



Life Energy Motion

Breakthroughs in Energy Measurement

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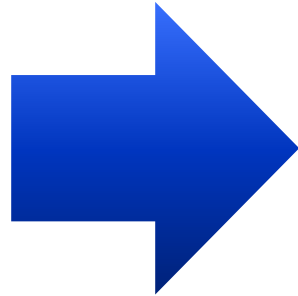
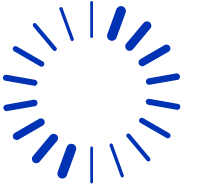




TEMA-Box, a story of success

More than 20 years traction measurement equipment

From TEMA-Box (2002) ... to ... TEMA4G (2025)



- Over all ... more than 35.000 pcs delivered

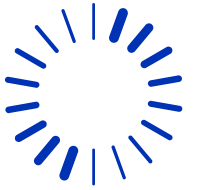
TEMA4G

EM4TII+

- Quality by design
- Made in Germany
- IP65
Measurement Class 0,5R
- 4 channel for AC and/or DC
- Temperature -40....+75°C



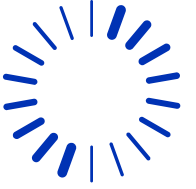
PEMG



- GPRS/LTE and GNSS
- Web-configuration
- 3 DCS in parallel
- High level security functions

- Optimized for Retrofit

TEMA4G – Data deliveries



CEBD plus EVENTs to multiple DCSs

Multiple AC and multiple DC and combinations

Data in Standard Format

System – Information Data after Power-Up

In Standard Format of Readings

CPID, Serials, FW, Settings, K-Factor, operating time, etc.

Monitoring – Information Data, each few seconds

In Standard Format of Readings

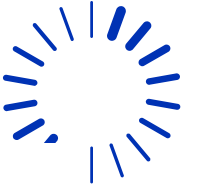
CPID, Position, Current, Voltage, Energy, etc.

About 40 measurement values available,
easy and individual configurable per device



Communication security

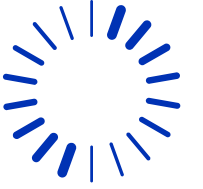
Communication ensured Secured



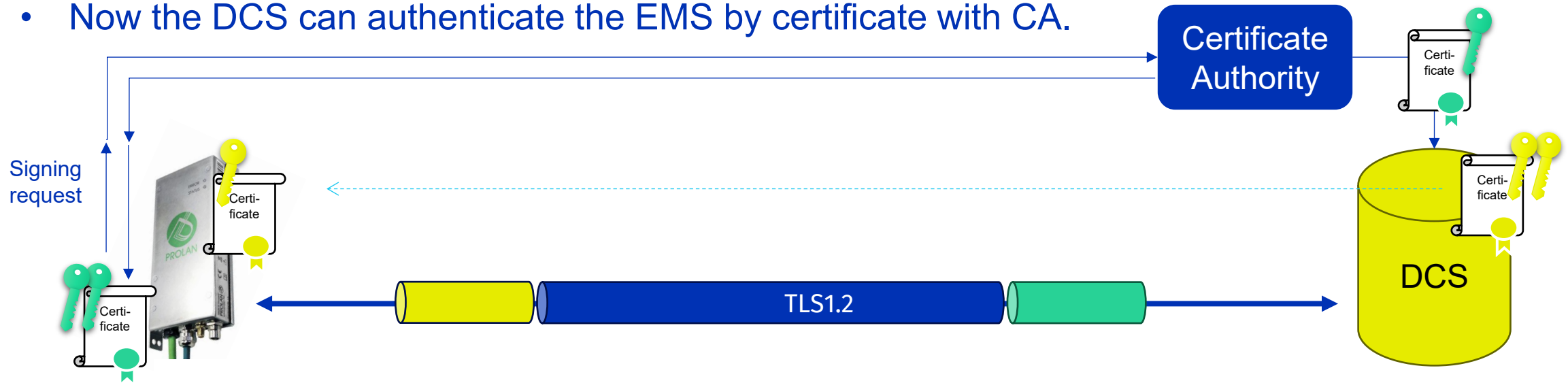
- EMS signed data by key-pair for verification
- integrated Firewall
- https communication with TLS 1.2
- ★ Certificate handling for EMS key-pair



Certificate handling for EMS key-pair

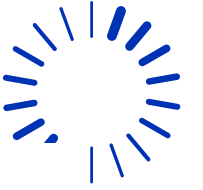


- Upload of DCS public key certificate into EMS to authenticate the DCS on EMS side.
- Generate of EMS public key pair at EMS for signed data of CEBD and EVENTS
- New: Possible creation of a signing request for Certificate Authority (CA), which DCS trusts.
- Upload the CA signed certificate at EMS.
- Now the DCS can authenticate the EMS by certificate with CA.



