SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

Accredited by NBA-AICTE and Accredited by NAAC – UGC with A++ Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

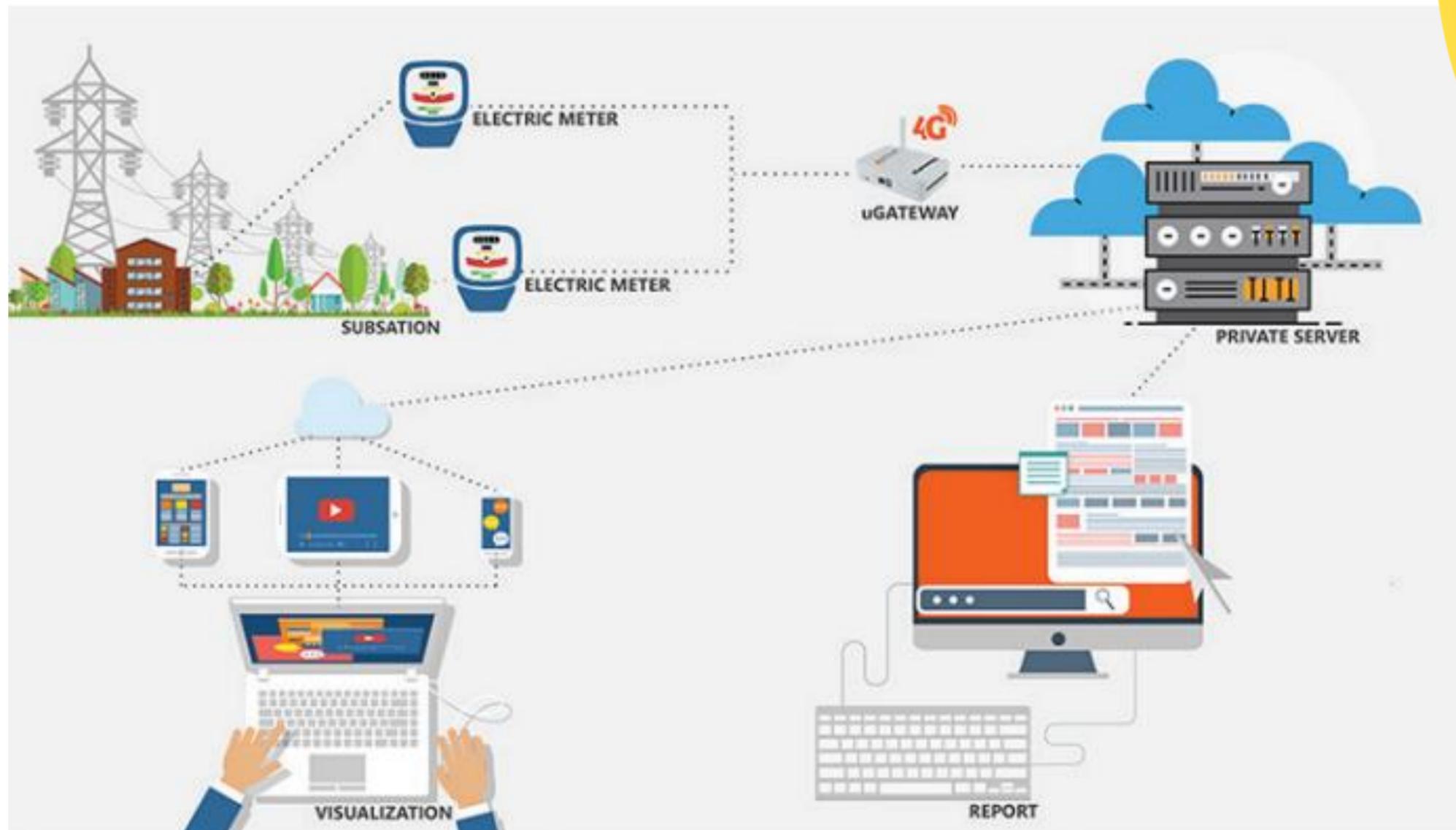## DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

UNIT 2

SMART GRID TECHNOLOGIES – AMI & AMR

19EEE308 – SMART GRIDS
III year / VI Semester

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- **Automatic meter reading (AMR)** is the technology of automatically collecting consumption, diagnostic, and status data from water meter or energy metering devices (gas, electric) and transferring that data to a central database for billing, troubleshooting, and analyzing.

