Indonesia reference meter AMI project product brochure

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V0.1	New		2024-12-06	Shawn		

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1. System overview

As shown in "Figure 1- 1 System block diagram", the entire reference meter AMI project includes four parts: Reference meter, Gateway, HES system and NMS system.

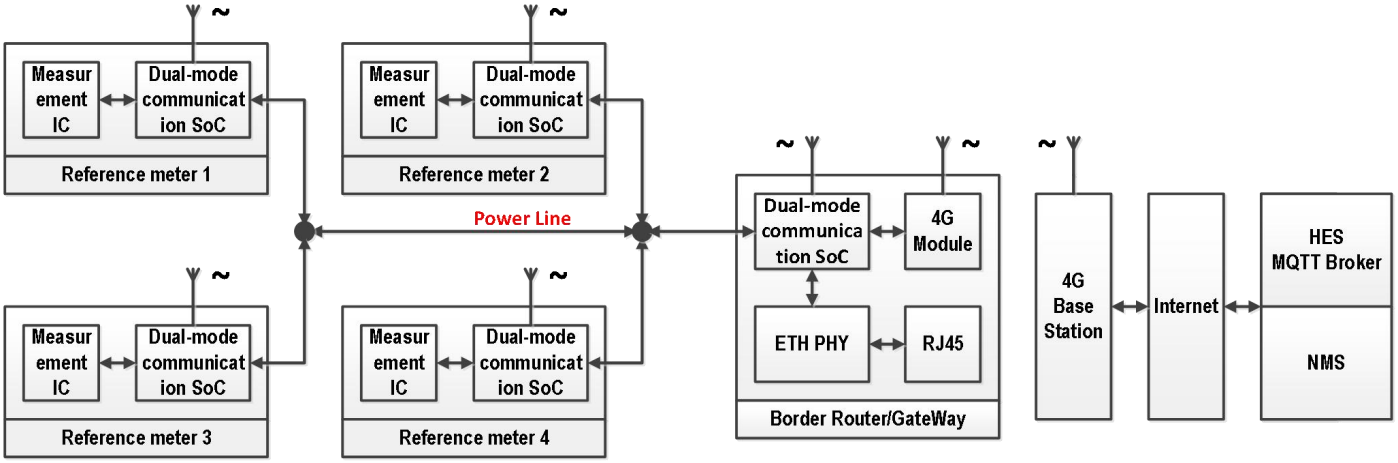


Figure 1- 1 System block diagram

2. Reference meter



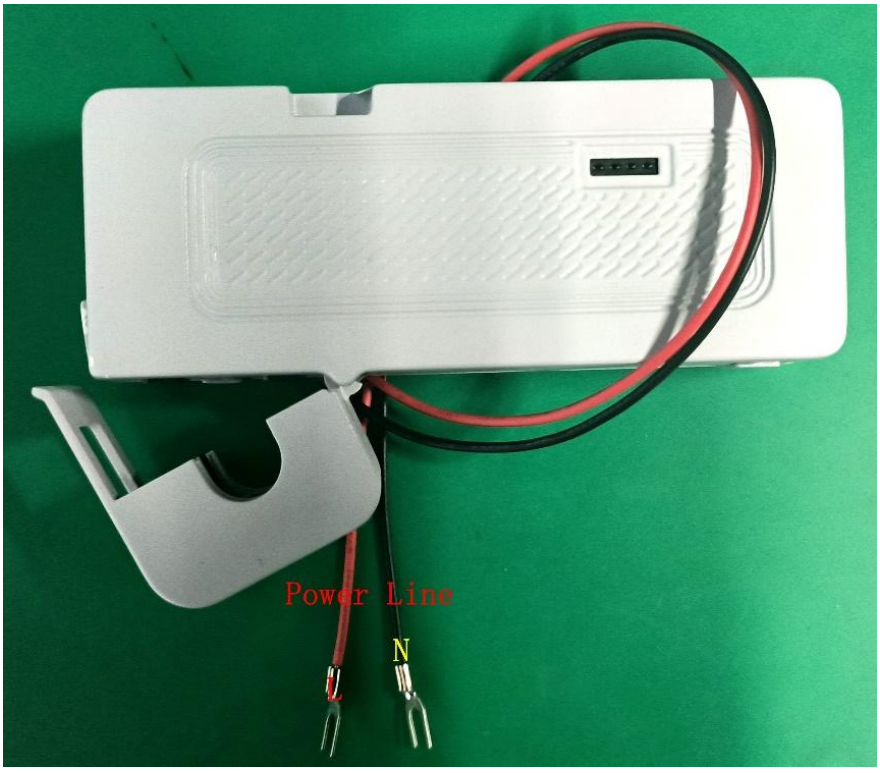


Figure 2- 2 Reference meter

HPLC technical indicators

Technical Indicators	parameter data	Additional information
Frequency range	0.2~12MHz	The default Band2: 0.781~2.930MHz
Modulation mode	OFDM	
Data Rate	93/205Kbps@Band2	Automatically adjust according to environment
Anti-attenuation	20dBμV	Typical value
Power spectral density	≤-45dBm/Hz	

