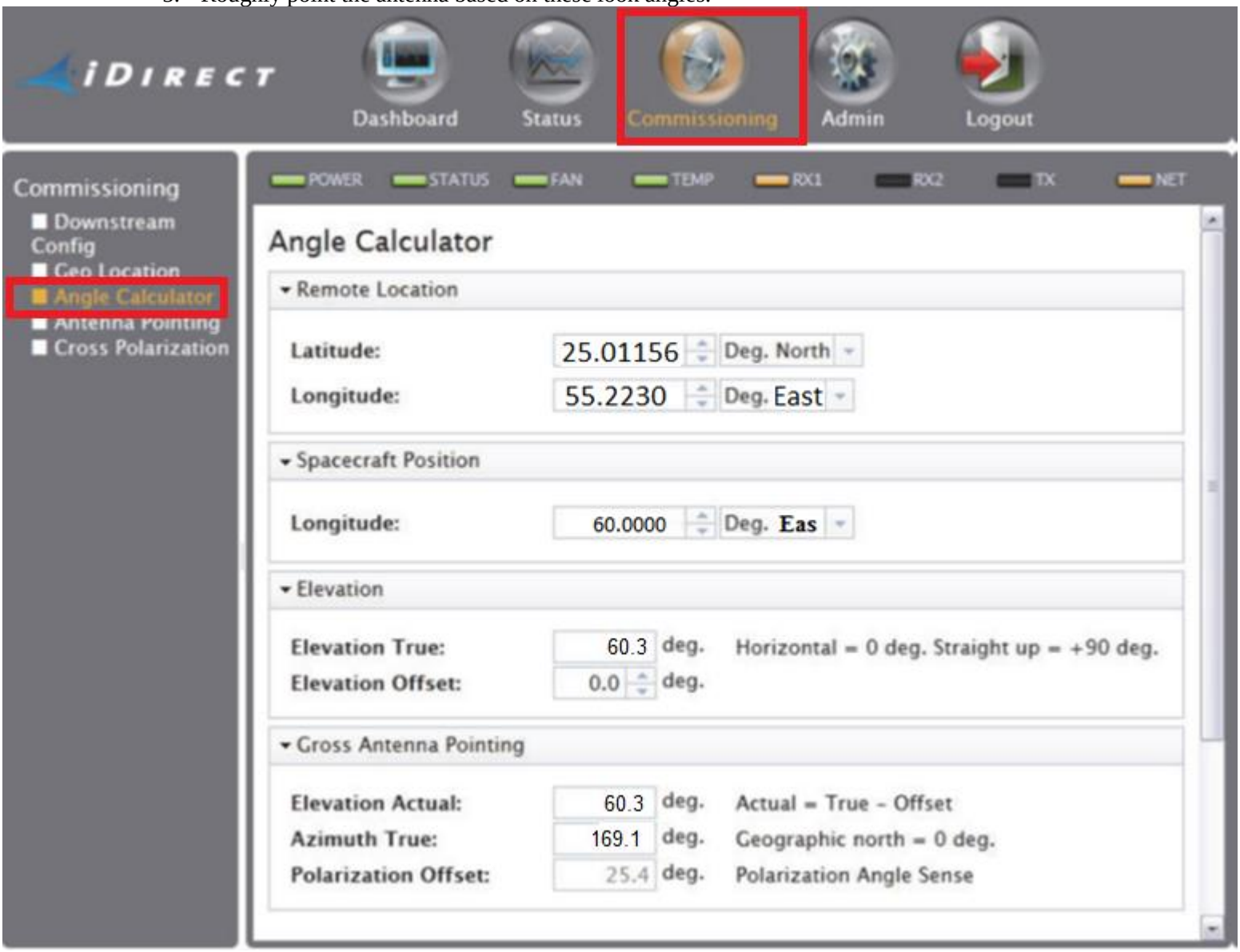
3.4.6 Setting Geo Location

1. After Log in.
2. Navigate to the **Commissioning Page** and click on **Geo Location.**
3. Enter in the site location Latitude and Longitude making sure to select appropriately Deg. North or South and Deg. East or West.
   (The below Location is not accurate please use the Site location)



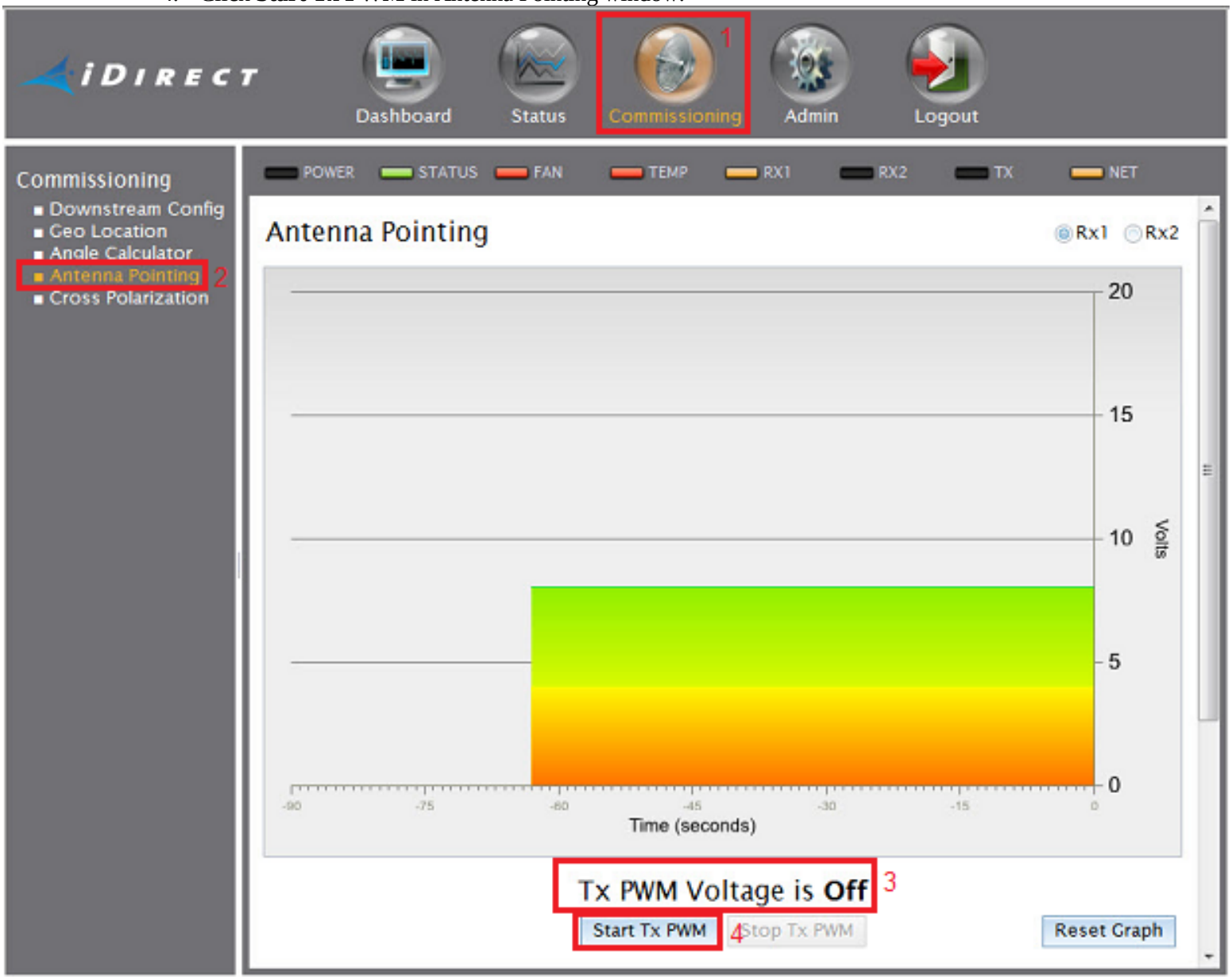
3.4.7 Calculating Look Angle

1. Click on **Angle Calculator** to calculate point angles in Commissioning Page**.**
2. Enter the site location Latitude and Longitude making sure to select appropriately Deg. North or South and Deg. East or West.
3. Enter IS-33e **Spacecraft Position. 60 degrees East Longitude.**
4. **Gross Antenna Pointing page displays the Elevation,** Azimuth and Polarization Offsets for the antenna setup. The Installation Design package Document contains the estimated azimuth, elevation and polarization settings.
5. Roughly point the antenna based on these look angles.



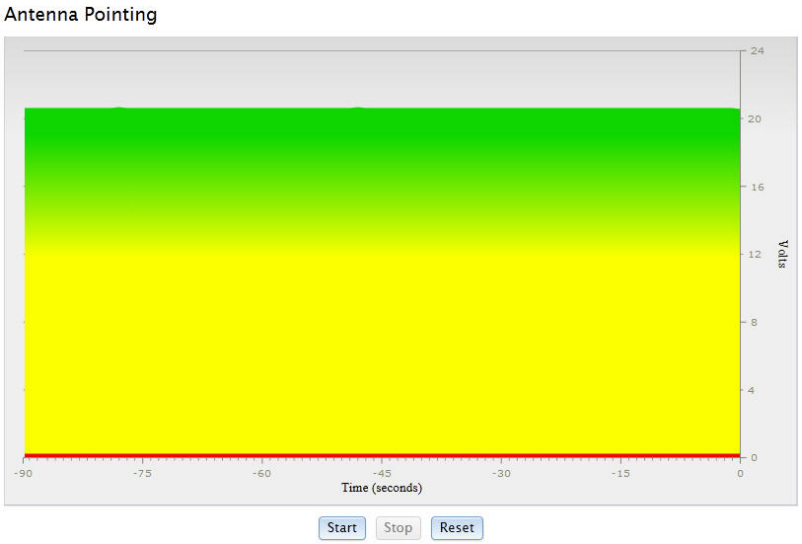
3.4.8 Antenna Pointing

1. Click Commissioning, then click Antenna Pointing window in Dashboard
2. For X7 Modem click Rx1 in upper right corner.
3. **Make sure that the TX coax cable is Disconnect from X7 modem. BUC voltage must be disabled.** Execute **Tx iflDC off** on the console/command line.
4. Click **Start Tx PWM** in Antenna Pointing window.

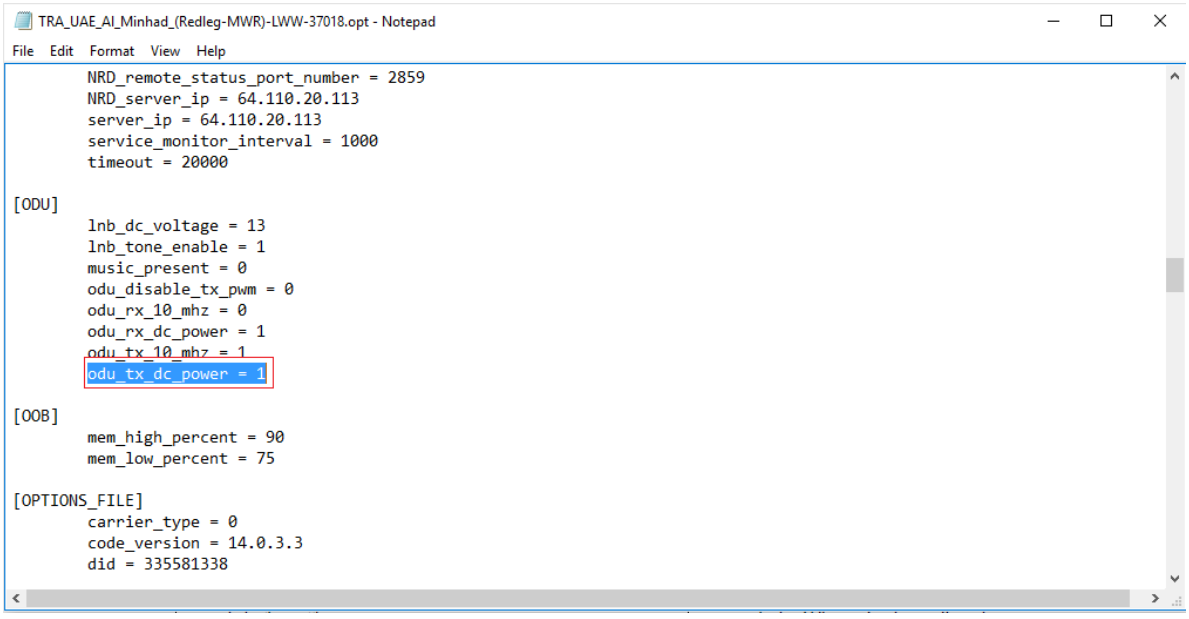


5. Slowly sweep the reflector a few degrees either side of the coarse azimuth pointing while observing the voltage graph peak indicators. The bar graph progressively turns from red to yellow and then to green as downstream carrier signal strength increase.

