Product Specifications

27 53 13 Wireless Clock System

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XR Time Synchronization System

Primex Wireless, Inc.

Specifier Note: This product specification is written according to the Construction Specifications Institute (CSI), MasterFormatTM, SectionFormat, and PageFormat, contained in the CSI Manual of Practice. The section must be carefully reviewed and edited by the Architect/Engineer/Consultant to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the drawings. Delete all “Specifier Notes” when editing this specification.

Contents

PART 1.0 GENERAL

The system is specified as described.

1.1 GENERAL REQUIREMENTS & SCOPE

A. Furnish and install a complete new Time Synchronization System using the Primex Wireless XR Time Synchronization System.
B. Furnish and install all system equipment, devices, accessories, and material in accordance with these specifications and drawing to provide a complete and operating system.
C. All bids shall be based on the equipment as specified herein. The model designations are that of Primex Wireless, Inc. The specifying authority must approve any alternate system.

1.2 SECTION INCLUDES

Specifier Note: Edit the following list as required for the project.

Specifier Note: **XR Time Synchronization System**

A. Transmitter (Master)
B. Satellite Transmitter
C. GPS Receiver
D. System Devices
    - Analog Clocks
    - Digital Clocks
    - Digital Personal Series LCD Clocks
    - Digital Elapsed Timers
    - Digital Programmable Timers
    - Digital Code Blue Timers

1.3 RELATED SECTIONS

Specifier Note: Edit the following list as required for the project. List other sections with work directly related to this section.

A. Division 26 “Electrical” (120 volt grounded outlet required for transmitter)
B. Division 26 Section “Common Work Results for Electrical”

1.4 REFERENCES

Specifier Note: List standards referenced in this section, complete with designations and titles. This article does not require compliance with standards, but is merely a list of those used.

A. National Fire Protection Association (NFPA): 1. NFPA 70 - National Electrical Code (NEC).
B. Manufacturer Installation and User Guides.

1.5 DEFINITIONS

This section provides commonly used terms within this specification.

A. **GPS:** Global Positioning System, a worldwide system that employs a constellation of satellites in an integrated network to determine geographic location anywhere in the world, and which employs and transmits Universal Coordinated Time, the world’s most accurate and reliable time.
B. **NTP:** Network Time Protocol, used for synchronizing the clocks on computer networks and devices from either a public server or a separate server on a private local area network.
C. **UTC:** Universal Coordinated Time

1.6 SYSTEM DESCRIPTION

This section describes the system as specified.

Wireless Clock System

A. System shall continually wirelessly synchronize clocks and/or timers, and shall be capable of clock readouts in multiple time zones where desired.
B. System shall operate on a 72MHz frequency. The 72MHz frequency transmitter efficiently sends time synchronization signals through commercial building materials to ensure all devices receive important time updates, even for Daylight Saving Time and after a power outage.
C. The system transmitters can be configured with a variety of power output levels to provide coverage for a single building or an entire campus.
D. The system supports an FCC license for operation of a 72MHz transmitter result in safe and interference free operation for users.
E. System shall provide wireless time from a master time source. This time source will either be the atomic clock on the GPS system or the clock from a defined NTP server that the XR transmitter can access via the customer Local Area Network (LAN). The master time will be synchronized to UTC.
F. Hard wiring for data communication will not be required to the clocks installed for the system.
G. Clocks shall automatically adjust for Daylight Saving Time in locations where DST is observed.
H. Each clock and/or timer and every other component in the system shall use both precise time and synchronized time.
I. Digital clocks shall be synchronized to within 10 milliseconds every 10 minutes and the system shall have an internal oscillator that maintains plus or minus four seconds per day between synchronization, so that clock accuracy shall not exceed plus or minus 0.2 seconds.
J. Analog Clocks shall be synchronized to within 10 milliseconds 6 times per day when operating clock strikes 2:01 AM, 6:01 AM, 10:01 AM, 2:01 PM, 6:01 PM, and 10:01 PM, and the system shall have an internal oscillator that maintains plus or minus one second per day between synchronization, so that clock accuracy shall not exceed plus or minus 0.2 seconds.
K. The system shall include an internal clock reference so that failure to detect the master time source shall not result in the clocks failing to indicate time. Additionally, XR transmitters will have an internal battery backup of up to eight hours in the event of a power failure so that settings and the correct master time will be instantly recalled upon restoration of power.
L. System shall incorporate a “fail-safe” design so that failure of any component shall not cause failure of the system. Upon restoration of power or repair of failed component, the system shall resume normal operation without the need to reset the system or any component thereof.
M. If transmitter stops transmitting valid time signals due to power failure, the clocks will continue to function as accurate quartz clocks until a valid time signal is decoded. If signal transmission is not restored after 48 hours, the second hand will “five step” as a visual indicator that the signal has been lost. Should the clocks lose power and signal, the clocks will not function.
N. Clock locations shall be as indicated and clocks shall be fully portable, capable of being relocated at any time.
O. U.S. only: System must operate in accordance with a “Radio Station Authorization”, Form FCC 601 – LM, granted by the Federal Communications Commission (FCC). This license will be issued to and held by the end user.
P. CANADA only: The system must operate in accordance with a “Technical Acceptance Certificate” issued under the authority of Industry Canada and the Ministry of Industry. This license will be granted to and held by the end user.

1.7 REGULATORY REQUIREMENTS

A. Equipment and components furnished shall be of manufacturer latest model.
B. System shall be installed in compliance with local and state authorities having jurisdiction.
C. U.S. only: The end user will hold a license, known as a “Radio Station Authorization” granted by the FCC. This license grants the end user protected use for wireless transmission at the designated frequency. This license will designate a unique “call sign” for each end user.
D. U.S. only: Transmitter and receiver shall comply with Part 90 of FCC rules as follows: This device may not cause harmful interference. This device must accept interference received, including interference that may cause undesired operation. Transmitter frequency shall be governed by FCC Part 90.35. Transmitter output power shall be governed by FCC Part 90 257 (b).
E. CANADA only: The end user will hold a license, known as a “Non Complex Fixed Station” Radio License granted by Industry Canada and the Ministry of Industry. This license grants the end user protected use for wireless transmission at the designated frequency.
F. CANADA only: IC-2365: Application for “License to Install and Operate a Radio Station in Canada” must be completed and signed by end user prior to license issuance. The end user will grant permission for Primex Wireless to apply for the license on their behalf. Primex Wireless will provide all documents and technical information to Industry Canada for approval. This license will designate a unique “call sign” for each end user.

