

InTekTM



Presents



AGENDA

- ➔ **Konsep AMR**
- ➔ **Hirarki Sistem AMR**
- ➔ **Interface/Protokol AMR**
- ➔ **Bridging Serial to Ethernet**
- ➔ **Interface Bridging Hardware**
- ➔ **Smart GSM Modem**
- ➔ **Universal Concentrator**
- ➔ **InTek AMSR**
- ➔ **Protocol Overview**
- ➔ **DLMS Overview**

PRESENTATION

PT. Integra Teknik Asia

www.integrateknik.com

PLN UDIKLAT Semarang

07 April 2008

**Standarisasi Pengiriman Data AMR
melalui Protokol berbasis IP
pada Meter dengan Interface/Protokol Serial**



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Konsep Basic [AMR]

- **Pembacaan Meter secara berkala (harian) melalui metoda “pull”/penarikan dari Master**
- **Data yang diambil terbatas pada Energy harian, Load Profile harian dan Max Demand**
- **Menggunakan model dial-up satu arah (dial-up dari Master ke setiap Remote/Meter)**

Konsep Extended [eAMR]

- **Data dari Meter dapat juga dikirimkan dengan metoda “push” (inisiatif dari Remote)**
- **Data dari Meter digunakan juga oleh aplikasi DMS/SCADA**
 - ❖ **Low voltage network fault management,**
 - ❖ **Network analyses,**
 - ❖ **Outage & electricity quality management,**
 - ✓ **Outage durations,**
 - ✓ **Voltage swells & sags,**
 - ✓ **Over voltage & Harmonic waves**



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◆ Perangkat Meter

- Jaringan
- Customer (Perumahan & Industri)

◆ Sistem Komunikasi

- GSM/GPRS
- LAN (Cable dan Wireless)
- Dial-Up (PSTN dan GSM)
- Power Line Carrier (PLC)
- Radio Data

◆ Software Master AMR

- Protocol Driver
- Gateway
- Database

◆ Energy Process Information

- Customer Services
- Billing Metering
- Site Management
- Balance Settlement
- Network Operations



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◆ Protocols

- IEC Standards
 - ✓ IEC 62056-21 (formerly IEC 61107 / FLAG),
 - ✓ IEC 62056-53 (DLMS) / IEC 62056-62 (COSEM),
 - ✓ IEC 62056-31 (EURIDIS),
 - ✓ IEC 60870-5-101, IEC 60870-5-102
- ANSI Standards
 - ✓ ANSI C12.18, ANSI C.19
- Other Standards
 - ✓ Modbus
 - ✓ DNP 3.0
 - ✓ Proprietary

◆ Interface

- Serial (RS232 / RS485)
- Ethernet TCP/IP (hanya pada DLMS dan DNP 3.0)
- USB



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Pertimbangan pemilihan protokol berbasis IP?

- ✓ Telah digunakan secara massal
- ✓ Paling murah dibandingkan data interface lainnya
- ✓ Tersedia baik untuk infrastruktur Publik maupun Private
- ✓ Ketersediaan aplikasi/protokol Security Multi-Level



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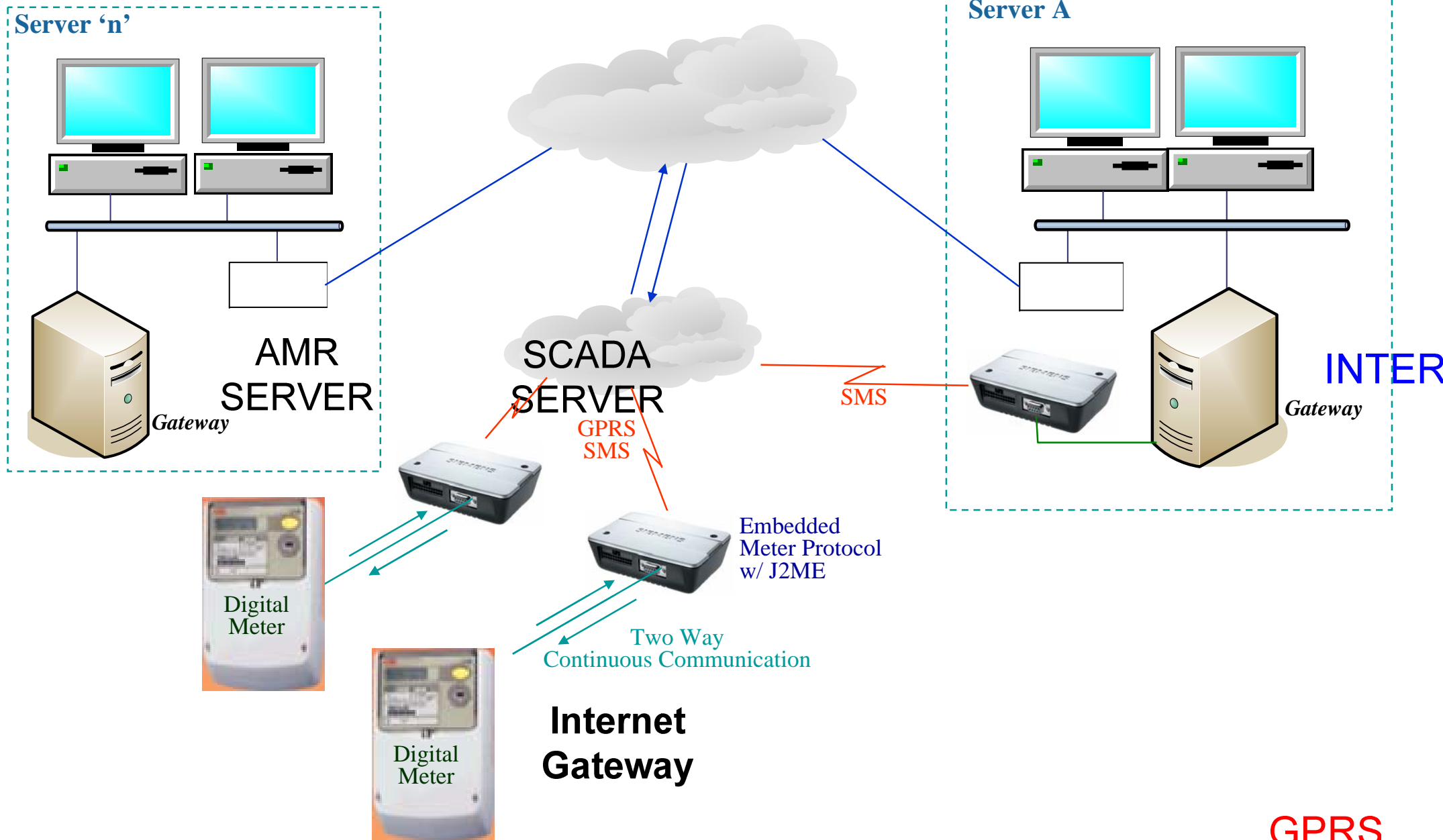
❖ **Smart GSM Modem**