RF technical indicators

Technical Indicators	parameter data	Additional information
Frequency range	920MHz ~ 923MHz	
Modulation mode	OFDM	
Transmit power	24dBm	Maximum value, power adjustable.
Data Rate	29.3kbps～375kbps	Automatically adjust according to environment.
Receive sensitivity	-115dBm@29.3kbps,	Typical value

RF Receive sensitivity - OFDM Option3(BW=200KHz)

Work Mode	RF Receive sensitivity(dBm)
PSDU MCS21	-115.0 @29.3kbps
PSDU MCS22	-114.0 @58.6kbps
PSDU MCS23	-11.5 @117.2kbps
PSDU MCS34	-108.0 @187.5kbps
PSDU MCS45	-106.5 @234.4kbps
PSDU MCS56	-101.5 @375kbps

General specifications

Item	Minimum value	Typical value	Maximum value	Unit
Storage temperature range	**-40**	**-**	**85**	**°C**
Operating temperature range	**-20**	**-**	**70**	**°C**
Operating humidity range	**5**	**-**	**95**	**%**

Reference meter function list

Function	Function description
AC power supply	AC230V, The isolation voltage is not less than 2.5KV.
Built-in antenna	The default antenna uses the built-in antenna.
Local communication network	HPLC+RF communication, hybrid adaptive networking.
Current measurement	AC230V 50Hz, Current measurement range 60A.
Voltage measuremen	AC230V 50Hz, Voltage measuremen.
Power measurement	Power measurement
Accumulated energy measurement	Accumulated energy measurement, accuracy level 1 (1%).
15 Minute Load Profile	15 Minute Load Profile
Power factor measurement	Power factor measurement
Power frequency measurement	Power frequency measurement
Phase identification	A/B/C Three-phase phase identify.
Remote OTA upgrade	Supports remote OTA upgrade. It also supports local upgrades.
UART Interface	1 UART interface for optical communication data collection.
Digital output	2 digital outputs, OC output, used to switch external relays, etc.
Digital input	2 digital inputs, OC input, internal pull-up, used to detect external switch status.

