Net.Time τ a PTP/NTP clock

Net.Time τ is a network clock ideal for ensuring the delivery of quality time, phase and frequency. It is suitable for telecom, financial, broadcast and data center applications because it is ruggest, friendly and accepts a wide variety of time references and provides the widest range of timing signals to facilitate network integration.

ALBEDO

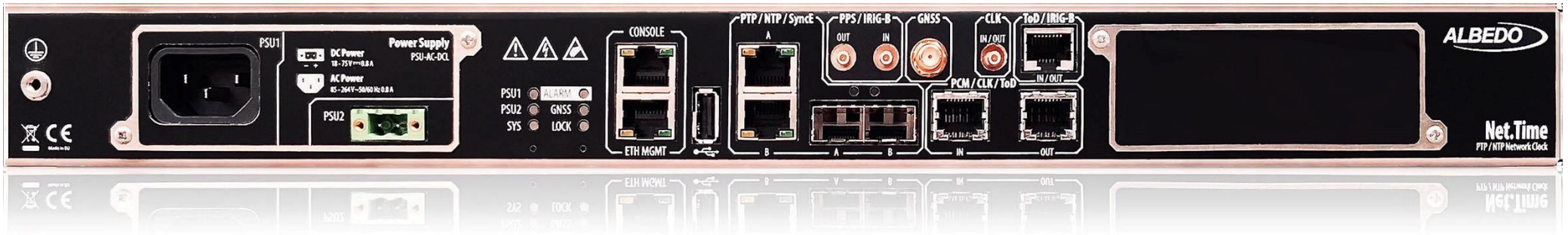
experts in test, measurement & timing

ICT electronics (1983)

Trend Comms (1995)

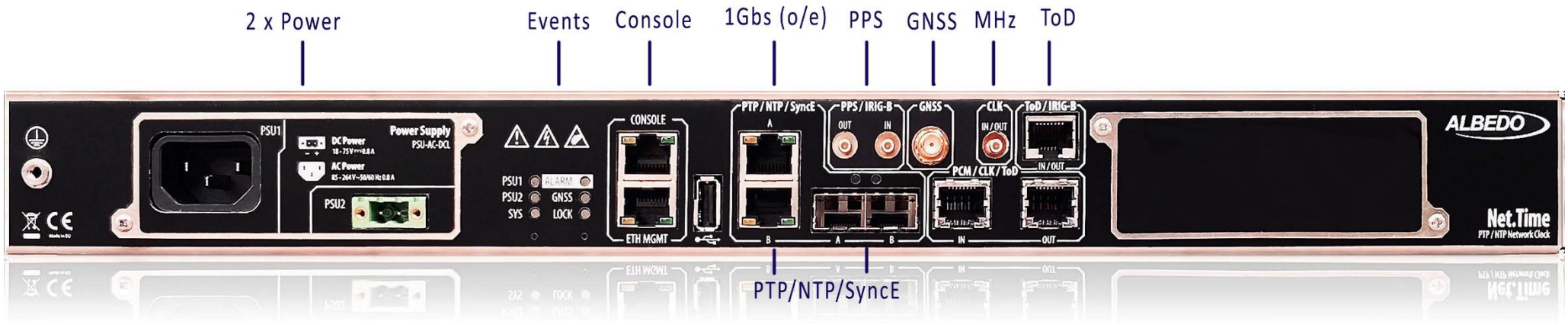
ALBEDO (2009-today)

About **Net.Time τ**



- Net.Time τ is a PTP/NTP/SyncE clock designed for the mobile, finance, broadcast and data centers
- Configurable as master, slave, and boundary clock
- Multiple options for input (GNSS, PTP, SyncE, ToD, PPS, T1/E1, MHz) and output (PTP, NTP, SyncE, ToD, PPS, T1/E1, MHz