- ✓ **Bridging untuk “Serial ke GSM GPRS TCP/IP”**
- ✓ **One Meter served by One Smart GSM Modem**
- ✓ **Mendukung Koneksi Multi Master melalui GSM GPRS TCP/IP**

❖ **Universal Concentrator**

- ✓ **Bridging untuk**
 - **Serial ke GSM GPRS TCP/IP**
 - **Ethernet LAN ke GSM GPRS TCP/IP**
- ✓ **Mendukung Koneksi Multi Devices/Meters dengan Multi Protocols**
- ✓ **Mendukung Koneksi Multi Masters melalui GSM GPRS TCP/IP dan juga Serial IP Dial-Up**

eAMR System with Smart GSM GPRS Modem



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Spesifikasi Hardware dan Software

General features

- Dual-Band EGSM900 and GSM1800
- Compliant with GSM phase 2/2+
- Output power:
 - Class 4 (2 W) for EGSM900
 - Class 1 (1 W) for GSM1800
- Control via AT commands
- SIM Application Toolkit
- Serial RS232 interface
- 9 GPIO's configurable as digital I/O or second serial RS232 port

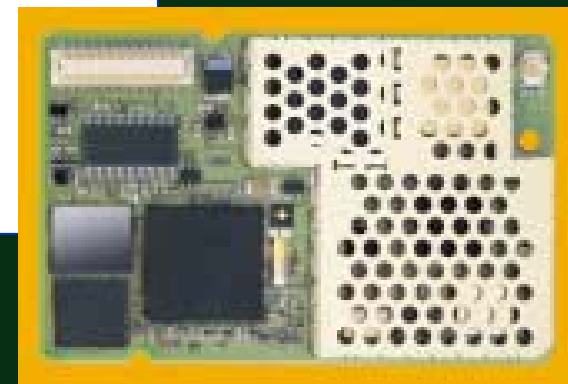


Specifications for SMS:

