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BP 400 / BP 4500 Big Pipe STL System Quick Installation Guide

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BP 400 / BP 4500 Big Pipe STL System Quick Installation Guide

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1. About this Quick Installation Guide

Please note that the instructions in this Quick Installation Guide have been abbreviated to provide a brief overview of the Big Pipe STL System and should be used in conjunction with the BP 4500 Radio User's Guide as well as system drawings and information for your specific configuration. It is highly recommended that you connect up your system in a lab environment and verify operation prior to field installation.

2. Tools/Items Required for Installation of the Big Pipe System

The following are needed to successfully install a Big Pipe System:

- Wire Stripping and Crimping Tool (for AC Power and RG59 cables)
- Screw drivers (both Flat and Phillips)
- Voltmeter / Ohmmeter
- Ground Cable / Strap
- Sealing Tape
- Cable Strapping
-] Laptop Computer
- Download Java interface application for communicating to the Radios.
- CAT-5 Crossover Cable for connecting a Personal Computer directly to a Multiplexer
- CAT-5 Straight Thru Cable for connecting a Personal Computer to a Multiplexer via a switch or a hub.
 - Qty (1) 8mm wrench or nut driver (for installing the Radio Brackets)
- Qty (2) 13mm wrenches or nut driver (for installing Pole Mounting Brackets and Clamps)

3. Verify Shipping Package Contents from B.E.

Depending on the type of system you have purchased, the equipment from B.E. will vary. However, there are some simple checks you should perform to ensure you received the proper pieces of the system.

Radios and related items:

- **TX HI and TX LO Radio Pair:** The radio pair may be on 5.8GHz or 5.3GHz depending upon your system. However, it is important to note that a 5.8GHz TX LO can only be connected to a 5.8GHz TX HI and the same for a 5.3GHz system.
- **Ethernet Outdoor Cable:** Standard RJ45 to weather-tight Conxall connector (two per radio pair).
- **Data Outdoor Cable:** Standard BNC to weather-tight TNC DS3 connector (four per radio pair; not used if your Radios are configured for Ethernet Only operation).
- **Outdoor Power Cable:** Un-terminated cable with weather-tight Conxall connector on one end for connection to radio (two per radio pair).
- AC Adapter: Un-terminated 48V Cable and AC Power cord with adapter (two per radio pair).
- **Radio Mounting Bracket Kit:** Each Radio comes with a mounting bracket kit.



| CO | Itenna Cable: Outdoor 50Ω coax cable with weather-tight N type connectors for nnecting the radios to the external antennas (2 per radio pair). | | | | | | | | | |
|----|--|--|--|--|--|--|--|--|--|--|
| Mu | Multiplexers and related items: | | | | | | | | | |
| | BP 400 INT Chassis : Multiplexer Frame with Power Supply and Fan (number per link depends upon your system's configuration). | | | | | | | | | |
| | BP 400 DS3 NAU : Network Card with DS3 Connections to Radio along with Ethernet, 4DS1, and Craft connections (one per BP 400 INT Chassis). | | | | | | | | | |
| | SIM Module: Service Interface Modules (ASIM, AVSIM, SMPTE310) (number per BP 400 INT Chassis depends upon your system's configuration). | | | | | | | | | |

4. Verify Frequency of the Radio Pair

- Inspect the ID Sticker on both Radios to ensure that they are in the same frequency band (5.8GHz or 5.3GHz). Please note that Radios of different frequency bands will not communicate. As such, a 5.8GHz radio will only talk to another 5.8GHz radio, while the same is true for the 5.3GHz radios.
- Inspect the ID Sticker on both Radios to ensure that the pair consists of a TX HI (TX High) and TX LO (TX Low) radio. Radios pairs transmit (TX) and receive (RX) on 2 different frequencies with their respective frequency bands, therefore a HI Band radio must be paired with a LO Band radio.



5. Typical Big Pipe System





6. Lightning Protection Kit

The Big Pipe System comes with Lightning Protection Kits (979-4500-001), (2) per link. Included in this kit is a Lightning Arrestor Box (141-1010) that connections from the Multiplexer to the Radio pass thru. Also included in the kit is an In-Line Coaxial Lightning Arrestor (141-1001) for the Radio to Antenna connection. It is very important that all lightning arrestor devices be properly installed.

Lightning Protection Kit (979-4500-001) contents:

141-1001 Lightning Arrestor, N-Type Coaxial
 141-1010 Lightning Arrestor, DS3/E3 Connector
 417-9079 Connectors, TNC, RG-59, 75 Ohm Male
 550-048 Connector, UG-57B/U N Adapter





6.1. Lightning Arrestor Box (for Multiplexer to Radio Connections)

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6.2. Coaxial Lightning Arrestor (Radio to Antenna Connection)

Figure 3 – Coaxial Lightning Arrestor Connections (Typical Each End of the Link)



7. Radio Pole Mounting Brackets

Each radio comes with a **Pole Mounting Bracket Kit**. The Pole Mounting Bracket (installed as shown below) will accept pole diameters ranging from 1.75" - 3.00". By flipping the Pole Clamp over, the unit may then be mounted on smaller pole diameters ranging between 1.0" - 1.75". Prior to mounting the radios on the tower near the antennas, most of the bracket assembly (Steps 1 & 2) may be completed on the ground. See the instructions included in the Pole Mounting Kit for additional information.

Please note that Radios operate at a High Frequency and cable length MUST be minimized to avoid RF loss (supplied RF Output Cable is 6 feet in length). The Azimuth Orientation of a Radio is NOT critical, only the Azimuth Orientation of the External Antenna.







8. Radio Connections

The following diagram should be used as a reference for connecting up the radios in your system.