6. Move the antenna azimuth as to maximize the level of the green bar and the PWM output voltage.
7. If the downstream carrier signal is not found, increase or decrease the elevation setting in 2 degree increments and repeat the azimuth sweep until the signal is found.
8. When locked on the carrier fine adjust the azimuth and elevation, then lock both the azimuth and elevation axis in place. Fine adjust the polarization via the feed assembly to maximize voltage.
9. Record the final voltage reading.
10. On **Antenna Pointing** screen click **Stop Tx PWM**.
11. Power cycle the modem to exit antenna pointing mode.



Note: The modem provides DC Voltage to the BUC. Options File must be double checked to ensure TX IFL DC is on (odu_tx_dc_power = 1) after antenna pointing is complete.



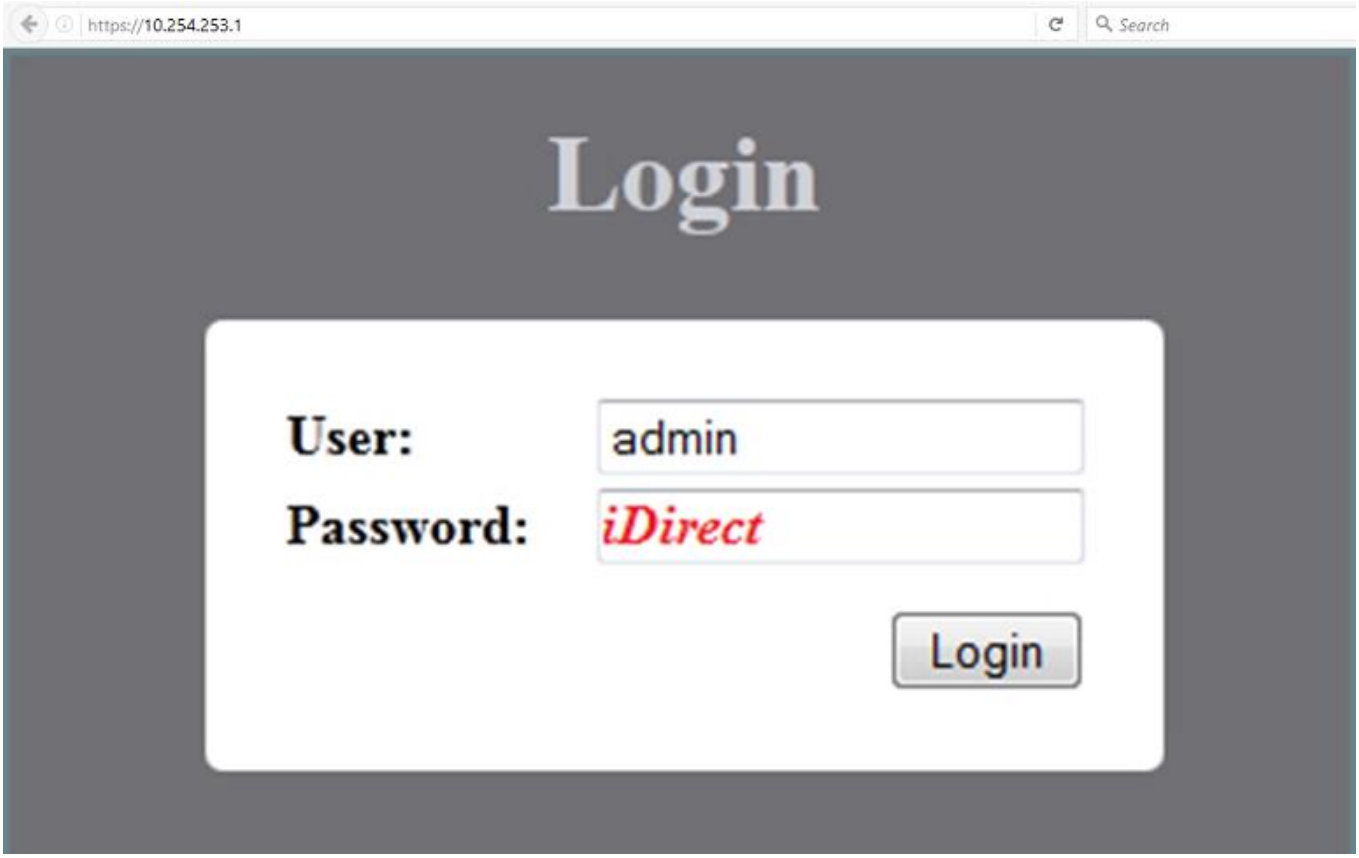
3.5 CROSS POLARIZATION TEST

(This Step requires the communication with NOC)

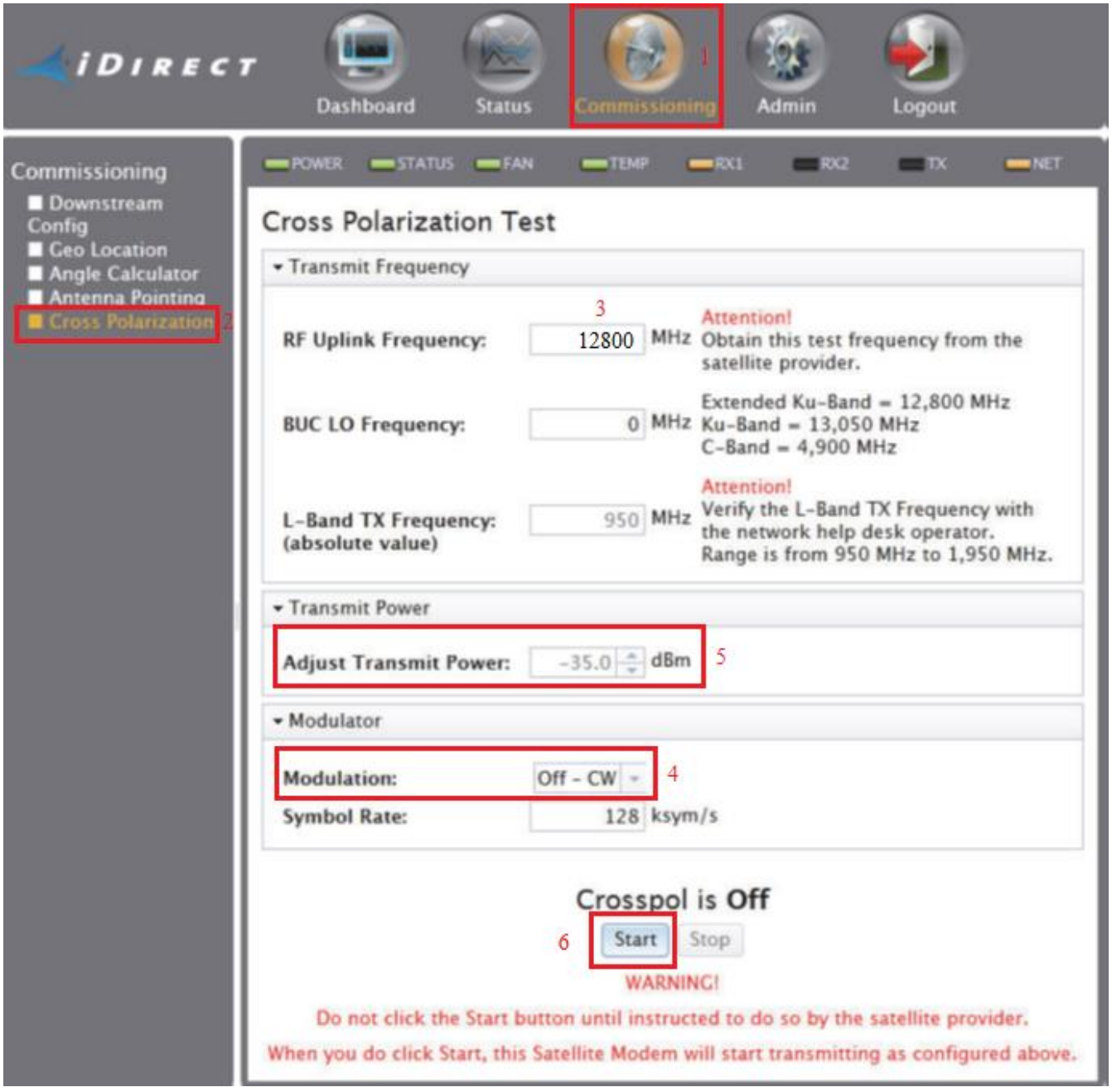
1. Call NOC. **NOC will remotely activate CW on the X7. If NOC is unable to remotely access the X7 then proceed with activating the CW locally using the following steps.**
2. Power down the modem and remove the RX IFL coax cable from the modem.
3. Connect the TX IFL cable to the BUC and modem.
4. Power on the modem
5. Connect via Web iSite and login

   User: admin

   Password: iDirect



6. Click Commissioning from dashboard.
7. Click Cross Polarization.
8. Navigate to Transmit Frequency page.
9. Enter in RF uplink frequency (Test frequency provided by NOC) and BUC Local Oscillating Frequency (12800MHz). The BUC LO may be present already if the Options File is loaded. The L-band TX frequency will be calculated automatically.
10. Make sure Modulation is Off-CW.
11. Set Tx Power to -35dBm.



12. When instructed by the NOC, click Start.
13. This activates a Continuous Wave (CW) carrier.
14. Adjust transmit power up or down with NOC in the recommended power increments.
15. At the instruction of the NOC, rotate the feed assembly slowly in one direction. Wait for the NOC to take a measurement and provide further instruction. Continue rotating the feed assembly in the direction specified until the peak value is attained.
16. Further adjustments to azimuth and elevation may be required. The NOC will make recommendations if further adjustments are necessary.
17. If the NOC determines that the antenna is peaked, then secure all fasteners.