G. CANADA only: Transmitter and receiver shall comply with RSS 119 of Issue 6 of Industry Canada specifications as follows: This device may not cause harmful interference, and this device must accept interference received, including interference that may cause undesired operation. Transmitter frequency shall be governed by IC: RSS119 Issue 6. Transmitter output power shall be governed by IC: RSS119 Issue 6.

1.8 SUBMITTALS

A. Product Data: Submit complete catalog data for each component, describing physical characteristics and method of installation. Submit brochure showing available colors, styles, sizes, and finishes of clocks.
B. Samples: Submit one specified system device model(s) for approval. Approved sample(s) shall be tagged and shall be installed in the work at location directed.
C. Manufacturer Instructions: Submit complete installation, set-up and maintenance instructions.
D. Floor plans indicating the location of system transmitter(s), approved by manufacturer, will be submitted to owner prior to installation.

US Specifier Note: In accordance with FCC regulations, an application for “Radio Station Authorization” must be filed prior to use of the equipment. Normally, the manufacturer will have completed the filing and obtaining the license. If not, the Owner will be required to file the application with the FCC prior to use. Furnishing the license, or a copy of the application, will confirm that FCC approval has been obtained.

CANADA Specifier Note: In accordance with Industry Canada regulations, an application for “Technical Acceptance Certificate” must be filed prior to use of the equipment. Normally, the manufacturer will have completed the filing and obtaining the license. If not, the Owner will be required to file the application with the Industry Canada prior to use. Furnishing the license, or a copy of the application, will confirm that Industry Canada approval has been obtained.

E. U.S. only: Operating License: Submit evidence of application for FCC Radio Station Authorization prior to installing equipment. Furnish the license or a copy of the application for the license, to the Owner/End User prior to operating the equipment. The original license must be delivered to the Owner/End User.
F. CANADA only: Submit IC Technical Acceptance Certificate prior to installing equipment. Furnish the license or a copy of the application for the license, to the Owner/End User prior to operating the equipment. The original license must be delivered to the Owner/End User.

1.9 SUBSTITUTIONS

A. Proposed substitutions, to be considered, shall be manufactured of equivalent materials that meet or exceed specified requirements of this Section.
B. Proposed substitutions shall be identified not less than 10 days prior to bid date.
C. Other systems requiring wiring and/or conduit between master and clocks and/or timers will not be accepted.
D. Other systems using wireless technology in an unlicensed frequency range will not be accepted.
E. Other systems using wireless technology where the license is held by any party other than the end user will not be accepted.

1.10 QUALITY ASSURANCE

A. U.S. only: Permits: Operating license for the transmitter from the FCC.
B. CANADA only: IC-2365: Application for “License to Install and Operate a Radio Station in Canada” must be completed and signed by end user prior to license issuance.
C. Qualifications: Manufacturer: Company specializing in manufacturing commercial time system products with a minimum of 30 continuous years of documented experience including 10 or more years of experience producing GPS wireless time systems.
D. Installer: Company with documented experience in the installation of commercial time systems.
E. Prior to installation a site survey must be performed to determine proper transmitter placement.

1.11 DELIVERY STORAGE AND HANDLING

A. Deliver all components to the site in the manufacturer original packaging.
B. Packaging shall contain manufacturer name and address, product identification number, and other related information.
C. Store equipment in finished building, unopened containers until ready for installation.

1.12 PROJECT SITE CONDITIONS

This section describes the Project Site Conditions for equipment specified.

A. Clocks and/or Timers shall not be installed until painting and other finish work in each room is complete.
B. Programmable Count Down Timers: a computer having the specified minimum system requirements for the scheduling software installation will be available for use in programming the timer.
C. Transmitter - External Antenna: Coordinate installation of system antenna for access to the roof to comply with safety standards detailed in manufacturer instructions and per local codes.

Specifier Note: Delete this site condition if an INTERNAL Antenna Transmitter model is specified. The content only applies to External Antenna Transmitter models.

D. GPS Receiver: Coordinate installation of GPS receiver for access to the roof or exterior side wall per manufacturer installation instructions.

Specifier Note: Delete this site condition if NTP will be the master time source.

1.13 SYSTEM STARTUP

A. At completion of installation and prior to final acceptance, turn on the equipment; ensure that all equipment is operating properly, and that all system devices and components are functioning.

1.14 WARRANTY

A. Manufacturer will provide a one year warranty on GPS receiver, transmitter, and satellite transmitter. All other devices and components will have a 1 year warranty.
B. Manufacturer offers a two, three, or five-year extended transmitter warranty.
C. Manufacturer offers a five-year extended clock warranty.
D. Manufacturer offers an extended warranty on system devices.

PART 2.0 PRODUCTS

The system is specified as described in this section.

2.1 MANUFACTURER

System shall be manufactured by:

U.S.:

Primex Wireless, Inc., 965 Wells Street, Lake Geneva, WI 53147

Phone: (800) 537-0464 | Fax: (262) 248-0061 | Email: info@primexwireless.com | www.primexwireless.com

CANADA:

Primex Wireless, Inc., 1310 Kerrisdale Blvd. Unit #4, Newmarket, ON L3Y 8V6

Phone: (800) 330-1459 | Fax (905) 952-0134 | Email: info@primexwireless.ca | www.primexwireless.ca

2.2 SEQUENCE OF OPERATION

The system shall perform in the sequence of operation as described.

A. Configure and install system appliance detailed in manufacturer installation instructions.
B. Configure and install system devices per model specifications detailed in manufacturer installation instructions.

Transmitter Operation

A. When power is first applied to the transmitter, it checks for and displays the software version. It then checks the position of the switches and stores their position in memory. The transmitter looks for the master time source.

