

SECTION 27 53 13

CLOCK SYSTEM – Wi-Fi SYNCHRONIZED NETWORK CLOCKS

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1. GENERAL
	1. GENERAL REQUIREMENTS & SCOPE
		1. Furnish and install a complete new Wi-Fi Clock System using the American Time Wi-Fi product line.
		2. Furnish and install all equipment, accessories, and material in accordance with these specifications and drawing to provide a complete and operating Wi-Fi Clock System.
		3. All bids shall be based on the equipment as specified herein. The model designations are that of American Time. The specifying authority must approve any alternate system.
	2. SECTION INCLUDES

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

* + 1. Analog Battery Clocks.
		2. Analog 110 VAC Clocks.
		3. Analog 24 VAC Clocks.
		4. Digital 2.5” 4 Digit (24, 110, 220 VAC).
		5. Digital 2.5” 6 Digit (24, 110, 220 VAC).
		6. Digital 4” 4 Digit (24, 110, 220 VAC).
		7. Digital 4” 6 Digit (24, 110, 220 VAC).
		8. Digital 2.5” 6 Digit Elapsed Time Indicator.
		9. Digital 4” 6 Digit Elapsed Time Indicator.
		10. Elapsed Time Set Station.
	1. RELATED SECTIONS

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

* + 1. Division 26 “Electrical”.
	1. 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.

* + 1. National Fire Protection Association (NFPA): 1. NFPA 70 - National Electrical Code (NEC).
	1. DEFINITIONS
		1. 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.
	2. SYSTEM DESCRIPTION
		1. The Wireless Clock System uses an 802.11 wireless system network connection for synchronization and firmware updates.
		2. The Wireless Clock System can be scaled from a single building to a network of buildings, or an enterprise spread across many time zones.
		3. System devices are synchronized by 802.11 n (b/g compatible) wireless network, 2.4GHz.
		4. PEAP enterprise security.
		5. Clocks can update time zone offsets, Daylight Saving Time changes (On/Off/Custom), Primary Time Server IP, Secondary Time Server IP, 802.11 Network Identification and 802.11 security information by turning into a limited Access Point with web browser interface.
		6. Clocks shall be fully portable, capable of being relocated at any time. (AC powered clocks require access to a power)
		7. Time signals originate from the system configured Network Time Protocol (NTP) source.
		8. Clocks maintain internal reference so that failure of the master NTP system will not cause clocks to fail. Clocks will continue indicating accurate time within plus or minus 0.35 seconds in 24-hours.
		9. Clocks preconfigured, plug and play installation (DHCP or static IP).
	3. SYSTEM COMPONENTS
		1. Clocks: IP addressable analog NTP synchronized clocks. Battery and AC 110 or 24 VAC powered.
		2. Clocks: IP addressable Digital NTP synchronized clocks. 24 and 120 VAC powered.
	4. REGULATORY REQUIREMENTS
		1. Equipment and components furnished shall be of manufacturer’s latest model.
		2. System shall be installed in compliance with local and state authorities having jurisdiction.
		3. Electrical Components, Devices, and Accessories: Listed and labeled per NFPA 70 by qualified testing agency.
		4. Regulatory Requirements: System design and installation shall comply with the following:
			1. National Electric Code (NEC)
			2. Local codes and regulations
	5. SUBMITTALS
		1. 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.
		2. Shop Drawings: Showing the following. 1. Diagram of proposed system showing system platform appliance, communication pathway, and schedule of individual device locations. 2. Indicate integration with the Owner's network and servers. Include a line diagram of network relationships. Show system power requirements.
		3. 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.
		4. Manufacturer's Instructions: Submit complete installation, set-up and maintenance instructions.

Specifier Note: Informational submittals require review, but not response, by A/E or Owner.

* + 1. Information submittal: Sample Warranty.
		2. Information submittal: System Maintenance Proposal.
	1. SUBSTITUTIONS
		1. Proposed substitutions, to be considered, shall be manufactured of equivalent materials that meet or exceed specified requirements of this Section.
		2. Proposed substitutions shall be identified not less than 10 days prior to bid date.
	2. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Manufacturer of Synchronized Clock Systems with a minimum of five years record of satisfactory manufacturing and support of systems comparable to basis of design system.
	3. DELIVERY, STORAGE AND HANDLING
		1. Deliver all components to the site in the manufacturer original packaging.
		2. Packaging shall contain manufacturer name and address, product identification number, and other related information.
		3. Store equipment in finished building, unopened containers until ready for installation.
	4. PROJECT SITE CONDITIONS
		1. Clocks shall not be installed until painting and other finish work in each room is complete
		2. System design is integrated with owner's wireless network.
	5. WARRANTY
		1. Manufacturer will provide a three year limited warranty on Wi-Fi clocks.
1. PRODUCTS

The Wi-Fi Clock System is specified as described.