3.6 1 dB Compression Point & Maximum Power

(This Step requires the communication with NOC)

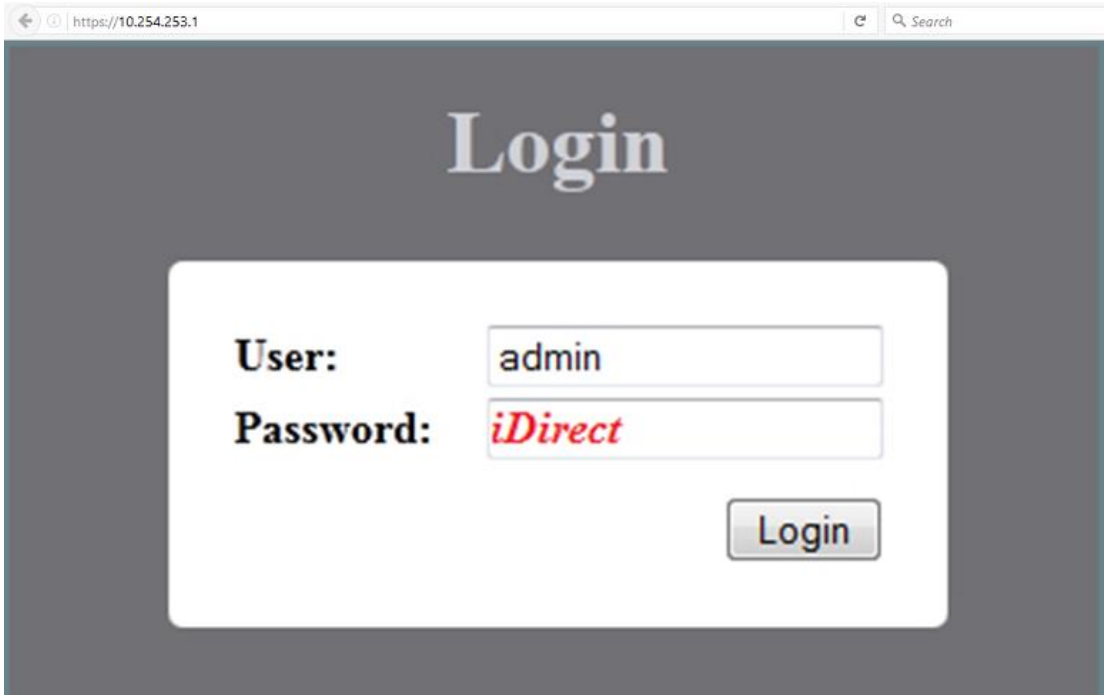
1. In **Transmit Power** field, increase power in 1dBm increments with the NOC.
2. Wait for measurement by NOC. If a 1dBm increase is observed, continue increasing in 1 dBm increments with the NOC until a nonlinear response is measured.
3. Once the measured power does not reflect the 1dBm increase on the modem, the BUC is in the non-linear range. Increase as instructed by the NOC until asked to stop.
4. Begin decreasing power until a 1:1 ratio is observed between TX modem power adjustment and measure power reading on the satellite.
5. A 1 dBm increment down from this value is the 1 dB compression point. Record the Modem **Transmit Power** Value.
6. Click **Stop** to turn off the CW carrier.

3.7 Acquiring the Network

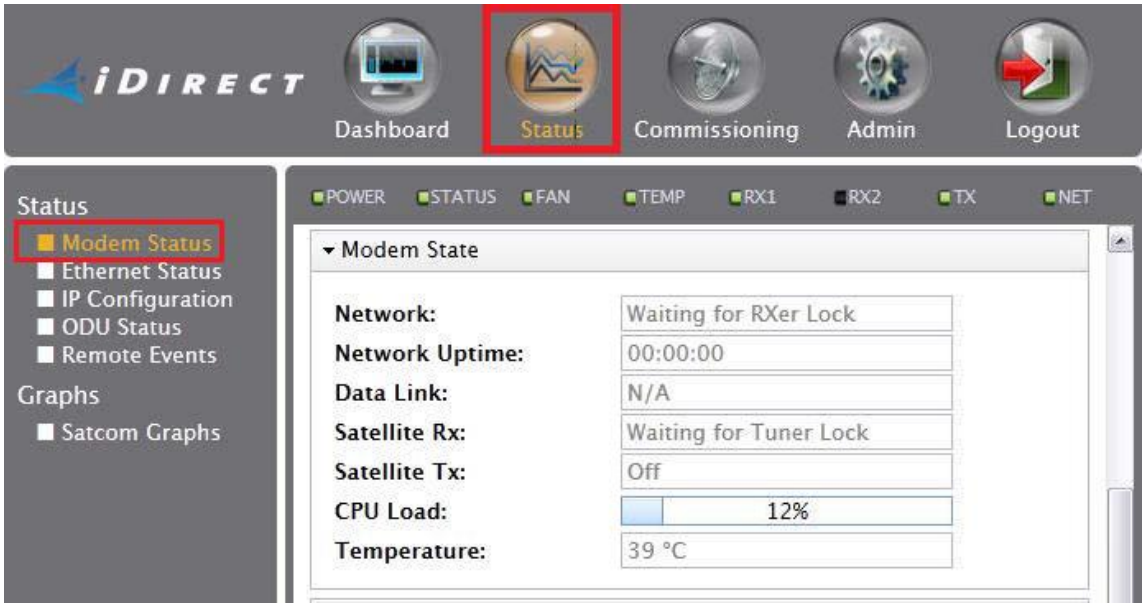
1. Remove power from the satellite modem.
2. Reconnect the RX IFL coax cable to the modem RX In port.
3. Reconnect power to the modem.
4. Monitor the modem LEDs or Web iSite dashboard to observe boot up and network acquisition progress. RX lock should be attained locking on receive outbound carrier.
5. NOC will verify if they see the remote active in the network via iMonitor.
6. TX and Net LEDs will turn green.

3.8 CHECKING REMOTE STATUS

1. Login to modem
   User: admin
   Password: iDirect



2. Click Status button in navigation bar then click Modem Status.
3. Good Status: Power, Status, Fan, Temp, RX1, TX and NET all green.



3.9 WIRELESS ACCESS POINTS

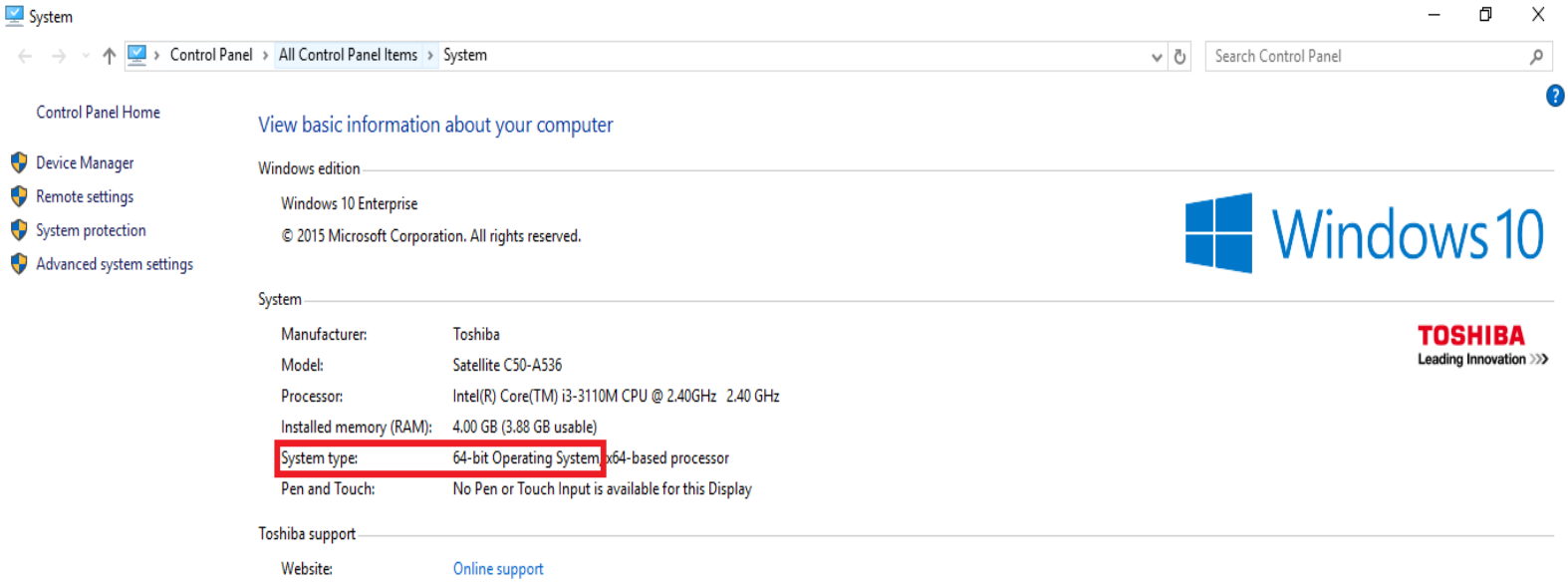
1. Install and Mount Wireless access points using either the indoor mount or outdoor mount.
2. Connect Ethernet cable with weather tight connectors on the WAP. Install antennas to the top side N-Type Connectors (Two antennas per WAP) install weather tight Ethernet PoE connector, install antennas
3. Plug access points into designated ports on switch identified in the Installation Design Package (IDP).
4. WAP blinking green is online and ready. Solid green is not ready. (5-10 minutes to be ready)
5. SSID: **MWRCAFE**; PW: **MWRU$3r!** (all WAPs, all cafes)

3.10 CAFÉ COMMISSIONING

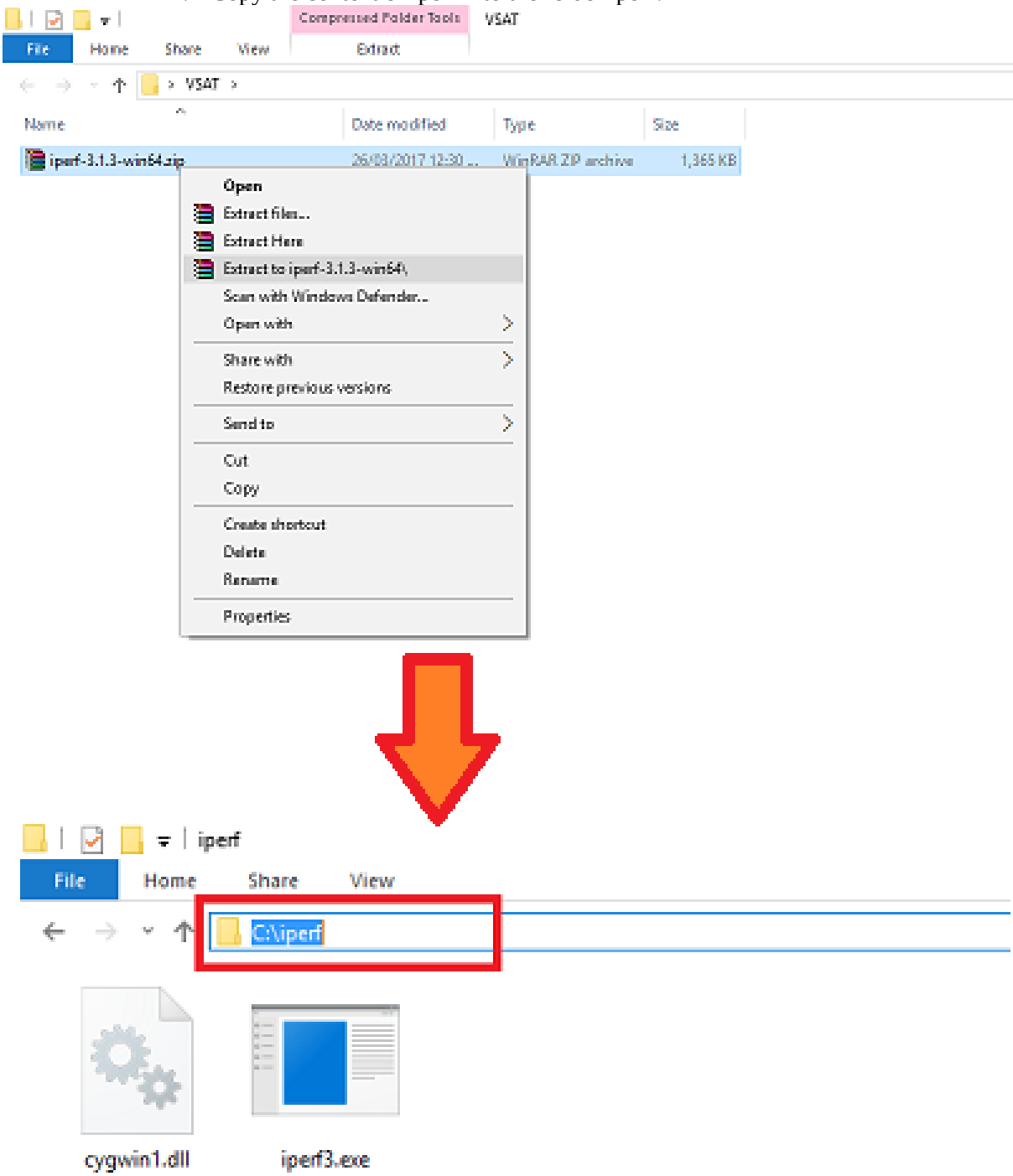
1. Once the satellite modem is active, notify the NOC start the software download and café commissioning process.
2. The café must receive a software update for the captive portal. The NOC will initiate the captive portal equipment update over the satellite link.
3. The NOC will verify the thin client image and VoIP firmware. Connectivity/ping tests will be performed by the NOC to test connectivity to remote café managed devices. This will verify the Management VLAN connectivity.