Master Time Source Operation

Specifier Note: Select the system's specified master time source:

A. **GPS Time Source:** With the transmitter in GPS mode, it powers to a connected GPS engine mounted with a clear view of the sky. Upon power, the GPS module seeks the GPS satellites in orbit to determine position and UTC time. Once the transmitter acknowledges receivable GPS data, it downloads time data and synchronizes its internal master clock to GPS time. The transmitter then starts to transmit its internal time once every second. The transmitter updates its internal clock every time it receives valid time data from the GPS.
B. **NTP Time Source:** With the transmitter in NTP mode, it connects over the Ethernet to the IP address of the NTP server. This IP address is programmed into the transmitter as part of its configuration. Once the connection to the NTP server is acknowledged, it downloads time data and synchronizes its internal master clock to NTP time. The transmitter then starts to transmit its internal time once every second. The transmitter updates its internal clock in this mode once per hour.

Clock and/or Timer Operation

A. After initial setup, the clock and/or timer will shut off the receiver. Six times each day an Analog Clock microprocessor will activate the receiver and starting with the stored channel it will again look for a valid time signal. Every 10 minutes a Digital Clock/Timer will activate the receiver and starting with the stored channel it will again look for a valid time signal. If necessary, the clocks will resynchronize to the correct time.
B. If an Analog clock has not decoded a valid time signal for a pre-determined number of days, it will go to a step mode. Low battery voltage is a common cause of the clock to not properly decode a time signal. If a clock goes into step mode, replace the batteries first and then determine if the clock synchronizes to master time source before attempting other troubleshooting methods.
C. If a Digital Clock/Timer has not decoded a valid time signal for a pre-determined number of days, the display colon indicator will flash continuously until a valid time signal is received.

2.3 EQUIPMENT

The system shall include all equipment as specified.

Transmitter Equipment

Specifier Note: Select one of the below transmitter models.

SUPPLY MODELS

Per specifications, supply the following model(s):

Model	Antenna	Time Source
1 Watt Transmitter (16 channel)	Internal	NTP and GPS
1 Watt Transmitter (49 channel)	Internal	NTP and GPS
1 Watt Transmitter (16 channel)	External	NTP and GPS
1 Watt Transmitter (49 channel)	External	NTP and GPS
5 Watt Transmitter (49 channel)	External	NTP and GPS
30 Watt Transmitter (49 channel)	External	NTP and GPS

1 Watt Transmitter

Specifier Note: Specifications apply to all 1 WATT transmitter models. Delete this section if 5 or 30 Watt Transmitter is specified.

A. The transmitter shall meet all of the below specifications.

Parameter	Specification
Transmission Frequency Ranges	72.020 to 72.980 MHz US: Each range is reserved by the FCC for licensed fixed mobile broadcasts.
Maximum Transmission	1 watt (30dBm) maximum at transmitter
Radio Technology	Narrowband FM
Channel Bandwidth	20 kHz maximum
Transition Mode	One-way communication
Data Rate	2 KBps
Operating Range	32°F - 122°F (0° - 50°C)
Transmitter output power	+26 to +30 dBm
Frequency Deviation	+/- 4 kHz
Power	120 VAC 60 Hz
Internal Power	5 VDC

Parameter	Specification
Carrier Frequency Stability	+/- 20 ppm
Channels	Specifier Note: Remove the reference to 16 selectable channels below when specifying XR transmitters. Remove the reference to 49 selectable channels below when specifying 14000, 14000-E or 14143 series transmitter 49 selectable channels to assure interference-free reception 16 selectable channels
Housing/Enclosure	Transmitter housing shall be black metal case, 16"W x 1 7/8" H x 12" D (40.64cm W x 4.52cm Hx 30.48cm D)
Power Supply	Power supply (included): • Input: 120 volt AC 50/60 Hz, 0.6 amps • Output: 9 volt DC
Internal Antenna Model	Internal antennal: 46.0" L (116.8cm), Weight: 7lbs
External Antenna Model	Cabling 100' (30.48m) between transmitter and antenna FCC Part 90 Accepted IC RSS-119 Accepted Weight: 8.25lbs (3.75kg)

B. Internal Antenna Model only: Transmitter shall transmit time continuously to all clocks in the system.
C. Internal clock: Transmitter shall contain an internal clock such that failure to update time from source will not disable the operation of the clocks.
D. Transmitter shall include a surge suppressor/battery backup and a mounting shelf.
E. Transmitter shall have the following switches

- Time zone adjustment switches for all time zones in the world. Includes: Eastern, Central, Mountain, Pacific, Alaska, and Hawaii.
- Switch to allow the following configuration: Daylight Saving Time bypass option, 12-hour or 24-hour display, GPS or NTP time source, Local or LAN configuration, UTC+ or UTC-, 30 minute UTC offset option CANADA (for Newfoundland).
- External Antenna Transmitter Model only: The DIP switches and channel switches are disabled during production by the manufacturer as the broadcast channel number and time zone are to be predetermined during the FCC licensing process based on end user location and existing wireless services operating in the area. The end user will be required to contact Primex Wireless if, for any reason, a different broadcast channel is required, since the request would require a modification of the license, requiring approval by the US: FCC, or if a different time source is desired. CANADA: by Industry Canada, or if a different time source is desired.

F. Transmitter housing shall incorporate a display, which shall include the following:

- Time readout
- AM and PM indicator if 12-hour time display is set
- Day and date readout
- Time zone indicator including Standard or Daylight Savings Time
- On screen menu to verify diagnostics, errors, time updates, and switch settings, toggled by sequence of push buttons next to display.
- Status LEDs: The LED signal indicator consists of three visual LEDs that indicate the status of the transmitter. The green LED indicates one of the three statuses, including (1) solid green: transmitter is transmitting, (2) not

illuminated: transmitter has not received an initial time signal after power up and/or reset, and (3) flashing: transmitter is not broadcasting due to standby mode or there is a condition that is causing the transmitter not to broadcast properly. The yellow LED indicates one of the two statuses, including (1) not illuminated: no warning conditions, (2) flashing: transmitter has not received a time update for 48 hours or a 1PPS (one pulse per second) has not been detected within the last 48 hours. The red LED indicates one status, (1) solid red: defined error condition exists.

5 and 30 Watt Transmitter

Specifier Note: Specifications apply to all 5 or 30 WATT transmitter models. Delete this section if a 1 Watt Transmitter is specified.

