

BRG Time Synchronization Comparison Chart

BRG Precision Sync. Methods	Description	Advantages	Disadvantages	Cost per Clock
59th Minute Impulse Correction	Time correction pulses are sent hourly over dedicated wiring.	Compatible with many older analog clock systems, uses existing dedicated clock wiring.	Time data only, date is not updated; however, all BRG digital clocks will automatically maintain the correct date.	\$25
Bi-Polar Impulse Time Receiver	Time correction pulses are sent every minute over dedicated wiring.	Compatible with many analog clock systems, uses existing dedicated clock wiring, low cost.	Time update pulses only, no time or date data is sent or received. However, all BRG digital clocks will automatically maintain the correct date.	\$25
CDMA Time Receiver	Time is received directly from CDMA cellular telephone transmissions. Provides absolute timing accuracy.	Obtains highly accurate time from cell phone towers, no fees or ongoing charges, no sync wires. Signal is typically available deep inside building without the need for antenna wires.	Signal may not be available in some areas. A signal test device is available.	\$495
PC Time Server	A PC may be used to obtain the time from the internet or other time source, then distribute the time to clocks using Sync Wire or Ethernet.	Existing computers may serve as a time server. Using an existing PC as a time server is less costly than a dedicated time server.	A PC time server is typically not as reliable as a dedicated time server or master clock. The wire sync distribution method requires a serial interface adapter.	\$125
Ethernet Communications	NTP or UDP time data is distributed over the existing computer network.	Obtains time from existing local or internet time servers. Highly accurate, med cost.	Long term reliability questionable as computer technology changes rapidly.	\$125
Fiber Optic Modem	Clocks, Timers and Counters and other displays may be linked over great distances using fiber optic cable. Usually for secure point-to-point links.	Clocks may be up to 20km apart. Fiber Optic cable transmission is secure. Highly reliable. Not prone to creating or receiving interference.	Requires the installation of fiber optic cable.	\$695
GPS Time Receiver	Time is received from the U.S. Government's Global Positioning System. Used mostly on master clocks. Provides absolute timing accuracy.	Obtains highly accurate time directly from military satellites. Worldwide coverage. Good long-term reliability. Window antennas are available.	Antenna must have a view of the sky. Requires line from clock to antenna.	\$495-\$595
IRIG-B Time Receiver	Time is distributed over dedicated time network wiring. Typically used for missile and space applications.	Obtains time from existing dedicated time network, compatible with military and space systems.	Dedicated wiring required	\$250

Midnight Reset or PLC Reset	Time correction pulses may be received from older master clock systems, computers or PLC's.	The clock can be configured to expect resets at a variety of times and periods. Not prone to interference.	Requires dedicated wiring.	\$25
Power Line Communications	Time, date and other data is distributed over existing power lines.	No new wires, medium cost, reliable	Electrical distribution transformers block the time signal.	\$100
Radio Sync	Time data is sent to clocks using time-proven UHF radio paging system. The master clock obtains the correct time using GPS or Network Time and sends it over a standard radio paging system to all clocks in the area.	No sync wires required, high reliability, very long range, reliable small or large scale synchronization. Battery powered analog clocks are available.	Cost comparable to wire sync systems for large systems. Smaller systems may cost more due to the cost of the transmitter(s)	\$125
Serial Wire Communications	Time is distributed using a dedicated twisted pair wire.	Up to 4,000 feet between and two clocks, low cost, reliable	Dedicated wiring must be installed.	\$25-\$50
SMPTE Time Receiver	Time is distributed over dedicated time network wiring.	Obtains time from existing dedicated time network.	Dedicated wiring required	\$250
Time Server – Stratum 1	A dedicated time server will obtain accurate time using GPS or CDMA and distribute it to computers and time displays over the computer network.	Use NTP and standard protocols to distribute the time. GPS and CDMA are highly reliable and accurate time sources. CDMA version does not require an outdoor antenna. Supports many standard protocols.	Available in rack mount only. GPS version requires that the antenna must have a view of the sky.	\$2,750 to \$2,875
Ultra-high Precision Oscillator	A precision oscillator maintains accurate time, avoiding the need for frequent time updates. The clock automatically adjusts for crystal aging and ambient temperature changes.	No sync wire is required, low cost, clocks may be relocated with ease, high accuracy, reliable.	Clocks may require adjustment in 5-8 years. Not recommended where split second long-term accuracy is required.	\$25
WWVB Time Receiver	Time is received from the NIST low frequency transmissions.	Highly accurate, medium cost.	Unreliable, prone to interference, outdoor antenna required, signal not available in all areas. NOT RECOMMENDED	N/A