Introduction of the

Automatic Meter Reading (AMR) System in Water Supplies Department (WSD)

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Automatic Meter Reading (AMR) System

The Automatic Meter Reading (AMR) System provides the metering data, status outputs and alert signals where applicable for operation and monitoring of the smart metering system.
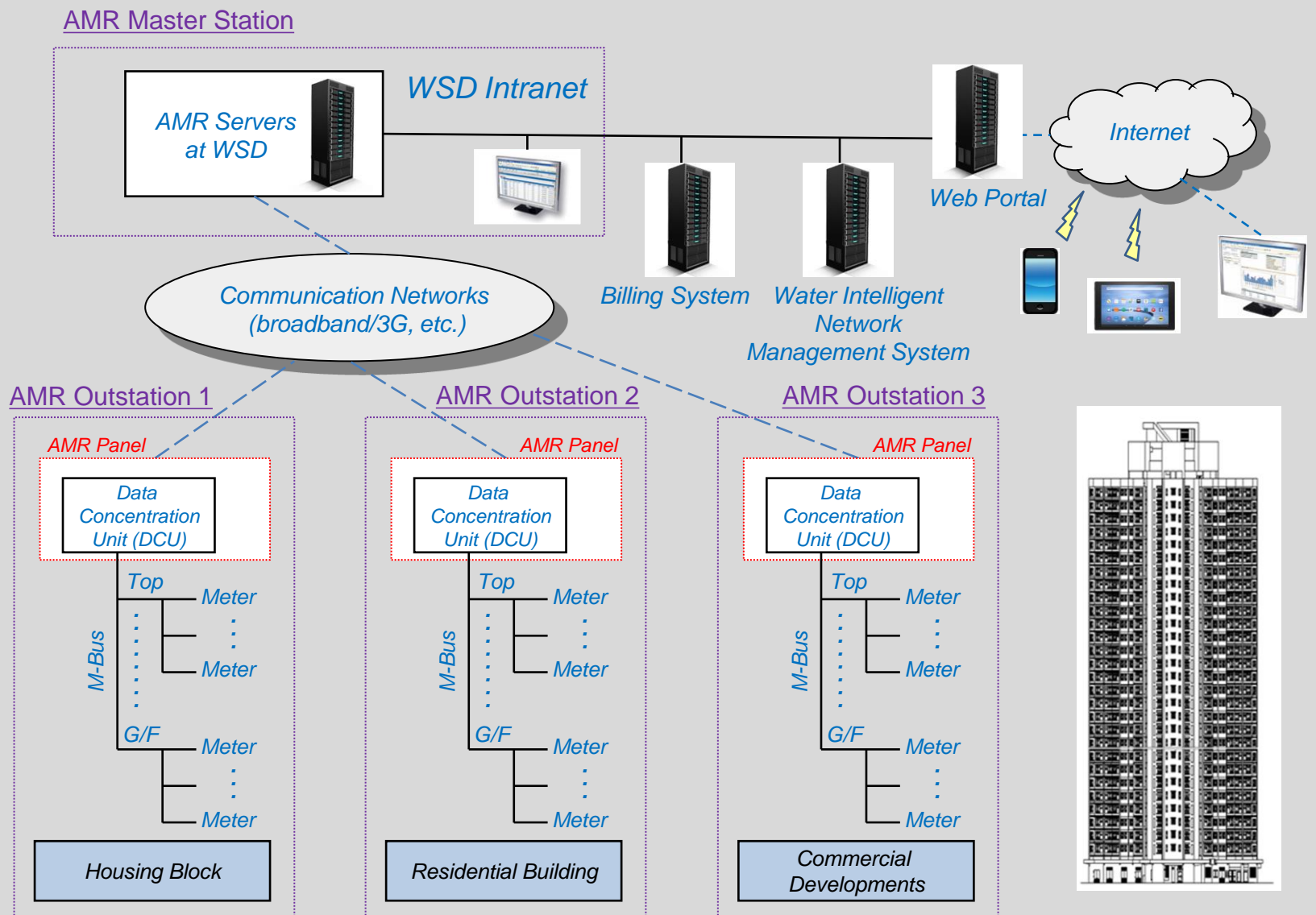
The smart water meter equipped with a meter interfacing unit (MIU) is capable of storing the meter reading and status in its internal memory for retrieval by the data concentration unit (DCU) at a preset interval via the M-Bus wires. The metering data collected by the DCU is transmitted to the master station in the WSD through broadband/3G network as deemed appropriate by the WSD for application of the smart metering system.