Interfaces **Net.Time T**



- 2 x 1Gb/s Optical & Electrical
- Control
- 2 x RJ45: Console and Management
- 1 x USB: Storage
- Timing
- 2 x SFP
- 2 x RJ-45
- 1 x SMA: unbalanced 50 Ω
- 3 x SMB: unbalanced 50 Ω
- 3 x RJ-48: balanced (RS-422) 100 Ω

Net.Time τ (Tau) **Markets**

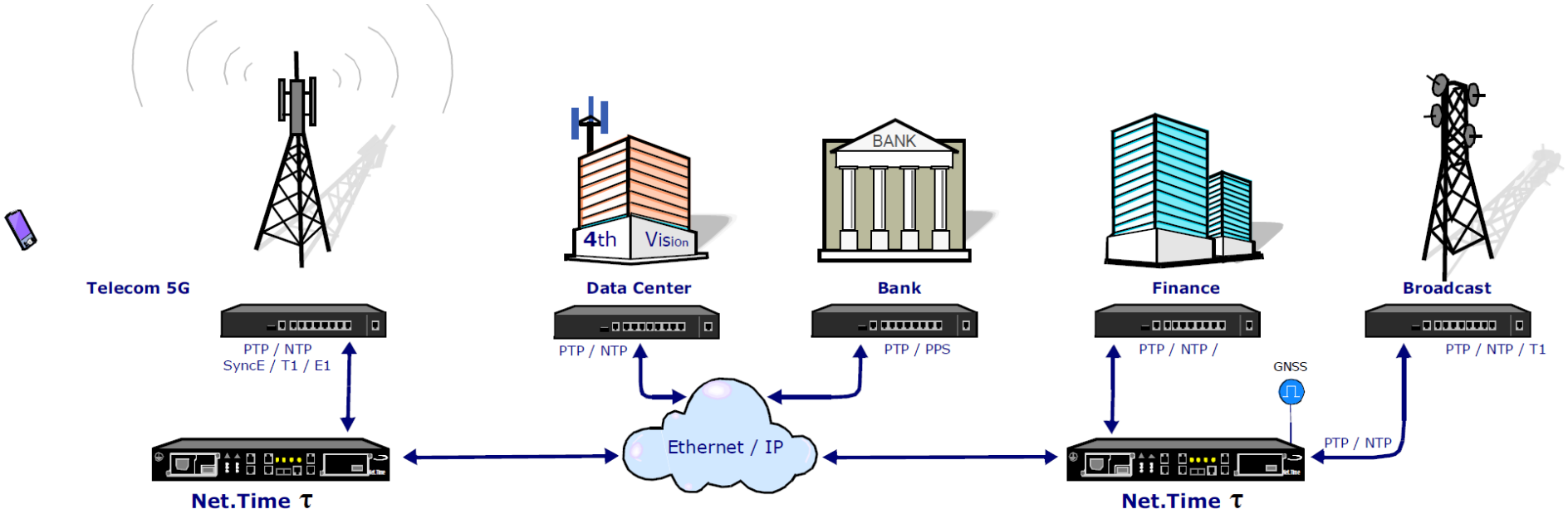
Data Centers

Finance