Figure 5 – Radio Connections



- 1. **POWER Connector** Ensure that the following steps are taken before connecting power to the Radios.
 - Step 1 The weather-proof connector connects to the radio. The un-terminated end must be connected to the AC Adapter (see Figure 6).
 - Step 2 Determine the location of the Lightning Arrestor Box. Refer to Figure 2 of this document for the Lightning Arrestor Box Connection Details. Additionally, refer to Section 2.13 of the BP4500 User's Guide for details. The Lightning Arrestor must be placed near the system ground and connected with customer supplied materials.
 - **Step 3** On the AC Adapter, crimp the female blue colored connector to the black wire and the female red colored connector to the white wire
 - **Step 4** Connect the blue female to blue male connector and the red female to the red male connector.
 - **Step 5** Cut the un-terminated end of the power cable to the desired length and strip the red and white or black wires.
 - **Step 6** Connect the blue female to blue male connector and the red female to the red male connector.







- 2. CRAFT Connector The Craft connection is only to be used by service technicians and is not intended for use during the operation of the radio. No craft cabling is provided with the system.
- **3. RSSI Connector** The RSSI connector is a BNC connection and is intended to be used in the aligning of the antennas. During the installation on a tower or building, a voltmeter should be connected to this port and the voltage peaked for the best signal strength. This voltage should be around **2.0V** which is approximately **-58dB** signal level. This level or stronger is desired for a good quality link.
- **4. DS3 OUT Connector** This TNC connector should be connected with the supplied Belden 8241 RG-59 cables to the RX 1 BNC connector on the multiplexer equipment.
- 5. DS3 IN Connector This TNC connector should be connected with the supplied Belden 8241 RG-59 cables to the TX 1 BNC connector on the multiplexer equipment.



Figure 7 – DS3 IN and DS3 OUT Radio Connections

- 6. ETHERNET 2 Connector When the radio is used in conjunction with the BE Multiplexer, this connection may be used for monitoring and commissioning the radio. RSSI, Power Level, Self Tests, and Monitoring of the remote radio can be accomplished through this connection or the Ethernet 1 connector. Connect to this port using the Belden Data twist CAT-5E cables.
- 7. ETHERNET 1 Connector When the radio is used in conjunction with the BE Multiplexer, this connection may be used for monitoring and commissioning the radio. RSSI, Power Level, Self Tests, and Monitoring of the remote radio can be accomplished through this connection or the Ethernet 2 connector. Connect to this port using the Belden Data twist CAT-5E cables.

Note: Only one ETHERNET port is typically used.



- EXTERNAL ANTENNA Connector This N Type connection is used to connect an External Antenna to the Radio via a supplied 50Ω coax cable. Please note that Radios operate at a High Frequency and cable length MUST be minimized to avoid RF loss (the supplied RF Output Cable is 6 feet in length).
- **9. LED Status Indicators** The LEDs indicate Ethernet 1, Ethernet 2, Data, RF Link, and Power / Local Alarm status. Refer to Table 1.2 in the BP 4500 User Guide for detail.



Figure 8 – Radio LED Status Indicators

9. Radio Setup, Monitoring, and Provisioning

Follow these steps to power on and then provision the radio:

Step 1 – It is highly recommended that you connect up your system in a lab and verify operation prior to installation on the tower.

- Step 2 If in a lab environment, connect cable with attenuators (minimum of 50dB) to the antenna connection on both radios. For outdoor installations, connect to the provided antenna. Be sure to install the coaxial lightning protector as shown in Figure 2.
- Step 3 If you do not already have Java installed on your computer, download Java to your computer by performing Steps 3a-3f prior to trying to connect to the radio through the Ethernet port for setup and monitoring of the radio. If you already have Java installed, proceed to Step 4.

Step 3a – Go to www.java.com



Step 3b - Click on "Java Software Download"

| Address 🛃 http: | //www.java.com/en/ | | | | | | | | |
|-----------------|--------------------|------|-----------|-------|-------------------|-----|----------|----------|--|
| Search the Web | - | Go | Visual P | lookr | narks es) | Pop | up Bin 💽 | S | earch Renults |
| | ٢ | Welc | iome to j | ava | .com. | | (| | Download Java Software Search Townload Townload Java Software Search |
| | Java | Duk | e's Zone |)II) | Games | ï | Mobile | ĥ | Desktop Java Everywhere |

Figure 9 – Java Software Download



| »://www.java.com/en/ | vnload/index.jsp | |
|----------------------|--|-------------------|
| | - Co Visual Bookmarks - Pop-up Bin 🔊 Search Results | |
| K | Welcome to java.com. Smart Pop-up Blocker ON/OFF | qle G |
| Java | Duke's Zone Games Mobile Desktop Java Everywhere | |
| | JAVA SOFTWARE for Your Computer | -u |
| | FREE DOWNLOAD Download Java Software for your desktop computer now! Download Now | N. L. D. D. N. L. |

Figure 10 – Java Software Download Now

Step 3d - Click on "Begin Download"



Figure 11 – Java Begin Download



| K | Welcome to java.com. Java Software Download Select Language Contact Help Brought to you by Sun Microsystems. | | | | | | | | |
|------------------|---|--|--|--|--|--|--|--|--|
| E | Search Go | | | | | | | | |
| Java | Duke's Zone Games Mobile Desktop Java Everywhere | | | | | | | | |
| San Mikitelykens | Windows Automated Downloads | | | | | | | | |
| | checking configuration | | | | | | | | |
| | Windows XP SP2 users: if you encounter an error, look at the top of this page for a yellow bar that reads "This site might require the following ActiveX control: 'Java Plug-in 1.5.0_04' from 'Sun Microsystems, Inc.'. Click here to install" Click the yellow bar and choose "Install ActiveX Control" to allow installation to proceed. | | | | | | | | |
| | We encountered an issue while trying to automatically install Java™ software onto your machine. As a result, Java software was not installed properly. | | | | | | | | |
| | You may not have the right system requirements to support Java software (see the box below). Most other issues can be resolved. Please consult the <u>Help</u> or <u>FAQ</u> sections for assistance. | | | | | | | | |
| | If the Java software has not begun downloading automatically, you may want to perform a manual download. | | | | | | | | |
| | Manual Download » | | | | | | | | |
| | System Requirements | | | | | | | | |
| | Windows 98 (2nd Editions) Windows ME | | | | | | | | |
| | Windows 2000 (SP3+) | | | | | | | | |

Figure 12 – Manual Download

Step 3f – Click on desired download option and follow prompts to complete installation.







