

6-8 GHz Frequency Diversity and 2+0 System Installation

Note: This section refers to 2+0 systems although it is also relevant for N+0 systems.

The Frequency Diversity method uses two FibeAir links, with two active transmitters and receivers on each side of the link connected to one or two antennas. (The description in this section relates to an installation with only one antenna.) The two transmitters on either side of the link operate at different frequencies, and the FibeAir *Hitless Switch* (described below) determines which receiver is receiving the best quality data.

Frequency diversity allows the system to automatically select a frequency for which the channel performance is better than the other frequency.

Frequency diversity systems with a single antenna require a *circulator* to combine the systems. The circulator is a three-port waveguide junction, whereby waves fed into the n port are outputted at the corresponding $n+1$ port.

2+0 systems combine n FibeAir links on a single antenna using a circulator, whereby each link operates at a different frequency.

The installation instructions in this section apply for both frequency diversity and 2+0 systems.

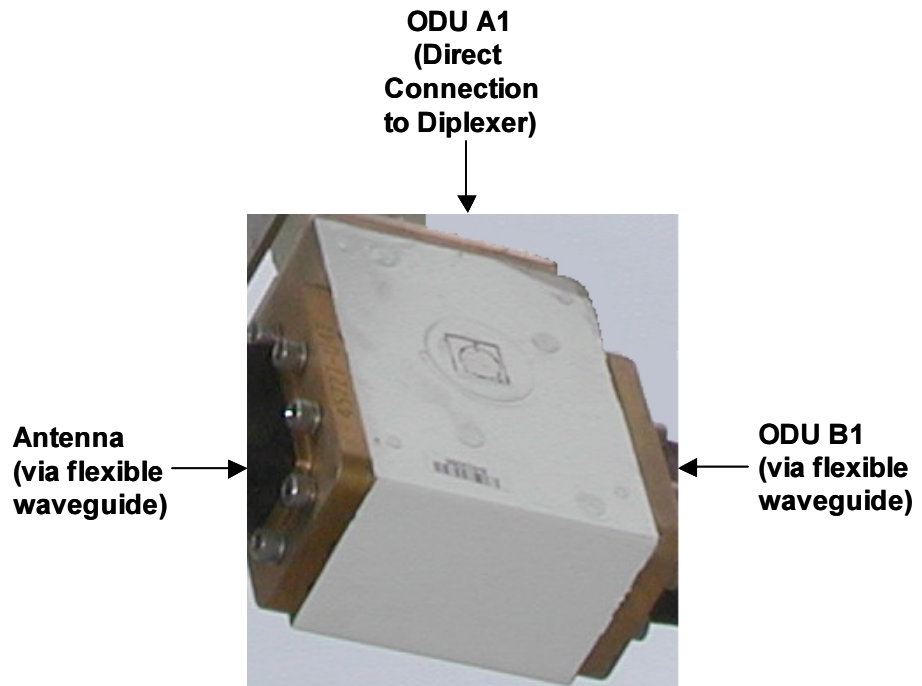
The following photo shows a closeup of a circulator installed in a frequency diversity/2+0 system.



Connecting the Circulator

The circulator is connected directly to one ODU diplexer, and to the other ODU via flexible waveguide.

The following figure shows the three circulator ports.



