IP-Pipe G1600

Quick Guide

1. G1600 Interconnect Network Configurations

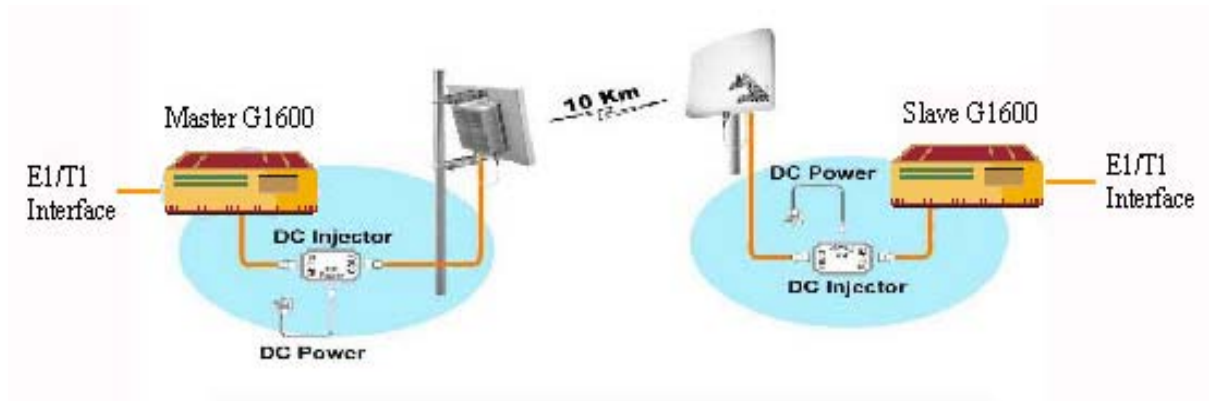Figure 1. E1/T1 Leased Line Connection over IP Network

Figure 2. E1/T1 over Outdoor 802.11b/g Wireless IP Bridge

Command Line Interface

Set Terminal COM port as **115200 baud, None parity, 8 data bit, 1 stop bit** and connect to the Console port (UART A) for using CLI Commands in Chapter 3 of "IP-Pipe G1600 User Manual" contained in the Manual CD.

A G1600 Pair Installation Steps

Usually, one master and one slave G1600s are pre-configured for a G1600 pair. The process of installing a G1600 pair involves the following steps:

1. Planning for G1600 interconnect network configurations
2. Installing the G1600 10/100BaseT Ethernet and E1/T1 cabling connections
3. Using CLI command (UART A) to display E1/T1 Bitstream (Interface B) and Ethernet Service (Interface C) parameters
4. Configuring CES, Ethernet and E1/T1 interfaces parameters
5. Verifying the E1/T1 connection of the G1600 pair over Ethernet connection

Example 1: Ethernet back-to-back as in Figure 1.

1. Check the physical hookup for correctness: The G1600 requires an E1/T1 cross cable in its connection to the E1/T1 source. An Ethernet cross-cable is also required for two G1600s in Ethernet back-to-back connection. A PC or dumb terminal connection to the console port must use a null modem (RS232) cross cable with settings of 115200, N, 8, 1.

2. Check that the Ethernet configuration parameters are correct. **RTP** header must be selected for IP packet, and choose payload per packet (say 96 bytes).

   The following CLI command displays the bitstream interface configuration:

```
\Config\Interfaces\Interface_C>gc


                    Current config      Next start up config
    Working mode.......: ETH                 ETH
    MII/RMII...........: MII                 MII
    AutoNeg............: ON                  ON
    Speed (Mb/s).......: -                   -
```

```
Duplex Mode........: -                         -
Flow control.......: Disabled                 Disabled
Clock source.......: DTE                      DTE
RMII ref clock out.: -                         -
Interface BW (kb/s): Unlimited                Unlimited
MAC address........: CD CD CD CD CD CD         CD CD CD CD CD CD
MAC Loopback.......: Enabled                  Disabled
PHY configured.....: YES                      YES
PHY number.........: 0                        0
Advertisement......: 10H 10F 100H 100F        10H 10F 100H 100F
```

3. Be sure that the LIU configuration parameters are compatible with the E1 signal source (line code, line build out, etc.).

   The following CLI command displays the bitstream interface configuration:

   ```
   \Config\Interfaces\Interface_B>gc
   ```

```
                        Current config      Next start up config
Working mode.......: BitStream                BitStream
Frame Size (bytes).: 96                       96
Underrun value.....: 0xFE                     0xFE
Clock source.......: Loopback-master          Loopback-master
Tx clock polarity..: Falling                  Falling
Rx clock polarity..: Rising                   Rising
Interface loopback.: Disabled                 Disabled
LIU line format....: E1                       E1
LIU type...........: DL_2155                  DL_2155
LIU line code......: HDB3                     HDB3
LIU line build out.: E1_75                    E1_75
LIU rx term........: 100ohm                   100ohm
LIU monitor gain...: Norm                     Norm
LIU Rx Equalizer Gain Limit: -12db            -12db
LIU Jitter Attenuation.....: Disabled         Disabled
LIU loopback...............: Disabled         Disabled
```

The Interface C gs command shows whether the link to the Ethernet is operational and whether the PHY has connected properly. Check your settings if this status report shows that there are problems.

4. Confirm that the configuration of the G1600 pair is compatible and consistent. See "Configuring a Pair of G1600s" on Chapter 1. The CES GetStatus (gs) command shows whether there is connectivity with the peer G1600 and the peer is reachable.

5. It is recommended to set one G1600 as Loopback-Master and the other as Recovered-Slave. If the Tx clocks on both G1600s are configured as Loopback-Master, make sure that the clock source driving both units is stable. Operating both units as Slave is not recommended and may produce unpredictable results.

6. Use an E1 tester to perform the remote loopback test.

Example 2: Wireless 802.11b/g Ethernet Bridge as in Figure 2.

1. Check the physical hookup for correctness: The G1600 requires an E1/T1 cross cable in its connection to the E1/T1source. A pair of 802.11b/g Wireless Ethernet bridge is also required for two G1600s to connect with as in Figure 2. A PC or dumb terminal connection to the console port must use a null modem (RS232) cross cable with settings of 115200, N, 8, 1.

2. Check that the Ethernet configuration parameters are correct. **Minimal** header must be selected, and a large payload per packet (say 1492 bytes) is recommended. Also, it is recommended to select 10M/Half for 802.11b Ethernet Bridge. Selection of Auto-Negotiation may result in longer time for synchronization.

3. It is recommended to set one G1600 as Loopback-Master and the other as Recovered-Slave. If the Tx clocks on both G1600s are configured as Loopback-Master, make sure that the clock source driving both units is stable.

4. Use an E1 tester to perform the remote loopback test.

Table 5-3 lists performance observations and problem suggested causes and corrections for G1600.

Observations	Possible Cause	Corrections
Jitter overflow and underflow is occurring on both G1600s	The maximum jitter setting is too low.	Look at the ping round-trip time on the CES GetStatus display. This is an indication of the network delay. The maximum jitter should be at least this long.
Wide variation between maximum and minimum jitter levels but no occurrence of jitter overflow or underflow	The jitter buffer is operating correctly. There is variability in the packet network possibly due to congestion.	If the minimum is close to zero or the maximum close to twice the maximum jitter setting, increase the maximum jitter setting to avoid future overflow or underflow.

** For more details about the operational theory and configuration, please read through Chap 1 and 2 of the G1600 user manual. Chapter 3, and 5 provide the details for CLI commands, testing and troubleshooting.