- Step 5 Connect the assembled power cable to the power input (refer to Figure 6).
- Step 6 Wait up to 60 seconds and verify solid green LED for PWR/LCL ALM, RF LINK, and DATA. The ENET 1 and ENET 2 LEDs will only light when you have Ethernet traffic connected to these ports such as a computer for monitoring or actual Ethernet to a network.
- **Step 7** Connect the Radio to your Personal Computer using the provided Ethernet Cable.
- Step 8 Setup your PC with the following information: 10.0.0.1 as IP address and Subnet mask as 255.0.0.0

On the PC go to **Start -> All Programs -> Accessories -> Communications -> Network Connections**. Next, select the **Local Area Connection** icon, then select **Properties** and the menu on the left will appear.

| General Authentication Advanced | General |
|---|---|
| Connect using: Broadcom 570x Gigabit Integrated Co Configure This connection uses the following items: Configure This connection uses the following items: Configure Configure Configure Configure Configure This connection uses the following items: Configure | You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings. Change the IP. address to ask your network administrator for IP. address to a sk your network administrator for IP. address to a sk your network administrator for IP. address to a sk your network administrator for IP. address to a sk your network administrator for IP. address to a sk your network administrator for IP. address to a sk your network administrator for IP. address to a sk your network administrator for IP. address to a sk your network administrator for IP. address to a sk your network administrator for IP. address to a sk your network administrator for IP. address to a sk your network administrator for IP. address to a sk your network administrator for IP. address to a sk your network administrator for IP. address to a sk your network administrator for IP. address to a sk your network address automatically. Image: Image |

Figure 14 – Configure the I.P. Address of the Personal Computer

- **NOTE:** The High band (TX HI) radio IP address is 10.0.0.3 and mask is 255.0.0.0 The Low band (TX LO) radio IP address is 10.0.0.2 and mask is 255.0.0.0
- **Step 9** Launch your web browser and enter either 10.0.0.2 or 10.0.0.3 to provision the radios.



NOTE: In order to provision the remote radio through the local radio there must be a good link. The default username is **root** and the default password is **rootpass** (all lowercase).



Figure 15 – Password Menu

- **NOTE:** A second user login may appear for users with certain versions of Windows Explorer. If a second login screen does appear, simply re-enter the same username and password.
- Step 10 If the following message appears click on "Yes" or "Always"



Figure 16 – Security Warning Menu

NOTE: The radios are sent from the factory with the power set for +16dBm output power for 5.8GHz radios and +8dBm for 5.3GHz radios.



Step 11 – To get an overview of the radio and it's performance go to the Information menu tab and select Current Configuration. Access this menu to monitor RSSI Level, BER, DS3 Input Status, TX and RX frequency, TX Power and other key operating parameters of the radio.

| | Remote Radio Info | ormation Conf | iguration Al | arms | Contact Us | Help | |
|------------|---------------------------------|--|---|--|--------------------------------|-------------------------------|--------------|
| Status | BP 4509 DS-3 | | 1.2. | Ξ | | vxTarget | Active |
| Indicators | DOC! | | | | Deci | (2) (D.) | Measurements |
| marcators | Receiver Overload | 181 | Tx Power Tx Synthesizer | | BER | -63 dBm < 10 ⁻⁸ | |
| | BER 🥥 | | Rx Synthesizer | • | Tx Power | -1 dBm |) |
| | Demodulator Lock 🛛 🥥 | T | DS-3 Input | • | Transmit | ter ON | |
| | | -V | CUPPE CONFIG | URATION | | | |
| | Radio Settings | Remote Radio RSSI Alarm on Loss o Li Ethernet Ethernet S | Mode : Normal Channel : 1: Tx 5.3 IP Address : 10.0.0.2 Alarm Level : -80 dBn f DS-3 Input : Enabled ne Build-out : 0 to 255 Port 1 Mode : 100 Mbp Port 2 Mode : 10 Mbp IP Address : 10.0.0.3 ubnet Mask : 255.0.0 ult Gatewav : 10.0.0.1 | 322 GHz, Rx 5.262 GH 2 n d 5 ft. ps Full Duplex s Half Duplex 3 .0 | Hz | | |
| | | | | | | | |
| NOTE: | A good RF link | Figure 17 – should hav | Current Co e the follow | onfiguratio ving: | n Menu | | |
| | RSSI should be | e Normal (inc | licator should | d be green) | | | |
| | Receiver Overl | oad should b | e Normal (in | dicator sho | uld be green) | | |
| | BER should be | e Normal (ind | icator should | l be green) | | | |
| | Demodulator | Lock should | be Normal (ir | ndicator sho | ould be green |) | |
| | RSSI level of - | 58dBm or be | tter | | | - | |
| | $\square BER of < 10^{-8} c$ | or better | | | | | |
| | When the mul Status should | ltiplexer equi be Normal, i | pment is con f it is not cor | nected to the | ne Radio, the DS-3 Input S | DS-3 Input tatus will be A | Alarm. |
| | If any of these of the radio di | e items are re shes and / or | d, then there the connect | e may be an ions to the | issue with th multiplexer e | e alignment quipment. | |