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Intro..

AUTOMATIC METER READING SYSTEM

An automatic meter reading system (AMR system) enables the remote collection of consumption data from customers' utilities using connected technologies. The AMR system gathers data in real time and saves and analysis the data for various applications. The AMR system comprises management software and AMR meters for water, electricity.

AN AMR DEVICE

An automated meter reading device (AMR device) is an attachment that can be retrofit onto an existing energy meter or water meter. It turns a traditional meter into a smart electricity meter or smart water meter through the capability to send real-time data via a connected network.

AMI infrastructure and AMR infrastructure typically consists of:

• A traditional utility meter

• An AMR device retrofit onto the traditional meter

• A data network that enables the real-time transfer of information

• An automated meter reading system application (ideally cloud-based)

Compare

	AMR	Smart Meter
Communication	One-way	Two-way
Information Provided	kWh Possibly peak kWh demand	• Cumulative kWh usage • Daily usage • Peak kW demand and readings • Voltage information • Outage information • Time of use kWh and peak kW readings • Tamper notifications
Convenience	Readings are collected remotely, saving you time and hassle	Readings are collated by a third party and sent to your supplier
Budget certainty	Help with forecasting and reducing costs	Help with forecasting and reducing costs
Universal	Yes	No
Retrofit	Yes	No
Real-time	Yes	No

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TYPES OF AMR TECHNOLOGIES

TOUCH TECHNOLOGY	RADIO FREQUENCY NETWORK	HANDHELD AMR
MOBILE AMR	SATELLITE AMR	WI-FI AMR
	POWER LINE COMMUNICATION (PLC) AMR	METER-READING AMR NETWORKS

ADVANTAGES

FLEXIBLE, ACCURATE BILLING

- Billing system automation
- Eliminate human error and billing problems
- Determine economical usage patterns to inform flexible and cost-effective billing
- Eradicate the need for estimated bills
- Real-time data from meters in hard-to-access places
- An affordable, SIM-free solution

ACTIONABLE BUSINESS INSIGHTS

- Become a data-driven business
- Real-time data, analysis and reporting allows for better utility management
- Identify wastage
- Reduce your carbon footprint
- Improve your environmental credentials
- Maximise utility efficiency
- Forecast and future-proof your products and services

SIMPLIFIED SUB-METERING

- Fast and simple roll-out
- Fairer, more accurate sub-metering saves time and prevents disputes
- Improve service
- Tenants only pay for the utilities they use each month

COST-EFFECTIVENESS

- Save on utility consumption and costs
- Protect against revenue loss
- Reduce the cost of labour
- Streamline field operations
- Reduce long-term expenditure

HOW DOES THE SYSTEM WORKS?

➤ The key to the system is a device called an ERT(Encoder-Receiver-Transmitter).

➤ This device is connected directly to a special electronic register on the water meter.

➤ Normally, the ERT does nothing - it "sleeps," waiting for the meter reader to approach.

➤ The meter truck-mounted reading the device sends out a continuous "wake up" signal.

➤ When an ERT receives the signal, it checks the reading on the meter register, encodes it into a digital signal, and begins transmitting its identification number and the current reading.

HOW DOES THE SYSTEMS WORKS?(contd.)

➢ After a few minutes, the ERT stops transmitting and goes back "to sleep," waiting for the next time meter reading.

➢ The truck-mounted computer system matches the ERT identification number with the property and records the reading. At the end of the day, the meter reader unloads the information to our billing system.