3.11 TESTING USING IPERF3

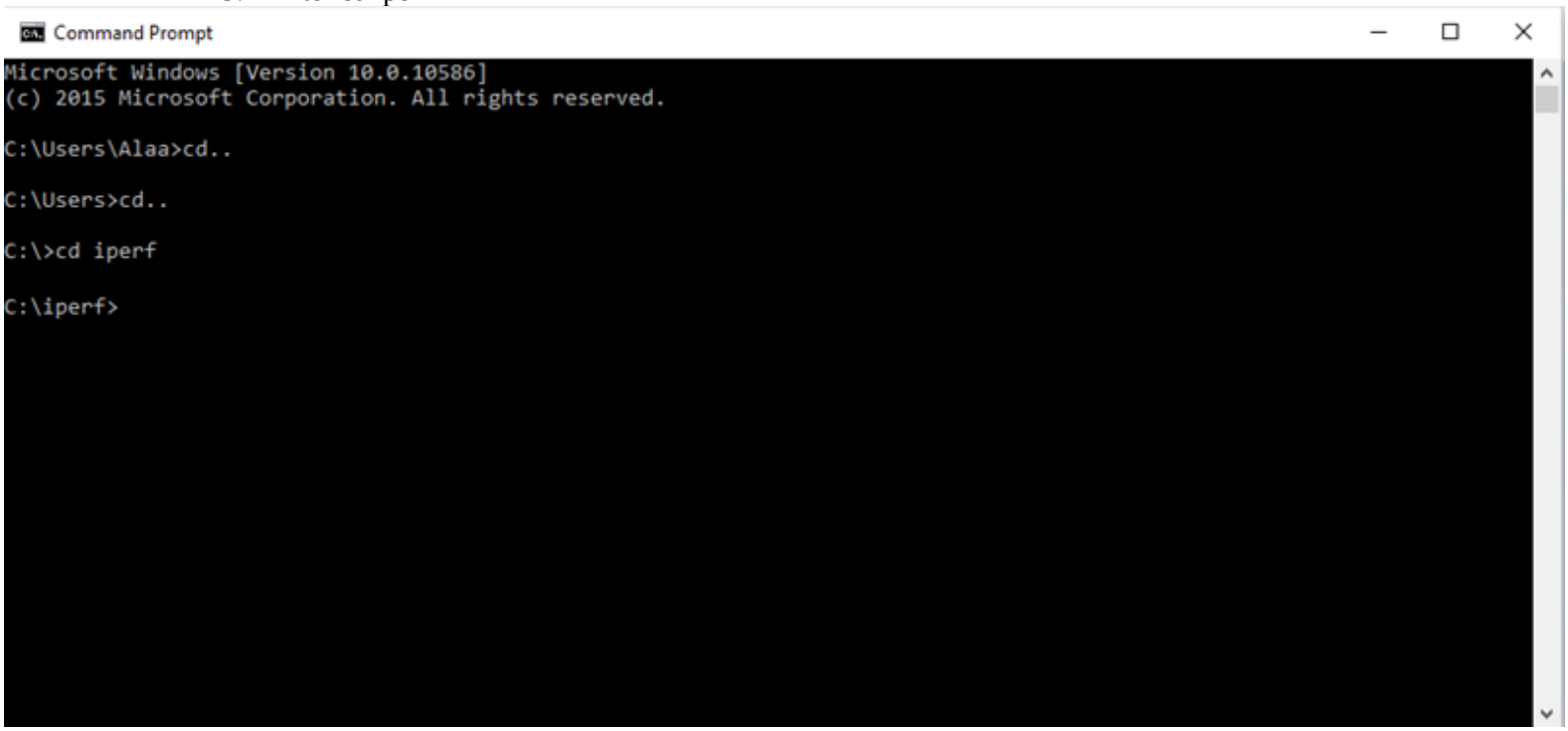
1. Check the laptop operating system type (32-bit (x86) or 64-bit)



2. Unzip the files of iperf-3.1.3-win32.zip (32bit) or iperf-3.1.3-win64 (64bit).
3. Create a folder named iperf on the root directory of your test laptop.
4. Copy the content of iperf into the folder iperf.



5. Local PC/Laptop must be plugged into switch emulating local thin client. A DHCP address will be issued to local test PC. For wireless site, local laptop will receive DHCP address from wireless network.
6. Access iperf folder on laptop via the command line to start iperf3 tests.
7. Open a command window by using Start ➔ Run and enter cmd.
8. At the Command window prompt enter cd.. Until you are on C:\ directory
9. Enter cd iperf



10. After you are in the directory C:\iperf> Run 90 second iperf3 bandwidth test in either direction from remote café accessing public iperf3 server. This confirms access to Internet and CIRs in both directions per café. Public iperf3 Server: "47.206.2.150":
    a) Test from café to server: iperf3 -c 47.206.2.150 -p 55201 -t 90 -i 2 --logfile [sitename].txt
    b) Test from server to café: iperf3 -c 47.206.2.150 -p 55201 -t 90 -i 2 -R >>[sitename].txt

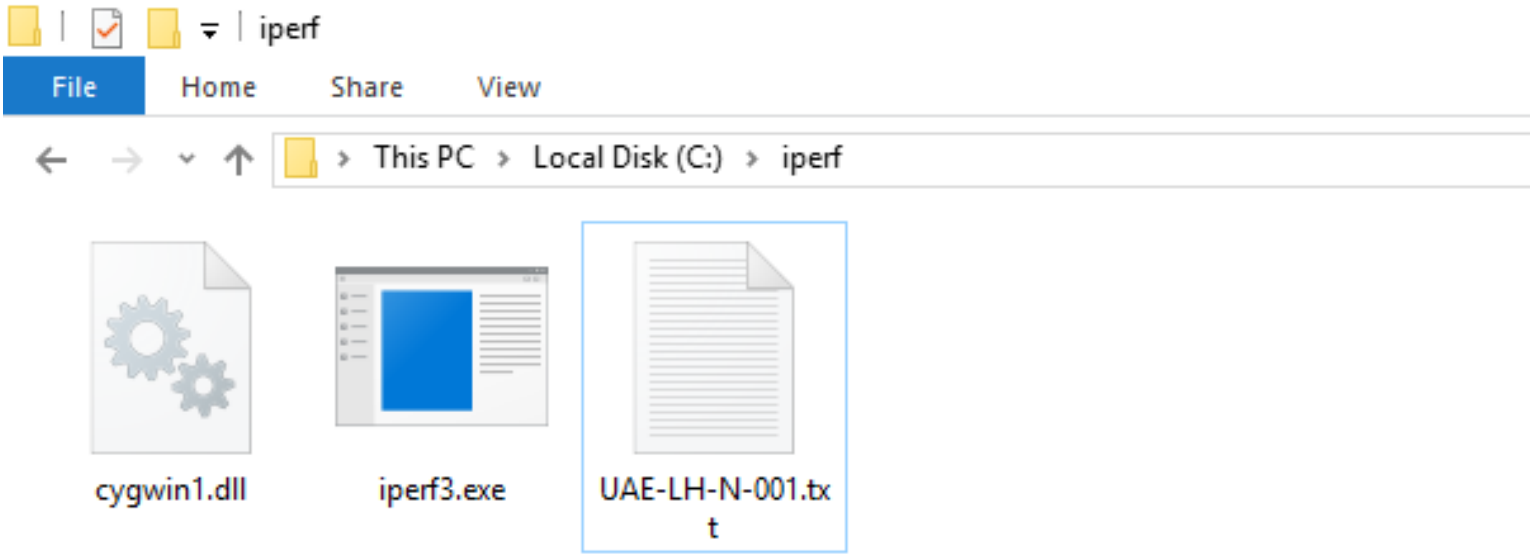
Note: the Syntax will look like the following example:

C:\iperf>iperf3 -c 47.206.2.150 -p 55201 -t 90 -i 2 --logfile UAE-LH-N-001.txt

C:\iperf>iperf3 -c 47.206.2.150 -p 55201 -t 90 -i 2 -R >>UAE-LH-N-001.txt

11. Executing these commands starts iperf3 test and exports results to log file in the iperf3 directory on local PC.

Note: Check the log file for data. It may take several attempts for the public server to respond.



12. Verify the test results.
13. Send test plan results and iperf3 log file to the NOC.

3.12 POST-COMMISSIONING ACTIVITIES

1. Document site configuration for updates to the IDP.
    a) Photos of site including indoor and outdoor equipment if permissible
    b) Update floor plan to show placement of equipment and general site layout (rack equipment location, thin clients placement and phones)
    c) Power Connections and Power Type
2. Compile site information and send to Trace NOC.
3. Instruct Site POC on the café setup and location of equipment
4. Provide basic training on creating an account and the wireless network
5. SSID

3.13 GOVERNMENT ACCEPTANCE

1. Perform Site Walk Through and Inspection
2. Display executed test plan to Site POC.
3. Show iperf3 bandwidth test results to Site POC
4. Gain concurrence site has been accepted through verbal or written acceptance (email, text)
5. Do not leave behind IDP or test plan.

4 BOQ

4.1 EXT150300428 | TRACE UAE AL MINHAD (REDLEG LIVING 1) - LGW

QTY	Unit	Part Number	HS	ECCN	Description	Unit Price	Total Price
VSAT System Components with Accessories							
1	Each	55072-229	7318.15.2000	EAR 99	Andrew WR229, HALF THICKNESS FLANGE GASKET, CPR229G, CPR229G	$11.55	$11.55
1	Each	62-1236201	8544.20.0000	EAR 99	Skyware Global 1.2M Type 123, Class II, Cross-Pol Feed, Ku-Band Receive/Transmit Antenna System.	$251.21	$251.21
250	Each	BC-0121-2	7318.15.2000	EAR 99	LMR-400 50-Ohm Coax Bulk Cable	$0.78	$195.00
3	Each	EZ-400-NMC-2-D	8544.42.0000	EAR 99	TMS N-Male (plug) LMR-400 connector, hex/knurl coupling nut, non-solder pin, 2-piece design	$12.12	$36.36
3	Each	EZ-600-FMH-75	8544.42.0000	EAR 99	F-Male (plug) crimp connector (non-solder pin) for LMR-600-75	$22.09	$66.27
1	Each	IDIREC-K0000103-0009	8517.62.0010	5A991b	KIT,X7 SATELLITE ROUTER,1GB,W/ +24V POWER SUPPLY, ROHS	$2,037.45	$2,037.45
250	Each	LMR-600-75	8544.20.0000	EAR 99	LMR-600 1/2" Flexible Low Loss Coax - Standard cable, Black PE jacket, 75 Ohm	$1.29	$322.50
1	Each	NJR2841S	8517.62.0050	5A991	NJR2841S Switchable Ku-Band PLL LNB (10.7 to 12.75 GHz)	$218.26	$218.26
1	Each	NJT5218N	8517.62.0050	5A991	NJRC 8W Universal Ku-band BUC, N Conn., VDC thrgh IFL Port	$1,850.00	$1,850.00
2	Each	PE9389	8536.69.4010	EAR 99	F MALE TO N FEMALE	$40.69	$81.38
Network Components with Accessories							
1	Each	C2911-AX/K9	8517.62.0050	5A002.A.1	Cisco 2911 w/3 GE 4 EHWIC 1 SM 256MB CF 1GB DRAM IPB SEC AX	$1,655.00	$1,655.00
1	Each	NETWORK-MS	8544.20.0000	EAR 99	SNMP Card MGE UPS	$395.41	$395.41
1	Each	NOMADI-969-5900-050	8517.69.0000	EAR99	AG 5900 GATEWAY, 500 DEVICE USERS, NSE SOFTWARE W/1ST YEAR LICENSE	$2,800.00	$2,800.00
1	Each	PW9130I1000R-XL2U	8517.62.0050	5A991.c	Eaton 9130 RM UPS, 230V, 50/60Hz, 1000VA/900W, C14 In, (6)C13 Out	$729.96	$729.96
1	Each	PWR-2911-POE	8517.62.0050	EAR99	Cisco 2911 AC Power Supply with Power Over Ethernet	$157.50	$157.50
1	Each	QUESTT-FE4119-20-02T	8544.42.0000	EAR 99	RACK - 3' 20 RMS 19" X 32" BLACK 410 SERIES TAPPED RAILS	$515.00	$515.00
1	Each	SM-ES2-24-P	8517.62.0050	5A991.c	Enhanced EtherSwitch L2 SM 23 FE 1 GE POE	$942.75	$942.75
2	Each	STAYON-3679	7318.15.2000	EAR 99	POWER STRIP EURO,RM SCHUKO PLUG TO 8 CEE7/7 RECEPTACLE,250 VOLT.	$49.00	$98.00
1	Each	SUPERM-MARITIME-CTO-2	8517.62.0050	5A002.A.1	SERVER - NR 1U SC514 - SINGLE PWS CHASSIS MCP-290-00056-0N (INCLUDE 95-SERVER-OS)	$3,727.60	$3,727.60
3	Each	CISCO-AIR-CAP1532E-B-K9	8517620050	5A002.A.1	Cisco Aironet 1532E - wireless access point	$538.20	$1,614.60
1	Each	CISCO-AIR-CT2504-15-K9	8517620050	5A002.A.1	CISCO 2504 WIRELESS CONTROLLER WITH 16 AP USER LICENSE	$1,947.50	$1,947.50
1	Each	CISCO-ASA5508-K9	8517620050	5A002.A.1	Cisco ASA 5508-X with FirePOWER Services -	$1,294.20	$1,294.20
1	Each	CISCO-WS-C2960X-48FPS-L	8517620050	5A991.C	Cisco Catalyst 2960X-48FPS-L - switch - 48	$2,374.20	$2,374.20
Installation Materials and Tools							
10	Each	10808	7318.15.2000	EAR 99	Die Cast Double expansion Anchor 3/8	$1.50	$15.00
2	Each	1348	7318.15.2000	EAR 99	Machine screws, Phillips pan head, Stainless steel 18-8, #8-32 x 3/4 Each	$0.27	$0.54
3	Each	1365	7318.15.2000	EAR 99	Machine screws, Phillips pan head, Stainless steel 18-8, #10-32 x 3/8	$0.14	$0.42
2	Each	1368	7318.15.2000	EAR 99	Machine screws, Phillips pan head, Stainless steel 18-8, #10-32 x 3/4"	$0.14	$0.28