Step 12 – If you desire to change any parameters, go to the Configuration menu tab, select Commission Radio, and then click Submit for the changes to take effect.

| Remote Radio | Information | Configuration | Alarms | | Contact Us | Help |
|-------------------|-------------|--------------------------|---------|------|-------------|--------------------|
| | | Commission Radio | Alt-R | | | |
| BP 4500 DS | -3 | Commission Manager | Alt-M | | | vxTarget |
| RSSI | | Access Manager | • | | RSSI | -63 dBm |
| Receiver Overload | • an | Test | Alt-T | | BER | < 10 ⁻⁸ |
| BER | • | Update Software | Alt-S | | Tx Power | -1 dBm |
| Demodulator Lock | • | 🗹 Auto Refresh Status | Alt-H | | Transmitter | ON |
| | | Reset Ethernet Statistic | s Alt-E | TION | U | |



- Step 13 Of you desire to change your Username and Password from the default, go to the Commission Manager page under the Configuration menu and setup your Username and Password for security and click submit changes. The default username is root and the default password is rootpass (all lowercase).
- Step 14 To Access the Remote Radio go to the Remote Radio menu tab and select the address. This address must match that of the remote radio and is set in the Commission Radio menu.

| Remote Radio | Information | Configuration | Alarms | Contact Us | Help |
|-------------------|-------------|----------------|--------|-------------|--------------------|
| 10.0.0.2 AILF | 3 | E | E | | vxTarget |
| RSSI | • | Tx Power | • | RSSI | -53 dBm |
| Receiver Overload | • 3 | Tx Synthesizer | 0 | BER | < 10 ⁻⁸ |
| BER | • | Rx Synthesizer | ٩ | Tx Power | 8 dBm |
| Demodulator Lock | • | DS-3 Input | • | Transmitter | ON |



Step 15 – To get back to the radio Monitor page, click on the **Information** menu tab and then select **Current Configuration**.

| Remote Radio | Information | Config. vation | Alarms | Contact Us | Help |
|--------------|-----------------------|----------------|--------|------------|----------|
| | Current Configuration | on AltC | | | |
| BP 4500 DS | Ethernet Statistics | • | SE | | vxTarget |



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|----------------------------------|---|
| | |

10. Alignment of the Link

10.1. Checking for Interference

- **Step 1** Power OFF the radio at the far end and look at the signal strength on the near end. With the far end OFF, the RSSI should be -70dB or lower.
- Step 2 Power OFF the radio at the near end and look at the signal strength on the far end. With the near end OFF, the RSSI should be -70dB or lower.

| Remote Radio | Information | Configuration | Alarms | | Contact Us | Help |
|-------------------|-------------|----------------|-------------|---|-------------|----------|
| BP 4500 DS- | -3 | | 3 | | | vxTarget |
| RSSI | • | Tx Power | 0 | | RSSI | -63 dBm |
| Receiver Overload | • all | Tx Synthesizer | 0 | | BER | < 10° |
| BER | • | Rx Synthesizer | 0 | | Tx Power | -1 dBm |
| Demodulator Lock | • | DS-3 Input | • | | Transmitter | ON |
| | d | CURRENT CO | NFIGURATION | 1 | 4 | |

Figure 21 – RSSI Value

10.2. Antenna Alignment

- **Step 1** If there are other links as part of the system ensure ONLY the pair of radios you are aligning are powered ON.
- **Step 2** Ensure that both Antennas are pointed at each other.
- **Step 3** Ensure that both radios are on the same channel.
- **Step 4** Ensure that both antennas are polarized the same.
- **Step 5** When a person is on the tower aligning an Antenna, the RSSI level may be monitored by using a voltmeter on the Radio's RSSI port. The RSSI voltage should be \sim 2.0V (-50 to -60dB) for a good link.
- Note: The RSSI port on the radio is broadband so you can get fooled.
- Step 6 If there are no other signals on in the area, the tower person should adjust the antenna until the RSSI voltage peaks. The antenna adjustments should be done as follows:
 - **Step 6a** Coarse sweep horizontal to find the voltage peak.
 - **Step 6b** Fine sweep horizontal to further define the peak and center within the peak.
 - Step 6c Coarse sweep vertical to find the voltage peak.
 - Step 6d Fine sweep vertical to further define the peak and center within the peak.
 - **Step 6e** Repeat process at the other end of the link.



10.3. Resolving Antenna Alignment Problems

In the event that a good link can not be established there are some things that can be done to try to improve it.

1) Change the frequency of your radio pair. Within the band that your radio pair is set to operate at, there are 3 frequencies to choose from. **Be sure to change the remote radio first or link will be lost.**