A. The transmitter shall meet all of the below specifications.

Parameter	Specification
Transmission Frequency Range	72.020 to 72.980 MHz. US: Each range is reserved by the FCC for licensed fixed mobile broadcasts.
Transmission Power at external antenna	5 watts (37 dBm) ERP and 30 watts (45 dBm) ERP
Radio Technology	Narrowband FM
Channels	Channel 1 through 16 (72.10-72..40 MHz) Channel 51 through 74 (72.42 - 72.98MHz)
Channel Bandwidth	20 kHz maximum
Transition Mode	One-way communication
Data Rate	2 KBps
Operating Range	32°F - 122°F (0° - 50°C)
Exciter Output Power	+26 to +30 dBm
Frequency Deviation	+/- 4 kHz
Transmitter Power Requirements	120 VAC 60 Hz
Internal Power Requirements	5 VDC
Current Draw	5 Watt: 0.9V 30 Watt: 1.41A
Carrier frequency stability	+/- 20 ppm
Amplifier Output Bandwidth (max)	20MHz

Parameter	Specification
Amplifier Gain Flatness	+/1 1db at 72 - 76 MHz
Fixed Output	5W output (37dBm) ERP 30W output (45 dBm) ERP
Harmonics (-dBc)	See FCC Part 90 requirements
Spurious	-60 dBc
VSWR (max)	1:3
Impedance	50 ohms
Connector to Antenna	N-male
Housing/Enclosure	Black metal case 22”W x 17”H x 22”D (55.88cm x 43.18 cm x 55.88cm)

B. Internal clock: Transmitter shall contain an internal clock such that failure to update time from source will not disable the operation of the clocks.
C. Transmitter shall include a surge suppressor/battery backup and a mounting shelf.
D. Transmitter shall have the following switches:

- Time zone adjustment switches for all time zones in the world. Includes: Eastern, Central, Mountain, Pacific, Alaska, and Hawaii.
- DIP Switch to allow the following configuration: Daylight Saving Time bypass option, 12-hour or 24-hour display, GPS or NTP time source, Local or LAN configuration, UTC+ or UTC-, 30 minute UTC offset option.
- The DIP switches and channel switches are disabled during production by the manufacturer as the broadcast channel number and time zone are to be predetermined during the FCC licensing process based on end user location and existing wireless services operating in the area. The end user will be required to contact Primex Wireless if, for any reason, a different broadcast channel is required, since the request would require a modification of the license, requiring approval by the FCC, or if a different time source is desired.

E. Transmitter housing shall incorporate a display, which shall include the following:

- Time readout
- AM and PM indicator if 12-hour time display is set
- Day and date readout
- Time zone indicator including Standard or Daylight Savings Time
- On screen menu to verify diagnostics, errors, time updates, and switch settings, toggled by sequence of push buttons next to display.
- Status LEDs: Green to determine time broadcast, yellow which flashes in the event of lack of time update after 48 hours, red which flashes to indicate connection or internal transmitter problem. The green broadcast mode LED will be solid to indicate the transmitter is broadcasting its signal, and dark to indicate the transmitter is in standby mode and not broadcasting.

External Antenna

Specifier Note: Section only applies to EXTERNAL Antenna Transmitter models. Delete if Internal Antenna Transmitter model is specified.

A. The antenna connects to the transmitter via a 100 foot (30.5m) 50-ohm coaxial cable.
B. 5 and 30 Watt models: External Antenna must be installed by Primex Wireless or a certified Primex Wireless installer.
C. Transmitter shall include an external antenna that meets the below specifications.

Parameter	Specification
Antenna Dimension	Radiating element 29.4 inches (747mm)
Ground Radials	41.5 inches (1063 mm)
Equivalent Flat Plate Area	0.68ft2 (0.063m2)
Polarization	Vertical
H-plane Beamwidth	Omni
E-plane Beamwidt	78 degrees (half power)
Max. Input power	75 watts@ 50 degrees
Gain	0 dBd. VSWR (max)<: 1.5
Frequency Range	68-78MHz (broadband)
Impedance	50 ohms
Lightning Protection	Direct Ground
Connector	N female
Mount	Pole or Wall Mountable. Mounting hardware supplied.
Certification	FCC Part 90 Accepted IC RSS-119 Accepted
Mask	Specifier Note: Select an optional antenna mast configuration listed below. See manufacturer's instructions for penetrating mount or non–penetrating mast options. Options: Non-Penetrating Antenna Mast Kit. Installer must provide ballast material per manufacturer instructions. Penetrating Antenna Mast Kit.
Mask Wind Survival Rating	120mph (200kph)

GPS Receiver

Specifier Note: If using NTP only for time source input, you may delete this section.

A. External Antenna model: GPS roof mounted with 16 foot cable (5m) attached. The GPS Receiver shall be a complete GPS receiver including antenna in a waterproof case, designed for roof or outdoor mounting. Provide mounting bracket for attachment to roof structure.
B. Internal Antenna model: GPS roof mounted, with 10 foot cable (3m) attached.
C. An extension cable is available from the manufacturer, including either a 50ft (15.25m), 100 ft (30.5m), or {200ft (61m).
D. The GPS Receiver cable must be plenum rated where required by local code.

NTP or GPS Time Source

A. Transmitter will allow for either NTP time input or GPS satellite time input with use of a GPS Receiver unit.
B. Unit shall obtain current time from either satellite via GPS or via NTP through an Ethernet port.

Satellite Transmitter

Specifier Note: Large buildings and multi-building projects may require satellite transmitters to provide proper coverage. Consult Primex Wireless for assistance in making this determination. If satellite transmitters are required, include this section.

A. Transmitter shall meet the below specifications.

Parameter	Specification
Frequency	72 MHz
Transmission Power	1 watt maximum
Antenna	Mounted on top of the housing, 46.0 inch L (116.8cm)
Power	Input: 120 VAC, 50/60 Hz Output: 9 volt DC
Daylight Savings Time	Bypass switch
Dimensions	5.75”L x 4.25”H x 1.25”D (14.6cm x 10.8cm x 3.16cm)
Weight	.075 lb (.34kg)
Operating Range	-32°-158°F (-36° to 70°C)

B. Satellite Transmitter shall receive the signal from a Wireless Receiver Switch and transmit the signal to the system devices in its vicinity, which are out of range from the system transmitter.
C. Transmitter shall include a wireless receiver switch, surge suppressor/battery backup, and mounting shelf.
D. A 5 foot (1.52m) RS232 cable connects receiver switch to the satellite transmitter.
E. Antenna mounted on top of the switch housing, 12.5 inch L (31.75cm).