* 1. MANUFACTURER
		1. Wi-Fi timekeeping system and its components shall be manufactured by one of the following acceptable manufacturers:
			1. American Time, 140 3rd Street South, Dassel, MN 55325 [www.american-time.com](http://www.american-time.com/)
	2. SEQUENCE OF OPERATION

The system shall perform in the sequence of operation as described. Clocks are to be pre-configured at the factory and require connection to battery, 24 VAC or 110 VAC power for proper operation.

Clock start-up if pre-configured

* + 1. Remove the gear locking pin from the movement if equipped.
		2. Apply power to the clocks by inserting the power plug of the battery pack into the Wi-Fi module or by connecting the power cord to 24 or 110 VAC power supply
		3. Verify LED operation signal.
			1. Flashes red when power is applied to the clock.
			2. Flashes Green within 60 seconds.
			3. Green flashing stops within 120 seconds.
		4. Verify the clock hands begin a rapid advancement synchronization cycle.

Clock start-up if configured on-site

* + 1. See user manual for instructions.
	1. EQUIPMENT

The Wi-Fi Clock System shall include all components as specified.

Wireless Battery Clocks

24 or 120 Powered Clocks.

Analog Clocks shall meet the below specifications.

* + 1. Analog clocks shall be wall mounted.
		2. Face shall be white. Hour and minute hands shall be black. Sweep second hand to be red.
		3. Additional colors, finishes, and dial faces are available from manufacturer.
		4. Clock faces can be customized by manufacturer to display organization name or logo as specified.
		5. Molded clock bezels and crystals are of durable poly carbonate.
		6. Clocks shall have a molded keyhole mounting slot on the back for ease of attachment to the wall.
		7. Clocks shall be capable of automatically adjusting for Daylight Saving Time.
		8. Analog Clock shall use battery-power for complete ease of location and standalone capability
		9. Battery-operated analog clocks shall have up to a 5-year battery life.
		10. Clocks shall come with batteries installed from the manufacturer.
		11. AC powered clocks shall come equipped with a Molex connection or two prong plug for easy installation
		12. Battery powered analog clocks synchronize 2 times per day
		13. AC analog and digital clocks are programmable for synchronization times.
		14. Tamper-resistant security brackets (optional) keep clocks secure. Screwdriver needed to remove clock from wall.
		15. Firmware may be updated in the field.
		16. Clocks are Wi-Fi, FCC, and ICES certified and ROHS compliant with an SNTP time reference.
		17. Clocks utilize staggered time synchronization wake times for unnoticed network load.