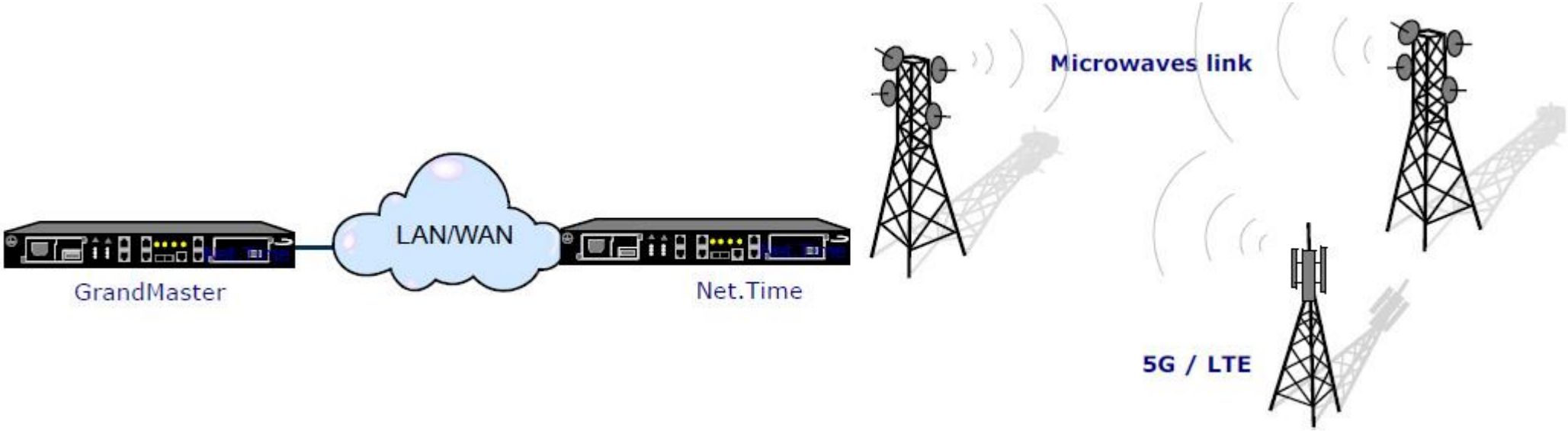
Broadcast

Telecom

Industry **Applications**



- 5G Telecom
- Air Traffic Control
- Mission-Critical applications
- Financial
- Broadcast

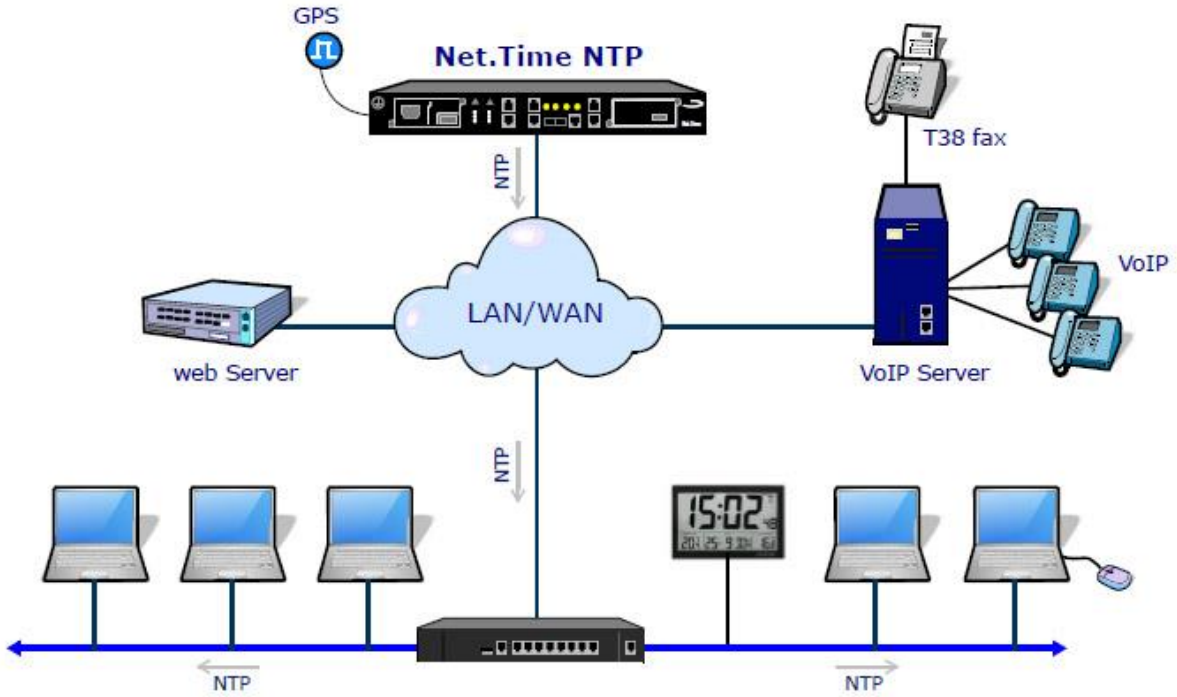


5G operators require accurate phase and timing in the **wireless backhaul** to **increase handset density** and **reduce cell size**.