Automatic Meter Reading (AMR) System

The infrastructure of the system consists of AMR Master Station and AMR Outstations.

- AMR Master Station – AMR application server, database server, time sync. server, communication equipment (router/modem), workstations, etc.

- AMR Outstation – Smart water meters equipped with meter interfacing units (MIU) of mechanical water meters and/or signal converter of electromagnetic (EM) water meters, Data Concentration Unit (DCU), Programmable Logic Controller (PLC), communication equipment (router/modem), backup battery panel, etc.

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Automatic Meter Reading (AMR) System

Typical equipment at AMR Master Station

Local Workstation

Application and Database Server

Time Sync. Server

VPN Modem and 3G/4G Modem

- **Monitor and control system & equipment**

- **Displays of alarms**

- **Reporting**

- **Information display**

- **Data log**

- **Alarm log**

- **Monitor and troubleshoot networks reliably**

- **Information distribution**

- **Time sync. Outstation DCU**

- **Interface to WSD intranet**

- **Acquire GPS time**

- **Provide time sync. Function for central equipment**

- **IP based communication**

- **Public wireless communication to Outstation DCU**

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Typical equipment at AMR Outstation

Communication Equipment (router/modem)	PLC	DCU	MIU	Water Meter	Backup Battery Panel

- **IP based communication**

- **Public wireless communication to central equipment**

- **IP based communication**

- **Send alarm status of outstation**

- **Provide communication self healing function**

- **IP based communication**

- **Open M-Bus communication**

- **Send MIU alarms**

- **Send MIU data log**

- **Open M-Bus communication**

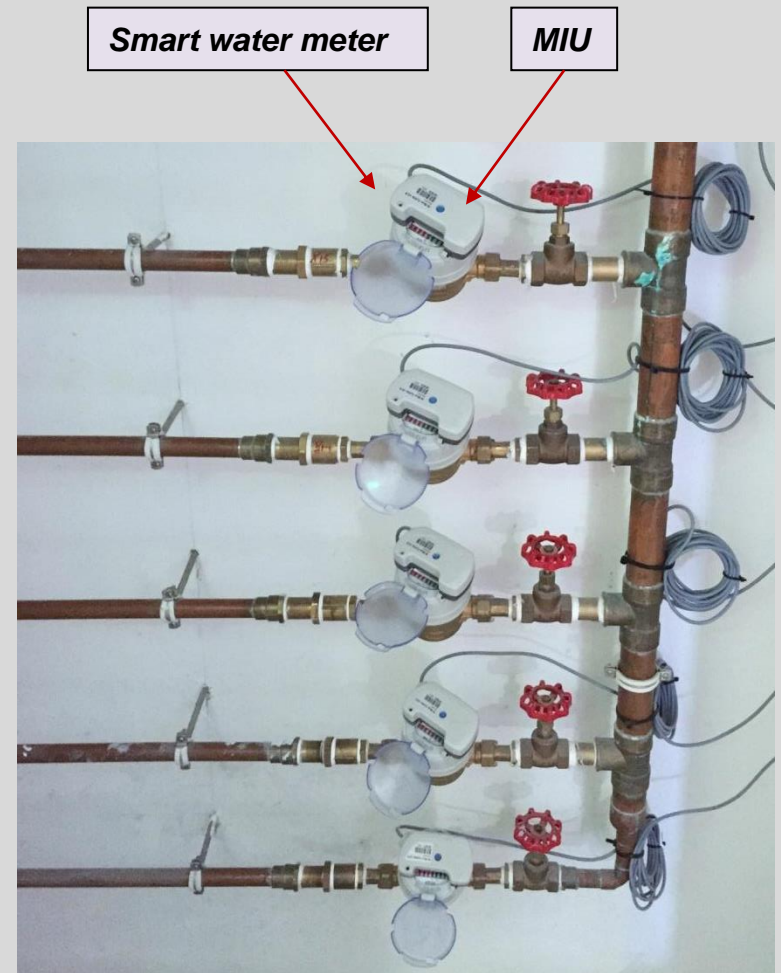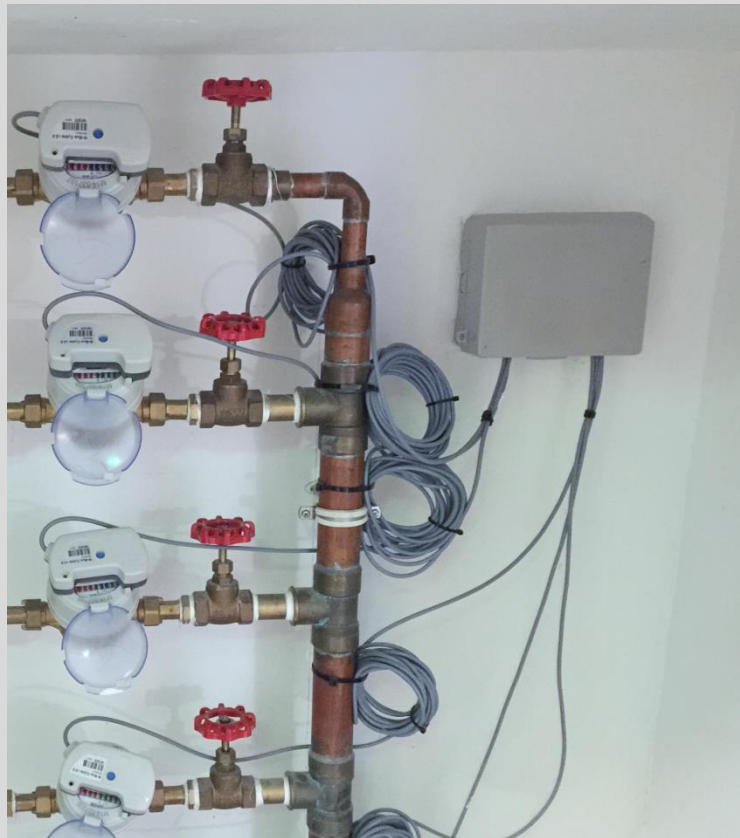- **Acquire pulse and flow from water meter**

