

SECTION 27 53 13

CLOCK SYSTEM - POWER OVER ETHERNET CLOCKS

This product specification is written according to the Construction Specifications Institute (CSI), MasterFormat™, SectionFormat, and PageFormat, contained in the CSI Manual of Practice. Reference 16735, Master Format 2004 section 27 53 13. *© 2017 American Time & Signal Co.*

1. GENERAL
	1. SECTION INCLUDES
		1. Power over Ethernet Clocks.
		2. Analog Clocks.
		3. Digital Clocks.
	2. RELATED DIVISIONS AND SECTIONS
		1. Division 27 05 00 – Communications: Conductors and cables.
		2. Division 27 15 00 – Communications: Horizontal cabling.
		3. Division 27 53 13 – Clock systems.
	3. REFERENCES
		1. National Fire Protection Agency (NFPA) – 70, National Electric Code 2005.
	4. DEFINITIONS
		1. PoE - Power over Ethernet. A system that passes electrical power safely, along with data, on Ethernet cabling, IEEE 802.3af standard.
		2. ETHERNET - Provides time synchronization via SNTP (Simple Network Time Protocol).
		3. LAN - Local Area Network. A network that connects computers and devices in a limited geographical area.
	5. SUBMITTALS
		1. Product Data: Submit complete catalog data for each component, describing physical characteristics and method of installation. Submit brochure showing available colors and finishes of clocks.
		2. Samples: Submit one clock for approval. Approved sample shall be tagged and shall be installed in the work at location directed.
		3. Manufacturer’s Instructions: Submit complete installation, set-up and maintenance instructions.
	6. QUALITY ASSURANCE
		1. Qualifications:
		2. Manufacturer: Company specializing in manufacturing commercial timekeeping systems with a minimum of 10 continuous years of documented experience.
		3. Installer: Company with documented experience in the installation of commercial timekeeping systems.
	7. 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.
	8. DELIVERY, STORAGE AND HANDLING
		1. 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.
		2. Store equipment in finished building, unopened containers until ready for installation.
	9. FIELD CONDITIONS
		1. Clocks shall not be installed until painting and other finish work in each room is complete.
		2. Coordinate PoE drops to all locations where a clock shall be installed. The clock shall be within 328 feet (100 meters) of the power source.
2. PRODUCTS
	1. SYSTEMS DESCRIPTION
		1. PoE Clocks.
		2. Clocks shall synchronize to SNTP through Ethernet. System shall not require hard wiring for its components except for PoE power. Clocks shall automatically adjust for daylight saving time per the daylight saving time settings within the clocks.
		3. Analog Clocks shall synchronize to +/- 1 second of the SNTP time.
		4. The system shall include an internal real time clock reference so that failure of the SNTP signal shall not cause the clocks to fail in indicating the correct time.
		5. The system shall incorporate a “fail-proof” design so that a temporary power interruption shall not cause failure of the system. Upon restoration of power, the system shall resume normal operation.
		6. Clocks will be powered through PoE for many years of maintenance-free operation.
		7. System instruction manual and equipment shall be available.
	2. MANUFACTURER
		1. Wireless 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/)
	3. EQUIPMENT
		1. PoE Clock:
			1. Time zone settings will be configured prior to shipment. Time zone settings may be changed in the field using the Network Clock Connect application or through a web interface. Time zone settings include all US time zones: Eastern, Central, Mountain, Pacific, Alaska and Hawaii.
			2. Automatic Daylight Saving Time Adjustment can be enabled or disabled from the Network Clock Connect application or through a web interface.
			3. The Network Clock Connect application and web interface will be password protected for administration purposes.
			4. Clock programming and setting configurations require a PC on the same LAN as the PoE clocks with the Network Clock Connect application or a web browser, or a subscription to the inCloud Management Portal (US/Canada only).
			5. The PoE clocks shall contain an internal clock such that failure of reception from the SNTP server will not disable the operation of the clocks.
		2. Power over Ethernet Injector: (optional power supply),
			1. IEEE 802.3af
			2. Output: 48-volt DC, 32mA
		3. Power over Ethernet Switch: (User supplied)
			1. IEEE 802.3af
			2. Output: 48-volt DC, 32mA
		4. Recommended (but optional) Surge Protector/Battery Backup:
			1. Input: 120-volt AC 60 Hz +/- 1 Hz.
			2. Output: 120-volt AC, 550VA, 300 watts
			3. Surge Energy Rating: 700 joules with 10x1000uS pulse
		5. Analog Clocks: Analog clocks, estimated 10”, 12” 15” and other diameter sizes. Additional colors and finishes are available from manufacturer. Analog clocks shall be wall mounted. Clocks shall have polystyrene frame and polycarbonate lens (other options available). Face shall be white. Hour and minute hands shall be black, second hand is red. Other clock features shall be:
			1. Analog clocks do not allow user mechanical adjustments.
			2. Time shall be automatically updated using SNTP.
			3. The clock will keep operating using its internal quartz clock in case of network signal loss due to malfunction of the LAN.