Timing is also required for

- spectrum reuse,
- handover control,
- event logging,
- new applications that are driving mobile business

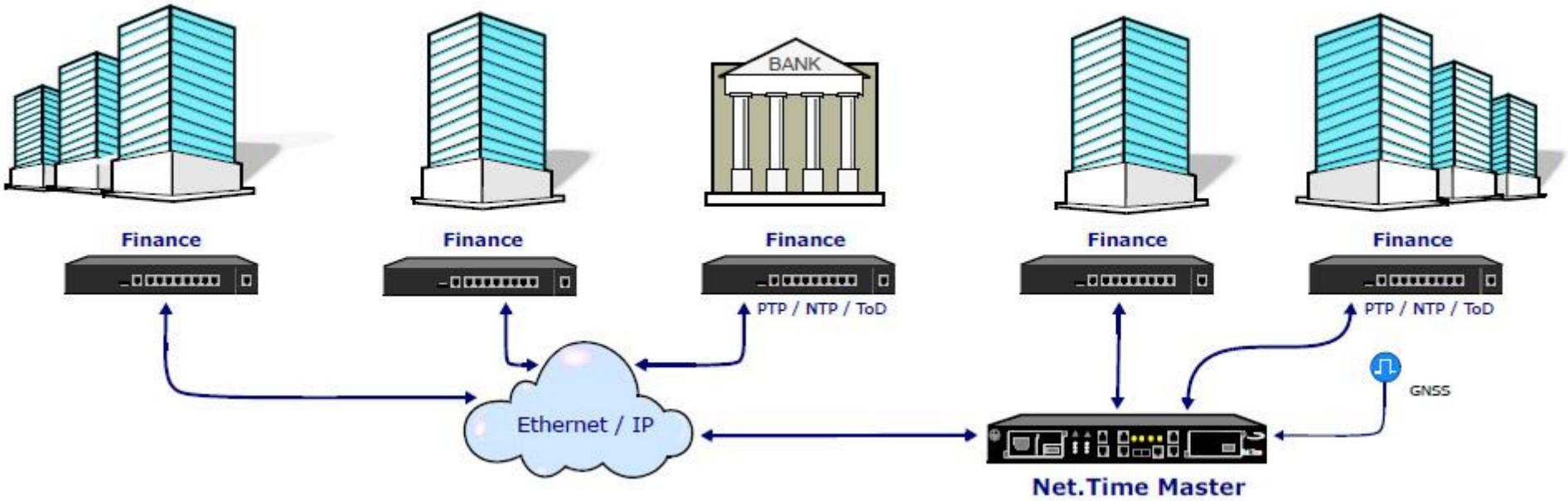
Data Centers



PTP synchronization is a widely used solution for synchronizing clocks in data centers and other industrial and scientific applications.

Net.Time provides accurate synchronization over Ethernet networks, which is important for many applications.

Finance



Banks, stock exchanges and other financial institutions are required by law to record transactions with a consistent and accurate time stamp, making PTP synchronization a suitable solution for these organizations, as accurate timing is fundamental to the applications they manage, such as high-frequency trading, audit and compliance, and clearing and settlement.

Broadcast

PTP is also used in some broadcast applications such as television and radio. Accurate time synchronization is important to ensure that audio and video streams are in sync and to avoid the lip-sync problem.

PTP provides a way to synchronize clocks over Ethernet networks with multiple devices must be synchronized to ensure smooth and seamless operations, making Net.Time τ a suitable solution multi-studio broadcast operations.

