Franklin Wireless

KRONOsync GPS or NTP Wireless Clock System

Franklin Wireless
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1-800-321-2353

Product Guide Specification

This product specification is written According to the Construction Specifications Institute (CSI), *MasterFormat*™, *Section Format,* and *Page Format,* contained in the CSI *Manual of Practice.*

Reference section 16730, 16735.
Reference Master Format 2004 section 275313 (27 53 13 Clock Systems)

Specifier Note: The following list should be reviewed and edited by Architect/Engineer as required for specific project

PART 1 – GENERAL

1.1 General Requirements and Scope

A. Furnish and install a complete new GPS or NTP Wireless Synchronized Clock system using the Franklin Wireless **KRONOsync** System. Specify GPS or NTP time source.

B. All Bids shall be based on Franklin Wireless' product specification as contained herein.

C. Bidders wishing to submit alternative equipment must supply alternative specification documents which contain technical documentation to prove it's a technical and functional equivalent.

D. Final Approval of any alternative system shall be determined at the time of job completion. Failure to provide the "precise functional equivalent" shall result in the removal of the alternative system at the contractor's expense.

1.2 Summary

A. GPS, NTP Wireless Transmission System

1. Transmitter with GPS Receiver or NTP (Network Time Protocol).
2. Secondary Transmitter

B. Wireless Receiving Devices

1. Analog Clocks – Battery/AC Powered
2. Digital Clocks – AC Powered

1.3 Related Divisions and Sections

A. Division 16- Electrical 120V grounded outlet required for Transmitter, AC powered Analog Clocks, and Digital Display LED Clocks.

B. Division 26- Electrical 120V grounded outlet required for Transmitter, AC powered Analog Clocks, and Digital Display Clocks.

1.4 References

A. Franklin Wireless Operations Manual and Associated drawings.

B. National Fire Protection Agency (NFPA) – 70, National Electric Code 2005

1.5 Definitions

(GPS): Global Positioning System, a worldwide system that employs 24 orbiting satellites in an integrated network to determine geographic location anywhere in the world, and which employs and transmits atomic time (UTC).

(NTP): Network Time Protocol, Short for ***N**etwork **T**ime **P**rotocol*, an Internet standard protocol (built on top of TCP/IP) that assures accurate synchronization to the millisecond of computer clock times in a network of computers. Based on UTC, NTP synchronizes client workstation clocks to the U.S. Naval Observatory Master Clocks in Washington, DC and Colorado Springs CO. Running as a continuous background client program on a computer, NTP sends periodic time requests to servers, obtaining server time stamps and using them to adjust computers clocks.

1.6 Submittals

A. System Product Data: Submit all data for each component, describing its operational and physical characteristics along with the method of installation. Submit a brochure showing all available colors and dimensions of clocks.

B. Operating License: The system must operate in accordance with a "Radio Station Authorization" form FCC 601 granted by the Federal Communication Commission (FCC). Submit evidence of application for operating license prior to installing equipment. Furnish the license, or if the license has not been received, a copy of the application for the license, to the Owner prior to operating the equipment. Upon receipt of License, deliver original license to Owner.

C. Samples: Submit one clock for approval. The approved sample is to be tagged and installed as part of the final operating system.

D. Manufacturer's Instructions: Submit complete installation, set-up and maintenance instructions.

E. Schematic indicating the location of the transmitter(s) and all clocks must be submitted by owner prior to installation.

1.7 Quality Assurance

A. Qualifications:

1. **Manufacturer:** Company specializing in manufacturing of timekeeping products with a minimum of 30 continuous years of documented experience.
2. **Installer:** Company with documented experience in the installation of commercial timekeeping systems.

B. Permits: Obtain FCC license for Transmitter authorization

1.8 Substitutions

A. Proposed substitutions, if considered, shall be manufactured of equivalent materials and meet or exceed all detailed operational features of the specified requirements of this section. Submission of an alternative shall contain an original draft point by point comparison of the submitted product relative to the requirements of this specification. Engineering drawings of the system and specifications of all components must be the same on a technical and functional level as per the Franklin Wireless specifications contained herein.

B. Any proposed substitutions must be identified not less than 10 days prior to bid date.

C. Other master clock systems requiring wiring or conduit between the master and clocks are not acceptable.

D. Other systems that are unlicensed or have the FCC license in the name of someone other than the building owner will not be accepted

E. Final Approval of any alternative system shall be determined at the time of job completion. Failure to provide the "precise functional equivalent" shall result in the removal of the alternative system at the contractor's expense.

1.9 Regulatory Requirements

A. Equipment and components furnished shall be manufacturer's latest model.

B. Master Transmitter and receiver shall comply with Part 90 of FCC rules, as follows:

1. This device must not cause harmful interference and must accept interference received, including interference that may result in undesirable operation.
2. Transmitter frequency shall be governed by FCC Part 90.35.
3. Transmitter output power shall be governed by FCC Parts 90 and 74.