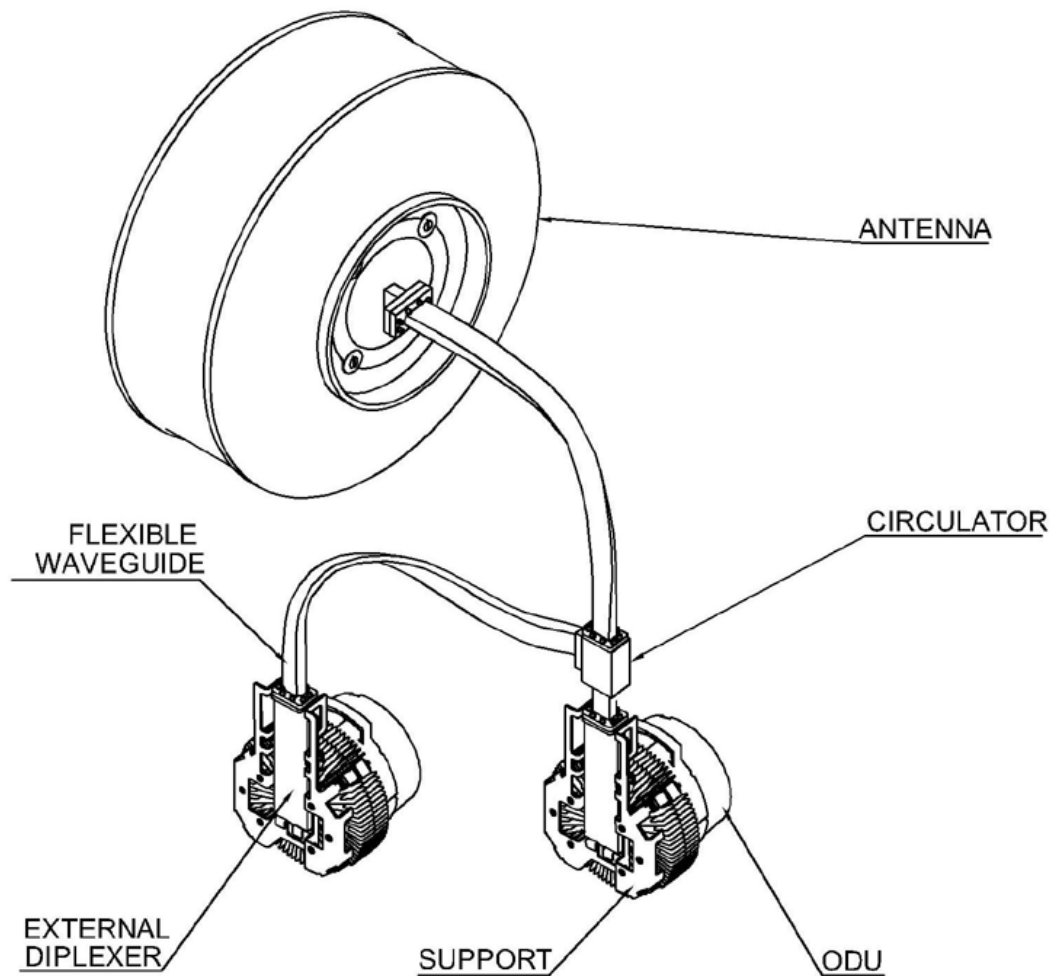
As shown in the figure above, the circulator connections are as follows:

- Direct connection to the ODU A1 diplexer.
- Remote connection (via flexible waveguide) to the ODU B1 diplexer.
- Remote connection (via flexible waveguide) to the antenna.

Important:

- **The circulator port connected directly to the ODU diplexer (ODU A1 in the figure above) must also be connected to the corresponding ODU on the remote side (which would be, for our example, A2).**
- **The diplexer connected directly to the circulator must output directly to the antenna (in accordance with the arrow symbols that appear on the circulator).**

The following diagram shows two ODUs connected to a single antenna via a circulator.



Upgrading a Link to Frequency Diversity / 2+0

The following sections describe frequency diversity/2+0 upgrading with and without a circulator already installed.

Upgrading a System without a Circulator

When a system is changed to a frequency diversity/2+0 system, the link will inevitably fall since a circulator needs to be installed.

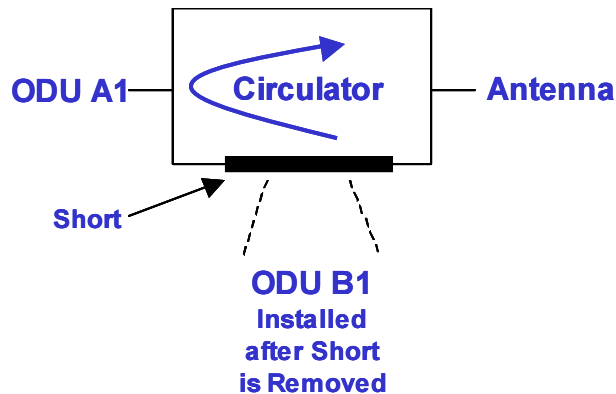
Thus, if the system is initially planned for a future second ODU connection, always install the circulator of the first ODU with a short.

Upgrading a System with a Circulator and Short

Future upgrades to frequency diversity/2+0 systems should be considered when the system is initially planned. The circulator should be installed with future upgrading in mind.

To enable future ODU connection to a frequency diversity/2+0 system that includes only one ODU, a short should be installed on the circulator. The short can be removed when an additional ODU is connected to the circulator.

The following figure shows the circulator with a short.



