

GPS MASTER CLOCKS

GPS TIME REFERENCE

FOR AE SERIES
MASTER CLOCK SYSTEMS



Send Accurate Time and Date to one clock or all the clocks throughout your facility...

Compatible with all AE Series and CC2000 Series System Clocks

For Schools, Factories, Hospitals and other facilities.



GPS-427A

+



AE2412R-427A

or



AE26R-427A

Each system requires a GPS-427A Antenna/Receiver and a GPS Master Clock. Choose either the AE2412R-427A or the AE26R-427A GPS Master Clock.

For System Clocks and Displays choose any of the AE Series Displays with Option 354 installed, or any of the CC2000 Series System Clocks.

For special requirements, the GPS Option (Option 427A) can be added to most six-digit AE Series Displays.

Complete systems are available for any size facility or campus. Call for details..



**APPLIED
TECHNICAL
SYSTEMS**

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AE Series GPS Clock Systems

The NAVSTAR Global Positioning System (GPS), developed by the U.S. Department of Defense, is an extremely accurate navigation system. Its 24 satellites are flying about 11,000 miles above the earth, so that any place on the earth will have a minimum of four satellites in view at any given time. Although they are moving very rapidly, their positions and orbits are known with great precision at all times.

The orbiting satellites have extremely accurate (and expensive!) clocks that use the vibrations of an atom as the fundamental unit of time. These atomic clocks are traceable to UTC/USNO to better than 100 nanoseconds, which is many orders of magnitude better than what is required for the typical school or facility clock system.

Part of every GPS receiver is a radio that listens for the signals being broadcast by these satellites. Each spacecraft continuously sends a data stream (NMEA Sentences) that contains its orbit information, equipment status, and the exact time.

The **GPS-427A Antenna/Receiver** receives (UTC) Universal Coordinated Time from the GPS (Global Positioning Satellite) system and provides a series of NMEA sentences for the AE Series, GPS Master Clock, or for your computer.

The **AE Series, GPS Master Clock** constantly analyzes the data from selected NMEA sentences for signal quality, and to be sure it has locked on to at least three satellites. It then extracts UTC from these data for use by the AEXX-427A. A "Locked On" indication is provided by illuminating the decimal point on the sixth digit. This may take several minutes the first time the unit is powered on, since it will not have any history of satellite locations for your location in its memory. Time is then updated each minute at the 30th second.

A programmable, time zone offset is entered to provide local time for any world time zone. This offset is added to the Hours of the UTC. The RS232 serial data output provides local time, date, Julian date, and day of the week data that can be displayed on unlimited numbers of AE Series, or CC2000 Series Remote Displays. For analog clock correction and bell ringing applications, this output can be connected to an MC Series Master Clock with the RS232 I/O Option installed. MC Series Master Clocks provided clock correction outputs such as 59TH Minute correction for three-wire, synchronous, analog secondary clocks, and bell circuit outputs.

During power outages, the AEXX-427A Master Clock will not display or transmit its time to the remote clocks. However, it will keep time using a 0.005% crystal for up to four hours on a rechargeable battery backup system. In addition the GPS-427A Antenna/Receiver will keep time and memory for up to six months. Upon the return of power, the system will display the backup time of the AEXX-427A until the next update at the 30th second of the minute. It will then display the backup time of the GPS-427A Antenna/Receiver until the system locks on again, typically within 60 seconds of the return of power to the system.