- During the establishment of an HTTPS connection, certificates are used for mutual authentication.

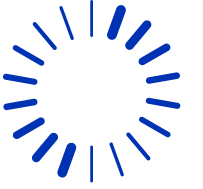
Communication ensured Secure



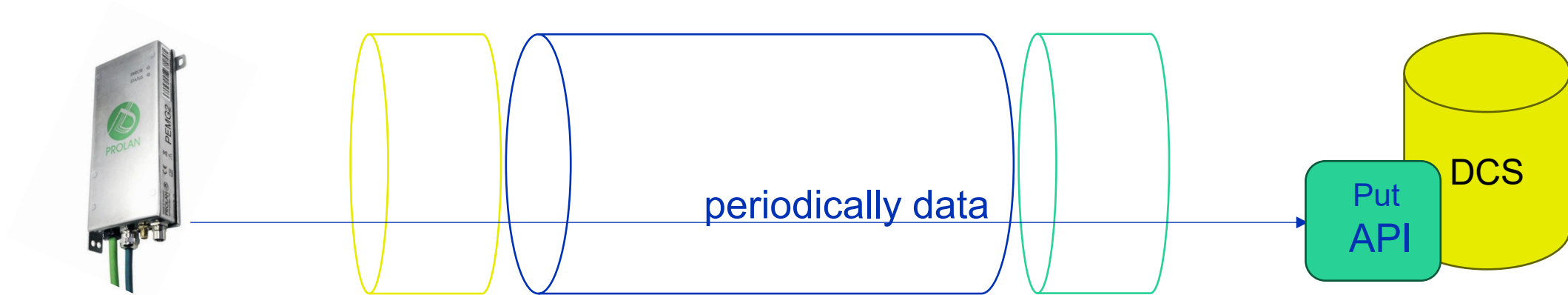
- EMS signed data by key-pair for verification
- Firewall integrated
- https communication with TLS 1.2
- Certificate handling for EMS key-pair
- ★ EMS initiated communication for inquiries



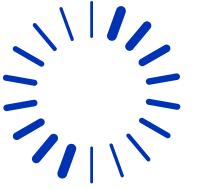
EMS initiated communication for inquiries



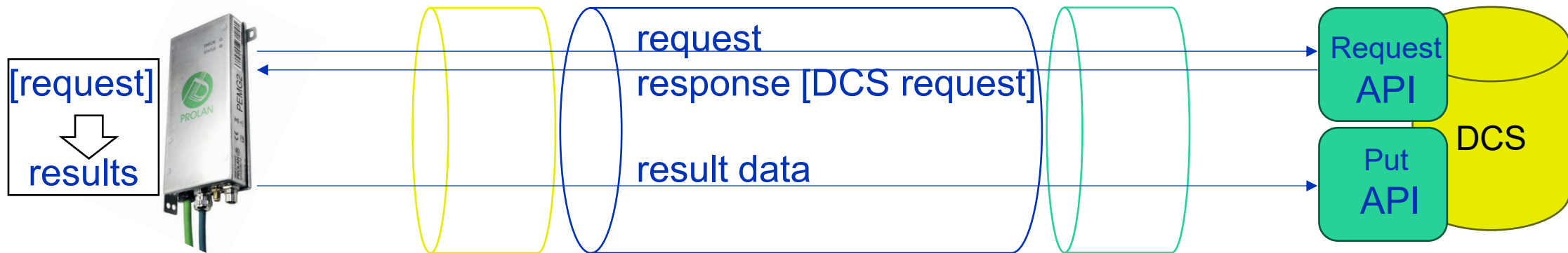
- Existing secured https communication, with optional authentication
- EMS send data (CEBD, EVENTS) to DCS periodically



EMS initiated communication for inquiries

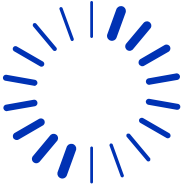


- Existing secured https communication, with optional authentication
- EMS inquires periodically the DCS for requests of data
- DCS sends request by response
- EMS act on request and send results (CEBD, EVENTS,..)



- No active build up of connection from outside the EMS necessary.
- More secured communication process.

EMS initiated communication



- EMS initiated communication is an ensured solution and more secured compared to direct ground-initiated communication.
- EMS can use SIM card without fixed IP
- High level security on EMS and DCS
- proofed cyber resilience solution (CRA)
- **Function added in normative prEN50463-4 [2026]**
4.3.6.4 HTTPS with periodic polling
- Already implemented and in progress with our customers