C. System shall be installed in compliance with local and state authorities having jurisdiction.

D. The end user must acquire an operating license, or "Radio Station Authorization" that will be granted by the FCC. This permits the end user to legally operate this Wireless system.

1.91 Delivery, Storage and Handling

A. Deliver all components to the site in the manufacturer's original packaging. Packaging shall contain manufacturer's name and address, product identification number, and other related information.

B. Store equipment in finished building, unopened containers until ready for installation.

1.95 Project Field Conditions

A. Clocks shall not be installed until painting and other finish work in each room is complete.

B. Coordinate installation of GPS receiver to an exterior wall or to an access point on the roof. GPS receiver must be mounted and wire ran back to the Transmitter and all entrances to the building made watertight.

PART 2 – PRODUCTS

2.1 Acceptable Manufacturer

Franklin Wireless: KRONOsync Wireless Time System

233 Railroad Dr, Warminster, PA 18974

Phone: 1-800-321-2353
Fax: 215-322-1022
Website: **www.Franklinclock.com**

2.2 System Description and Operation

The KRONOsync Wireless GPS, NTP timekeeping system consists of a master Transmitter located on the inside the building, a GPS receiver mounted on the roof, exterior of the building or window, or NTP receiver box connected via an RJ45 Ethernet cable from an in-house computer network to the transmitter, along with analog or digital clocks, and accessories. Once operational, the transmitter shall keep all system clocks synchronized to the second all day, each day, everyday.

System shall synchronize all clocks to each other. System shall utilize GPS or NTP technology to provide atomic time to components.

System shall not require hard wiring for its components except for AC power. Analog clocks may be battery operated for full portability if required.

Clocks shall automatically adjust for Daylight Saving Time per the Daylight Saving time settings in the Master Clock.

Analog Clocks shall synchronize to +/- 1 second of the master clock displayed time.

The system has an internal clock that will continuously be updated by the GPS or NTP. If a GPS or NTP failure were to occur, the clocks would continue to be synchronized to the internal clock and would not deviate from one another. Once GPS or NTP time is restored, all clocks would once again be synchronized.

The system has a fail safe design so that if a power interruption were to occur, the clocks will continue to operate. Upon the restoration of power, the transmitter will once again communicate with the clocks and normal operation will resume.

Analog clocks shall require 2 "D" cell batteries and be portable and if AC powered, wired to end user specifications.

System shall be 100% programmable from the front operation panel with lights that indicate power status, and GPS or NTP reception.

System programming for Time Zone, Frequency, 12 or 24 hour operation and DST on/off must be programmable from the front of transmitter to avoid system movement.

2.3 Equipment

Master Wireless Transmitter: The Transmitter is to be installed in an internal location, and can be mounted as a stand alone unit, or as part of a rack system. The LED and associated buttons on front of Transmitter will allow for the programming and display of the following operating features:

a. **Master Transmitter**: KRONOsync Model **# 101005** Shall have an internal clock which will guarantee that the operation of the clocks will continue to be synchronized in the event of a temporary GPS failure.

b. **Time Zones**: Display and programming must allow for the selection and display of Time zones for all of North America: Eastern, Central, Mountain, Pacific, Alaska and Hawaii. It must also allow for all international time zone options.

c. **Daylight Saving Time**: Transmitter must allow for automatic adjustment of the system, allowing it to be active or inactive.

d. **12hr or 24hr Operation:** System must allow for programming of desired method of operation on the face of the transmitter.

e. **Frequency Range**: 467.2125- 467.4375 MHz.

f. Programming: All programming of operating features must occur on the front of the Transmitter and all changes must be able to be viewed on the digital display as the changes are being made.

Specifier Note: Specify the time source as either GPS or NTP. Select additional GPS Cable length (if needed) for the appropriate distance between transmitter and the GPS unit. GPS unit must have an unobstructed view of the sky.

g. GPS Receiver: GPS roof mounted receiver comes with an attached 15' cable (3m). The GPS receiver will be water tight and has a built in receiver. Additional extension cable lengths of 25' 50' and 100' are available. A GPS mounting bracket is provided for secure roof mount or side wall installation.

h. NTP Receiver: Receiver box comes with a 20" Ethernet cable.

i. Transmitter Power: 5 watt.

j. Transmission Range: Up to 2 miles radius (transmitter power dependent)

k. Operating Range: 32 degrees F to 158 degrees F (0 degrees C. to 70 degrees C.)

l. Radio Technology: Narrowband FM, 12.5 KHz bandwidth

m. Antenna: Shall be used for indoor applications and attached to the rear of the transmitter. No external antenna required.

n. Power Supply: (included with transmitter)

- Input: 120-volt AC 50/60 Hz
- Output: 12-volt DC, 3 Amps

Recommended: **Surge Protector/Battery Backup:**

- Input: 120-volt AC 60 Hz +/-1 Hz.
- Output: 120-volt AC, 550VA, 300 watts
- Surge Energy Rating: 365 joules

o. Analogue Clocks: Analog clocks will be battery operated using 2 "D" cell batteries provided by the manufacturer or AC power based on specification. All clocks shall be wall mounted. Clocks shall have ABS (polystyrene), Wood, or Metal Frame and polycarbonate or glass lens. (other options available). Face shall be white or antique. Hour and minute hands shall be black, second hand is red.

p. Clock features:

Clocks shall automatically update from the transmitter 6 times a day. 2:00, 6:00, 10:00 AM/PM. Use manufacturers provided "D" cell batteries or AC power adapter. **Logo Clock Faces:** Analog clocks shall bear the Owner's logo as indicated. Custom logo's are available as an option.