| Remains Pacitio Antonicadaes | | Constanting II | | Remote Radio | Information | Configuration | Alarms | Contact Us | Help |
|------------------------------|---|----------------------|-------------|-------------------|-------------|---|--|------------------|--------------------|
| BP 4500 DS-3 | Commission Badly still | KL/ | AQ TX Site | BP 4500 DS | -3 | | 3= | к | LAQ TX Site |
| RSSI Q | Access Manager | RSS | 53 dilm | RSSI | | Tx Power | | RSSI | -53 dBm |
| Receiver Overload O | Test | DER | < 10 | Receiver Overload | • 31 | Tx Synthesiz | er o | BER | < 10 ⁻⁸ |
| BIR O | Update Software | Tx Power | - 14 dillen | BER | • | Rx Synthesiz | er 🔍 | Tx Powe | r -14 dBm |
| Demodulator Lock Q | * Auto Parkrash Status | Transmitter | ON | Demodulator Lock | • 1 | DS-3 Input | • | Transmit | ter ON |
| | Pleset Elhernet Statistice | | <u> </u> | | | COMM | SSION RADIO | | |
| | Channel (3: For 5:30) GHz, Re 5 Transmitter CM To Youwer: 54 attim Remote IP Addense: 10 | .2711 čilu • • | | | | Chann Troug Tx Powe Remote D-New | el : 3: Tx 5.338 G 2: Tx 5.330 G 3: Tx 5.330 G | Hz, Rx 5.270 GHz | |
| | RSSI Mum Level : 88 IIBm | * | | | | RSSI Alarm Lev | el :-80 dBm | * | |
| 1 | Alarm In Loss of Ch 3 Agent Landon | | | | | arm on Loss of DS3 lip | ut :enable | <u> </u> | |
| | Compared to the second state of the second state | | | | | Ethermet Dort 1 Mor | in : u - 225 TL In : Auto Negotia | | |
| | Etimmet Port 1 Monin: Sullo Hingoliate | | | | | Ethernet Port 1 Mor | le : Auto Negolia Submit | te - | |

Figure 22 – Changing Frequency of the Radios

- 2) Change the polarization of the antennas.
- 3) Switch Hi and Lo Band Radios end for end of the link.
- 4) In a Multiple link system, **DO NOT** put a Hi and a Lo Band Radio next to each other on the same tower.



11. Multiplexer to Radio Connections

The following defines how to connect the Multiplexer to the Radios and also where to connect your inputs to the Multiplexer.







12. Network Access Unit (NAU) Connections

The following shows the connections to the NAU module in the Big Pipe Multiplexer if configured with this module.



Figure 24 – NAU Connections



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13. AES Audio Service Interface Module (ASIM) Connections

The following shows the connections to the ASIM (Audio Only) module in the Big Pipe Multiplexer if configured with this module.



Figure 25 – ASIM Connections



14. Video/Audio Service Interface Module (VSIM) Connections

The following shows the connections to the VSIM (Video and Audio) module in the Big Pipe Multiplexer if configured with this module.



Figure 26 – VSIM Connections



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15. Monitoring the Multiplexer

15.1. Connecting a Personal Computer to the Multiplexer

The Craft Port on the Multiplexer may be used to monitor and change its parameters. The Craft I.P. address of the unit is usually labeled on the Multiplexer. The Subnet Mask is always 255.255.255.0.

Step 1 – Connect a personal computer to the Multiplexer. If connecting directly to the Multiplexer, a crossover cable is required. If connecting through a switch or a hub, a straight through cable is needed.



Figure 27 – Connecting to the Multiplexer Craft Port

Step 2 – In order to establish communication between the PC and the Multiplexer, the PC has to be configured in the same I.P. address family as labeled on the front of the Multiplexer or 10.0.0.1 which will always allow you to connect.

On the PC go to **Start -> All Programs -> Accessories -> Communications -> Network Connections**. Next, select the **Local Area Connection** icon, then select **Properties** and the menu on the left will appear.

| General Authentication Advanced | General | |
|--|--|--|
| Connect using: Broadcom 570x Gigabit Integrated Co Configure This connection uses the following items: Configure This connection uses the following items: Configure This connection uses the following items: Configure This connection uses the following items: Configure C | You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings. ① ① ① ① ① ① ① | Change the I.P. address then select Of |

Figure 28 – Configure the I.P. Address of the Personal Computer



Step 3 – In an Internet Explorer address bar, depending on which you set up your PC in Step 2, enter either the I.P. address labeled on the front of the Multiplexer or 10.0.0.1.





Step 4 – To login with administrative permissions, enter the following User Name and Password and then select Login.

> User Name = **default** Password = **welcome**



Figure 30 – User Login Menu



| Local Site - Craft Terminal - Microsoft Internet Explo | 161 | | | | | | | |
|--|---------------------------|------------------|-------------|----------------------|-----------------------|---------------|--------------|------------------|
| Elle Edit Yew Favorites Iools Help | | | | | | | | 4 |
| 🛛 🚱 Back 🔹 🔘 🕤 🛃 🛃 🏠 🔎 Search 🤺 | =avorites 🧭 🎑 • 🍦 | | 12 28 | | | | | |
| Address a http://10.0.0.1/ehs/1/ | | | | | | | | Go 🕴 Links 🎽 📆 🕶 |
| S Viewpoint - Web Search - | Search Results 🛛 🔝 Bookma | irks 💌 字 Pop-ups | | Photos | | | | |
| Terramana Communications Local Site | | | | Card | View | | | |
| Terawave continuincatoris Estar Site | Slot | Provisioned | Equipped | SW Version | HW Revision | n Serial | Oper State | Admin State |
| Shelf View | 1 VII | DEO | VIDEO | 05.02.14 | C1 | # 32812 | is | is |
| Slot Provisioned Equipped | | | SWDL Boot | HWDL Info R | eset Card Stat | Logo IP Cfg | | |
| 3 NAU/DS3-Trunk V NAU/DS3 | Video Port | Audio CFG | Video CFG | Video MPEG | ACAL VCAL | SAR Cfg TS IO | Auto ACAL | Auto VCAL |
| | | TG | Alarm Diags | Test Colors | Codec Activation | SVC Cfg S | SVC Pol Chan | Sel |
| | | | | | | | | |
| VIDEO VIDEO | | | | Operatio | n Screen | | | |
| Submit Refresh | | | | | | | | |
| Seaton Organization | | | Please s | elect functional but | tions for specific op | eration | | |
| Config Info Clock Browse | | | | | | | | |
| | | | | | | | | |
| Alarm Aim Ctg Bridge ATM Trtc | | | | | | | | |
| Locout | | | | | | | | |
| | | | | | | | | |
| User Name : default | | | | | | | | |
| Access Level : Administrator | | | | | | | | |
| Login Time : 15:01:48 8/30/2005 | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Done | | | | | | | | 🎱 Internet |

Step 5 – Once you are logged in, you will get a screen similar to the following.

