Clock Server For Time Synchronization

Select the timing reference around the clocks, controllers and equipment in your project.





RACK REFERENCE

One project. Several timing paths.



PORTABLE TIMING

Ten product candidates, five integration pathways and a practical commissioning checklist. Compatibility depends on the receiving device, protocol, electrical interface and ordered configuration.

00 PROJECT SELECTION MAP

Begin with the receiving device

These are candidate pathways, not prevalidated end-to-end clock systems. Confirm the actual clock or controller specification before selecting a source.

Project need	Receiving requirement	Product candidates	Page
Network or direct time	NTP client, or defined pulse / serial input	HCE211-Slave HCE201	03
Shared rack reference	10 MHz and / or 1PPS inputs	HCE5436A-IV HCE5436A-V	04
Continuity planning	Defined outage and holdover target	HCE5418A-1V HCE5418A-N	05
Existing infrastructure	IRIG-B, TOD or E1 / 2.048 MHz	HCE5435 HCE5432A	06
Test and event workflows	TTL trigger capture or scheduled pulse	HCE5432C-D HCE5435-BDV1	07

A COMPLETE CLOCK SYSTEM MAY NEED MORE THAN A REFERENCE

The products here supply timing references or specialist timing functions. A compatible controller, distribution stage, network infrastructure and clock endpoints may be needed. Those components are not specified or included by this catalog.

KEEP NETWORK LABELS PRECISE

NTP is documented for HCE211-Slave and optional on selected other models. HCE5432A lists optional SNTP. HCE5418A-N LAN does not confirm NTP, and HCE5435-BDV1 RJ45 is a differential timing link. PTP support is not established.

01 NETWORK AND DIRECT TIME

Start at the clock or controller

For a synchronized-clock project, first identify what each endpoint actually accepts. NTP, serial time and pulse inputs are different paths.

01 Time reference > 02 Matched service or signal > 03 Compatible clock / controller

DOCUMENTED NTP PATH

HCE211-Slave



HCE211-Slave documents NTP service alongside portable rubidium timing. Use it as a candidate where the endpoint is an NTP client and the operating role fits a portable unit.

- NTP service and test functions
- 10 MHz, 1PPS, TOD and IRIG-B
- Battery-powered portable enclosure

Integration check
Validate client behaviour, polling load and network delay. The 1 us test figure is not an NTP client-accuracy guarantee.

DIRECT PULSE AND TOD PATH

HCE201



HCE201 supplies one second pulse and one serial TOD output in the base listing. Use it with a controller that explicitly accepts the matching signal and message format.

- 1PPS on BNC, TTL by default
- TOD on DB-9, RS232 by default
- NTP is an option, not a base claim

Integration check
Confirm the HCE201 enclosure and power mapping, plus serial messages and electrical levels. The photo is illustrative.

Project question Do all clocks accept NTP, or does the installation need a separate controller with defined pulse or serial inputs?

02 SHARED RACK REFERENCE

Plan the number of timing loads

When clocks, controllers or instruments need wired frequency and pulse references, size the physical output count before choosing the chassis.

01 Satellite reference > 02 Dedicated 10 MHz / 1PPS > 03 Matched downstream inputs

FOUR CHANNEL PAIRS IN 1U

HCE5436A-IV



HCE5436A-IV provides four 10 MHz outputs and four 1PPS outputs. It is the smaller rack choice when the receiving equipment needs these direct signals.

- 4 x 10 MHz sine + 4 x 1PPS TTL
- Dual AC inputs
- NTP / RJ45 monitoring via Opt N

Integration check
A 10 MHz reference is not a wall-clock protocol. Check the downstream controller before connecting any clock system.

TEN CHANNEL PAIRS IN 2U

HCE5436A-V



HCE5436A-V provides ten 10 MHz outputs and ten 1PPS outputs. Choose it when the project requires more independent connections from one reference.

- 10 x 10 MHz sine + 10 x 1PPS TTL
- Dual AC inputs
- NTP / RJ45 monitoring via Opt N

Integration check
Count frequency and pulse loads separately. Confirm rubidium or BeiDou options when continuity requirements call for them.

Project question How many independent frequency and pulse inputs must be served, and which outputs need a network option instead?

03 CONTINUITY PLANNING

Choose the reference for an outage

Rubidium references can support holdover planning, but acceptable drift, outage duration and operating conditions must be agreed for the complete system.

01 Locked reference > 02 Defined holdover interval > 03 Measured end-system error

SHALLOW RACK INTEGRATION

HCE5418A-1V



HCE5418A-1V places four 10 MHz outputs and four 1PPS outputs in a shallow 1U enclosure. NTP and time-code expansion are optional.

