



ATOMIC TIME

**ILNAS**

BUREAU LUXEMBOURGEOIS  
DE MÉTROLOGIE

## SYNCHRONIZATION FOR BUSINESS CLOCKS

One of the roles of the ILNAS-BLM as the National Institute of Metrology is the generation and dissemination of the reference time. The Cs133 atomic clocks at BLM generates the local reference time UTC (LUX) with extreme precision and contribute to the realization of the global UTC time, thus ensuring perfect traceability to the International System of Units (SI).

### SYNCHRONIZATION SERVICE FOR BUSINESS CLOCKS

A Network Time Protocol (NTP) synchronization service has been created by the BLM for business users who need accurate clocks, for example for the generation of qualified electronic time stamps, such as those used for identification purposes and time marking of financial transactions.

Users can synchronize their clocks via the internet on the reference time of the BLM. The latter ensures the reliability of the service and guarantees the traceability at UTC time of the clocks of connected customers with issuance of a certificate.



LE GOUVERNEMENT  
DU GRAND DUCHÉ DE LUXEMBOURG  
Ministère de l'Économie

# ADVANTAGES OF NTP SYNCHRONIZATION ON THE BLM TIME SERVER:

- ✓ User login certified by ILNAS ;
- ✓ Traceability guarantee to UTC by direct connection to the national time server with a certificate traceable to UTC issued by the National Metrology Institute which benefits of the international recognition ;
- ✓ Precise, reliable and robust solution ;
- ✓ Independence from the GPS system, internet time or NTP servers located in other countries (not traceable) ;
- ✓ Immunity to all disturbances affecting radio reception systems ;
- ✓ Use of optical fibers to guarantee a high level of performance, reliability and security ;
- ✓ Reduced costs for the client. There is no longer any need to invest in expensive internal generation equipment for time and associated management costs. The customer is only a user of a service supplied and completely managed by the BLM ;
- ✓ No need to access the roof for the installation of reception antennas and cables ;
- ✓ Management of leap seconds integrated into the service.

## REFERENCES ABOUT THE TRACEABILITY REQUIREMENTS FOR BUSINESS CLOCKS:

Requirements for business clocks and time stamps	Ref.
Qualified Trust Service Providers - qualified electronic time stamp	REGULATION (EU) No 910/2014 Art. 42
Loi du 30 mai 2018 relative aux marchés d'instruments financiers transposant la directive 2014 /65 (UE) (MiFID II)	Article 11 Synchronisation des horloges professionnelles
Supplementing Directive 2014/65/EU of the European Parliament and of the Council with regard to regulatory technical standards for the level of accuracy of business clocks	Art. 1 – 5 & annexes
Electronic Signatures and Infrastructures (ESI); Policy and Security Requirements for Trust Service Providers issuing Time-Stamps	ETSI EN 319 421 V1.1.1 (2016-03)
Timestamping Authorities (TSA)	RFC3628 7.3.1. Time-Stamp Token
Internet X.509 Public Key Infrastructure -Time-Stamp Protocol (TSP)	RFC3161 2.1 Requirements of the TSA
Technical Specification - Electronic Signatures and Infrastructures (ESI); Policy requirements for time-stamping authorities	ETSI TS 102 023 V1.2.2 (2008-10) 7.3.1.c Time-stamp token 7.3.2 Clock Synchronization with UTC



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