Important:

A 15 dB degradation of system gain will occur when the short is removed while the system is operating. To minimize the 15 dB degradation time, install an additional ODU connection as follows:

1. Set up the ODU.
2. Connect the diplexer.
3. Connect the flexible waveguide.
4. Remove the short quickly.
5. Connect the waveguide to the circulator.

Chapter 4

System Setup

Prerequisites

The system setup and configuration follows the system installation, initial testing, and antenna alignment as described in Chapter 3.

The Setup Procedure

The FibeAir 1500/1528 setup procedure consists of the following operations :

1. Defining general settings
 - Setting local device communication parameters
 - Setting SNMP parameters
2. Defining system configuration parameters
 - Setting transmit frequency
 - Setting output power levels
3. Defining system information
 - Date
 - Time
 - Name
 - Contacts
 - Location
4. Defining SONET/SDH configuration parameters
5. Defining management setup parameters
 - Defining manager list
 - Defining alarm groups
 - Setting external alarm inputs
 - Setting alarm outputs

System Setup

To start the FibeAir 1500/1528 radio link configuration you first need to set up the Ethernet and PPP/SLIP IP addresses. Once you have defined these addresses, you will be able to configure the system using the CeraView software.

To set the addresses, perform the following operations:

1. Connect the RS-232 port of your computer to the RS-232 (9-PIN) port on the indoor unit front panel. This port is labeled “Terminal” and is located near the front panel LEDs.
2. Connect to the standard Windows HyperTerminal at 19,200 bits per second.
3. After you are connected, press **Enter**.

The login menu appears.



Figure 4-1 FibeAir 1500/1528 Terminal - Login Screen

4. Type **Ceragon** as the password. The main menu displays.

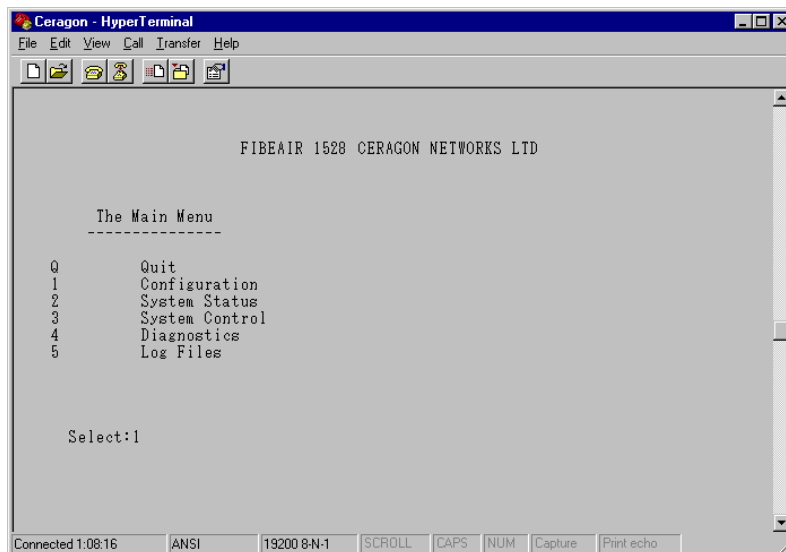


Figure 4-2 FibeAir 1500/1528 Terminal - Main Menu

For a more detailed description of the HyperTerminal configuration procedure, refer to the following section.

Connecting to the HyperTerminal

Setting Up the HyperTerminal Connection

To set up the HyperTerminal connection, perform the following operations:

1. Connect the RS232 port of your computer to the Terminal port of the IDU.
2. Select **Start** > **Programs** > **Accessories** > **Communication** > **HyperTerminal**.
3. Double-click the **HyperTerminal** application icon.
4. In the Connection Description box, enter the name **Terminal** and click **OK**.
5. In the **Connect Using** field (in the Phone Number box) select **Direct to Com 1** and click **OK**.
6. In the **Port Settings** tab (Com 1 Properties box) configure the following settings:
 - Bits per second – 19,200
 - Data bits - 8
 - Parity - None
 - Stop bits - 1
 - Flow control - Hardware
7. Click **OK**.
8. End the HyperTerminal connection.

Connecting to the Terminal

To connect to the terminal, perform the following operations:

1. Connect the RS232 port of your computer to the Terminal port of the IDU.
2. Select **Start** > **Programs** > **Accessories** > **HyperTerminal**.
3. Double-click the **Terminal** connection icon. The HyperTerminal screen opens.
4. Enter the password **Ceragon** and press **Enter**. The Main Configuration Menu appears.