Figure 31 – Multiplexer Operation Menu

15.2. Changing the Craft I.P. Address of the Multiplexer

From the Operation Menu, select **Config**, and the System Configuration menu will appear. To change the Craft I.P. address simply type in the new one and click submit.

| 🖨 Local Site - Craft Terminal - Microsoft Internet Explo | otat | | | |
|--|--|-------------------------|--------------------------------------|-----------------------|
| Eile Edit View Favorites Iools Help | | | | A. |
| 🚱 Back 🔹 🕥 - 💌 😰 🏠 🔎 Search 🬟 | Favorites 🚱 🔗 🍓 🔟 🕘 🌋 | 1 🚳 | | |
| Address a http://10.0.0.1/ehs/1/ | | | | 🔄 🄁 Go 🕴 Links 🎽 👘 🕶 |
| S Viewpoint - Web Search - | Search Results 🖸 Bookmarks 🔹 🛃 Pop-ups 👻 | N 🔄 🔹 🚺 Photos | | |
| Territoria Communications I cool Site | | Ca | rd View | |
| Terawave Communications Local Site | Slot Provisioned E | quipped SW Version | HW Revision Serial C | per State Admin State |
| Shelf View | 2 ASIM/IN ASI | M/IN 05.02.10 | C1 # 500890 is | is |
| Slot Provisioned Equipped | | SWDL Boot HWD | L Info Reset Crd Cfg | |
| 3 NAU/DS3-Trunk V NAU/DS3 | RS232 | | RS232 Cfg | |
| | | | | |
| | | | | |
| | | System (| Configuration | |
| Submit Refresh | Parameter Name | Parameter Value | Parameter Name | Parameter Value |
| | Craft IP Address | 10.2.4.4 | Shelf Type | TW400 |
| System Operation | Craft IP NetMask | 255.255.255.0 | Model | 0001 |
| Alarm Alm Cfa Bridge ATM Trfa | System Default IP Gateway | 10.2.4.1 | SW Version | 05.02.11 |
| Addition Annong Entry Entry | System Time | 12:11:38 8/30/2005 | Time Zone | PST |
| Logout | Daisy Level | 0 | Trap Source IP Address | 10.10.10.1 |
| TT much T museul C. A. | PHY Address | 00.30.fc.04.b5.e0 | Reset PHY Transmitter | no 💟 |
| Access Level : Administrator | Enable/Disable TCP/UDP Port Filter | disable 💟 | Enabled TCP/UDP Port List (p1-p2,p3) | |
| Login Time : 15:01:48 8/30/2005 | Submit Refresh | Administration Mgn | nt Intf Change Color Cfg Data 7 | Fest LED |
| | CM SVC | IP Routing Polling Inte | rvals ILMI Cfg Telnet Prt Card I | 0 |
| | Status | | Welcome To Terawave Communications | |
| E Done | | | | 🥑 Internet |

Figure 32 – Craft I.P. Address



15.3. MGMT PVC (Management Private Virtual Connection)

A MGMT PVC is a connection on the Local Multiplexer that allows the operator to access the Remote Multiplexer through the Local Multiplexer's Craft port. The MGMT PVC is setup in the units prior to shipment and should not need to be changed. Access to a remote Multiplexer requires the user to perform a "route add" on the computer interfacing to the Local Multiplexer. Most MGMT PVCs are setup at the factory to allow access as follows:

- 10.10.10.1 Local; 10.10.10.2 Remote
- 10.10.10.101 Local; 10.10.10.100 Remote

The MGMT PVC is documented as part of your system as illustrated below.



te –p add 10.10.10.0 Mask 255.255.255.0 10.1.8.75

Figure 33 – MGMT PVC Documentation Example



15.4. Identifying the MGMT PVC without documentation

Step 1 – Log into the Local Multiplexer.



| 🔄 Local Site - Craft Terminal - Microsoft Internet Expl | orer | _ 2 🛛 |
|---|--|---------------|
| Elle Edit View Favorites Iools Help | | |
| 🚱 Back 🔹 🕥 - 💌 😰 🏠 🔎 Search 🤸 | ? Favorites 🚱 🔗 - 🍓 🔟 - 🛄 🎎 🦓 | |
| Address 🗃 http://10.10.10.1/ehs/1/ | 🗹 🄁 Go | Links » 🖣 📆 🔹 |
| S Viewpoint - Web Search - | Search Results 🗓 Bookmarks 🔹 🗹 Pop-ups 🔹 🔊 🔹 🚺 Photos | |
| Teramana Communications Local Site | Card View | |
| Teraware Communications Eoca Site | Slot Provisioned Equipped SW Version HW Revision Serial Oper State 4 | Admin State |
| Shelf View | 3 NAU/DS3 NAU/DS3 05.02.11 D4 is trun | k |
| Stat Provisioned Equipped | SWDL Boot HWDL Info Reset TransBridge FDB Stats Mgmt PVC Alarm Diags Profile | |
| 3 NAU/DS3-Trunk 💟 NAU/DS3 | DS1_1 DS1/DS0 Cfg DS1 Perf CES Cfg CES Stats SVC Cfg SVC Pol | |
| | | |
| | Operation Screen | |
| Submit Refresh | | -1 |
| | Please select functional buttons for specific operation | |
| System Operation | | |
| Contig Into Clock Browse | | |
| Alarm Alm Cfg Bridge ATM Trfc | | |
| Logout | | |
| | | |
| User Name : default | | |
| Access Level : Administrator | | |
| Logni 1000 . 00.39.30 30 02003 | | |
| | | |
| 🖉 Done | I 🥥 I 🖉 | nternet |