Transmitter Rack

Specifier Note: Where desired for mounting transmitter, specify the following "optional" equipment (one for each transmitter).

A. Transmitter rack, 3” (76.2mm) x 16.5” (419mm) x 18” gauge metal, epoxy covered, will be supplied.

Event Scheduler Pro Software (Programmable Count Down Timer)

A. Provide scheduling software for installation and programming by owner.
B. Software shall be compatible with the following PC operating systems: Windows NT with Service Pack 6a, Windows NT, Windows XP, Windows Vista, Windows 7. End user/owner will require valid administrator rights to install the software.
C. Software shall be provided from manufacturer in a form of a CD, suitable for operation in standard CD-ROM drives.

Analog Clocks

Analog Clocks shall meet the below specifications.

A. Analog clocks shall be wall mounted.
B. Face shall be white. Hour and minute hands shall be black.
C. Additional colors, finishes, and dial faces are available from manufacturer.
D. Clock faces can be customized by manufacturer to display organization name or logo as specified.
E. Clock frames and lenses are of durable thermoplastic.
F. Clocks shall have a tamper proof/theft resistant clock-lock mounting slots.
G. Analog clocks shall be capable of automatically adjusting for Daylight Saving Time. An on-off switch located on the transmitter shall disable this function if desired.
H. Clock shall have either a battery-power, 120 VAC or 24 VAC power supply built into the clock assembly.

I. If power is interrupted, the clock will stop until power resumes. Upon resumption of power, the clock will self correct to the current time.
J. Electric (AC) models will include a cord with pigtail.
K. Battery-operated analog clocks shall have up to a 5-year battery life. Battery life is based on common operating conditions and may very due to installed site conditions.
L. Installer will furnish clock batteries in accordance with manufacturer instructions.
M. Battery-operated analog clocks shall remember the time during changing of batteries.
N. Time shall be automatically updated from the transmitter 6 times per day.
O. If the transmitter stops transmitting valid time signals due to power failure, the clocks will continue to function as accurate quartz clocks until a valid time signal is decoded. If signal transmission is not restored after 96 hours, the second hand will “five -step” as a visual indicator that the signal has been lost. Should the clocks lose power and signal, the clocks will not function.
P. Analog clock receivers shall be as follows: Receiver sensitivity: >-110 dBm, Receiver power: Dual Alkaline batteries supplied by manufacturer or AC-powered: 24VAC or 120VAC, Antenna type: internal, Antenna gain: -7 dBd

Specifier Note: Analog clock faces can be made with Owner's logo as an option. Arrange for Owner to provide hard copy or digital copy of logo in format required by Primex Wireless. Contact Primex Wireless for details.

SUPPLY MODELS

Per specifications, supply the following model(s):

Traditional Series Analog Clock Battery Models

Description
9" (22.86cm) Black [battery]
12.5" (31.75cm) Black
12.5" (31.75cm) White
12.5" (31.75cm) Black, Dual-Sided
16" (40.64cm) Black
13.5” (34.29cm) Black, Square
13.5” (34.29cm) Silver, Square

Traditional Series Analog Clock Electric Models

Description
12.5" (31.75cm) 24VAC, Black
12.5" (31.75cm) 120VAC, Black
12.5" (31.75cm) 120VAC, White
16" (40.64cm) 24VAC, Black
16" (40.64cm) 120VAC, Black
12.5" (31.75cm) 120VAC, Black, Wall, Dual-Sided
12.5" (31.75cm) 120VAC, Black, Ceiling, Dual-Sided
12.5" (31.75cm) 24VAC, Black, Wall, Dual-Sided
12.5" (31.75cm) 24VAC, Black, Ceiling, Dual-Sided
13.5” (34.29cm) 120VAC Black, Square
13.5” (34.29cm) 120VAC, Silver, Square

Traditional Series Analog Clock Battery Models - Remote Antenna

Description
12.5" (31.75cm) Black, Remote Antenna
12.5" (31.75cm) White, Remote Antenna

Wood Series Analog Clock Battery Models

Description
11.5” (29.21cm) Honey Arabi
11.5” (29.21cm) Honey Roman
11.5” (29.21cm) Dark Cherry Arabic
11.5” (29.21cm) Dark Cherry Roman
11.5” (29.21cm) Clear Oak Arabic
11.5” (29.21cm) Clear Oak Roman
11.5” (29.21cm) Walnut Arabic
11.5” (29.21cm) Walnut Roman
12.5” (31.75cm) Walnut Roman
16” (40.64cm) Clear Oak Roman
16” (40.64cm) Dark Cherry Arabic
16” (40.64cm) Dark Cherry Roman
16” (40.64cm) Honey Roman
16” (40.64cm) Honey Arabic
16” (40.64cm) Walnut Roman
16” (40.64cm) Walnut Arabic

Gallery Series Battery Models

Description
24” Distressed Beige Gallery Series Clock, Roman Dial
24” Distressed Beige Gallery Series Clock, Arabic Dial

Metal Series Analog Clock Models

Description
12.5" (31.75cm) Silver Tone
12.5" (31.75cm) Silver Tone, Electric
15" (38.1cm) Silver Tone, Dual-Sided
15" (38.1cm) Silver Tone, Dual-Sided, Electric

Platinum Series Analog Clock Models

Description
9.5" (24.13cm) Platinum
13.75" (34.93cm) Platinum
13.75" (34.93cm) Platinum, Electric

Digital Clocks

Clocks shall meet the below specifications.