- OCXO default oscillator
- Rubidium optional oscillator

Locking time

Metric	OCXO	Rubidium
Locking time	< 5 minutes	< 4 hours

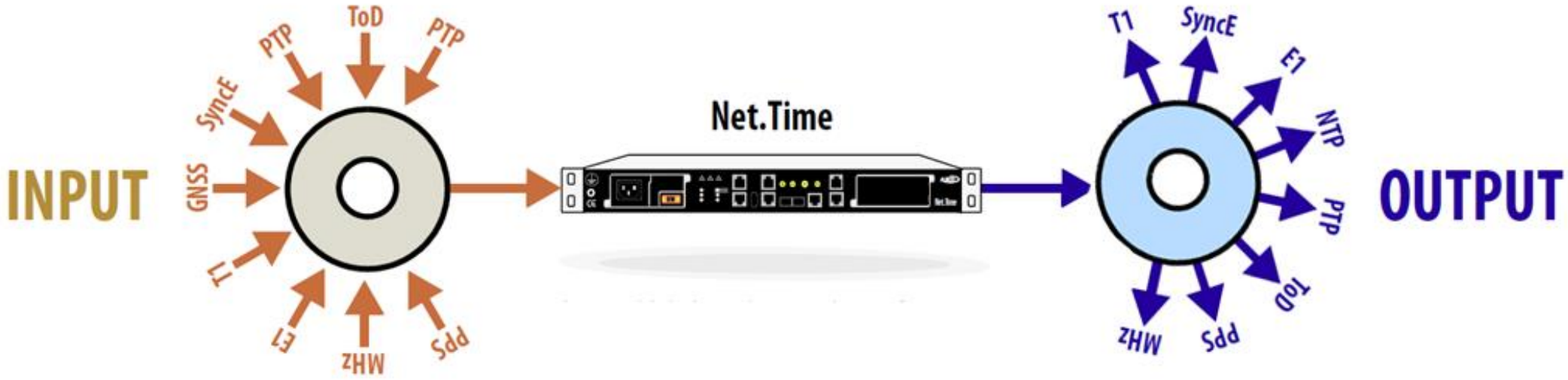
Performance locket 24h.

Metric	OCXO	Rubidium
GNSS	± 45 ns	± 40 ns
1PPS / ToD	± 10 ns	±10 ns

Performance in hold-over

Metric	OCXO	Rubidium
Phase within ±100 ns	-	10 hours
Phase within ±500 ns	2 hours	24 hours
Phase within ±1.0 µs	4 hours	48 hours
Phase within ±10.0 µs	24 hours	-

Net.Time т is a **universal protocol translator**

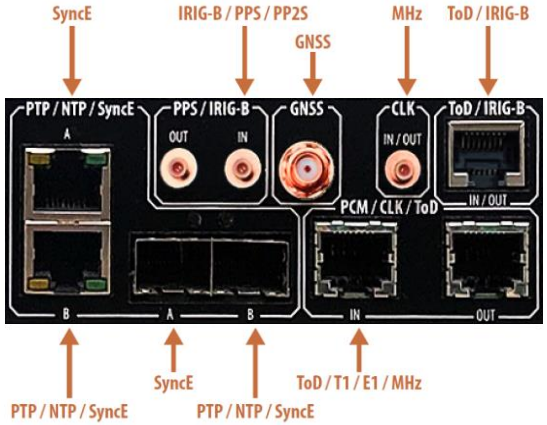


Net.Time is very flexible because it accepts multiple clock references to discipline the internal circuits. GNSS is the default and the most obvious reference but signals such as PTP, SyncE, ToD, PPS even MHz, E1/T1 can also be used as back-up in case of failure or spoofing.

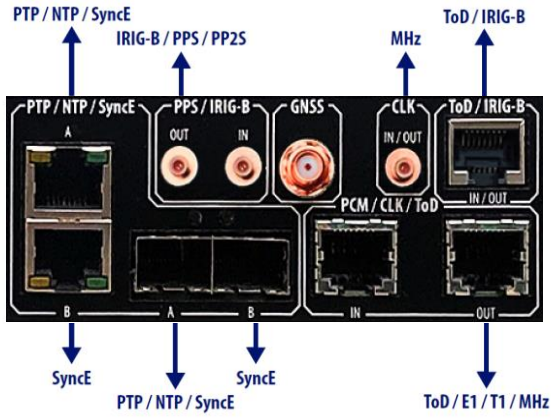
Everything will continue as before and without losing the phase or the time of output signals.