			4. Analog clock faces shall bear Owner’s logo as indicated or end user’s specific logo, name or other.
			5. Optional: Buzzer feature for notification on clocks.
			6. Optional w­ire guards: Provide one for each analog clock as follows:
				1. 15x15 inch size, for nominal 12-inch diameter analog clocks.
				2. 19x19-inch size, for nominal 15-inch diameter analog clocks.
				3. Manufacturers guards sized to protect their products
		6. Aluminum Clocks: Analog aluminum clocks in two sizes, estimated 12” and 15” diameter and 2.5” deep. Clocks shall be wall mount with aluminum case and polycarbonate crystal. Clocks shall automatically adjust for DST changes
			1. Aluminum analog clocks shall have the same product characteristics and operating requirements as the standard analog clocks (reference specifications above).
		7. Wood Clocks: Wood bezel analog clocks available with multiple finishes and sizes available per manufacturer. Analog clocks shall be wall mounted. Dial face shall be white. Hour and minute hands shall be black, second hand is red. Other clock features shall be:
			1. Wood Analog clocks will have the same product characteristics and operating requirements as the standard analog clocks (reference analog clocks specifications above).
		8. Digital Clocks: Digital clocks provide synchronized time throughout a facility and are plugged directly into a standard Ethernet jack drawing both time and power from the network. No AC power outlets are needed.
			1. Digital clocks with no user mechanical adjustments.
			2. Time shall be automatically updated using SNTP
			3. 18 gauge black powder coated finish case
			4. Supports DHCP or static IP addressing
			5. 12 or 24-hour display formats with AM/PM indicators
			6. Optional: Countdown timer available
			7. Optional: Buzzer for notification available
			8. Digit options
				1. 2.5”, 4-digit red or green LED
				2. 2.5”, 6-digit red or green LED
				3. 4”, 4-digit red or green LED
				4. 4”, 6-digit red or green LED
			9. Double Dial models available – wall or ceiling mount
			10. Time zone management per individual analog or digital clock
		9. Steel/Aluminum Clocks approximately 13” and 16” outside diameter.
			1. Steel and Aluminum Analog clocks will have the same product characteristics and operating requirements as the standard plastic analog clocks (reference analog clocks specifications above).
		10. Elapsed Time Indicators
			1. Digital clocks only (countdown)
		11. Security Brackets
		12. Network Clock Connect: Ability to access and manage your schedules on your computer. This application was developed by American Time for ease of customer programming and activation. Network Clock connect is used for configuring and monitoring your network clocks. This can be downloaded from the American Time website or from the optional USB drive.
		13. inCloud Management Portal: Ability to access and manage devices and schedules from cloud-based management portal. This interface was developed by American Time for ease of customer programming, activation, and management. inCloud is used to configure, update, and monitor network clocks. Available as an additional subscription-based service in the United States and Canada only.
	4. SUBSTITUTION LIMITATIONS
		1. Proposed substitutions, to be considered, shall be manufactured of equivalent materials that meet or exceed specified requirements of this Section.
		2. Other systems requiring wiring and/or conduit between system controller and clocks will not be acceptable.
	5. SYSTEM OPERATION AND STARTUP SEQUENCE
		1. Power over Ethernet Analog Clock Operation
			1. When power is first applied to the PoE clock, it attempts to receive an IP address through DHCP. Once the system controller has received an IP address, it requests the time using SNTP. That time is then stored in the real-time chip. The PoE clock will then enter correction in which the hands of the clock will spin until the proper time is reached. The clock will update its internal clock every time it receives valid time data from the SNTP requests.
		2. Power over Ethernet Digital Clock Operation
			1. When power is first applied to the PoE clock, it attempts to receive an IP address through DHCP. Once the system controller has received an IP address, it requests the time using SNTP. That time is then stored in the real-time chip. The received time will then be displayed.

1. EXECUTION
	1. EXAMINATION
		1. Verify that construction is complete in spaces to receive equipment and that rooms are clean and dry.
		2. Verify that there is a PoE drop for at the exact installation point of each clock.
	2. FIELD INSPECTION
		1. Prior to final acceptance, inspect each system component to function properly and replace parts that are found defective.
	3. MANUFACTURER SERVICES
		1. If needed, provide technical assistance as demonstrated in the manufacturer’s system user guide, on product start up and system setup, to owners or installers representatives via phone, fax, or e-mail.
	4. SYSTEM INSTALLATION
		1. Install in accordance with manufacturer’s installation manual furnished with the system, for proper installation of each system component.
	5. CLEANING ­
		1. Prior to final acceptance, clean exposed surfaces of all system components, using cleaning methods recommended by the manufacturer.

END OF SECTION