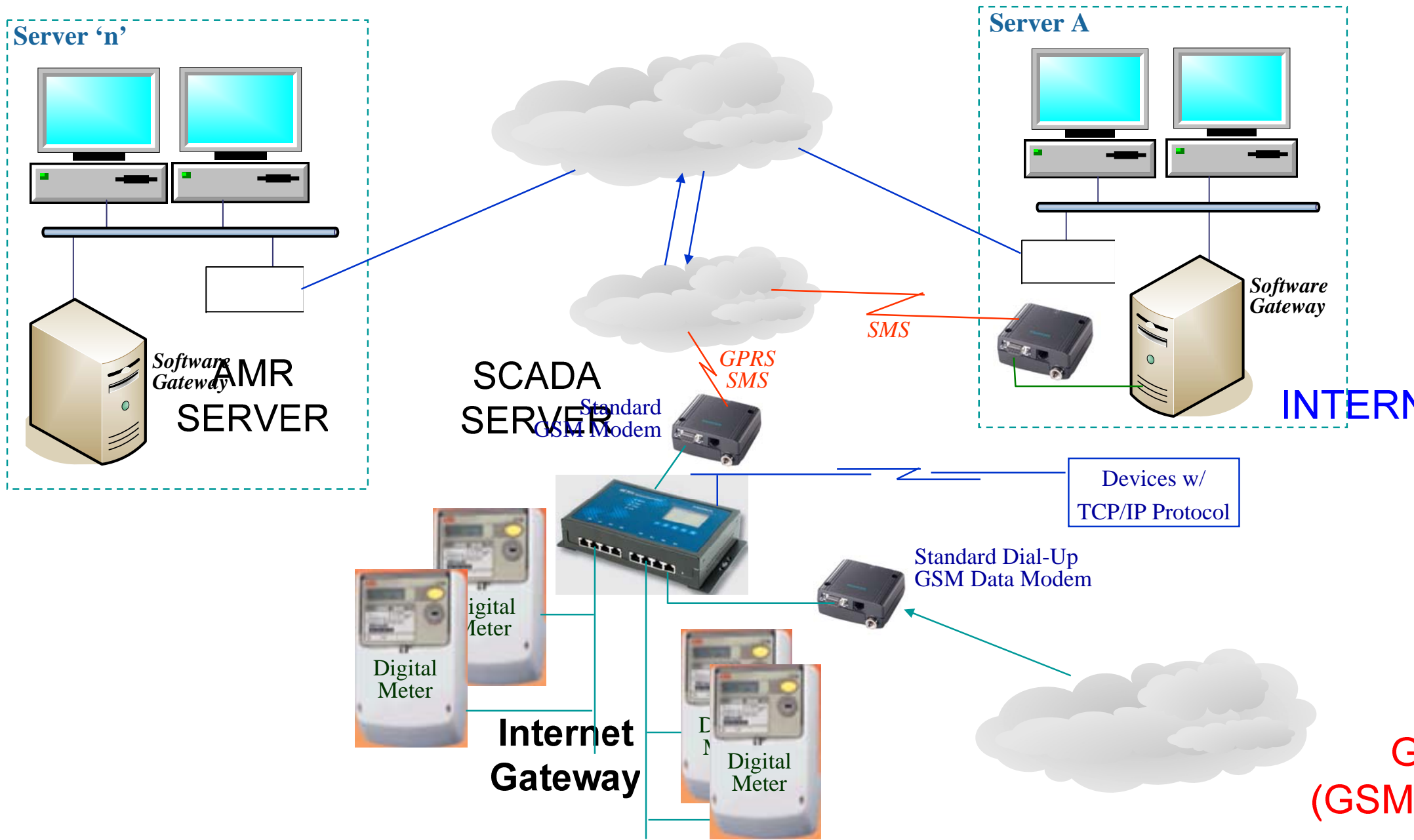
- Point-to-point MO and MT
- SMS cell broadcast
- Text and PDU mode

Open software platform:

- J2ME™
- Flash file system (300 kB)
- PC-emulator with debug environment
- CLDC 1.0 standard
- IMP 1.0 standard



eAMR System with Universal Concentrator



G
(GSM)

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Spesifikasi Hardware dan Software

- Single Board Computer (SBC) hardware
- Embedded Linux operating system



- Intel Xscale IXP-422 266 MHz Processor
- On-board 128 MB RAM, 32 MB Flash Disk
- Eight RS-232/422/485 serial ports
- Dual 10/100 Mbps Ethernet
- Optional PCMCIA/CompactFlash/Wireless LAN
- LCM display and keypad for HMI



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InTek eAMR Gateway (Remote)

- Berfungsi membaca status/value dari IED/RTU dengan Protocol Standar yang ada pada setiap Meter/IED dan mengirimkannya melalui GPRS (default) atau SMS (bilamana diperlukan).
- Periode pengiriman Load Profile melalui dapat diprogram secara periodik
- true exception untuk alarm (berdasarkan event atau limit point terlampaui)

InTek eAMR Master

- Menangani koneksi ke Gateway Remote dan penyimpanan ke database
- Interface Real-Time Data ke Sub-Sitem/Aplikasi lainnya (SCADA, dll.)
- Load Profile akan disimpan langsung ke ODBC/SQL database, proses selanjutnya akan dikerjakan oleh Billing Software
- Memberikan laporan tabular dan graphical trending dari konsolidasi laporan untuk setiap InTek eAMR Gateway (lokasi Meter)

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❑ Register-based

- ✓ Peta IO Point spesifik
- ✓ Contoh Protokol :
 - IEC 62056-21 (formerly IEC 61107 / FLAG)
 - Modbus
 - DNP 3.0

❑ Object-based

- ✓ Peta IO Point standar untuk semua Device/Meter
- ✓ Koneksi ke Multi Devices/Meters Seragam dan Transparan
- ✓ Contoh Protokol :
 - IEC 62056-53 (DLMS) / IEC 62056-62 (COSEM)
 - IEC 61850



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COSEM-DLMS

Electricity metering

Data exchange for meter reading, tariff and load control

IEC 62056-42: Physical layer services & procedures for connection-oriented asynchronous data exchange

IEC 62056-46: Data link layer using HDLC protocol

IEC 62056-53: COSEM Application layer

IEC 62056-61: Object identification system (OBIS)

IEC 62056-62: Interface classes



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TERIMA KASIH