Note: *The Terminal screens are depicted here as black text on a white background for ease of reading. The original screens are white text on black background.*

Quick Setup

To perform quick setup, carry out the following operations:

1. From the Main Configuration Menu, select **1 – Quick Setup** and press **Enter**. The Quick Setup menu appears.

Note: *Quick Setup is the recommended option if you are not familiar with the system. More advanced users may use the Full Configuration menu.*

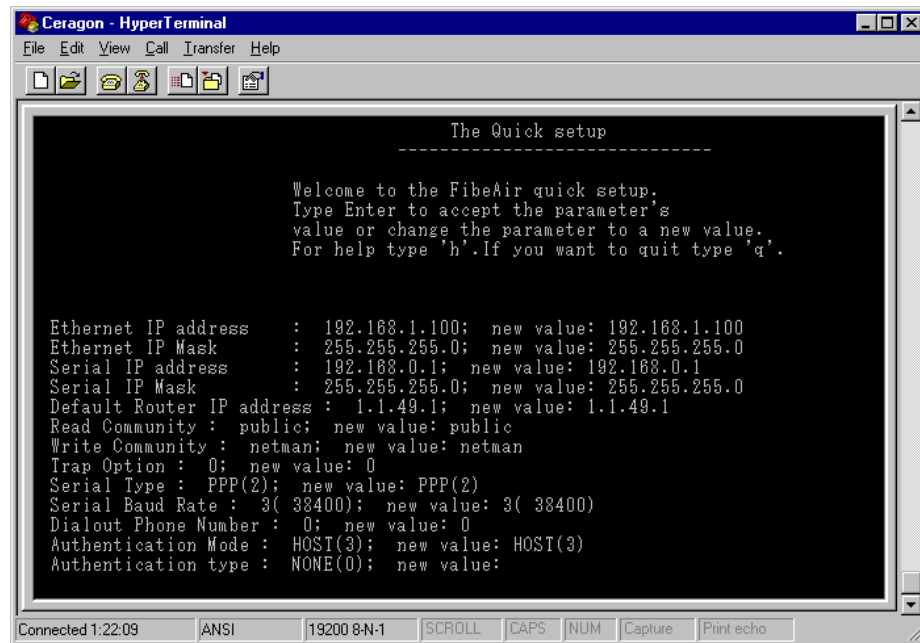


Figure 4-3 FibeAir 1500/1528 Terminal - Quick Setup Menu

2. Accept or change each parameter value. Press **Enter** to accept the existing value or type in the new value in the space provided.

Ethernet IP address: The FibeAir 1500/1528 Ethernet port IP address you wish to use.

Ethernet IP Mask: Your network IP sub-net address.

Serial IP address: The FibeAir 1500/1528 Serial port IP address you wish to use.

Serial IP Mask: Your network IP sub-net address.

Default Router IP address: The FibeAir's default router address.

Read community: The community password for read only devices.

Write community: The community password for read/write devices.

Trap option: "0" – sending standard trap, "1" – sending trap with unit serial I.D. The recommended option is "0".

Serial Type: Defines the serial communication type, PPP or SLIP.

Serial Baud Rate: Serial communication port baud rate.

Dial-Out Phone Number: The phone number to be dialed by the indoor unit.

The PPP protocol adds security to the communication and therefore additional parameters need to be configured in the system:

Authentication Protocol Type:

- 0 – None
- 1 – PAP (without encryption)
- 2 – CHAP (with encryption)

Authentication Mode:

- 2 – GUEST. The IDU gives the user name and password to the network manager.
- 3 – HOST. The IDU receives the user and password from the network manager and validates them.
- 4 – DYNAMIC. When the IDU receives a phone call, it acts as a HOST. If it initiates a call to the network manager (SNMP trap) it will act like a GUEST. In case of a direct connection (without a dialup modem) it acts as a HOST.

Dial-In Authentication User Name: Enter the user name that is used to validate a user dialing in to the indoor unit.

Dial-In Authentication Password: Enter the password that is used to validate a user dialing in to the indoor unit.

Dial-Out Authentication User Name: Enter the user name that will be used by the IDU to gain access to the remote manager.

Dial-Out Authentication User Password: Enter the Password that will be used by the IDU to gain access to the remote manager.

Transmit Frequency: The frequency Channel number you wish to use.

Transmit Power: Power output level.