3. Gateway

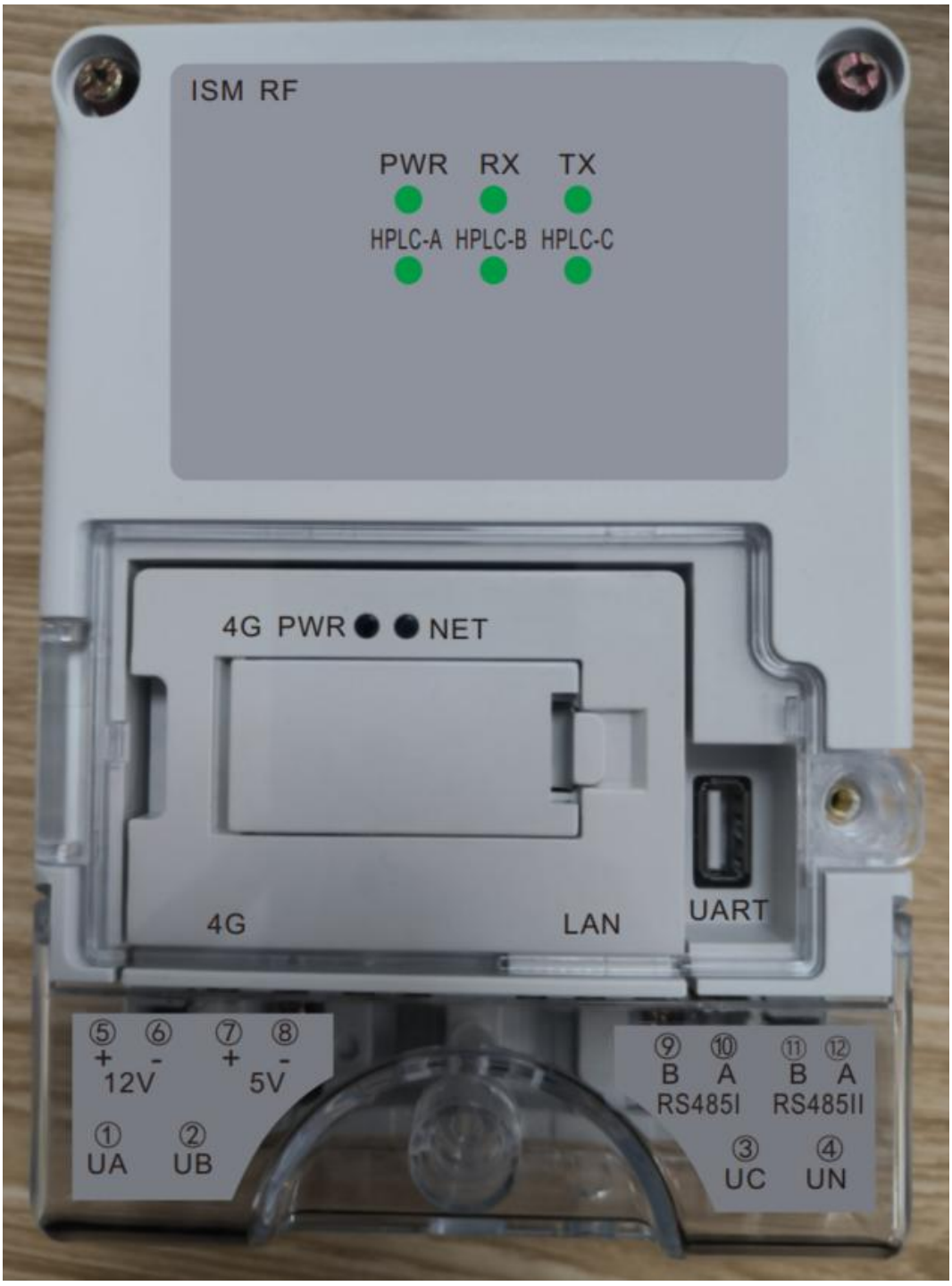


Figure 3- 3 Gateway

HPLC technical indicators

Technical Indicators	parameter data	Additional information
Frequency range	0.2~12MHz	The default Band2: 0.781~2.930MHz
Modulation mode	OFDM	
Data Rate	93/205Kbps@Band2	Automatically adjust according to environment
Anti-attenuation	20dBμV	Typical value
Power spectral density	≤-45dBm/Hz	

RF technical indicators

Technical Indicators	parameter data	Additional information
Frequency range	920MHz ~ 923MHz	
Modulation mode	OFDM	
Transmit power	26dBm	Maximum value, power adjustable.
Data Rate	29.3kbps～375kbps	Automatically adjust according to environment
Receive sensitivity	-115dBm@29.3kbps,	Typical value

RF Receive sensitivity - OFDM Option3(BW=200KHz)

Work Mode	RF Receive sensitivity(dBm)
PSDU MCS21	-115.0 @29.3kbps
PSDU MCS22	-114.0 @58.6kbps
PSDU MCS23	-11.5 @117.2kbps
PSDU MCS34	-108.0 @187.5kbps
PSDU MCS45	-106.5 @234.4kbps
PSDU MCS56	-101.5 @375kbps

General specifications

Item	Minimum value	Typical value	Maximum value	Unit
Storage temperature range	**-40**	**-**	**85**	**°C**
Operating temperature range	**-20**	**-**	**70**	**°C**
Operating humidity range	**5**	**-**	**95**	**%**

Gateway function list

Function	Function description
AC power supply	AC230V, The isolation voltage is not less than 2.5KV.
Antenna	Local communication and 4G module antennas use SMA.
Local communication network	HPLC+RF dual-mode communication, hybrid adaptive networking.
Local network size	The maximum number of nodes supported by a single network is 1024, and the network layer supports up to 15 layers.
Local network configuration	HPLC Band: B0 - B8, frequency band configuration. RF wireless frequency point configuration: 920MHz - 923MHz.
Remote communication network	Use 4G network, MQTT data protocol, 1376.2 NMS protocol.
Remote network configuration	1. 4G module: APN, user, password. 2. NMS: domain name/IP, port. 3. NTP: domain name/IP, port (default 123). NTP time correction. 4. MQTT Broker: domain name/IP, port, and backup server: IP, port.
Phase identification	A/B/C Three-phase phase identify and report.
Data collection and push	Collect all metering data and push it to MQTT Broker regularly.
Remote OTA upgrade	Supports remote OTA upgrade. It also supports local upgrades.
RS485 interface	Two RS485 interfaces, support Modbus protocol, support DLMS and other data acquisition protocols.
Ethernet Port	1 100Mbps Ethernet port for local maintenance and configuration.