- **Generate leakage, battery low alarm**

- **Register tenant water counter**

- **Provide power backup function in case of main supply failure**

Typical arrangement of smart water meters

Smart water meter

MIU

Typical arrangement of Electromagnetic (EM) water meter for AMR application

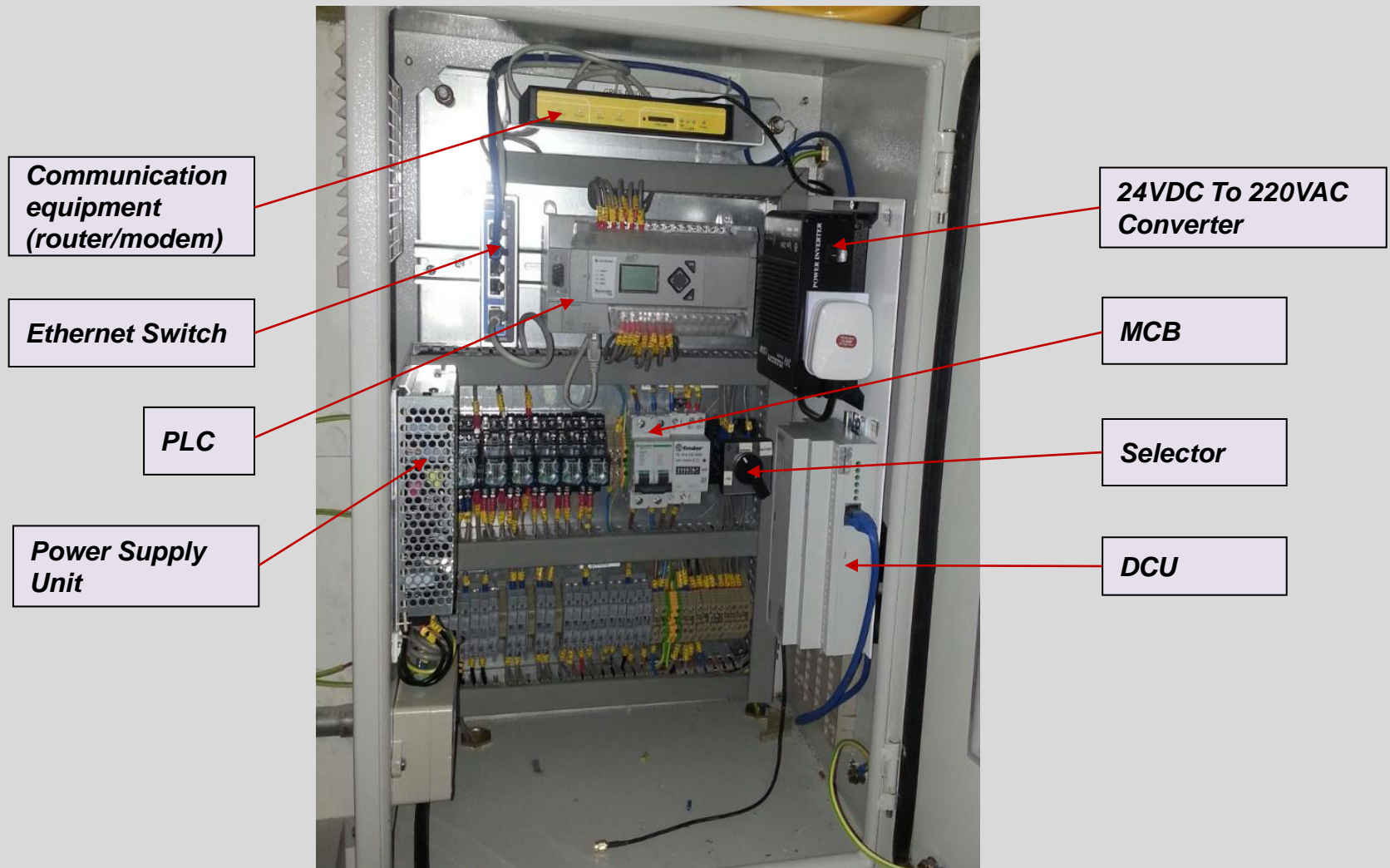EM water meter

EM water meter converter generating pulse output

Pulse to M-Bus Converter

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Typical AMR Outstation Panel

Battery Charger Panel

Battery Panel

AMR Panel

Typical Overview of AMR Panel

Communication equipment (router/modem)

Ethernet Switch

PLC

Power Supply Unit

24VDC To 220VAC Converter

MCB

Selector

DCU

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Automatic Meter Reading (AMR) System

Benefits

- Improve meter reading efficiency (i.e. automatic reading of water meters and reduce human error)

- Detection of abnormal water consumption (e.g. leakage of customers' piping)

- Better planning and management of water supplies

- Enhancing customer services through provision of timely water consumption information via Internet and mobile phone

- Ideal platform for promotion of water conservation

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