Introducing the market's first high-performance optical cesium clock

coreSync™ OSA 3300-HP outperforms magnetic cesium clocks

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OSCILLOQUARTZ
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Markets for cesium atomic clocks

Telecommunication network reference
- Telecom and mobile operators (ePRTC)
- TaaS/GBaaS

Assured PNT and critical infrastructure
- Power utilities, railways, transport, airports
- Defense

Enterprise / data centers (ICPs) / finance
- Synchronization of distributed databases
- High-frequency trading

Metrology, standard labs and scientific networks
- Time-scale networks and calibration services
- Time references

OSA 3300-HP for demanding applications in metrology, standard labs, TaaS, and more

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Resilient PNT mandate/standard update

New gov mandate for resilient PNT* requirements

***P**ositioning, **N**avigation & **T**iming**

****T**iming is the most critical parameter enabling **PN**

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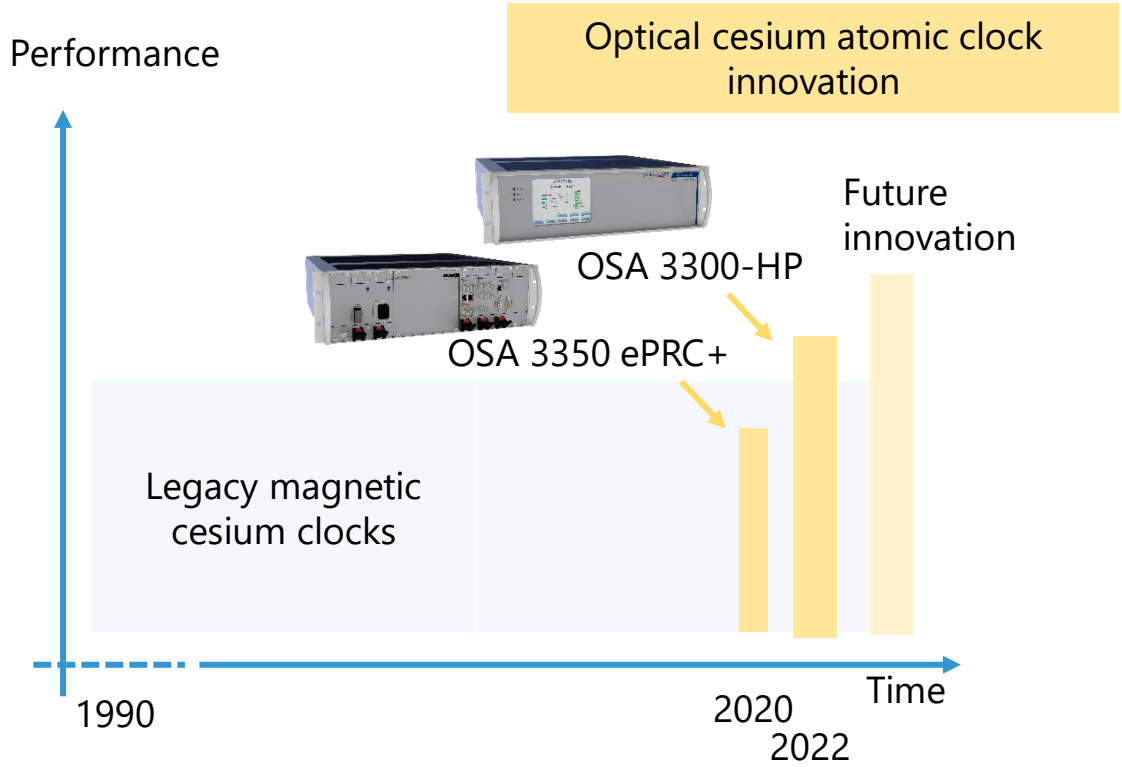
Evolution of cesium atomic clock technology



OSA 3300-HP

- Applying superior optical cesium technology
- Major performance improvements
- OSA 3300-HP optical cesium atomic clock innovation will replace legacy technology
- Designed for metrology, national labs, GBaas/TaaS and more

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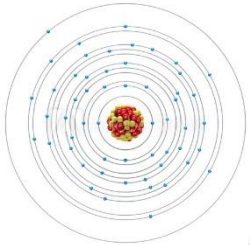
Optical and magnetic cesium

Lifetime

Optical cesium improves the utilization of Cs atoms, leading to longer lifetime

Performance

Optical cesium achieves superior performance



Reliability

Both cesium clock technologies apply proven, highly reliable components

Production

Midterm advantages for optical cesium due to synergies with photonic assembly technologies