4. NMS

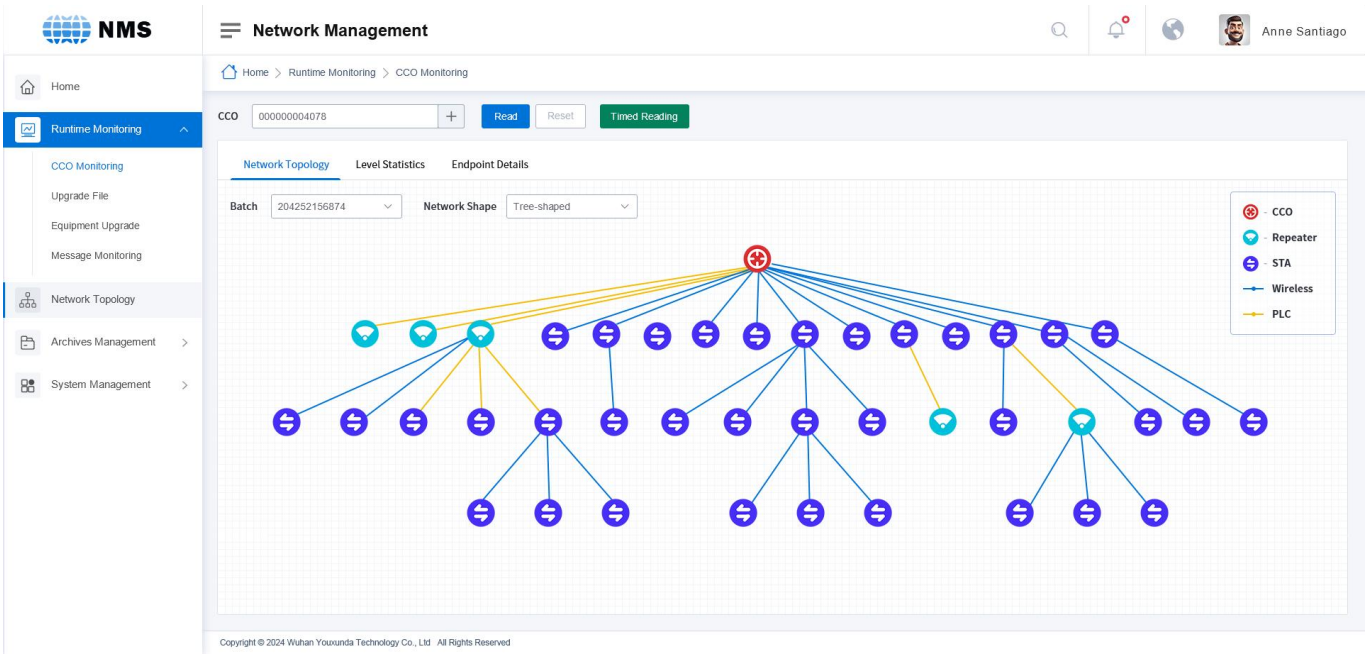


Figure 4- 4 NMS System

NMS system functions include: dashboard, gateway local network parameter monitoring, gateway remote network parameter monitoring, device remote OTA upgrade, network topology analysis, basic data maintenance and system management, etc.

● Home page: Real-time statistics and display of the installation and deployment of on-site equipment, the network online status of the equipment, statistical analysis of application layer communication success rate through different dimensions, abnormal event reporting, and time trends of various network indicators, etc.

● Operation monitoring: supports the allocation of management areas, management equipment and system operation permissions to operation and maintenance personnel according to different user permissions. Local and remote network parameter control, remote equipment upgrade, etc. can be performed on the equipment according to permissions.

● Network topology: Query the gateway network topology, and statistically analyze network link routing, hierarchy and other information.

● Data management: The system supports a vertical structured management model for area, gateway, relay and reference meter data. Supports assigning management area, management equipment and system operation rights to operators according to different user rights.

● system management: manage system user accounts, user permissions, data dictionary, logs and other information.