➢ AMR also need Meter Interface Unit (MIU).It responds to calls initiated through the software installed on a PC. A simple three-wire hook-up from the encoded register provides input from the meters to the MIU.
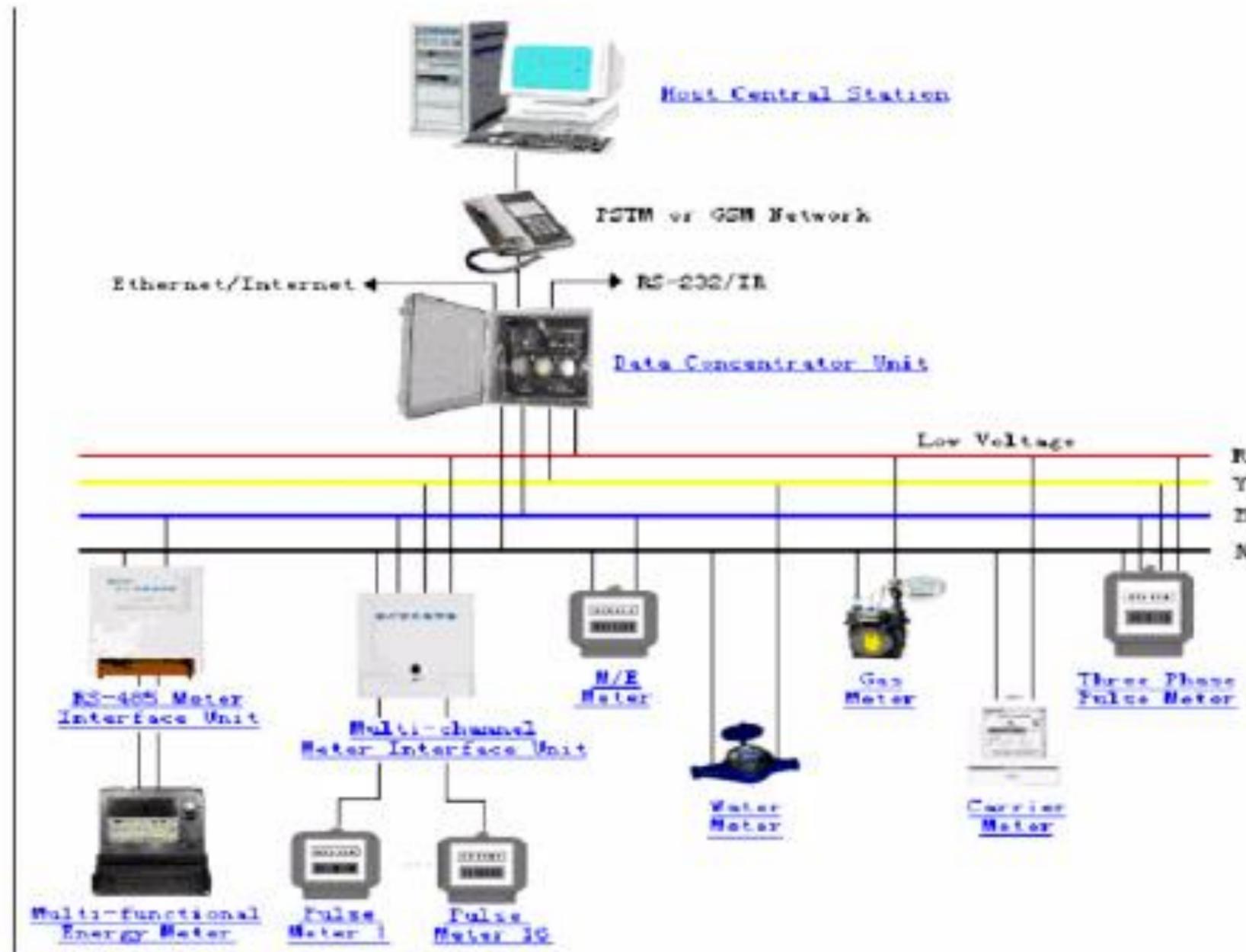
AMR SYSTEM OVERVIEW

- The remote Automatic Meter Reading (AMR) System is a host driven, multi-level network system consisting of a Host Central Station (HCS), Data Concentrator Units (DCU) and Meter Interfacing Units (MIU), with built-in flexibility and expandability.

  ➢ Host Central Station Hardware And Software Requirements(HCS).
  ➢ Data Concentrator Unit(DCU).
  ➢ Multi-Channel Meter Interface Unit(MIU).
  ➢ Single Phase Meter Interface Unit(MIU).
  ➢ Handheld Programming Unit(HPU).

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BLOCK DIAGRAM OF AMR

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Summary

Activity

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KEEP
LEARNING..
Thank u

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