1	Each	2080	8544.42.0000	EAR 99	AC Plug IEC60320 C14 14awg Male Straight Entry UL	$11.22	$11.22
1	Each	23-3/4X30FT	7318.15.2000	EAR 100	3M Type 23 3/4X30FT Self Fusing Tape	$14.46	$14.46
10	Each	2561	7318.15.2000	EAR 99	Hex machine screw nuts, Stainless steel 18-8, #10-32 Each	$0.14	$1.40
1	Each	2667	8504.40.6001	EAR 99	AC Male Power Plug Cont. Europe CEE7/7 16 Amp 250 Volt Black Straight Entry w/ Strain Relief	$8.00	$8.00
29	Each	2946	7318.15.2000	EAR 99	2946 - #10 Stainless Steel Flat Washer	$0.24	$6.96
12	Each	2947	7318.15.2000	EAR 99	1/4 Stainless Steel Flat Washer	$0.14	$1.68
2	Each	2955	7318.15.2000	EAR 99	AC Connector IEC60320 C13 Female 14awg Straight Entry	$14.35	$28.70
12	Each	2956	7318.15.2000	EAR 99	Lock washers, Stainless steel 18-8, 1/4"	$0.14	$1.68
10	Each	3062	7318.15.2000	EAR 99	USS Flat Washere Steel grade 8	$0.17	$1.70
1	Each	33SUPER-3/4X66FT	7318.15.2000	EAR 99	Scotch® Super 33+™ Vinyl Electrical Tape, 3/4 in x 66 ft (19 mm x 20.1 m)	$5.02	$5.02
10	Each	4874	7318.15.2000	EAR 99	10-32 x 3/4 Stainless Steel Mach Screw	$0.55	$5.50
10	Each	4876	7318.15.2000	EAR 99	Socket cap, Stainless steel 18-8, #10-32 x 1-1/4"	$0.27	$2.70
12	Each	4883	7318.15.2000	EAR 99	Socket head screws, Stainless steel 18-8, 1/4-20 x 3/4 Each	$0.34	$4.08
4	Each	5413	8544.20.0000	EAR 99	3 ft. (10A) IEC C14 to IEC C13 Extension Cable (x1) - 10A	$7.74	$30.96
40	Each	5566	7318.15.2000	EAR 99	Stainless steel 18-8 flat washers	$0.14	$5.60
3	Each	5612	8544.20.0000	EAR 99	6 ft. (10A) IEC C14 to IEC C13 Extension Cable	$10.24	$30.72
1	Each	6110063-04	8544.20.0000	EAR 99	1.2M NPM, 1.6M X 1.6M, 73mm MAST,W/ PADS	$133.62	$133.62
1	Each	73560	7318.15.2000	EAR 99	Grease, Silicone Compound DM(TM), 5.3 oz	$16.33	$16.33
1	Each	7630	7318.15.2000	EAR 99	Geist BRELN PDU 102-0020/16	$100.00	$100.00
5	Each	7680	7318.15.2000	EAR 99	Stay Online Cat6 Crossover Cable - Red 10 Foot	$10.22	$51.10
5	Each	8276Z	7318.15.2000	EAR 99	Stay Online Cat6 (Cat5e Compatible) Ethernet Patch Cable - 6 Foot Green	$3.00	$15.00
10	Each	856	7318.15.2000	EAR 99	HEX Bolt 3/8 x 2-1/2"500	$0.24	$2.40
17	Each	9002	7318.15.2000	EAR 99	Cable Yung-Li Cord Bulk 14x3c SJT 105* 300 Volt Black UL. INDOORS --IN FEET--	$1.09	$18.53
40	Each	9668	7318.15.2000	EAR 99	Machine screw, Phillips pan head, Stainless steel 18-8, #12-24 x 5/8"	$0.17	$6.80
19	Each	BOLTDE-2955	7318.15.2000	EAR 99	#2955 Lock washers, Stainless steel 18-8, #10	$0.05	$0.95
50	Each	BT4LH-L0	7318.15.2000	EAR 99	Cable Tie with metal barb, 14.9", Light-Heavy cross section	$0.58	$29.00
8	Each	CM-1221	7318.15.2000	EAR 99	3.0" x 3.5" cable ring - rack cable management	$8.35	$66.80
2	Each	INTERN-70120	7318.15.2000	EAR 99	RECEPTACLE EUROPEAN SHUCKO WEATHERPROOF SINGLE RECEPTACLE GRAY HINGED COVER	$7.09	$14.18
2	Each	INTERN-70125	7318.15.2000	EAR 99	MOUNT BOX WEATHERPROOF SURFACE MOUNT BOX FOR RECEPTACLES NO.70124 AND 70120	$5.96	$11.92
4	Each	INTERN-70141	7318.15.2000	EAR 99	PLUG BLACK EUROPEAN SCHUCKO PLUG STRAIGHT CORD GRIP MEETS CEE 7-7 REQRS MATES	$5.15	$20.60
3	Each	INTERN-81131X1M	7318.15.2000	EAR 99	EUROPEAN CEE7/7 SCHUKO 10 AMPERE 230-250V POWER CORD, (EU1-16P) DIN 49441 PLUG, IEC 60320 C-13 CONN	$5.63	$16.89
1	Each	ITR040202040	7318.15.2000	EAR 99	Victron Energy Isolation Transformer 2000W 115/230V	$575.66	$575.66
1	Each	PET10-6000	7318.15.2000	EAR 99	4 ft. Grounding Rod	$8.30	$8.30
1	Each	PK9GTACP	7318.15.2000	EAR 99	9 Terminal Ground Bar Kit	$6.29	$6.29
50	Each	PLT2S-C20	7318.15.2000	EAR 99	PLT2S-C20	$0.25	$12.50
15	Each	PV14-8R-C	8544.42.0000	EAR 99	PV14-8R-L Ring Terminal Lug	$0.88	$13.20
10	Each	PV14-P47-E	8544.42.0000	EAR 99	Pin Terminal, 16 - 14 AWG, vinyl insulated, .49 pin length.	$0.99	$9.90

5	Each	PV6-8R-T	8544.42.0000	EAR 99	Ring Terminal, large wire, 6 AWG, #8 stud size, vinyl insulated	$2.90	$14.50
1	Each	SLW	8544.20.0000	EAR 99	3M Scotchcode Wire Marker Write-On Dispenser SLW, Wire O.D. 0.23 to 1.32 Inches (includes SMP pen)	$67.68	$67.68
22	Each	TFFN-16-STR-GRN-500S	7318.15.2000	EAR 99	TFFN-16-STR-GRN-500S Wire 600V AWG 16 Ground. Wire	$0.15	$3.30
310	Each	THHN-6-STR-GRN-500S	8544.20.0000	EAR 99	THHN-6-STR-GRN-500S WIRE 600V AWG 6 Grnd.Wire	$0.33	$102.30
1	Each	WL-8	1515.90.8002	EAR 99	American Grease Stick - White Lithium Grease, 8oz	$7.38	$7.38
1289					**Total FOB (In USD)**		**$24,823.45**