A. Digital Clock must be able to receive synchronized time signal from the master or satellite transmitter.
B. Digital Clock display must include a 12 or 24-hour time display, a PM indicator light, and an alternating time and date display option.
C. Surface-mount models are available from the manufacturer.
D. Flush-mount models are available from the manufacturer.
E. Dual-mount models are available from the manufacturer.
F. Digital Clock shall be capable of automatically adjusting for Daylight Saving Time.
G. Digital Clock shall have either a 120 VAC or 24 VAC power supply built into the clock assembly.
H. 120 VAC Digital Timer will include a power cord with a plug or a cord with pigtail.
I. 24 VAC clocks and timers will include an power cord with pigtail to be hard wired to building 24VAC power grid.
J. Digital Clock must be viewable from 150 feet (45.7m).

K. Digital Clock must have highly visible 7-segment LED digits.
L. Digital Clock shall have three display dimmer options, 75%, 50%, and 25%.
M. Digital Clock LED colors, sizes, digit layouts, and mount options are available from the manufacturer.

SUPPLY MODELS

Per specifications, supply the following model(s):

Surface-Mount Models with 2.5" Digits

Description	Note
4˚ Slope Bracket, 10’ (3.0m) cord with plug	Specify 4-Digit or 6-Digit
4˚ Slope Bracket, 30" (76cm) cord with pigtail	Specify 4-Digit or 6-Digit
18˚ Slope Bracket, 10’ (3.0m) cord with plug	Specify 4-Digit or 6-Digit
18˚ Slope Bracket, 30" (76cm) cord with pigtail	Specify 4-Digit or 6-Digit

Surface-Mount Models with 4" Digits

Description	Note
4˚ Slope Bracket, 10’ (3.0m) cord with plug	Specify 4-Digit or 6-Digit
4˚ Slope Bracket, 30" (76cm) cord with pigtail	Specify 4-Digit or 6-Digit

Flush-Mount Models with 2.5" Digits

Description	Note
30" (76cm) cord with pigtail	Specify 4-Digit or 6-Digit

Dual-Mount Models with 2.5" Digits

Mount	Description	Note
Wall	10’ (3.0m) cord with plug	Specify 4-Digit or 6-Digit
Wall	30" (76cm) cord with pigtail	Specify 4-Digit or 6-Digit
Ceiling	10’ (3.0m) cord with plug	Specify 4-Digit or 6-Digit
Ceiling	30" (76cm) cord with pigtail	Specify 4-Digit or 6-Digit

Dual-Mount Models with 4" Digits

Mount	Description	Note
Wall/Ceiling	9' (2.74cm) cord with plug10’ (3.0m) cord with plug	4-Digit only
Wall/Ceiling	30" (76cm) cord with pigtail	4-Digit only
Ceiling	9' (2.74cm) cord with plug10’ (3.0m) cord with plug	6-Digit only
Ceiling	30" (76cm) cord with pigtail	6-Digit only

Digital Code Blue Timer

Digital Code Blue Timer shall meet the below specifications.

A. Timer must function as a clock and must integrate seamlessly to existing code blue control system.
B. Timer shall include a three button wall mountable control switch. This control will be mounted in a single gang electrical box. Control cover plate shall be stainless steel. Control buttons must be washable with water and common disinfectants.
C. The timer switch control shall connect to timer with a supplied reversed wire (cross-pinned) CAT5 cable with a RJ45 connector or a reversed wire (cross-pinned) telephone cable with an RJ-11 connector. It can be extended up to 100 feet (30.48m).
D. Timer switch control can be configured to simultaneously activate two connected timers.
E. Timer display must include a 12 or 24-hour time display, a PM indicator light, and an alternating time and date display option.
F. Timer shall be capable of automatically adjusting for Daylight Saving Time.

G. Timer must include an optional audible tone to alert changes in interval cycles in the count-up and count-down function.
H. Timer must include adjustable brightness control.
I. Timer must have power outage memory backup and maintain correct time for 8 hours without power.
J. Timer shall have either a 120 VAC or 24 VAC power supply built into the clock assembly.
K. 120 VAC timer will include a power cord with a plug or a cord with pigtail.
L. 24 VAC timer will include a power cord with pigtails to be hard wired to building 24 VAC power grid.

SUPPLY MODELS

Per specifications, supply the following model(s):

Surface-Mount Models with 2.5" Digits

Description	Note
4˚ Slope Bracket, 10’ (3.0m) cord with plug	6-Digit only
4˚ Slope Bracket, 30" (76cm) cord with pigtail	6-Digit only
18˚ Slope Bracket, 10’ (3.0m) cord with plug	6-Digit only
18˚ Slope Bracket, 30" (76cm) cord with pigtail	6-Digit only

Surface-Mount Models with 4" Digits

Description	Note
4˚ Slope Bracket, 10’ (3.0m) cord with plug	6-Digit only
4˚ Slope Bracket, 30" (76cm) cord with pigtail	6-Digit only

Flush-Mount Models with 2.5" Digits

Description	Note
30" (76cm) cord with pigtail	6-Digit only

Digital Elapsed Timer

Digital Elapsed Timer shall meet the below specifications.

A. Timer must also function as a clock or function as count-down/count-up interval timer when programmed with a three button wall mount control switch.
B. Timer must accurately count up or count down up to a maximum of 99 hours, 59 minutes, and 59 seconds.
C. Timer shall include a three button wall mountable control switch. This control will be mounted in a single gang electrical box. Control cover plate shall be stainless steel. Control buttons must be washable with water and common disinfectants.
D. Switch control shall connect to timer with a supplied reversed wire (cross-pinned) CAT5 cable with an RJ-45 connector or a reversed wire (cross-pinned) telephone cable with an RJ-11 connector. It can be extended up to 100 feet (30.48m).
E. Timer switch control can be configured to simultaneously activate two connected timers.
F. Timer shall be capable of automatically adjusting for Daylight Saving Time
G. Timer must be viewable from 150 feet (45.7m).
H. Timer must have highly visible 7-segment LED digits.
I. Time shall have three display dimmer options, 75%, 50%, and 25%.
J. Timer display must include a 12 or 24-hour time display, a PM indicator light, and an alternating time and date display option.
K. Additional LED colors, sizes, digit layouts, mounts, and timer options are available from the manufacturer.
L. Timer must have an audible tone option on the count-up and count-time function with a frequency of 3KHz +/- 0.5KHz.
M. Timer shall have either a 120 VAC or 24 VAC power supply built into the clock assembly.
N. 120 VAC model will include a power cord with a plug or a cord with pigtail
O. 24 VAC model will include a power cord with pigtails to be hard wired to building 24 VAC power grid.

