EKOSync 1588

Electric Grid Synchronization

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Arf Technologies combines its expertise and knowledge to deliver cutting-edge technologies in the field of integrated electronics. The company strives to achieve a leading position in the electronic industry by developing innovative and high-quality products that cater to the specific needs of its customers.

A person with a watch knows what time is is. A person with two watches never sure.
-Segal's Law

Seamless grid operations start with precise, synchronized time.

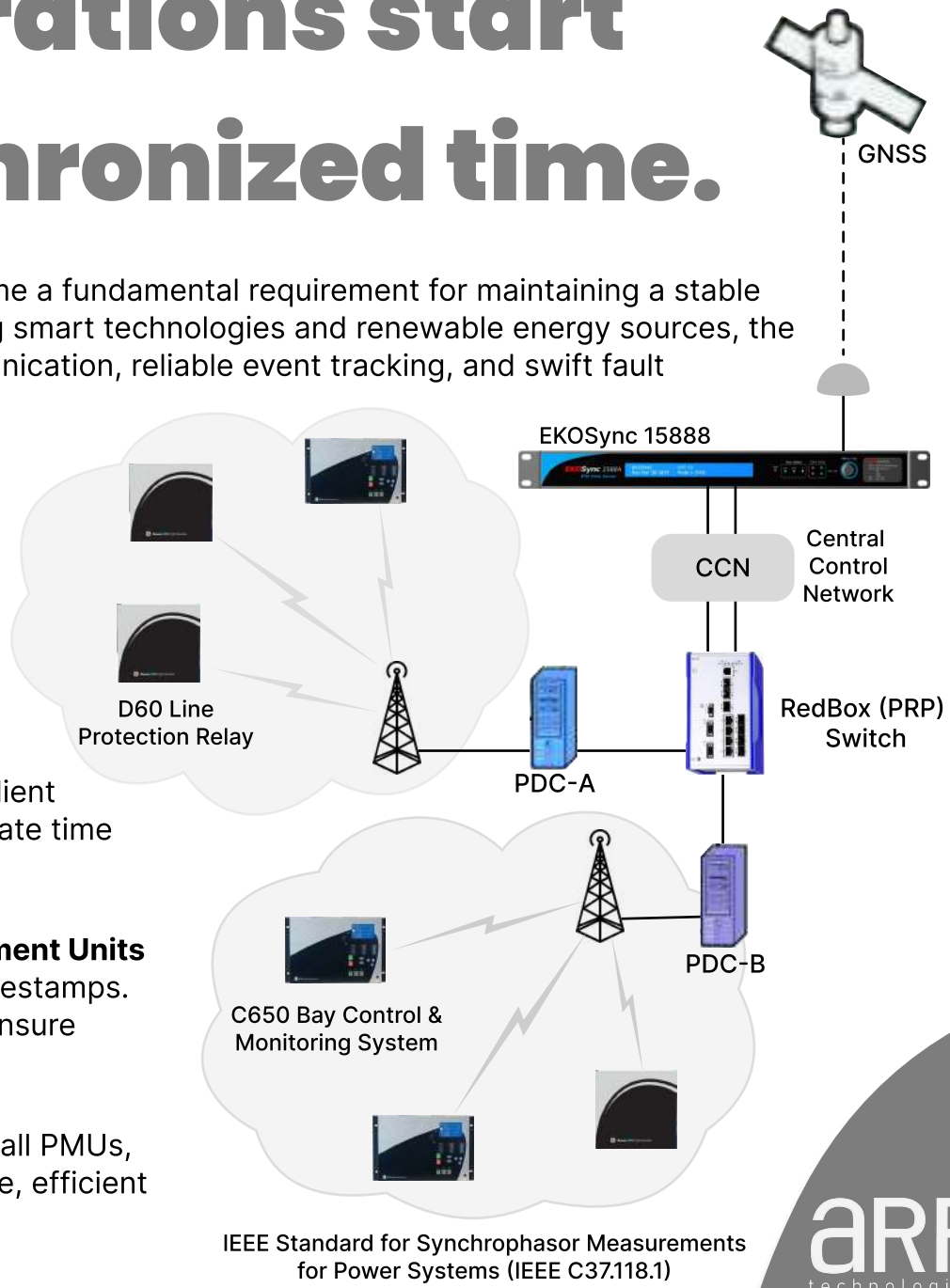
In the evolving energy sector, precise time synchronization has become a fundamental requirement for maintaining a stable and efficient power grid. As grids become more advanced, integrating smart technologies and renewable energy sources, the need for accurate synchronization grows. It ensures seamless communication, reliable event tracking, and swift fault detection, all of which are crucial for grid stability and performance.

The increasing digitalization of energy infrastructure is opening new opportunities for time synchronization solutions. These technologies play a **key role in real-time monitoring**, **grid control**, and **cybersecurity**, enabling innovations such as predictive energy management and enhanced protection against cyber threats.