ADVA optical cesium technology outperforms legacy magnetic solutions

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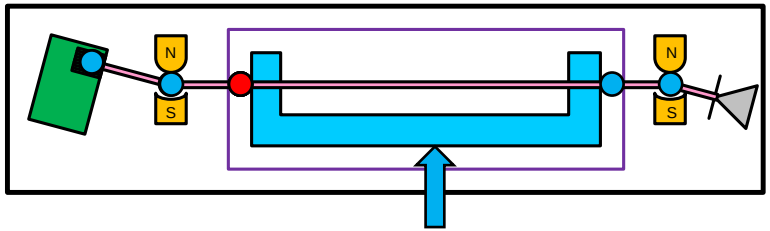
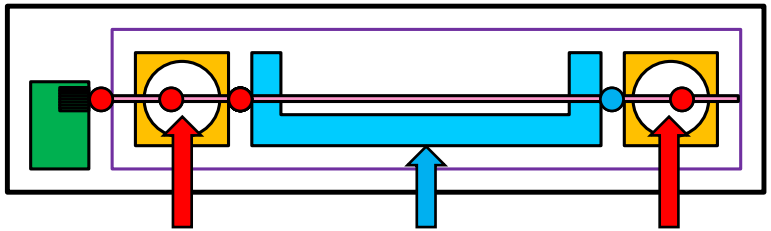
Cesium clock: magnetic vs. optical



- Weak flux
  - Strong **velocity selection** (bent)
  - Magnetic deflection (**atoms kicked off**)
- Typical performances (SP):
  - **$3x10^{-11}$ $\tau^{-1/2}$, floor = $5x10^{-14}$**
  - 10 years
  - HP can be achieved with a 5-year lifespan
- **Stringent** alignment (bent beam)
- Critical component **under vacuum** (electron multiplier)



- High flux (x100)
  - **No velocity selection** (straight)
  - Optical pumping (**atoms reused**)
- Typical performances (HP):
  - **$5x10^{-12}$ $\tau^{-1/2}$, floor = $1x10^{-14}$**
  - 10 years
- **Relaxed** alignment (straight beam)
- Critical component **outside vacuum** (laser)

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OSA 3300-HP design and interfaces

Front

- Touch screen
- LEDs indicating operational conditions

Rear

- Main switch
- Fully redundant and hot-swappable PSUs
- AC and DC power inputs (24V or 48V)
- Internal battery (>1 hour)
- 4 sine outputs (1x 5MHz and 2x 10MHz low noise, 1x 100MHz)
- 4x 1PPS outputs
- 1x 1PPS input
- Management (TCP/IP, RS232, alarm relays)
- SNMP available in next release

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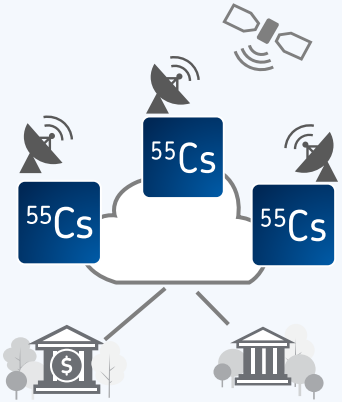
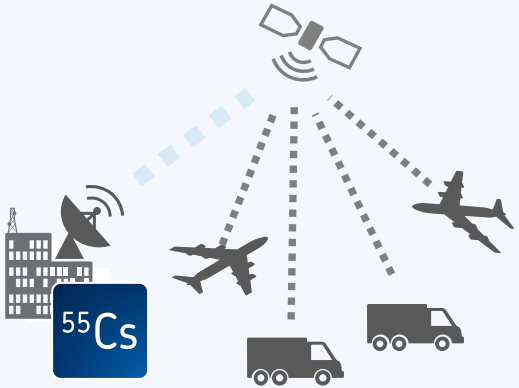
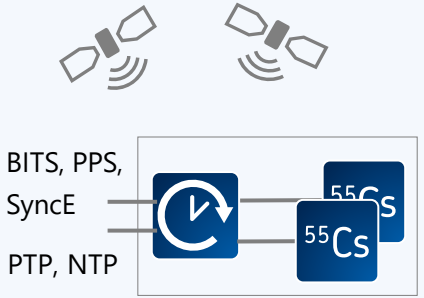
OSA 3300 – key applications



Metrology, timekeeping institutes, science labs, providing ultra-precise TaaS/GBaaS offerings



Space navigation augmentation systems and defense applications



PRC/ePRC and ePRTC for communication and cloud service providers

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OSA 3300-HP main advantages

- High-performance (HP) with a 10-year lifespan
- New generation of cesium clock based on optical pumping technology
- Critical component **outside vacuum** (laser)
- No need to extend the atom oven temperature like in magnetic cesium
- Modern design with user-friendly touch screen
- Fully RoHS compliant

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Key takeaways

- Innovation is overdue with cesium atomic clock technology
- Technology improvements make ADVA's new optical cesium technology fit for high-performance applications
- OSA 3300-HP is the market's first optical cesium atomic clock for high-performance frequency standards
- A premium product for the most demanding applications in metrology, timekeeping labs, research and many others

Taking the lead in high-performance frequency standards

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Oscilloquartz technology and expertise

Atomic clock

Magnetic and optical cesium technology

Highest accuracy and stability

ePRC and ePRTC as ultimate backup for GNSS outages

Network

Time, phase and frequency using PTP, NTP, SyncE and TDM

Multiple levels of backup for aPNT resiliency

Embedded modules, SFP packages, compact and modular designs

On-path assistance and optical timing channel

GNSS receivers

Single-band, multi-band, multi-constellation and dual receivers

Comprehensive GNSS assurance with jamming and spoofing detection

Integrated antenna, anti-jam variants

Managed

Easy operations, simple GUI with Ensemble Sync Director

Syncjack™ PTP and GNSS assurance for transparency and availability

Immediate fault/attack detection and response

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