SUPPLY MODELS

Per specifications, supply the following model(s):

Surface-Mount Models with 2.5" Digits

Description	Note
4˚ Slope Bracket, 10’ (3.0m) cord with plug	6-Digit only
4˚ Slope Bracket, 30" (76cm) cord with pigtail	6-Digit only

Surface-Mount Models with 4" Digits

Description	Note
4˚ Slope Bracket, 10’ (3.0m) cord with plug	6-Digit only
4˚ Slope Bracket, 30" (76cm) cord with pigtail	6-Digit only

Flush-Mount Models with 2.5" Digits

Description	Note
30" (76cm) cord with pigtail	6-Digit only

Digital Programmable Count Down Timers

Timer shall meet the below specifications.

A. Timer must also function as clocks and must display count down time between programmed events.
B. Timer shall have a either a 120 VAC or 24 VAC power supply built into the clock assembly.
C. 120 VAC timer will include a power cord with a plug or a cord with pigtail.
D. Timer requires installation of manufacturer supplied scheduling software on owner provided computer.

SUPPLY MODELS

Per specifications, supply the following model(s):

Surface-Mount Models with 2.5" Digits

Description	Note
4˚ Slope Bracket, 10’ (3.0m) cord with plug	6-Digit only
4˚ Slope Bracket, 30" (76cm) cord with pigtail	6-Digit only

Surface-Mount Models with 4" Digits

Description	Note
4˚ Slope Bracket, 10’ (3.0m) cord with plug	6-Digit only
4˚ Slope Bracket, 30" (76cm) cord with pigtail	6-Digit only

Flush-Mount Models with 2.5" Digits

Description	Note
30" (76cm) cord with pigtail	6-Digit only

Dual-Mount Models with 2.5" Digits

Mount	Description	Note
Wall	10’ (3.0m) cord with plug	6-Digit only
Wall	30" (76cm) cord with pigtail	6-Digit only

Mount	Description	Note
Ceiling	10’ (3.0m) cord with plug	6-Digit only
Ceiling	30" (76cm) cord with pigtail	6-Digit only

Dual-Mount Models with 4" Digits

Mount	Description	Note
Ceiling	10’ (3.0m) cord with plug	6-Digit only
Ceiling	30" (76cm) cord with pigtail	6-Digit only

Personal Series LCD Digital Clock

Clocks shall meet the below specifications.

A. Overall dimensions: 7.5”H (19.1cm) x 11.5”W (29.2cm) x 1.75”D (4.5cm); Weight: 1.25 lbs (.57kg). Time display dimensions: 2.25”H (5.7cm) x 5.5”W (14cm). Calendar display dimensions: 3.81”H (9.7cm) x 5.5”W (14cm).
B. Personal series clocks must be able to receive synchronized time signal from Primex Wireless master or satellite transmitter.
C. Clock will synchronize its time at 2:01, 6:01, and 10:01 a.m. and p.m. daily by scanning the last channel from which it received a signal. The scan will terminate after one minute if a signal is not received.
D. Clock must have time (12/24 hour modes), date, and day-of-week option.
E. Clock must have backlight illumination option.
F. Clock must be capable of automatically adjusting for Daylight Saving Time.
G. Clocks can be displayed on table or desktops as well as wall mounted.
H. Installer will furnish clock batteries in accordance with manufacturer instructions.
I. Battery-operated model requires 4 C-cell alkaline batteries.

SUPPLY MODELS

Per specifications, supply the following model(s):

Personal Series LCD Clock

Description
Personal Series LCD Clock

Wire Guard Accessory

Specifier Note: Where desired for protection of clocks, specify the following Wire Guard(s).

A. Provide Clock Wire Guard(s) to protect against accidental damage or vandalism with a clock wire guard accessory.
B. Cable Connection Sealant: Radio Shack Coaxial Cable Connector Sealant 278-1645, or approved electrical grade silicone sealant.
C. Supply the following models:

SUPPLY MODELS

Per specifications, supply the following model(s):

Description
14" x 14" Analog Wire Guard (for 12.5" clock)
18" x 18" Analog Wire Guard (for 16" clock)
Digital Wire Guard, 2.5", 4 or 6-digit
Digital Wire Guard,4", 4 or 6-digit
2.5" Digital Size Clear Polycarb Digital Guard (fits both 4 and 6 digit)
2.5" Digital Size Clear Polycarb Digital Guard with Gasket (fits both 4 and 6 digit)

Description
4" Digital Size Clear Polycarb Digital Guard (fits both 4 and 6 digit)
4" Digital Size Clear Polycarb Digital Guard with Gasket (fits both 4 and 6 digit)

2.4 ADDITIONAL EQUIPMENT

Specifier Note: Below section lists optional system equipment and other systems provided by Primex Wireless, Inc.. Include as applicable to specification.

Division 27 "Public Address Systems" (see Primex Wireless XR Bell Scheduling System Specifications)

Battery Pack

A. Dual C-cell Alkaline Battery Pack.
B. Dual D-cell Alkaline Battery Pack.

Switch Control Extension Cable (Timers)

A. Elapsed Timer switch control extension cable 3 pr UTP 100 ft. (30.48m) max.
B. Code Blue Timer switch control extension cable 4 pr UTP 100 ft. (30.48m) max.

PART 3.0 EXECUTION

3.1 EXAMINATION

A. Examine conditions with the Installer present for compliance with requirements and other conditions affecting the performance of the system and the system devices.
B. Do not proceed until unsatisfactory conditions have been corrected.
C. Verify that construction is complete in spaces to receive equipment and that rooms are clean and dry.
D. Verify that 120 volt electrical outlet is located within 6 feet (1.83m) of location of transmitter and the outlet is operational and properly grounded.
E. Code Blue and Elapsed Timer: Verify single gang electrical box for switch control is mounted and within 15 feet (4.5m) of elapsed timer. Verify pathway for connecting cable is available and compliant to local building codes.
F. AC-powered devices: Verify that electrical power outlet is near location of clock or timer and the outlet is operational and properly grounded.