Figure 34 – Accessing the MGMT PVC Menu

| ocaronia - ciani naminisii - minozoni mianiai ezhioi | 191 | | | | | | | | | | - |
|---|----------------------------------|---|---|--|--|---|--|--|---|--|---|
| , Ear New Favorites Tools Help | | | | | | | | | | | |
| 🕽 Back 🔹 🐑 - 💌 📓 🎧 🔎 Search 🜟 F | Favorites 🚱 🔂 | 3- 🌦 📼 - | _ 12 - 35 | | | | | | | | |
| ress 🛃 http://10.10.10.1/ehs/1/ | | | | | | | | | | 2 🔁 Go | Links » |
| /iewpoint - Web Search - 🖌 | Search Results 🛛 🔝 B | iookmarks 👻 🛃 Poj | p-ups 🔹 💊 📃 | 3 • 🚺 | Photos | | | | | | |
| erawaye Communications Local Site | | | | | | Card View | | | | | |
| | Slot | Provisioned | Equipped | | SW Versio | n HWR | evision : | Serial | Oper State | A | dmin State |
| Shelf View | 3 1 | VAU/DS3 | NAU/DS3 | 05. | 02.11 | D4 | # 19 | /294 | is | trunk | 2 |
| Slot Provisioned Equipped | 8 | SWDL Boot H | IVVDL Info | Reset | TransBri | ige FDB St | ats Mgmt F | VC | Alarm Diags | Profile | |
| 3 NAU/DS3-Trunk VAU/DS3 | DS1_1 | | DS1/DS0 Cfg | DS1 | Perf CI | ES Cfg CES | Stats SVC | Chn | SVC Cfg S | VC Pol | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | Manag | gement PVC I | list | | | | |
| Submit Refresh | Number | Admin Port Status 0. p | (Slot. 0. ort. if) VPI | VCI | IP Addr | IP NetMask | Destination Address | Mtu Size | Encaps Type | Status | Select |
| System Operation | 1 | enable 3.0.0. | 6.1 1 | 100 | 10.10.10.1 | 255.255.255.0 | 0.0.0.0 | 1500 | llcRoutedIPv4 | activ | • |
| Config Info Clock Browse | 2 | disable 0.0.0. | 0.0 0 | 0 0 | 0.0.0.0 | 255.255.255.0 | 0.0.0.0 | 1500 | llcNone | standby | |
| Alarm Alm Cfg Bridge ATM Trfc | 3 | disable 0.0.0. | 0.0 0 | 0 0 | 1000 | 255 255 255 0 | 0000 | 1500 | lichlone | standby | 0 |
| | | | | v 1 | | 633.633.633.0 | 0.0.0.0 | 1200 | nerione | standoy | |
| | 4 | disable 0.0.0. | 0.0 0 | 0 0 | 0.0.0.0 | 255.255.255.0 | 0.0.0.0 | 1500 | licNone | standby | 0 |
| Logout | 4 5 | disable 0.0.0. disable 0.0.0. | 0.0 0 0.0 0 | 0 0 | 0.0.0.0 | 255.255.255.0 255.255.255.0 255.255.255.0 | 0.0.0.0 | 1500 1500 | llcNone llcNone | standby standby standby | 0 |
| Logout | 4 5 6 | disable 0.0.0. disable 0.0.0. disable 0.0.0. | 0.0 0 0.0 0 0.0 0 | 0 (0 (0 (| 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 | 255.255.255.0 255.255.255.0 255.255.255.0 | 0.0.0.0 0.0.0.0 0.0.0.0 | 1500 1500 1500 | llcNone llcNone llcNone | standby standby standby | 0 |
| Logout ser Name : default | 4 5 6 7 | disable 0.0.0. disable 0.0.0. disable 0.0.0. disable 0.0.0. | 0.0 0 0.0 0 0.0 0 0.0 0 | | 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 | 255,255,255,0 255,255,255,0 255,255,255,0 255,255,255,0 | 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 | 1500 1500 1500 1500 | IIcNone IIcNone IIcNone IIcNone | standby standby standby standby standby | 000000000000000000000000000000000000000 |
| Logout er Name : default cress Level : Administrator | 4 5 6 7 8 | disable 0.0.0. | 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 | | 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 | 255,255,255,0 255,255,255,0 255,255,255,0 255,255,255,0 255,255,255,0 255,255,255,0 | 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 | 1500 1500 1500 1500 1500 | IIcNone IIcNone IIcNone IIcNone IIcNone | standby standby standby standby standby | 000000000000000000000000000000000000000 |
| Logout ser Name : default occess Level : Administrator ogin Time : 08:59-38 9/1/2005 | 4 5 6 7 8 9 | disable 0.0.0. | 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 | 0 (0 0 (0 0 (0 0 (0 0 (0 0 (0 | 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 | 255.255.255.0 255.255.255.0 255.255.255.0 255.255.255.0 255.255.255.0 255.255.255.0 255.255.255.0 | 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 | 1500 1500 1500 1500 1500 1500 1500 | licNone licNone licNone licNone licNone licNone | standby standby standby standby standby standby standby | 000000000000000000000000000000000000000 |
| Logout ser Name : default ccess Level : Administrator ogin Time : 08:59:38 9/1/2005 | 4 5 6 7 8 9 10 | disable 0.0.0. disable 0.0.0. | 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 | | 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 | 255, 255, 255, 255, 0 255, 255, 255, 255, 0 255, 255, 255, 255, 0 255, 255, 255, 0 255, 255, 255, 0 255, 255, 255, 0 255, 255, 255, 0 | 0.0.00 0.0.00 0.0.00 0.0.00 0.0.00 0.0.00 0.0.00 0.0.00 0.0.00 | 1500 1500 1500 1500 1500 1500 1500 1500 | llcNone llcNone llcNone llcNone llcNone llcNone llcNone | standby standby standby standby standby standby standby standby | 000000000000000000000000000000000000000 |

Step 3 – Select MGMT PVC Number 1 and click Modify at the bottom of this menu.