Additional finishes and colors available.

Automatically adjusts for Daylight Savings Time, if option is selected.

Clocks will keep operating in synchronized mode if GPS or NTP signal is lost due to GPS or NTP failure. Once signal is re-acquired, clocks will resume GPS or NTP time synchronization.

Clocks will keep operating as quartz based clocks if there is a transmitter malfunction.

Clock Models: (Battery/Electric)
- 13" Standard Model **# 210001 #312001** 120VAC, **#311001** 24VAC
- 16" Standard Model **# 220001 #322001** 120VAC, **#321001** 24 VAC
- **Wood Clocks:** (see brochure or website for specific model)
- **Brushed Aluminum Clocks:** (see brochure or website for specific model)
- **Digital Display Clocks:** (see brochure or website for specific model)
- **Security Brackets:** Built in to rear of clocks for wall mounting

q. Digital Clocks must be able to receive synchronized time signals from the Franklin Wireless KRONOsync Transmitter and possess the same operating features as all Analog clocks.

r. Wire guards: Provided to protect clocks in harsh environments:

- 16 x 16 inch Wire Guard for 13-inch diameter analogue clocks. Model #**104001**
- 19 x 19-inch Wire Guard for 16-inch diameter analogue clocks. Model #**104002**

2.4 System Operation and Startup

A. Transmission System shall receive Atomic Time information every second from the GPS receiver which is mounted with an unobstructed view of the sky and is connected to the system master transmitter, or the NTP receiver mounted on and connected to transmitter. Upon power up and receipt of GPS or NTP time, the Transmitter will then transmit GPS or NTP synchronized time to all receiving devices programmed to the system frequency. The transmitter and all receiving devices will monitor receipt of GPS or NTP time and remain synchronized.

B. Wireless Master Transmitter Operation

- When power is first applied to the master transmitter, the power light will flash and it will search for a valid GPS or NTP signal and upon receipt, it will set the internal clock of the transmitter. The transmitter will update its internal clock whenever it receives a valid time signal from the GPS or NTP receiver. It shall transmit GPS or NTP time 3 times per minute to all receiving devices.

D. Analog Clock Operation

- For battery clocks, insert the two supplied "D" cell batteries. The receiver will search for a signal from the transmitter by scanning all frequencies. Upon receipt of the signal, the clock will store the frequency in memory and set the clock to the exact second of the transmitter. The clocks will locate the position of the hands and automatically set them to be in perfect synchronization to the Master Transmitter. The clock hands will move in a quick "clockwise" motion until they get to the transmitter time.

D. Digital Clock Operation

- Connect the DC adapter (supplied with each digital clock) to the appropriate power source. The built in receiver will search for a signal from the transmitter by scanning all frequencies. Upon receipt of signal confirmation, the digital clock will store the frequency in its non-volatile memory and synchronize to the exact time of transmitter.

PART 3 - EXECUTION

3.1 Examination

Verify that construction is complete in spaces to receive equipment and that rooms are clean and dry.

Verify that 120-volt electrical outlet is located within 6 feet of location of transmitter and the outlet is operational and properly grounded.

Verify that all 120-volt electrical outlets for the AC powered clocks are located at the exact installation point and the outlet is operational and properly grounded.

3.2 System Installation

Install in accordance with manufacturer's installation manual furnished with system.

The **GPS receiver** shall be mounted on the outside wall of the building, roof, or inside window. In all cases the GPS unit must have a clear view of the sky. If mounted on exterior side wall, there is to be no overhanging structure that can block its view of the sky. If located on the roof, it must be at a height that will prevent it from contacting potentially standing water, or buried under snow. If inside window mounted, the class cannot contain chemical shielding. (Low E)

The **NTP receiver** shall be located next to or sit on top of the Transmitter. Connect the RJ45 Ethernet cable from your computer network to back of the NTP receiver. Connect the NTP receiver to the Transmitter with the supplied cable. The NTP receiver does not require individual power supply.

3.3 Cleaning

Prior to final acceptance, clean exposed surfaces of all system components, using cleaning methods recommended by the manufacturer. Remove any labels from the faces of the clocks.

3.4 Manufacturer Services/Demonstration

Provide technical assistance to owner's representatives on functioning of the system and ongoing operation requirements. Use operations manual, or call 1-800-321-2352.

3.5 Field Inspection

Prior to final acceptance, inspect entire system to ensure proper functioning and synchronization of components and replace any parts found defective. Contact Franklin Wireless at **1-800-321-2352**