<u>सं. दि. नि. परिपत्र 02/2025</u>

<u>CNS CIRCULAR 02/2025</u>

भारतीय विमानपत्तन प्राधिकरण
Airports Authority of India

संचार, दिक्चालन , निगरानी-प्रचालन एवं अनुरक्षण निदेशालय
Directorate of CNS-O&M

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Subject: Standardization of Technical Specifications i.r.o Digital Clocks & NTP Servers.

1. Introduction: -

1.1 In CNS/ATM systems, precise time synchronization is crucial for safety and operational efficiency. A uniform time reference across all the CNS/ATM facilities including control room and ATC operational units (e.g. Tower/Approach/Area) is very essential. So, a reliable clock system is essential to maintain consistent and uniform time references across all the CNS/ATM facilities to enhance safety, operational efficiency and reducing the risk of error.

1.2 Further it has also been observed by vigilance department that there are no standard technical specifications of Master Clock, Slave Clock & Standalone Clock available in CNS department and hence requested to issue systematic improvement regarding Standard technical specifications of Master Clock, Slave Clock & Standalone clock.

1.3 Accordingly, it has been decided to standardize the technical specifications for Digital NTP clocks & NTP servers.

2. Purpose and Objective: -

The purpose of this circular is to standardize the '*Minimum Technical specification of Digital NTP Clocks and GPS NTP Servers*' for procurement of such clocks in future. The Minimum Technical specifications are enclosed as Annexure I.

3. Applicability: -

This CNS Circular is applicable to all Airports / Field stations.

4. Queries: -

Any queries or further guidance on the contents of this CNS circular should be referred to:

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5. Validity: -

These guidelines shall supersede all previous instructions in this regard and this CNS Circular shall remain in force until further notice.
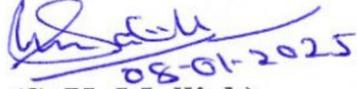
08-01-2025

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Executive Director (CNS-OM)

ANNEXURE- I

1. Minimum Technical specification of Digital NTP Clocks

S. No	Parameters Type	Description
1	Display type	• High Bright-Single Seven Segment LED Numeric Display, single sided. • The clock should have 6 digits in the HH:MM: SS • Size of the digits: 2"/2.5"/4" (approx.) (As per station requirement) • Red colour illumination • Non-Glare Display • Wide viewing angle facilitated by RED transparent filter overlay
2	Connectivity type	• Wi-Fi / PoE / LAN (as per station requirement)

3	Standard Features	• Sync to any NTP or SNTP source for accurate time.
		• The clock should be capable of free running with accuracy +500 ms deviation per day in case of
		   1. LAN failure
		   2. Synchronizing signal failure.
		     ▪ Provides sync fail indication in case of synchronization failure.
		• Clock must have battery backed up RTC for high stability during free running mode.
		• Fully configurable network settings, including DHCP /STATIC IP
		• Password protection prevents unauthorized tampering.
		• Supports 12- or 24-hr format – HH:MM: SS
		• Support different Time zones.
		• Adjustable brightness levels with scheduled dimming.
		• Visibility: >50 meters.
		• Reset option available on the clock to restore default configuration.
		• Inbuilt surge protection.
		• Table top / Panel / Wall Mountable (as per station requirement)

4	Control and monitoring software	• Software provided for configuration and control parameters of clocks. • Remote monitoring: Clocks are monitored remotely (as per station requirement)
5	Power	• AC 110-240v, 50Hz. (If not PoE clocks) • Power consumption < 15W
6	Operating Parameters	• Temperature: 0 to +55°C or as per station requirement • Humidity: Up to 90% (non-condensing) • Storage Humidity: Up to 90% (non-condensing @ 25°C)
7	Physical	• IP Rating: IP20. • Weight: not more than 4.5 kg. • Material: Die-cast aluminium / Powder coated CRCA/ABS/ MS
8	Compliance	• Tested for Restriction of Hazardous Substances (RoHS) and CE equivalent Indian standards from Govt. recognized and accredited laboratories.
9	Accessories supplied with the Clocks.	• Software • Mounting panel
10	Switch for PoE clocks	• PoE clock compliant with IEEE802.3af/ 802.3at • PoE/PoE+ switches based on power requirements (quantity and ports as per station requirement)
11	Wi-Fi clocks	• Wi-Fi Antenna: 2.2 dBi dipole. • Magnetic mount Antenna • Compatible Wi-Fi Communication Protocols: 802.11 b/g/n/ac/ax (2.4 or 5 GHz) • Compatible Security Protocols: WPA/WPA2/WPA3