Figure 35 – MGMT PVC Menu



| 🕘 Local Site - Craft Terminal - Microsoft Internet Exp | plorer | | | | _ @ 🗙 |
|--|--|--------------------------|-----------------------|------------------------|------------|
| Eile Edit Yiew Favorites Tools Help | | | | | 1 |
| 😋 Back 🝷 💿 🕘 👔 😭 🔎 Search 🤞 | Favorites 🚱 🔗 🍓 🔟 - 🛄 | 12 3 | | | |
| Address 🗃 http://10.10.10.1/ehs/1/ | | | | 💟 ラ Go 🕴 | unks 🎽 📆 🔹 |
| Viewpoint - Web Search - | 🔒 Search Results 🚺 Bookmarks 🖃 🌱 Pop-ups | 🔹 💊 🗔 🗸 👔 Photos | | | |
| Terawaye Communications Local Site | | Car | d View | | |
| Terawate Continuineatoris Local Site | Slot Provisioned | Equipped SW Version | HW Revision Seri | al Oper State Admin | h State |
| Shelf View | 3 NAU/DS3 NA | U/DS3 05.02.11 | D4 # 19294 | l is trunk | |
| Slot Provisioned Equipped | SWDL Boot HWD | L Info Reset TransBridge | FDB Stats Mgmt PVC | Alarm Diags Profile | |
| 3 NAU/DS3-Trunk V NAU/DS3 | DS1_1 DS1/ | DS0 Cfg DS1 Perf CES C | Cfg CES Stats SVC Chr | n SVC Cfg SVC Pol | |
| | | | | | |
| | | | | | |
| | | Management PV | C Configuration [1] | | |
| Submit Refresh | Parameter Name | Parameter Value | Parameter Name | Parameter Value | |
| | Index | 1 | Admin Status | enable 🔽 | |
| System Operation | Port (Slot.0.0. Port. if) | 3.0.0.6.1 | VPI | 1 | |
| | VCI | 100 | IP Address | 10.10.10.1 | |
| Alarm Alm Ctg Bridge ATM Tric | IP NetMask | 255.255.255.0 | Destination Address | 0.0.0.0 | |
| Logout | Mtu size | 1500 | Encaps Type | licRoutedIPv4 | |
| | < <back< td=""><td>Submit Refresh</td><td>Welcome To Te</td><td>erawave Communications</td><td></td></back<> | Submit Refresh | Welcome To Te | erawave Communications | |
| User Name : default | | | | | |
| Login Time : 08:59:38 9/1/2005 | | | | | |
| and and a second of the second | | | | | |
| | | | | | |
| A Done | | | | 🙆 Interne | ŧ |

Step 4 – The I.P. address shown is the MGMT PVC address of the Local Multiplexer.

Figure 36 – MGMT PVC I.P. Address of the Local Multiplexer

Step 5 – Repeat the process for the Remote Multiplexer.

15.5. Perform a "route –p add" on your Personal Computer

Access to the Remote Multiplexer requires the user to perform a "route -p add" on the personal computer that is being used to interface to the Local Multiplexer. The "route - p add" command is issued from a Command Prompt as shown below.

On the PC, go to All Programs -> Accessories -> C:\ Command Prompt

For information on your Big Pipe System's specific configuration, see the In-Band Management section of the "XXXX (your stations call letters) Big Pipe Configurations" document included in the shipment.

| 📾 Command Prompt | - 🗆 🗙 |
|--|-------|
| C:\>route -p add 10.10.10.0 mask 255.255.255.0 10.2.4.4_ | - |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | - |





15.6. Check the added "route"

Check the added route by issuing the "route print" from the Command Prompt as shown.

| C:\>route print | | | | |
|---|---|--|-------------------------------------|------------------------|
| Interface List Øx100 11 43 60 cket Scheduler Min | MS b4 c5 Bro iport | TCP Loopback inte adcom 570x Gigabi | rface t Integrated Con | troller - P |
| Active Routes: Network Destinatio 0.0.0.0 10.2.0.0 | n Netmask 0.0.0.0 255.255.0.0 | Gateway 10.2.1.1 10.2.2.66 | Interface 10.2.2.66 10.2.2.66 | Metric 20 20 |
| 10.2.0.0 | 255.255.255.0 | 10.2.4.4 | | 20 1 20 |
| 127.0.0.0 224.0.0.0 255.255.255.255 | 255.0.0.0 240.0.0.0 255.255.255.255 | 127.0.0.1 10.2.2.66 10.2.2.66 | 127.0.0.1 10.2.2.66 10.2.2.66 | 1 20 1 |
| Default Gateway: ==================================== | 10.2.1.1 | Cateway Addwess | Metwic | ====== |
| network Address | Netmask | Gateway Address | Metric | |

Figure 38 – Example of the "route print" command

15.7. Deleting a "route" from your Personal Computer

To delete a route, issue the "route delete" command from the Command Prompt.

C:\>route delete 10.10.10.0 mask 255.255.255.0

16. Technical Support

For technical support, contact the RF Customer Service Department at:

Phone: (217) 224-9617 E-mail: <u>rfservice@bdcast.com</u> Fax: (217) 224-9607