Smart grids enhance energy distribution by improving efficiency and integrating renewable sources, supporting sustainability. However, decentralized energy production introduces challenges, requiring resilient grids to manage fluctuations and defend against cyber threats. Accurate time synchronization is key to ensuring **stability** and **reliability**.

Wide Area Measurement Systems (WAMS) rely on **Phasor Measurement Units** (PMUs) to measure voltage, current, and phasor data with precise timestamps. These timestamps must comply with the **IEEE C37.118.1** standard to ensure interoperability and consistent system-wide analysis.

EKOSync 1588 Time Servers provide reliable synchronization across all PMUs, aligning measurements to a common time scale and supporting secure, efficient grid operation.



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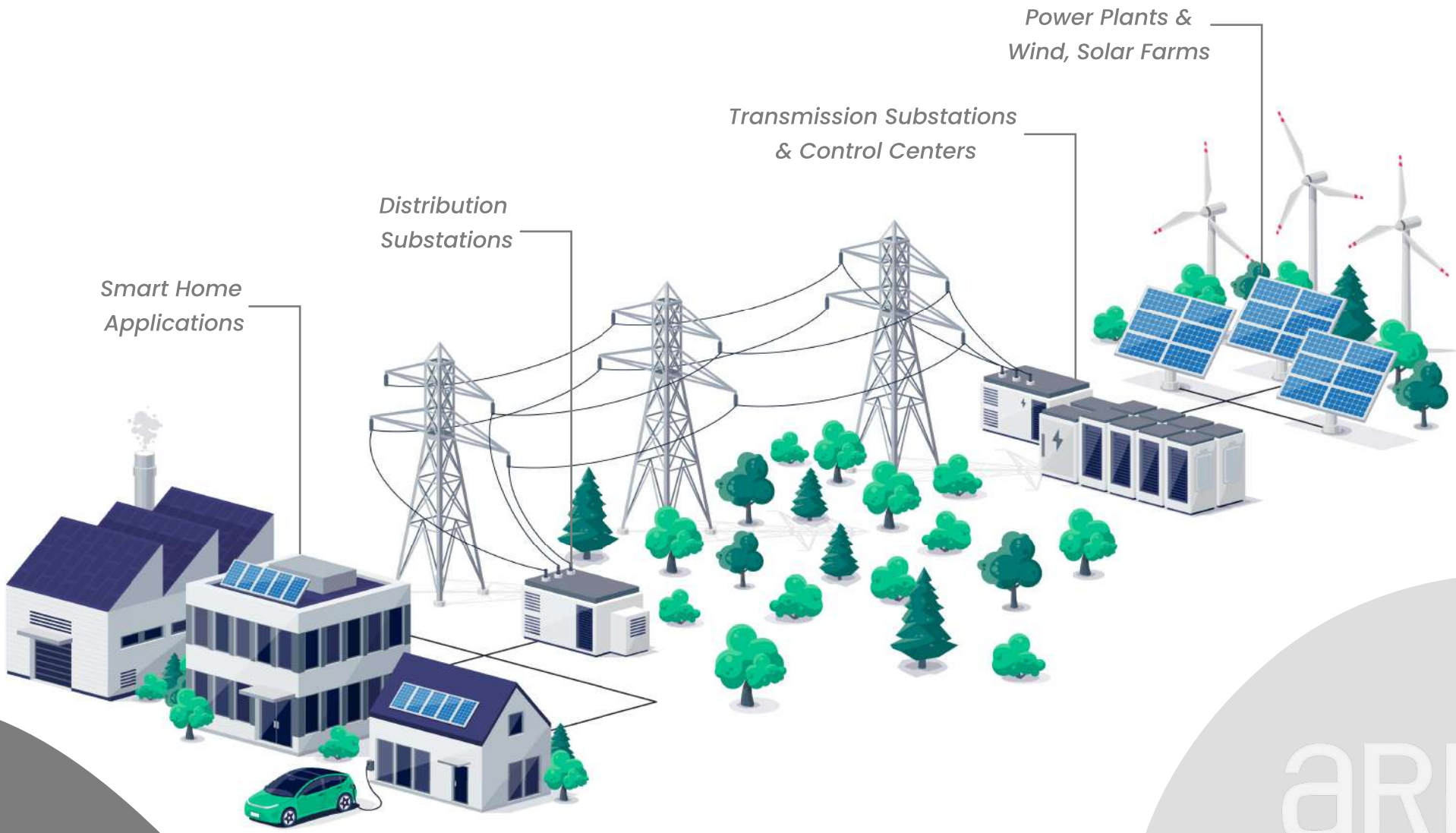
Power Grid Architecture



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Time Support for Critical Processes

Time synchronization enhances the functionality of systems like WAMS/WACS by ensuring accurate timing for critical processes such as frequency balancing and voltage control.