3.2 INSTALLATION

Specifier Note: To assure optimum performance of the system, a site survey is recommended to be performed by Primex Wireless or a Certified Primex Wireless installation company. To assure optimum performance of the Time Synchronization System, transmitter(s) location (s) must be specified in the construction documents. Contact Primex Wireless Technical Support at 1-800-404-8112.

A. General: Install system in accordance with applicable codes.
B. Install system equipment in accordance with manufacturer written instructions.
C. Provide all system equipment necessary for a complete and operable system.

GPS Unit

GPS Unit (INTERNAL Antenna Transmitter Model only):

1. Install GPS unit on roof in location indicated, in clear view of the sky.
2. Install unit in location free from standing water and above accumulations of leaves or debris.
3. Seal cable connection to GPS with cable connection sealant.
4. Any added cable lengths must be protected from outside elements.

GPS Unit (EXTERNAL Antenna Transmitter Model only):

1. Locate transmitter in a penthouse, electrical closet or telecommunications room in a central location in the building.
2. Clearance around all side of the transmitter to comply with local building codes.

Master Time Source

If GPS Unit will be used as master time source:

1. Attach GPS receiver to transmitter using cable.
2. Set GPS/LAN DIP switch to GPS.

If NTP will be used as master time source:

1. Connect CAT5/CAT5e/CAT6 EIA/TIA standard Ethernet cable from transmitter LAN port to available network drop.
2. Set GPS/LAN DIP switch to NTP.

Specifier Note: If NTP is the master time source, the network drop used to connect the XR transmitter must have connectivity to the NTP server, which can be verified by the owner's Information Technology department manager. The default NTP address is time.nist.gov. If the network has a different NTP IP address, it may be programmed into the transmitter by the installer to allow connection to the proper network time. Contact Primex Wireless Technical Support at 1-800-404-8117.

Specifier Note: Valid for transmitter with GPS input. The GPS unit can be mounted on the roof, on a pole, or at a window. In each case, the GPS unit must have a clear view of the sky. If the GPS unit is mounted on the roof, it must be located on a suitable bracket, well above the level of standing or incidental water. If the GPS unit is mounted at a window, it must be located away from low-E glass. If transmitter to use NTP as time source, delete following work instruction with this note.

Transmitter (EXTERNAL Antenna only)

1. Transmitter is connected to external antenna via a 50 ohm coaxial cable. Typical length – 100 feet (30.5m)
2. Cable routing should comply with ANSI EIA/TIA-569 and local building codes.
3. If cable is routed through conduit, the conduit should be a minimum of 2 inch (50.8mm) diameter.
4. Transmitter enclosure must be bonded to an earth ground per ANSI EIA/TIA 607, NEC Article 250, and local building codes.
5. Antenna should be mounted to a mast on the roof of the building connecting to the transmitter via a 50-ohm coaxial cable.
6. Consult manufacturer instruction manual for specific clearances and mounting instructions.
7. Antenna must be bonded to an earth ground per ANSI EIA/TIA 607, NEC Article 250, and local building codes.

Specifier Note: Select procedure appropriate to the master time source from either of the following:

Transmitter (INTERNAL Antenna only)

1. Locate transmitter where indicated, a minimum of 2 to 3 feet (.6 to 1 meter) above the floor, away from large metal objects such as filing cabinets, lockers or metal framed walls.
2. Transmitter(s) will be placed at locations indicated within specifications and drawings.
3. Connect antenna to transmitter, using care not to strip threads.
4. Connect power supply to the transmitter.
5. Set the channel number on the display to correspond to the FCC license.
6. Plug power supply into electrical outlet.

Analog Clocks

A. Furnish all equipment necessary for a complete and operational system.
B. Perform the following operations with each clock:
    1. Configure and set clock to correct time in accordance with manufacturer instructions.
    2. Observe clock until valid signals are received and clock adjusts itself to correct time.
    3. Install each clock per its model mounting specifications per manufacturer instructions and mounting instructions at the indicated location.

Digital Clocks

A. Cable routing must comply with ANSI EIA/TIA- 569-A and local building codes.
B. Furnish all equipment necessary for a complete and operational system.
C. Perform the following operations with each clock:
    1. Configure and set clock to correct time in accordance with manufacturer instructions.
    2. Observe clock until valid signals are received and clock adjusts itself to correct time.
    3. Install each clock per its model mounting specifications per manufacturer instructions and mounting instructions at the indicated location.

Digital Timers

A. Cable routing must comply with ANSI EIA/TIA- 569-A and local building codes.
B. Furnish all equipment necessary for a complete and operational system.
C. Perform the following operations with each clock:
    1. Mount timer per model mounting specifications.
    2. Apply power per timer model power specifications.
    3. Connect timer to switch control unit with manufacturer provided cable or approved extension cable.
    4. Fasten timer to mounting bracket.
    5. Set time zone, time date option, and brightness level in accordance with manufacturer instructions and per owner requirements.
    6. Observe timer until valid time signal is received and timer displays correct time.

Wire Guards

Specifier Note: Delete this section if wire guards are not specified.

A. Secure to wall, using approved theft-resistant fasteners.

3.3 FIELD INSPECTION

A. Inspection: Make observations to verify that system devices and components are properly labeled.
B. Prior to final acceptance, inspect each system device and component, adjust as required, and replace parts which are found defective.

3.4 MANUFACTURER SERVICES

A. If needed, provide technical assistance as demonstrated in the manufacturer guides, on product start-up and system setup, to owners or installers representatives via phone, fax, or email.
B. Installation and user guides shall be provided.

3.5 CLEANING

A. Prior to final acceptance, clean exposed surfaces of devices, using cleaning methods recommended by manufacturer.
B. Remove temporary labels from clock faces. Do not remove labels from backs of clocks.

3.6 DEMONSTRATION

A. Provide training to Owner's representative on setting, adjusting and configuring device and routine maintenance.
B. Provide training to Owner's representative on installing the software, adjusting and programming the transmitter, setting and adjusting system devices and routine maintenance.

3.7 PROTECTION

A. Protect finished installation until final acceptance of the project.

3.8 TESTING

A. All devices must be tested at their operational location under normal operational conditions to assure reception of signal.