4.2 EXT150300427 | TRACE UAE AL MINHAD (REDLEG LIVING 3) – LGW

QTY	Unit	Part Number	HS	ECCN	Description	Unit Price	Total Price
VSAT System Components with Accessories							
1	Each	55072-229	7318.15.2000	EAR 99	Andrew WR229, HALF THICKNESS FLANGE GASKET, CPR229G, CPR229G	$11.55	$11.55
1	Each	62-1236201	8544.20.0000	EAR 99	Skyware Global 1.2M Type 123, Class II, Cross-Pol Feed, Ku-Band Receive/Transmit Antenna System.	$251.21	$251.21
250	Each	BC-0121-2	7318.15.2000	EAR 99	LMR-400 50-Ohm Coax Bulk Cable	$0.78	$195.00
3	Each	EZ-400-NMC-2-D	8544.42.0000	EAR 99	TMS N-Male (plug) LMR-400 connector, hex/knurl coupling nut, non-solder pin, 2-piece design	$12.12	$36.36
3	Each	EZ-600-FMH-75	8544.42.0000	EAR 99	F-Male (plug) crimp connector (non-solder pin) for LMR-600-75	$22.09	$66.27
1	Each	IDIREC-K0000103-0009	8517.62.0010	5A991b	KIT,X7 SATELLITE ROUTER,1GB,W/ +24V POWER SUPPLY, ROHS	$2,037.45	$2,037.45
250	Each	LMR-600-75	8544.20.0000	EAR 99	LMR-600 1/2" Flexible Low Loss Coax - Standard cable, Black PE jacket, 75 Ohm	$1.29	$322.50
1	Each	NJR2841S	8517.62.0050	5A991	NJR2841S Switchable Ku-Band PLL LNB (10.7 to 12.75 GHz)	$218.26	$218.26
1	Each	NJT5218N	8517.62.0050	5A991	NJRC 8W Universal Ku-band BUC, N Conn., VDC thrgh IFL Port	$1,850.00	$1,850.00
2	Each	PE9389	8536.69.4010	EAR 99	F MALE TO N FEMALE	$40.69	$81.38
Network Components with Accessories							
1	Each	C2911-AX/K9	8517.62.0050	5A002.A.1	Cisco 2911 w/3 GE 4 EHWIC 1 SM 256MB CF 1GB DRAM IPB SEC AX	$1,655.00	$1,655.00
1	Each	NETWORK-MS	8544.20.0000	EAR 99	SNMP Card MGE UPS	$395.41	$395.41
1	Each	NOMADI-969-5900-050	8517.69.0000	EAR99	AG 5900 GATEWAY, 500 DEVICE USERS, NSE SOFTWARE W/1ST YEAR LICENSE	$2,800.00	$2,800.00
1	Each	PW9130I1000R-XL2U	8517.62.0050	5A991.c	Eaton 9130 RM UPS, 230V, 50/60Hz, 1000VA/900W, C14 In, (6)C13 Out	$729.96	$729.96
1	Each	PWR-2911-POE	8517.62.0050	EAR99	Cisco 2911 AC Power Supply with Power Over Ethernet	$157.50	$157.50
1	Each	QUESTT-FE4119-20-02T	8544.42.0000	EAR 99	RACK - 3' 20 RMS 19" X 32" BLACK 410 SERIES TAPPED RAILS	$515.00	$515.00
1	Each	SM-ES2-24-P	8517.62.0050	5A991.c	Enhanced EtherSwitch L2 SM 23 FE 1 GE POE	$942.75	$942.75
2	Each	STAYON-3679	7318.15.2000	EAR 99	POWER STRIP EURO,RM SCHUKO PLUG TO 8 CEE7/7 RECEPTACLE,250 VOLT.	$49.00	$98.00
1	Each	SUPERM-MARITIME-CTO-2	8517.62.0050	5A002.A.1	SERVER - NR 1U SC514 - SINGLE PWS CHASSIS MCP-290-00056-0N (INCLUDE 95-SERVER-OS)	$3,727.60	$3,727.60
3	Each	CISCO-AIR-CAP1532E-B-K9	8517620050	5A002.A.1	Cisco Aironet 1532E - wireless access point	$538.20	$1,614.60
1	Each	CISCO-AIR-CT2504-15-K9	8517620050	5A002.A.1	CISCO 2504 WIRELESS CONTROLLER WITH 16 AP USER LICENSE	$1,947.50	$1,947.50
1	Each	CISCO-ASA5508-K9	8517620050	5A002.A.1	Cisco ASA 5508-X with FirePOWER Services -	$1,294.20	$1,294.20
1	Each	CISCO-WS-C2960X-48FPS-L	8517620050	5A991.C	Cisco Catalyst 2960X-48FPS-L - switch - 48	$2,374.20	$2,374.20
Installation Materials and Tools							
10	Each	10808	7318.15.2000	EAR 99	Die Cast Double expansion Anchor 3/8	$1.50	$15.00
2	Each	1348	7318.15.2000	EAR 99	Machine screws, Phillips pan head, Stainless steel 18-8, #8-32 x 3/4 Each	$0.27	$0.54
3	Each	1365	7318.15.2000	EAR 99	Machine screws, Phillips pan head, Stainless steel 18-8, #10-32 x 3/8	$0.14	$0.42
2	Each	1368	7318.15.2000	EAR 99	Machine screws, Phillips pan head, Stainless steel 18-8, #10-32 x 3/4"	$0.14	$0.28
1	Each	2080	8544.42.0000	EAR 99	AC Plug IEC60320 C14 14awg Male Straight Entry UL	$11.22	$11.22
1	Each	23-3/4X30FT	7318.15.2000	EAR 100	3M Type 23 3/4X30FT Self Fusing Tape	$14.46	$14.46

10	Each	2561	7318.15.2000	EAR 99	Hex machine screw nuts, Stainless steel 18-8, #10-32 Each	$0.14	$1.40
1	Each	2667	8504.40.6001	EAR 99	AC Male Power Plug Cont. Europe CEE7/7 16 Amp 250 Volt Black Straight Entry w/ Strain Relief	$8.00	$8.00
29	Each	2946	7318.15.2000	EAR 99	2946 - #10 Stainless Steel Flat Washer	$0.24	$6.96
12	Each	2947	7318.15.2000	EAR 99	1/4 Stainless Steel Flat Washer	$0.14	$1.68
2	Each	2955	7318.15.2000	EAR 99	AC Connector IEC60320 C13 Female 14awg Straight Entry	$14.35	$28.70
12	Each	2956	7318.15.2000	EAR 99	Lock washers, Stainless steel 18-8, 1/4"	$0.14	$1.68
10	Each	3062	7318.15.2000	EAR 99	USS Flat Washere Steel grade 8	$0.17	$1.70
1	Each	33SUPER-3/4X66FT	7318.15.2000	EAR 99	Scotch® Super 33+™ Vinyl Electrical Tape, 3/4 in x 66 ft (19 mm x 20.1 m)	$5.02	$5.02
10	Each	4874	7318.15.2000	EAR 99	10-32 x 3/4 Stainless Steel Mach Screw	$0.55	$5.50
10	Each	4876	7318.15.2000	EAR 99	Socket cap, Stainless steel 18-8, #10-32 x 1-1/4"	$0.27	$2.70
12	Each	4883	7318.15.2000	EAR 99	Socket head screws, Stainless steel 18-8, 1/4-20 x 3/4 Each	$0.34	$4.08
4	Each	5413	8544.20.0000	EAR 99	3 ft. (10A) IEC C14 to IEC C13 Extension Cable (x1) - 10A	$7.74	$30.96
40	Each	5566	7318.15.2000	EAR 99	Stainless steel 18-8 flat washers	$0.14	$5.60
3	Each	5612	8544.20.0000	EAR 99	6 ft. (10A) IEC C14 to IEC C13 Extension Cable	$10.24	$30.72
1	Each	6110063-04	8544.20.0000	EAR 99	1.2M NPM, 1.6M X 1.6M, 73mm MAST,W/ PADS	$133.62	$133.62
1	Each	73560	7318.15.2000	EAR 99	Grease, Silicone Compound DM(TM), 5.3 oz	$16.33	$16.33
1	Each	7630	7318.15.2000	EAR 99	Geist BRELN PDU 102-0020/16	$100.00	$100.00
5	Each	7680	7318.15.2000	EAR 99	Stay Online Cat6 Crossover Cable - Red 10 Foot	$10.22	$51.10
5	Each	8276Z	7318.15.2000	EAR 99	Stay Online Cat6 (Cat5e Compatible) Ethernet Patch Cable - 6 Foot Green	$3.00	$15.00
10	Each	856	7318.15.2000	EAR 99	HEX Bolt 3/8 x 2-1/2"500	$0.24	$2.40
17	Each	9002	7318.15.2000	EAR 99	Cable Yung-Li Cord Bulk 14x3c SJT 105* 300 Volt Black UL. INDOORS --IN FEET--	$1.09	$18.53
40	Each	9668	7318.15.2000	EAR 99	Machine screw, Phillips pan head, Stainless steel 18-8, #12-24 x 5/8"	$0.17	$6.80
19	Each	BOLTDE-2955	7318.15.2000	EAR 99	#2955 Lock washers, Stainless steel 18-8, #10	$0.05	$0.95
50	Each	BT4LH-L0	7318.15.2000	EAR 99	Cable Tie with metal barb, 14.9", Light-Heavy cross section	$0.58	$29.00
8	Each	CM-1221	7318.15.2000	EAR 99	3.0" x 3.5" cable ring - rack cable management	$8.35	$66.80
2	Each	INTERN-70120	7318.15.2000	EAR 99	RECEPTACLE EUROPEAN SHUCKO WEATHERPROOF SINGLE RECEPTACLE GRAY HINGED COVER	$7.09	$14.18
2	Each	INTERN-70125	7318.15.2000	EAR 99	MOUNT BOX WEATHERPROOF SURFACE MOUNT BOX FOR RECEPTACLES NO.70124 AND 70120	$5.96	$11.92
4	Each	INTERN-70141	7318.15.2000	EAR 99	PLUG BLACK EUROPEAN SCHUCKO PLUG STRAIGHT CORD GRIP MEETS CEE 7-7 REQRS MATES	$5.15	$20.60
3	Each	INTERN-81131X1M	7318.15.2000	EAR 99	EUROPEAN CEE7/7 SCHUKO 10 AMPERE 230-250V POWER CORD, (EU1-16P) DIN 49441 PLUG, IEC 60320 C-13 CONN	$5.63	$16.89
1	Each	ITR040202040	7318.15.2000	EAR 99	Victron Energy Isolation Transformer 2000W 115/230V	$575.66	$575.66
1	Each	PET10-6000	7318.15.2000	EAR 99	4 ft. Grounding Rod	$8.30	$8.30
1	Each	PK9GTACP	7318.15.2000	EAR 99	9 Terminal Ground Bar Kit	$6.29	$6.29
50	Each	PLT2S-C20	7318.15.2000	EAR 99	PLT2S-C20	$0.25	$12.50
15	Each	PV14-8R-C	8544.42.0000	EAR 99	PV14-8R-L Ring Terminal Lug	$0.88	$13.20
10	Each	PV14-P47-E	8544.42.0000	EAR 99	Pin Terminal, 16 - 14 AWG, vinyl insulated, .49 pin length.	$0.99	$9.90
5	Each	PV6-8R-T	8544.42.0000	EAR 99	Ring Terminal, large wire, 6 AWG, #8 stud size, vinyl insulated	$2.90	$14.50

1	Each	SLW	8544.20.0000	EAR 99	3M Scotchcode Wire Marker Write-On Dispenser SLW, Wire O.D. 0.23 to 1.32 Inches (includes SMP pen)	$67.68	$67.68
22	Each	TFFN-16-STR-GRN-500S	7318.15.2000	EAR 99	TFFN-16-STR-GRN-500S Wire 600V AWG 16 Ground. Wire	$0.15	$3.30
310	Each	THHN-6-STR-GRN-500S	8544.20.0000	EAR 99	THHN-6-STR-GRN-500S WIRE 600V AWG 6 Grnd.Wire	$0.33	$102.30
1	Each	WL-8	1515.90.8002	EAR 99	American Grease Stick - White Lithium Grease, 8oz	$7.38	$7.38
1289					**Total FOB (In USD)**		**$24,823.45**