Monitoring with Precise Time

Accurate timekeeping enhances real-time monitoring of grid conditions, ensuring true time to detection of faults.

Cybersecurity & Network Protection

Dedicated time servers operate independently from the internet, minimizing security risks and protecting critical infrastructure from cyber threats and unauthorized access.

Accurate Data Timestamping

As PMUs and control centers operate in sync, time synchronization ensures that exchanged data is accurately timestamped.

Accurate Data Analysis

Time synchronization ensures precise correlation of data from PMUs and control centers, enabling accurate analysis and more informed decision-making for grid management and optimization.

TEİAŞ Türkiye Elektrik İletim A.Ş. · Schneider Electric · ABB · Boğaziçi Elektrik Dağıtım · SIEMENS · Hitachi Energy

Our Timing Solution

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1 Time Synchronization

- Full IEEE 1588v2 PTP Grandmaster & Slave functions
- NTP/ SNTP (IEC 61850) Multicast & Broadcast Server
- IRIG-B Time Code
- FREQ 5-10-20-25MHz.

2 Precision

- Precision: +/- 100 nS
- Holdover: VCTCXO (default): 5 mSec/24 hr
- OX-221 (optional): 30 µSec/24 hr

3 Reliability

- All around the world accepted as reliable

QULSAR PTP Solution

4 Quality

- Production Quality

EKOSinerji uzmanları tarafından garanti edilmiştir

5 Web Interface

- Multi Platform

Management and configuration from all operating systems with a web-based interface

6 Ethernet

- NTP/PTP Protocols
- Telnet Command Line
- HTTP Protocol
- FTP Protocol
- IPV4 (Layer 2)

7 Sustainable Design

- Recyclable Materials
- Energy-saving: Power Saving Components
- Fanless Design: Eliminates problems caused by fan failure

8 Connection

- RJ45 Ethernet A & B Models: 2 total
- SFP Ethernet B Model: 2 total
- BNC Antenna: 1, TOD:1, FREQ:1, PPS:1 (A & B)
  IRIG-B: A Model: 1 total, B Model : 8 total

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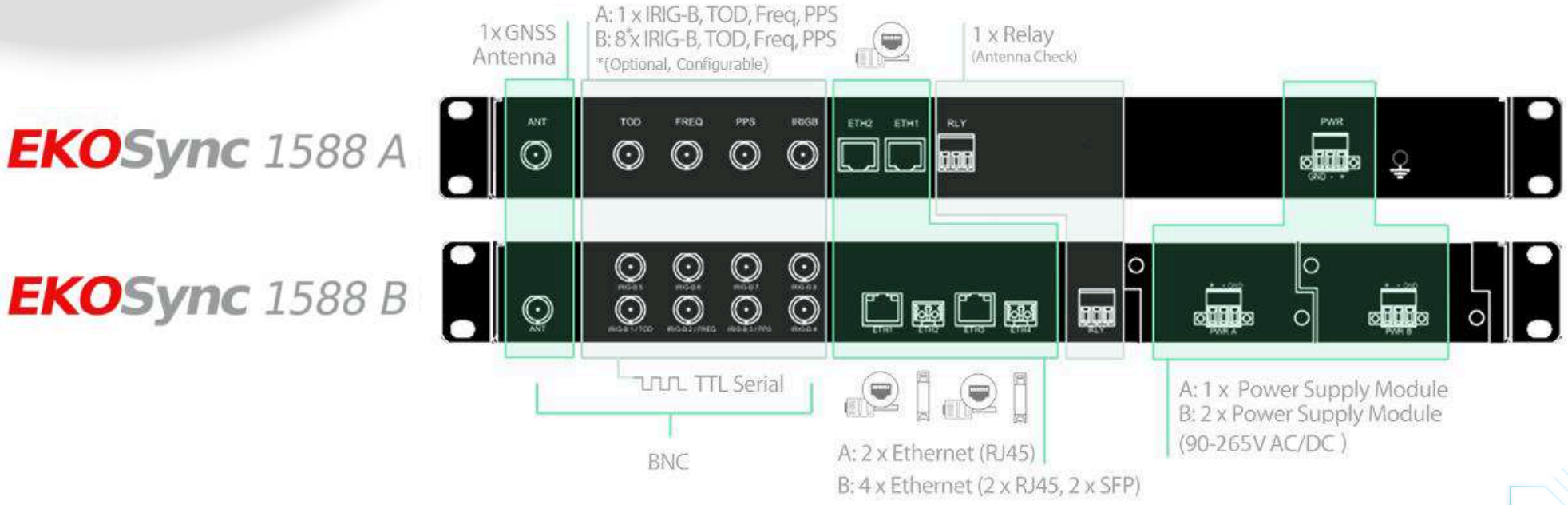
EKOSync 1588 Time Servers



The EKOSync 1588 implements a time & frequency synchronization system using packet timing to deliver a full, high performance, reliable timing solution.

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