- Rubidium reference in 1U
- 240 mm enclosure depth
- Optional NTP and IRIG-B interfaces

Integration check
Confirm the 1V / V1 model name and ordered options. Define the required warm-up and satellite-lock conditions.

LAN AND CONSOLE INTEGRATION

HCE5418A-N



HCE5418A-N combines four 10 MHz outputs and four 1PPS outputs with LAN and a dedicated serial console in a 2U enclosure.

- Rubidium reference in 2U
- 10/100 LAN plus serial console
- NTP service remains unconfirmed

Integration check
Do not select it as an NTP server solely because it has LAN. The <10 ns RMS statement is a conditional relative measurement.

Project question What time error is acceptable during the longest reference outage, and how will that error be measured?

04 EXISTING INFRASTRUCTURE

Integrate the installed timing system

Retain the electrical interface that existing equipment requires. Time-code distribution and telecom synchronisation are related but not interchangeable.

01 Existing input specification > 02 Matching format and level > 03 Controlled integration test

MIXED TIME-CODE INTERFACES

HCE5435

HCE5435 OUTPUT OVERVIEW

- 10 MHz sine / TTL
- 1PPS TTL / RS422
- IRIG-B AC / DC
- Serial TOD

Interface overview, not a chassis drawing

HCE5435 is a candidate for controllers and instruments using IRIG-B, serial TOD, 1PPS or 10 MHz. Its listed time-code outputs cover AC and two DC electrical formats.

- IRIG-B AC, DC-TTL and DC-RS422
- 10 MHz sine / TTL and 1PPS
- NTP / Ethernet not specified

Integration check
Verify time-code format, pinout and level at both ends. Confirm the fitted oscillator and ordered enclosure. The diagram represents interfaces only.

TELECOM REFERENCE INTERFACES

HCE5432A



HCE5432A targets compatible E1 and 2.048 MHz telecom inputs. It also lists 10 MHz, 1PPS and serial time/status outputs.

- 75-ohm E1 and 2.048 MHz
- Opt EIO retiming with bypass
- Opt N provides SNTP and MIB II

Integration check
Check HDB3 line coding, impedance and the retiming requirement. Source standard references are not independent certification.

Project question Which interface is already deployed, and can its receiving specification be supplied before selecting the reference?

05 TEST AND EVENT WORKFLOWS

Coordinate triggers and recorded time

Some projects need event timing rather than a clock display. Separate a scheduled output pulse from a timestamp captured at an external input.

01 Defined trigger event > **02** Generation or capture > **03** Verified timestamp / response

CAPTURE WHEN AN EVENT OCCURRED

HCE5432C-D



HCE5432C-D records a selectable TTL trigger edge and returns a calendar timestamp over RS232. The specified record resolution is 10 ns.

- BNC TTL event input
- Dedicated RS232 timestamp output
- 10 / 20 / 40 MHz and IRIG-B outputs

Integration check
Resolution is not absolute event accuracy. Agree event rate, latency, trigger threshold and the timestamp time zone.

SCHEDULE WHEN A PULSE IS SENT

HCE5435-BDV1



HCE5435-BDV1 supplies four programmable pulse channels with a documented 1-5 second period range, alongside fixed timing outputs.

- GPS / BeiDou rubidium reference
- Four programmable PPS outputs
- Removable battery assembly

Integration check
RJ45 ports carry RS422 1PPS + TOD, not Ethernet. Confirm battery runtime and per-channel pulse behaviour.

Project question Does the workflow require generating a trigger, recording one, or measuring the delay between both?

06 INTEGRATION CHECKLIST

Define the project before ordering

Use this brief to align the clock supplier, network team and system integrator. Candidate selection becomes useful only when the receiving side is known.

☐ Clock endpoints

List clock and controller model numbers, quantities, locations, accepted protocols and electrical inputs. Confirm UTC, local time, time-zone and daylight-saving behaviour.

☐ Reference and distribution

Choose satellite reference, antenna position and cable route. Document every network or wired timing hop, signal level, impedance, connector and distribution device.

☐ Network and management

Where NTP or SNTP is required, specify the exact server option, client polling load, network paths, configuration access and the test used to measure endpoint error.

☐ Continuity and site power

State the permitted error during reference loss, the outage duration, battery requirement and site supply. Do not infer redundant system operation from a single product feature.

☐ Acceptance and handover

Define locked and holdover tests, measured clock-display error, fault reporting and recovery. Obtain configuration-specific documentation and confirm the configuration requirements.

Procurement note Request a configuration-specific quotation and current manufacturer datasheet. Compatibility, downstream clock supply and complete system design must be agreed for the specified installation.

Discuss your clock project | syncclocks.com/contact/