4.3 EXT150300411 | TRACE UAE AL MINHAD (REDLEG LIVING 4) – LGW

QTY	Unit	Part Number	HS	ECCN	Description	Unit Price	Total Price
VSAT System Components with Accessories							
1	Each	55072-229	7318.15.2000	EAR 99	Andrew WR229, HALF THICKNESS FLANGE GASKET, CPR229G, CPR229G	$11.55	$11.55
1	Each	62-1236201	8544.20.0000	EAR 99	Skyware Global 1.2M Type 123, Class II, Cross-Pol Feed, Ku-Band Receive/Transmit Antenna System.	$251.21	$251.21
250	Each	BC-0121-2	7318.15.2000	EAR 99	LMR-400 50-Ohm Coax Bulk Cable	$0.78	$195.00
3	Each	EZ-400-NMC-2-D	8544.42.0000	EAR 99	TMS N-Male (plug) LMR-400 connector, hex/knurl coupling nut, non-solder pin, 2-piece design	$12.12	$36.36
3	Each	EZ-600-FMH-75	8544.42.0000	EAR 99	F-Male (plug) crimp connector (non-solder pin) for LMR-600-75	$22.09	$66.27
1	Each	IDIREC-K0000103-0009	8517.62.0010	5A991b	KIT,X7 SATELLITE ROUTER,1GB,W/ +24V POWER SUPPLY, ROHS	$2,037.45	$2,037.45
250	Each	LMR-600-75	8544.20.0000	EAR 99	LMR-600 1/2" Flexible Low Loss Coax - Standard cable, Black PE jacket, 75 Ohm	$1.29	$322.50
1	Each	NJR2841S	8517.62.0050	5A991	NJR2841S Switchable Ku-Band PLL LNB (10.7 to 12.75 GHz)	$218.26	$218.26
1	Each	NJT5218N	8517.62.0050	5A991	NJRC 8W Universal Ku-band BUC, N Conn., VDC thrgh IFL Port	$1,850.00	$1,850.00
2	Each	PE9389	8536.69.4010	EAR 99	F MALE TO N FEMALE	$40.69	$81.38
Network Components with Accessories							
1	Each	C2911-AX/K9	8517.62.0050	5A002.A.1	Cisco 2911 w/3 GE 4 EHWIC 1 SM 256MB CF 1GB DRAM IPB SEC AX	$1,655.00	$1,655.00
1	Each	NETWORK-MS	8544.20.0000	EAR 99	SNMP Card MGE UPS	$395.41	$395.41
1	Each	NOMADI-969-5900-050	8517.69.0000	EAR99	AG 5900 GATEWAY, 500 DEVICE USERS, NSE SOFTWARE W/1ST YEAR LICENSE	$2,800.00	$2,800.00
1	Each	PW9130I1000R-XL2U	8517.62.0050	5A991.c	Eaton 9130 RM UPS, 230V, 50/60Hz, 1000VA/900W, C14 In, (6)C13 Out	$729.96	$729.96
1	Each	PWR-2911-POE	8517.62.0050	EAR99	Cisco 2911 AC Power Supply with Power Over Ethernet	$157.50	$157.50
1	Each	QUESTT-FE4119-20-02T	8544.42.0000	EAR 99	RACK - 3' 20 RMS 19" X 32" BLACK 410 SERIES TAPPED RAILS	$515.00	$515.00
1	Each	SM-ES2-24-P	8517.62.0050	5A991.c	Enhanced EtherSwitch L2 SM 23 FE 1 GE POE	$942.75	$942.75
2	Each	STAYON-3679	7318.15.2000	EAR 99	POWER STRIP EURO,RM SCHUKO PLUG TO 8 CEE7/7 RECEPTACLE,250 VOLT.	$49.00	$98.00
1	Each	SUPERM-MARITIME-CTO-2	8517.62.0050	5A002.A.1	SERVER - NR 1U SC514 - SINGLE PWS CHASSIS MCP-290-00056-0N (INCLUDE 95-SERVER-OS)	$3,727.60	$3,727.60
3	Each	CISCO-AIR-CAP1532E-B-K9	8517620050	5A002.A.1	Cisco Aironet 1532E - wireless access point	$538.20	$1,614.60
1	Each	CISCO-AIR-CT2504-15-K9	8517620050	5A002.A.1	CISCO 2504 WIRELESS CONTROLLER WITH 16 AP USER LICENSE	$1,947.50	$1,947.50
1	Each	CISCO-ASA5508-K9	8517620050	5A002.A.1	Cisco ASA 5508-X with FirePOWER Services -	$1,294.20	$1,294.20
1	Each	CISCO-WS-C2960X-48FPS-L	8517620050	5A991.C	Cisco Catalyst 2960X-48FPS-L - switch - 48	$2,374.20	$2,374.20
Installation Materials and Tools							
10	Each	10808	7318.15.2000	EAR 99	Die Cast Double expansion Anchor 3/8	$1.50	$15.00
2	Each	1348	7318.15.2000	EAR 99	Machine screws, Phillips pan head, Stainless steel 18-8, #8-32 x 3/4 Each	$0.27	$0.54
3	Each	1365	7318.15.2000	EAR 99	Machine screws, Phillips pan head, Stainless steel 18-8, #10-32 x 3/8	$0.14	$0.42
2	Each	1368	7318.15.2000	EAR 99	Machine screws, Phillips pan head, Stainless steel 18-8, #10-32 x 3/4"	$0.14	$0.28
1	Each	2080	8544.42.0000	EAR 99	AC Plug IEC60320 C14 14awg Male Straight Entry UL	$11.22	$11.22
1	Each	23-3/4X30FT	7318.15.2000	EAR 100	3M Type 23 3/4X30FT Self Fusing Tape	$14.46	$14.46

10	Each	2561	7318.15.2000	EAR 99	Hex machine screw nuts, Stainless steel 18-8, #10-32 Each	$0.14	$1.40
1	Each	2667	8504.40.6001	EAR 99	AC Male Power Plug Cont. Europe CEE7/7 16 Amp 250 Volt Black Straight Entry w/ Strain Relief	$8.00	$8.00
29	Each	2946	7318.15.2000	EAR 99	2946 - #10 Stainless Steel Flat Washer	$0.24	$6.96
12	Each	2947	7318.15.2000	EAR 99	1/4 Stainless Steel Flat Washer	$0.14	$1.68
2	Each	2955	7318.15.2000	EAR 99	AC Connector IEC60320 C13 Female 14awg Straight Entry	$14.35	$28.70
12	Each	2956	7318.15.2000	EAR 99	Lock washers, Stainless steel 18-8, 1/4"	$0.14	$1.68
10	Each	3062	7318.15.2000	EAR 99	USS Flat Washere Steel grade 8	$0.17	$1.70
1	Each	33SUPER-3/4X66FT	7318.15.2000	EAR 99	Scotch® Super 33+™ Vinyl Electrical Tape, 3/4 in x 66 ft (19 mm x 20.1 m)	$5.02	$5.02
10	Each	4874	7318.15.2000	EAR 99	10-32 x 3/4 Stainless Steel Mach Screw	$0.55	$5.50
10	Each	4876	7318.15.2000	EAR 99	Socket cap, Stainless steel 18-8, #10-32 x 1-1/4"	$0.27	$2.70
12	Each	4883	7318.15.2000	EAR 99	Socket head screws, Stainless steel 18-8, 1/4-20 x 3/4 Each	$0.34	$4.08
4	Each	5413	8544.20.0000	EAR 99	3 ft. (10A) IEC C14 to IEC C13 Extension Cable (x1) - 10A	$7.74	$30.96
40	Each	5566	7318.15.2000	EAR 99	Stainless steel 18-8 flat washers	$0.14	$5.60
3	Each	5612	8544.20.0000	EAR 99	6 ft. (10A) IEC C14 to IEC C13 Extension Cable	$10.24	$30.72
1	Each	6110063-04	8544.20.0000	EAR 99	1.2M NPM, 1.6M X 1.6M, 73mm MAST,W/ PADS	$133.62	$133.62
1	Each	73560	7318.15.2000	EAR 99	Grease, Silicone Compound DM(TM), 5.3 oz	$16.33	$16.33
1	Each	7630	7318.15.2000	EAR 99	Geist BRELN PDU 102-0020/16	$100.00	$100.00
5	Each	7680	7318.15.2000	EAR 99	Stay Online Cat6 Crossover Cable - Red 10 Foot	$10.22	$51.10
5	Each	8276Z	7318.15.2000	EAR 99	Stay Online Cat6 (Cat5e Compatible) Ethernet Patch Cable - 6 Foot Green	$3.00	$15.00
10	Each	856	7318.15.2000	EAR 99	HEX Bolt 3/8 x 2-1/2"500	$0.24	$2.40
17	Each	9002	7318.15.2000	EAR 99	Cable Yung-Li Cord Bulk 14x3c SJT 105* 300 Volt Black UL. INDOORS --IN FEET--	$1.09	$18.53
40	Each	9668	7318.15.2000	EAR 99	Machine screw, Phillips pan head, Stainless steel 18-8, #12-24 x 5/8"	$0.17	$6.80
19	Each	BOLTDE-2955	7318.15.2000	EAR 99	#2955 Lock washers, Stainless steel 18-8, #10	$0.05	$0.95
50	Each	BT4LH-L0	7318.15.2000	EAR 99	Cable Tie with metal barb, 14.9", Light-Heavy cross section	$0.58	$29.00
8	Each	CM-1221	7318.15.2000	EAR 99	3.0" x 3.5" cable ring - rack cable management	$8.35	$66.80
2	Each	INTERN-70120	7318.15.2000	EAR 99	RECEPTACLE EUROPEAN SHUCKO WEATHERPROOF SINGLE RECEPTACLE GRAY HINGED COVER	$7.09	$14.18
2	Each	INTERN-70125	7318.15.2000	EAR 99	MOUNT BOX WEATHERPROOF SURFACE MOUNT BOX FOR RECEPTACLES NO.70124 AND 70120	$5.96	$11.92
4	Each	INTERN-70141	7318.15.2000	EAR 99	PLUG BLACK EUROPEAN SCHUCKO PLUG STRAIGHT CORD GRIP MEETS CEE 7-7 REQRS MATES	$5.15	$20.60
3	Each	INTERN-81131X1M	7318.15.2000	EAR 99	EUROPEAN CEE7/7 SCHUKO 10 AMPERE 230-250V POWER CORD, (EU1-16P) DIN 49441 PLUG, IEC 60320 C-13 CONN	$5.63	$16.89
1	Each	ITR040202040	7318.15.2000	EAR 99	Victron Energy Isolation Transformer 2000W 115/230V	$575.66	$575.66
1	Each	PET10-6000	7318.15.2000	EAR 99	4 ft. Grounding Rod	$8.30	$8.30
1	Each	PK9GTACP	7318.15.2000	EAR 99	9 Terminal Ground Bar Kit	$6.29	$6.29
50	Each	PLT2S-C20	7318.15.2000	EAR 99	PLT2S-C20	$0.25	$12.50
15	Each	PV14-8R-C	8544.42.0000	EAR 99	PV14-8R-L Ring Terminal Lug	$0.88	$13.20
10	Each	PV14-P47-E	8544.42.0000	EAR 99	Pin Terminal, 16 - 14 AWG, vinyl insulated, .49 pin length.	$0.99	$9.90
5	Each	PV6-8R-T	8544.42.0000	EAR 99	Ring Terminal, large wire, 6 AWG, #8 stud size, vinyl insulated	$2.90	$14.50

1	Each	SLW	8544.20.0000	EAR 99	3M Scotchcode Wire Marker Write-On Dispenser SLW, Wire O.D. 0.23 to 1.32 Inches (includes SMP pen)	$67.68	$67.68
22	Each	TFFN-16-STR-GRN-500S	7318.15.2000	EAR 99	TFFN-16-STR-GRN-500S Wire 600V AWG 16 Ground. Wire	$0.15	$3.30
310	Each	THHN-6-STR-GRN-500S	8544.20.0000	EAR 99	THHN-6-STR-GRN-500S WIRE 600V AWG 6 Grnd.Wire	$0.33	$102.30
1	Each	WL-8	1515.90.8002	EAR 99	American Grease Stick - White Lithium Grease, 8oz	$7.38	$7.38
1289					**Total FOB (In USD)**		**$24,823.45**

