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Equipment Overview

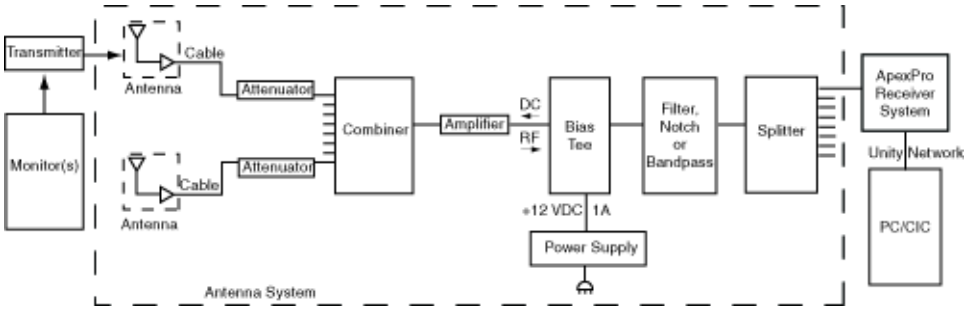
Overview

A transmitter is directly connected to the patient and transmits monitored data via the antenna to a corresponding receiver in a one-to-one correspondence between transmitters and receivers. Up to 16 receivers (four quad receiver modules with four receivers on each) may reside in a receiver system. Up to four quad receiver modules connect to the receiver backplane PCB, which is responsible for managing communications between all connected receivers and the telemetry server. The communication between the telemetry server and the receiver backplane is 10BaseT Ethernet and is called the CARESCAPE Network RX. The telemetry software processes the patient data from the receivers and makes the patient's ECG parameter and waveform data available for display at network viewing stations or the central station.

The telemetry system consists of the following components:

- Patient monitoring equipment
  - Masimo oximeter (optional)
  - CARESCAPE v100 monitor (optional)
- Transmitter (one for each monitored patient)
  - ApexPro CH Transmitter
  - CARESCAPE T4 Transmitter
  - CARESCAPE T14 Transmitter
- Antenna system
  - Receiver antenna
  - Attenuator
  - Antenna splitters/combiner
  - Amplifier
  - Bias tee
  - Antenna filter as needed (bandpass and/or notch)
  - DC power source to power the receiver antennas and antenna amplifiers
  - Enterprise Access antenna system
- ApexPro 400 MHz Receiver
- ApexPro 600 MHz Receiver
- CARESCAPE Network
- CARESCAPE Telemetry Server

- Central station



Power requirements

The DC power requirements for the antenna system depend greatly on the configuration of each individual system. To ease the power requirements of the telemetry system, the power supply for the antenna system is external to the receiver system and separate from the antenna.

Interface with receiver subsystem

Each receiver in the quad receiver module, located in the receiver subsystem, receives data from the transmitters. This data is processed by the telemetry system and then transmitted via the dedicated Ethernet interface to a central station for further processing and display. The quad receivers and the receiver subsystem together are known as the receiver system.

The interface between the antennas and the receiver system consists of coaxial cabling and connectors for transferring the transmitted signal. The interface uses 75-ohm cable from each antenna field and F style 75-ohm connectors as a connection medium. The preferred cable is RG-6, but for longer lengths RG-11 may be used.

Interface with multiple receiver subsystems

To interface the antenna system with multiple receiver systems, each antenna field in the antenna system is split into the appropriate number of tap points using combiners/splitters before connecting to each receiver system.

CARESCAPE Network

The CARESCAPE Network is the networking system used to transmit information from one GE product to others connected to the same CARESCAPE Network.

ApexPro antenna system

Antenna

The antenna system is used for transmission of data from the transmitter to the receiver system.

The antenna is a circularly-polarized array of sloping half-wave dipoles with an omni-directional coverage pattern. The antenna is available in two versions: active

and passive. An active antenna includes an active amplifier, while a passive antenna provides no signal amplification. The receiver antenna comes with a standard drop ceiling T-bar mount.

Antenna amplifier

The antenna amplifier boosts the signal when losses from other antenna components exceed the gain of the antenna. DC power for the amplifier is obtained from the +12 VDC power supply.

Coaxial cable

Coaxial cabling is used to connect the omni-directional antennas and amplifiers to the receiving equipment. Controlled-impedance cabling is used and 75-ohm, RG-6 type is recommended. Plenum- or riser-rated cable is used to meet NEC fire codes. RG-11 may be used if cable lengths become long and dB losses become excessive.

Splitters/combiner

Passive splitters/combiners split or combine the RF signal into multiple paths. The same splitter may also be used as a combiner to join multiple RF signals into one path. There are two-, four-, or eight-way splitters available that are DC-passive.

Attenuators

Attenuators lower signals and balance antenna runs. The attenuators are DC-passive and are available as 3 dB, 6 dB and 10 dB attenuators.

Power supply

A +12 VDC power supply at 1 A supplies power to the antenna system. Power supplies accept AC voltages between 90-270 VAC. AC inputs have internal fuses that are not replaceable. The output of the supply is short circuit protected.

Bias tee

The antenna bias tee allows the injection of DC power from the antenna power supply into the antenna system cabling. The bias tee supplies RF isolation between the RF signals on the antenna cabling and the power supply. It contains a DC block that blocks the conduction of DC power to the receiver system and associated hardware. A bias tee is used with each power supply.

Notch filter

Notch filters are frequency or TV channel specific and notch out the TV video, audio, or digital center of the band signals. Notch filters also filter pager signals or other strong RF signals that can be found in a telemetry environment.

Bandpass filter

The bandpass filter rejects frequencies outside its listed bandwidth and passes frequencies inside its listed bandwidth. It is used in place of certain notch filters to provide wide band filtering with less in-band loss than multiple notch filters.