भारतीय विमानपत्तन प्राधिकरण
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डिजिटल घड़ी और एनटीपी सर्वर में तकनीकी विशिष्टताओं का मानकीकरण
Standardization of Technical Specifications i.r.o. Digital Clocks & NTP Servers

2. Minimum Technical specification of GPS NTP Server

S. No.	Parameters Type	Description
1	General Requirement	• Rack mountable GPS-based full-featured NTP server for synchronizing all types of NTP and SNTP clients in LAN. • Capable of serving accurate time to any NTP/SNTP client. • NTP server throughput of 1000 or more requests per second. • Real-time monitoring of GPS signal status, time source, and server performance. • Tools for troubleshooting time synchronization issues and GPS signal quality. • Support for multiple GNSS constellations (NAVIK, GPS, GLONASS, Galileo etc.) for better accuracy and redundancy. • Support Role-based access controls for user management and configuration. • Firmware is field-upgradeable; updates can be installed directly from the unit or via a remote network connection. Software updates are provided free of charge for the lifetime of your product. • The Server will continue to serve NTP Stratum 1 time if the GPS reference signal is lost using TCXO/OCXO or rubidium oscillator. • NTP server shall be provided with GPS antenna kit with a provision of Lightening Surge protection according to IEC61000-4-5 standards.
2	Accuracy	• GPS Receiver :$\leq \pm 50$ nanoseconds or better when locked with GPS. • Holdover Accuracy (when GPS signal lost): Drift rate should be ≤ 10 milliseconds/day Time for 24 hours after signal loss.
3	Front Panel	• Must have provision to display time in 6 digits in the HH:MM: SS. • LCD screen or LED indicators for Power, GPS Locked, and GPS receiver status. • Alarm LED for fault conditions.
4	Network Service Timing	• IPv4, IPv6 • NTP v2, v3 and v4 with Unicast, Broadcast and Multicast Modes. • SNMP v1, v2 and v3.

5	Management and Communication	- Logs of events and alarms. - Web GUI, CLI (command-line interface), or SNMP support for remote management. - Monitoring tools for event logs, health status, timing performance graphs, and alerts.
6	Interfaces	- Minimum 2x 100/1000 Base T, RJ-45 (Electrical) for NTP output 1x100/1000 Base F, Fx (Optical/SFP) (As per station requirement) for NTP output
7	Security Features.	- Configurable MD5-based encrypted password for SSH, Telnet, and web server access. - NTP v3, v4, MD5 Authentication with Symmetric and Auto key Management - Network Security Features SNMP v3 - SHA/MD5 Authentication - SNMP v3 with SHA/MD5 Authentication and options for no-auth / auth / priv security. - Security conscious users can disable any or all of the risky protocols such as HTTPS, Telnet, and Time and Day time or restrict access to specific hosts.
8	Certification	- The NTP server Compliant with CISPR for EMI radiation. - Tested for Restriction of Hazardous Substances (RoHS) and CE equivalent Indian standards from Govt. recognized and accredited laboratories.
9	Power Supply	- Redundant hot swappable power Supplies. 1+1 AC power (100-230VAC, 50 Hz) or AC+DC
10	Environmental	- Operating Temperature: 0° C to 50° C or as per station requirement. - Relative Humidity: 10% to 90%, non-condensing - The NTP server has Ingress protection IP20 enclosure.
11	Antenna	- IP67 rated antenna - Lightning protection according to IS 61000-4-5 or equivalent. - Supports cable length up to 90 meters. - Rugged, all-weather housing capable of operation over -30° to +60°C. - Cable lengths available: 30/50/60/90 meters (station should select based on requirement).

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DISCLAIMER