Timing signals: **Universal Protocol Translator**

clock reference inputs



synchronization outputs



	GNSS	PTP	NTP	SyncE	ToD	PPS	T1/E1	MHz
RJ45 (A)		out	out	out				
SPF (A)		out	out	out				
RJ45 (B)		in/out	out	in/out				
SPF (B)		in/out	out	in/out				
RJ48 (C)					in		in	in
RJ48 (D)					out		out	out
SMB (E)						out		
SMB (F)						in		
SMA (G)	in							
SMB (H)								out
RJ48 (I)					in/out			

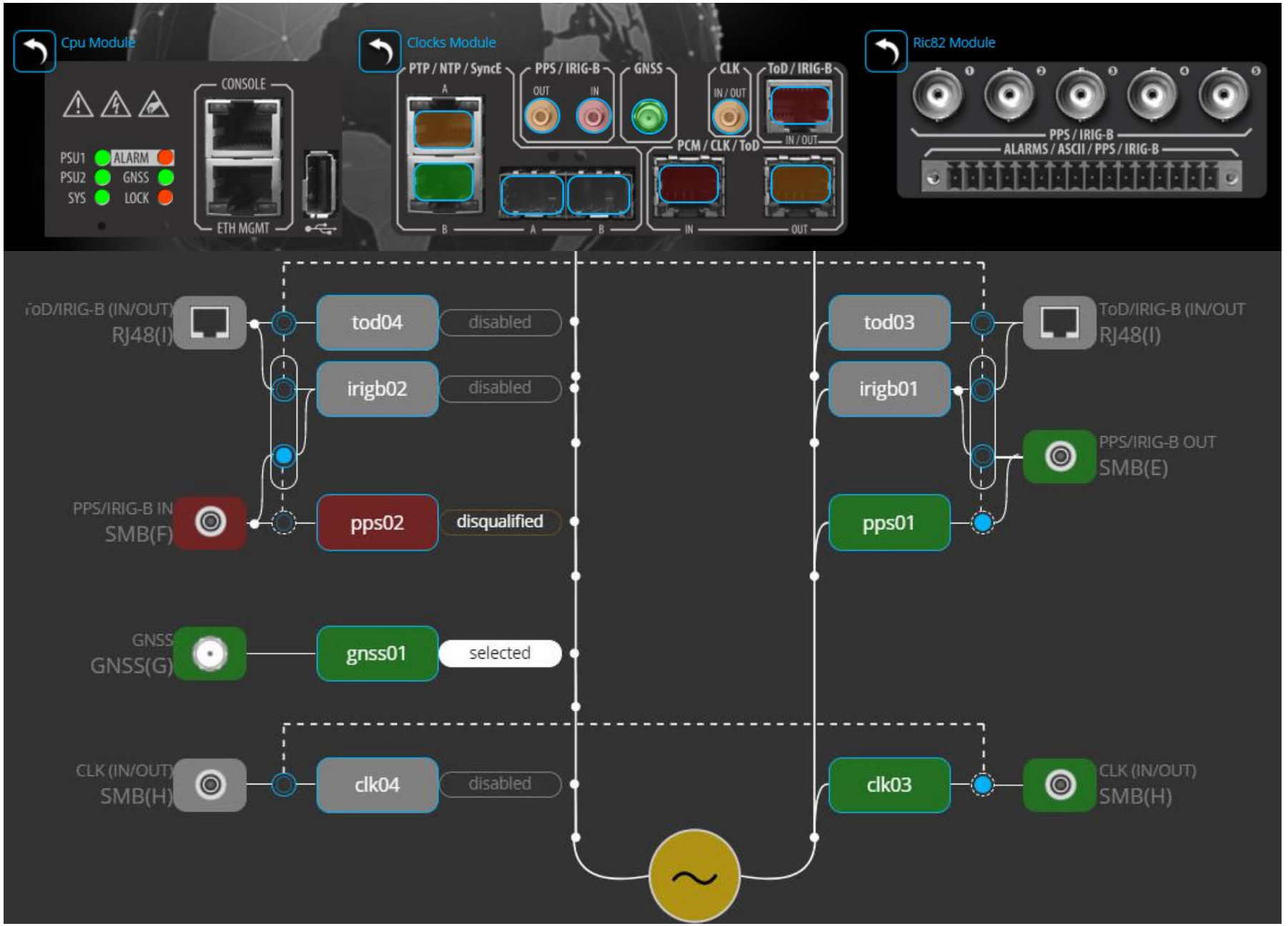
Oustanding **PTP** features

- Optic & electrical interfaces
- 10 Mbps / 100 Mbps / 1 Gbps
- 512 unicast PTP clients at 128 message/sec
- Profiles: Telecom, Default profiles
- 2xPorts that may have independent profiles
- PTP Profile translation
- Roles: GrandMaster, Boundary, Slave

NTP server features

- Server & client modes
- Optical & electrical interfaces
- Up to 1000 transactions / sec.
- NTP protocol versions
  - NTPv3 (RFC 1305)
  - NTPv4 (RFC 5905)
- SNTP protocol versions: SNTPv3 (RFC 1769)

Web Server Interface



Net.Time Top **Benefits**

- Advanced functions
  - Universal Protocol translator
  - Network fault tolerant
  - Hierarchical reference input
  - 512 PTP unicast clients
- Rugged Clock
  - +70ºC fan-less operation
  - Power fault tolerant
  - Reference fault tolerant
  - Automatic Ref. switchover

The Net.Time **family**