4.4 EXT150300412 | TRACE UAE AL MINHAD (REDLEG MWR) – LWW

QTY	Unit	Part Number	HS	ECCN	Description	Unit Price	Total Price
VSAT System Components with Accessories							
1	Each	55072-229	7318.15.2000	EAR 99	Andrew WR229, HALF THICKNESS FLANGE GASKET, CPR229G, CPR229G	$11.55	$11.55
1	Each	62-1236201	8544.20.0000	EAR 99	Skyware Global 1.2M Type 123, Class II, Cross-Pol Feed, Ku-Band Receive/Transmit Antenna System.	$251.21	$251.21
250	Each	BC-0121-2	7318.15.2000	EAR 99	LMR-400 50-Ohm Coax Bulk Cable	$0.78	$195.00
3	Each	EZ-400-NMC-2-D	8544.42.0000	EAR 99	TMS N-Male (plug) LMR-400 connector, hex/knurl coupling nut, non-solder pin, 2-piece design	$12.12	$36.36
3	Each	EZ-600-FMH-75	8544.42.0000	EAR 99	F-Male (plug) crimp connector (non-solder pin) for LMR-600-75	$22.09	$66.27
1	Each	IDIREC-K0000103-0009	8517.62.0010	5A991b	KIT,X7 SATELLITE ROUTER,1GB,W/ +24V POWER SUPPLY, ROHS	$2,037.45	$2,037.45
250	Each	LMR-600-75	8544.20.0000	EAR 99	LMR-600 1/2" Flexible Low Loss Coax - Standard cable, Black PE jacket, 75 Ohm	$1.29	$322.50
1	Each	NJR2841S	8517.62.0050	5A991	NJR2841S Switchable Ku-Band PLL LNB (10.7 to 12.75 GHz)	$218.26	$218.26
1	Each	NJT5218N	8517.62.0050	5A991	NJRC 8W Universal Ku-band BUC, N Conn., VDC thrgh IFL Port	$1,850.00	$1,850.00
2	Each	PE9389	8536.69.4010	EAR 99	F MALE TO N FEMALE	$40.69	$81.38
Network Components with Accessories							
1	Each	C2911-AX/K9	8517.62.0050	5A002.A.1	Cisco 2911 w/3 GE 4 EHWIC 1 SM 256MB CF 1GB DRAM IPB SEC AX	$1,655.00	$1,655.00
1	Each	NETWORK-MS	8544.20.0000	EAR 99	SNMP Card MGE UPS	$395.41	$395.41
1	Each	NOMADI-969-5900-050	8517.69.0000	EAR99	AG 5900 GATEWAY, 500 DEVICE USERS, NSE SOFTWARE W/1ST YEAR LICENSE	$2,800.00	$2,800.00
1	Each	PW9130I1000R-XL2U	8517.62.0050	5A991.c	Eaton 9130 RM UPS, 230V, 50/60Hz, 1000VA/900W, C14 In, (6)C13 Out	$729.96	$729.96
1	Each	PWR-2911-POE	8517.62.0050	EAR99	Cisco 2911 AC Power Supply with Power Over Ethernet	$157.50	$157.50
1	Each	QUESTT-FE4119-20-02T	8544.42.0000	EAR 99	RACK - 3' 20 RMS 19" X 32" BLACK 410 SERIES TAPPED RAILS	$515.00	$515.00
1	Each	SM-ES2-24-P	8517.62.0050	5A991.c	Enhanced EtherSwitch L2 SM 23 FE 1 GE POE	$942.75	$942.75
2	Each	STAYON-3679	7318.15.2000	EAR 99	POWER STRIP EURO,RM SCHUKO PLUG TO 8 CEE7/7 RECEPTACLE,250 VOLT.	$49.00	$98.00
1	Each	SUPERM-MARITIME-CTO-2	8517.62.0050	5A002.A.1	SERVER - NR 1U SC514 - SINGLE PWS CHASSIS MCP-290-00056-0N (INCLUDE 95-SERVER-OS)	$3,727.60	$3,727.60
1	Each	CISCO-AIR-CAP1532E-B-K9	8517620050	5A002.A.1	Cisco Aironet 1532E - wireless access point	$538.20	$538.20
1	Each	CISCO-AIR-CT2504-15-K9	8517620050	5A002.A.1	CISCO 2504 WIRELESS CONTROLLER WITH 16 AP USER LICENSE	$1,947.50	$1,947.50
1	Each	CISCO-ASA5508-K9	8517620050	5A002.A.1	Cisco ASA 5508-X with FirePOWER Services -	$1,294.20	$1,294.20
1	Each	CISCO-WS-C2960X-48FPS-L	8517620050	5A991.C	Cisco Catalyst 2960X-48FPS-L - switch - 48	$2,374.20	$2,374.20
8	Each	2200-46135-019	8529.10.0212	EAR 99	Polycom VVX 300 - VoIP phone	$102.00	$816.00
1	Each	CISCO-AIR-CAP1532E-B-K9	8517620050	5A002.A.1	Cisco Aironet 1532E - wireless access point	$538.20	$538.20
1	Each	CISCO-AIR-CT2504-15-K9	8517620050	5A002.A.1	CISCO 2504 WIRELESS CONTROLLER WITH 16 AP USER LICENSE	$1,947.50	$1,947.50
1	Each	CISCO-ASA5508-K9	8517620050	5A002.A.1	Cisco ASA 5508-X with FirePOWER Services -	$1,294.20	$1,294.20
1	Each	CISCO-WS-C2960X-48FPS-L	8517620050	5A991.C	Cisco Catalyst 2960X-48FPS-L - switch - 48	$2,374.20	$2,374.20
20	Each	210-AIWG	8528.51.0000	EAR 99	Dell 24 Monitor - E2417H	$113.99	$2,279.80
20	Each	329-BDBE	8471.30.0100	5A992.C	Wyse 7040 thin client	$550.00	$11,000.00
20	Each	Wyse Keyboards	8471.60.1050	EAR 99	Wyse Keyboards INCLUDED NSP	$0.00	$0.00
20	Each	Wyse Mouse	8471.60.1050	EAR 99	Wyse Mouse INCLUDED NSP	$0.00	$0.00

20	Each	85618-102	90717208040	EAR 99	Head sets Plantronics C310	$39.95	$799.00
5	Each	HU-N5086	8471.30.0000	EAR 99	HAVIA WEBCAM	$17.32	$86.60
Installation Materials and Tools							
10	Each	10808	7318.15.2000	EAR 99	Die Cast Double expansion Anchor 3/8	$1.50	$15.00
2	Each	1348	7318.15.2000	EAR 99	Machine screws, Phillips pan head, Stainless steel 18-8, #8-32 x 3/4 Each	$0.27	$0.54
3	Each	1365	7318.15.2000	EAR 99	Machine screws, Phillips pan head, Stainless steel 18-8, #10-32 x 3/8	$0.14	$0.42
2	Each	1368	7318.15.2000	EAR 99	Machine screws, Phillips pan head, Stainless steel 18-8, #10-32 x 3/4"	$0.14	$0.28
1	Each	2080	8544.42.0000	EAR 99	AC Plug IEC60320 C14 14awg Male Straight Entry UL	$11.22	$11.22
1	Each	23-3/4X30FT	7318.15.2000	EAR 100	3M Type 23 3/4X30FT Self Fusing Tape	$14.46	$14.46
10	Each	2561	7318.15.2000	EAR 99	Hex machine screw nuts, Stainless steel 18-8, #10-32 Each	$0.14	$1.40
1	Each	2667	8504.40.6001	EAR 99	AC Male Power Plug Cont. Europe CEE7/7 16 Amp 250 Volt Black Straight Entry w/ Strain Relief	$8.00	$8.00
29	Each	2946	7318.15.2000	EAR 99	2946 - #10 Stainless Steel Flat Washer	$0.24	$6.96
12	Each	2947	7318.15.2000	EAR 99	1/4 Stainless Steel Flat Washer	$0.14	$1.68
2	Each	2955	7318.15.2000	EAR 99	AC Connector IEC60320 C13 Female 14awg Straight Entry	$14.35	$28.70
12	Each	2956	7318.15.2000	EAR 99	Lock washers, Stainless steel 18-8, 1/4"	$0.14	$1.68
10	Each	3062	7318.15.2000	EAR 99	USS Flat Washere Steel grade 8	$0.17	$1.70
1	Each	33SUPER-3/4X66FT	7318.15.2000	EAR 99	Scotch® Super 33+™ Vinyl Electrical Tape, 3/4 in x 66 ft (19 mm x 20.1 m)	$5.02	$5.02
10	Each	4874	7318.15.2000	EAR 99	10-32 x 3/4 Stainless Steel Mach Screw	$0.55	$5.50
10	Each	4876	7318.15.2000	EAR 99	Socket cap, Stainless steel 18-8, #10-32 x 1-1/4"	$0.27	$2.70
12	Each	4883	7318.15.2000	EAR 99	Socket head screws, Stainless steel 18-8, 1/4-20 x 3/4 Each	$0.34	$4.08
4	Each	5413	8544.20.0000	EAR 99	3 ft. (10A) IEC C14 to IEC C13 Extension Cable (x1) - 10A	$7.74	$30.96
40	Each	5566	7318.15.2000	EAR 99	Stainless steel 18-8 flat washers	$0.14	$5.60
3	Each	5612	8544.20.0000	EAR 99	6 ft. (10A) IEC C14 to IEC C13 Extension Cable	$10.24	$30.72
1	Each	6110063-04	8544.20.0000	EAR 99	1.2M NPM, 1.6M X 1.6M, 73mm MAST,W/ PADS	$133.62	$133.62
1	Each	73560	7318.15.2000	EAR 99	Grease, Silicone Compound DM(TM), 5.3 oz	$16.33	$16.33
1	Each	7630	7318.15.2000	EAR 99	Geist BRELN PDU 102-0020/16	$100.00	$100.00
5	Each	7680	7318.15.2000	EAR 99	Stay Online Cat6 Crossover Cable - Red 10 Foot	$10.22	$51.10
5	Each	8276Z	7318.15.2000	EAR 99	Stay Online Cat6 (Cat5e Compatible) Ethernet Patch Cable - 6 Foot Green	$3.00	$15.00
10	Each	856	7318.15.2000	EAR 99	HEX Bolt 3/8 x 2-1/2"500	$0.24	$2.40
17	Each	9002	7318.15.2000	EAR 99	Cable Yung-Li Cord Bulk 14x3c SJT 105* 300 Volt Black UL. INDOORS --IN FEET--	$1.09	$18.53
40	Each	9668	7318.15.2000	EAR 99	Machine screw, Phillips pan head, Stainless steel 18-8, #12-24 x 5/8"	$0.17	$6.80
19	Each	BOLTDE-2955	7318.15.2000	EAR 99	#2955 Lock washers, Stainless steel 18-8, #10	$0.05	$0.95
50	Each	BT4LH-L0	7318.15.2000	EAR 99	Cable Tie with metal barb, 14.9", Light-Heavy cross section	$0.58	$29.00
8	Each	CM-1221	7318.15.2000	EAR 99	3.0" x 3.5" cable ring - rack cable management	$8.35	$66.80
2	Each	INTERN-70120	7318.15.2000	EAR 99	RECEPTACLE EUROPEAN SHUCKO WEATHERPROOF SINGLE RECEPTACLE GRAY HINGED COVER	$7.09	$14.18
2	Each	INTERN-70125	7318.15.2000	EAR 99	MOUNT BOX WEATHERPROOF SURFACE MOUNT BOX FOR RECEPTACLES NO.70124 AND 70120	$5.96	$11.92
4	Each	INTERN-70141	7318.15.2000	EAR 99	PLUG BLACK EUROPEAN SCHUCKO PLUG STRAIGHT CORD GRIP MEETS CEE 7-7 REQRS MATES	$5.15	$20.60
3	Each	INTERN-81131X1M	7318.15.2000	EAR 99	EUROPEAN CEE7/7 SCHUKO 10 AMPERE 230-250V POWER CORD, (EU1-16P) DIN 49441 PLUG, IEC 60320 C-13 CONN	$5.63	$16.89

1	Each	ITR040202040	7318.15.2000	EAR 99	Victron Energy Isolation Transformer 2000W 115/230V	$575.66	$575.66
1	Each	PET10-6000	7318.15.2000	EAR 99	4 ft. Grounding Rod	$8.30	$8.30
1	Each	PK9GTACP	7318.15.2000	EAR 99	9 Terminal Ground Bar Kit	$6.29	$6.29
50	Each	PLT2S-C20	7318.15.2000	EAR 99	PLT2S-C20	$0.25	$12.50
15	Each	PV14-8R-C	8544.42.0000	EAR 99	PV14-8R-L Ring Terminal Lug	$0.88	$13.20
10	Each	PV14-P47-E	8544.42.0000	EAR 99	Pin Terminal, 16 - 14 AWG, vinyl insulated, .49 pin length.	$0.99	$9.90
5	Each	PV6-8R-T	8544.42.0000	EAR 99	Ring Terminal, large wire, 6 AWG, #8 stud size, vinyl insulated	$2.90	$14.50
1	Each	SLW	8544.20.0000	EAR 99	3M Scotchcode Wire Marker Write-On Dispenser SLW, Wire O.D. 0.23 to 1.32 Inches (includes SMP pen)	$67.68	$67.68
22	Each	TFFN-16-STR-GRN-500S	7318.15.2000	EAR 99	TFFN-16-STR-GRN-500S Wire 600V AWG 16 Ground. Wire	$0.15	$3.30
310	Each	THHN-6-STR-GRN-500S	8544.20.0000	EAR 99	THHN-6-STR-GRN-500S WIRE 600V AWG 6 Grnd.Wire	$0.33	$102.30
1	Each	WL-8	1515.90.8002	EAR 99	American Grease Stick - White Lithium Grease, 8oz	$7.38	$7.38
1404					**Total FOB (In USD)**		**$44,882.55**

5 CONTACT LIST

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