

Below is a brief description of the remote terminal station (CPE) basic functions.
Refer to Function diagram for better understanding.

Wireless Terminal

The Wireless Terminal provides all the major communication function required at or near the subscriber site. It incorporates the following functions:

- Radio transceiver,
- Radio Controller (Asic Array),
- Terminal controller (RTS Wireless Terminal Motherboard),
- POTS interfaces,
- Optional Broadband data Interface,
- DC/DC power supply and power conversion
- Indirect lightning protection of the interfaces and power input port,
- Maintenance and configuration port.

Radio transceiver

The Wireless Terminal provides the radio transceiver function for communicating with the base station radio. It provides the output port for connecting the RF Antenna cable to the third party external antenna. The appropriate antenna can be selected to provide the gain required based on the distance from the base station antenna tower.

The 2.4GHz radio provides a dynamic power control features to ensure the uniformity of the received power level at the radio base station, initially at startup but continuously after. The process will be periodically verified and adjusted to compensate for setup condition, traffic conditions and path loss changing conditions, temperature effect and aging, by the radio controller. The settable range is from -36dBm to +26dBm depending on the receive level at the base station. The power output is adjusted in 0.5 dB steps.

The output power level is adjusted based on the information received from the base station updates every 12mS for active terminals and up to every 1.5 seconds for inactive channels. Between base station updates, the power is adjusted based on the receive signal level from the base station, and look tables using the transmitter level indication, the temperature monitor, and the output frequency, the number of CDMA channels to be transmitted and previous updates.

Radio controller (ASIC Array)

The radio controller provides the platform for the digital processing of an integrated RF modem terminal decoding multiple 32Kbit CDMA access channels using a proprietary Integrated Modem ASIC design. The ASIC Array board uses a DSP, 12 modem ASICs, and 2 FPGAs for normal operation. One FPGA provides summation of 5 TX I/Q channels to the dual DAC and one provides the timing recovery and data distribution other board and slave ASIC. The radio controller interfaces with the transceiver and the motherboard and provides the initial timing of the system and has the control of the Radio board for Transmit power level, AGC parameter and synthesizer.

Errored Burst Treatment.

When a burst carrying voice band traffic is lost due to error, the radio controller replays the last burst to the voice interface channel when the channel carry PCM traffic till a valid burst is received and inserts a null to the voice channel when the channel carries ADPCM traffic.

When a burst-carrying packet switched is lost due to error, the radio controller discards the packet.

Terminal controller (RTS Wireless Terminal Motherboard)

This is the main controller of the Remote Terminal Station, motherboard. The motherboard interfaces with the ASIC Array card, Voice Module card, ADSL card and Radio card and supplies power to the entire Terminal Station cards.

The motherboard provides POTS interface, management interface and power protection and also manages the detection, configuration, acquisition and LED indication. It provides user control access via the management interface.

POTS interfaces.

The Wireless Terminal provides the hardware and software function to provide two 2-wire POTS interface.

The second voice interface is not a hardware option and is provided by default by the terminal. However it is possible to disable the functionality of the 2 POTS interface via NMS.

The default voice channels are “toll quality” at 32 Kbps. The algorithm is Adaptive Differential Pulse Code Modulation (ADPCM).

Each 2-wire POTS interface is software configurable to enable V.90 voice band data capability. The 2.4GHz system supports the establishment of Pulse Code Modulation PCM 64Kbps voice channels for each of the WT voice lines.

When enabled, the system uses modem/ fax tone detection to accomplish automatic switching from the default 32 Kbps ADPCM to 64Kbps PCM voice channel upon detection.

Broadband Data Module Interface (optional)

The broadband data module provides the following functions:

Provides a G.lite DSL/ATM CO line card function to support the connection of standard ADSL modem at the subscriber premise.

Provides a packet channel interface with the Wireless Terminal controller board to carry the user data.

Provides a control plane interface to carry operational control signal/messages from the WT main board to the module-processing unit.

Provides a management plane interface to allow configuration, maintenance and performance monitoring well as software download to the Broadband data module.

The Wireless Terminal provides a means to test the packet channel radio connection from a 10BaseT or 10/100BaseT port with a laptop computer isolated from the broadband data module. That should ease installation and troubleshooting.

Maintenance and configuration port

The Wireless Terminal unit can be controlled through the RS-232 console port for setup installation alignment, frequency selection and maintenance.

The connectors will be a DB-9 on both ends.

The Wireless Terminal has a 10BaseT connection in addition to the RS-232 port.

The RTS provides a relative signal strength indication to a PC interface for antenna installation and alignment in addition to the DVM output.

The Wireless Terminal provides a 10BaseT port allowing establishing a PPP connection from the laptop computer over the VLAN when enabled or control channel. This will enable accessing WEB sites, HDT NMS port/ configuration, or CO network remotely using a laptop computer. The port shall be routed to be accessible from the access panel.

DC/DC power supply and power conversion

The Wireless Terminal operates from a battery providing a nominal voltage of 24Volts DC connected directly to the unit. The input current is 2A max and the voltage can range from +15V to +28V.

The Multi-Output Fly-back converter provides regulated +3.3V+6.2V, -6.2V, +12V and – 12V to supply the motherboard and all related interface. This module is fused on the DC power input while the buck converter provides the +8.2V to power the PA.

The Wireless Terminal monitors the AC outage. The power failure will be reported to the operator at the beginning of the battery base operation for AC ON/ OFF indication.

Indirect lightning protection of the interfaces and power input port

The Wireless Terminal has an electrical protection for indirect lightning protection of the telephone pairs, and terminal block with screw type connector for the connection of up to 2 user interface cable pairs (2 phone lines). 2 telephone lines available with replaceable lightning protection gas tubes kit installed.

The Wireless Terminal holds an electrical protection for indirect lightning protection of the DC power lines and terminal block with screw type connector for the connection of up to 4 power supply conductors (2 + and 2 -). This will allow to more easily connecting several pair in parallel to power the unit.

WT Functions Basic Overview