		Net.Time φ (Phi)	Net.Time Ω (Omega)	Net.Time T (Tau)
DIFFERENCES	Default rate	100 Mb/s	1 Gb/s	1 Gb/s
	Alarm relay contacts	Optional	Optional	-
	Display	Yes	Optional	-
	Modules	Optional	Optional	-
	IRIG-B	Yes (i/o)	Optional	-
	NTP	Yes (o)	Yes (o)	-
	PRP	Optional	Optional	-
	PTP Power profile	Yes (i/o)	Optional	-
	PTP Telecom profile	-	Optional	Yes (i/o)
	SyncE	-	Optional	Yes (i/o)
COMMON FEATURES	Platform	19", 1 RU, Aluminum case		
	Temperature	-40 ~ +70°C (Passive cooling)		
	Power Supply	Redundant (2 x Sockets): • AC: 100 ~ 240 VAC, 50- 60 Hz (IEC 60320 C13/C14) • DC: 18 ~ 75 VDC or 43 ~160 VDC (2-pin 5.1 mm) • AC/DC: 85 - 264 VAC and 100 - 370 VDC (2-pin 5.1 mm)		
	GNSS	72 channels (GPS, GLONASS, BeiDou, Galileo)		
	Oscillators	OCXO, Rubidium		
	Accuracy	GNSS <40 ns, ToD <10 ns		
	Holdover	• Rubidium: 100 ns @ 10h; 500 ns @ 24 hours; 1µs @ 48 hours • OCXO: 500 ns @ 2 hours; 1µs @ 4 hours; 5µs @ 24 hours		
	PTP Default profile	All models		
	Time signals (in/out)	PTP, NTP(out), ToD, n x PPS, IRIG-B, SyncE, MHz, T1, E1		
	Protocol Translator	Any input signal or protocol to any output signal or protocol		
	Configuration	Slave / Master / Boundary (up to 512 unicast clients)		
	Management	Web Server, CLI, Syslog, SNMP v2, v3		

That' all

www.albedotelecom.com

ALBEDO

in Test we Trust