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

* + 1. Supply models – Per specifications, supply the following models:
			1. Molded Case Analog – (Note battery, 24 VAC or 120 VAC operating power)
				1. 12” Black molded surface mount bezel with polycarbonate crystal (actual outside diameter 13 ¼”)
				2. 12” Black molded flush mount bezel with polycarbonate crystal (actual outside diameter 13 ¼”)
				3. 12” Black molded bezel with polycarbonate crystal (actual outside diameter 13 ¼”) Double Dial Wall Mount
				4. 12” Black molded bezel with polycarbonate crystal (actual outside diameter 13 ¼”) Double Dial Ceiling Mount
				5. 15” Black molded surface mount bezel with polycarbonate crystal (actual outside diameter 16”)
				6. 15” Black molded flush mount bezel with polycarbonate crystal (actual outside diameter 16”)
				7. 15” Black molded bezel with polycarbonate crystal (actual outside diameter 16”) Double Dial Wall Mount
				8. 15” Black molded bezel with polycarbonate crystal (actual outside diameter 16”) Double Dial Ceiling Mount
			2. Aluminum Case Analog – (Note battery, 24 VAC or 120 VAC operating power)
				1. 12” Aluminum bezel with polycarbonate crystal (actual outside diameter 13 3/8”)
				2. 15” Aluminum bezel with polycarbonate crystal (actual outside diameter 16 ¼”)
			3. Wood Case Analog – (Note battery, 24 VAC or 120 VAC operating power)
				1. 12” Mahogany or Light Oak finish with polycarbonate crystal (actual outside diameter 15 ¾”)
				2. 15” Mahogany or Light Oak finish with polycarbonate crystal (actual outside diameter 18 ½”)
			4. Steel Case Analog – (Note battery, 24 VAC or 120 VAC operating power)
				1. 12” Black round steel surface mount bezel with glass crystal (actual outside diameter 13 ¼”)
				2. 12” Black round steel flush mount bezel with glass crystal (actual outside diameter 13 ¼”)
				3. 15” Black round steel surface mount bezel with plexiglass crystal (actual outside diameter 16 ¼”)
				4. 15” Black round steel flush mount bezel with plexiglass crystal (actual outside diameter 16 ¼”)
				5. 12” Black square steel surface mount bezel with glass crystal (actual outside dimension 12 5/8”)
				6. 12” Black square steel flush mount bezel with glass crystal (actual outside dimension 12 5/8”)
			5. Digital – (24, 110, 220 VAC operating power)
				1. 2.5” red, 4-digit, surface, black, 24 VAC w/ molex
				2. 2.5” red, 4-digit, surface, black, 120 VAC w/ molex
				3. 2.5” red 4-digit, surface, black, 120 VAC 3 prong plug
				4. 2.5” red 6-digit, surface, black, 24 VAC w/ molex
				5. 2.5” red 6-digit, surface, black, 120 VAC w/ molex
				6. 2.5” red 6-digit, surface, black, 120 VAC 3 prong plug
				7. 2.5” red 6-digit, surface, black, 220V
				8. 2.5” ETI, red 6-digit, surface, black, 24 VAC w/ molex
				9. 2.5” ETI, red 6-digit, surface, black, 120 VAC w/ molex
				10. 2.5” ETI, red 6-digit, surface, black, 220 VAC w/ molex
				11. 4” red 4-digit, surface, black, 24 VAC w/ molex
				12. 4” red 4-digit, surface, black, 120 VAC w/ molex
				13. 4” red 4-digit, surface, black, 120 VAC 3 prong plug
				14. 4” red 6-digit, surface, black, 220V
				15. 4” red 6-digit, surface, black, 24VAC w/ molex
				16. 4” red 6-digit, surface, black, 120 VAC w/ molex
				17. 4” red 6-digit, surface, black, 120 VAC 3 prong plug
				18. 4” red 6-digit, surface, black, 220V
				19. 4” ETI, red 6-digit, surface, black, 24 VAC w/ molex
				20. 4” ETI, red 6-digit, surface, black, 120 VAC w/ molex
				21. 4” ETI, red 6-digit, surface, black, 220 VAC w/ molex
				22. 4” Double-sided 4-digit, ceiling mount, 24 VAC w/ molex
				23. 4” Double-sided 4-digit, ceiling mount, 120 VAC w/ molex
				24. 4” Double-sided 4-digit, wall mount, 24 VAC w/ molex
				25. 4” Double-sided 4-digit, wall mount, 120 VAC w/ molex

1. EXECUTION
	1. EXAMINATION
		1. Examine conditions with the Installer present for compliance with requirements and other conditions affecting the performance of the Wi-Fi Clock System.
		2. Verify that construction is complete in area to receive clocks and that rooms are clean and dry.
	2. INSTALLATION
		1. General: Install clocks in accordance with manufacturer’s written instructions.
			1. Perform the following operations with each clock:
				1. Power up the clock.
				2. Observe clock until valid signals are received and clock goes into the correction mode.
				3. Install each clock per its mounting instructions at the indicated location.
				4. Check to make sure clock has synchronized to the correct time
	3. FIELD INSPECTION
		1. Inspection: Make observations to verify that Wi-Fi Clocks and components are properly installed and synchronized.
	4. MANUFACTURER SERVICES
		1. Installation and user guides shall be provided.
		2. Manufacturer’s representative to provide specified level of commissioning services.

Specifier Note: Only include one level of commissioning. Contact American Time for additional information.

* 1. CLEANING ­
		1. Prior to final acceptance, clean exposed surfaces of devices, using cleaning methods recommended by manufacturer.
		2. Remove temporary labels from clock faces. Do not remove labels from backs of clocks.
	2. DEMONSTRATION
		1. Initial Demonstration and Training: Provide demonstration and training for Owner's facility staff in administering system.
		2. Demonstrate maintenance procedures for system devices.
	3. TESTING
		1. Clocks shall be tested at their operational location under normal operational conditions.

END OF SECTION