REDZ
SMART COMMUNICATION

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LKM655 MODBUS TCP to IEC62056-21 Protocol Meter Gateway

with 2 x 10/100Base-T(x) Ports,
1 x RS232 and 1 x RS485 Serial Ports
BPL (Broadband Power Line Link)

Main Features

- Supports 2 x 10/100Base-T(X) ports + 1 x BPL link
- Wide Range 3 phase input,
  110V–240V/50-60Hz wide range Power Input
- Supports up to 30Mbps PHY rate on BPL with
  Up to 10 hops and 1000 nodes
- Up to 432 sub-carriers from 2 to 28MHz
  analog bandwidth on BPL
- Support LDPC-C FEC with 128-bit AES core on BPL
- Supports Full/Half-Duplex
  auto MDI/MDI-X on each port
- Supports 1 x RS232 and 1 x RS485
  Serial Connection up to 115200 Baud
- Embedded web interface for ease of use
- 2 different Gateway Operating Modes:
  Serial IEC Meter to Modbus TCP Gateway
    with MQTT Publisher
  TCP/IP IEC Meter to Modbus RTU Gateway
    with MQTT Publisher
- Up to 20 IEC Meter reading and
  conversion of their data to
  Modbus TCP or RTU conversion
- Reading up to 48 OBIS Registers and
  all are user configurable from web interface
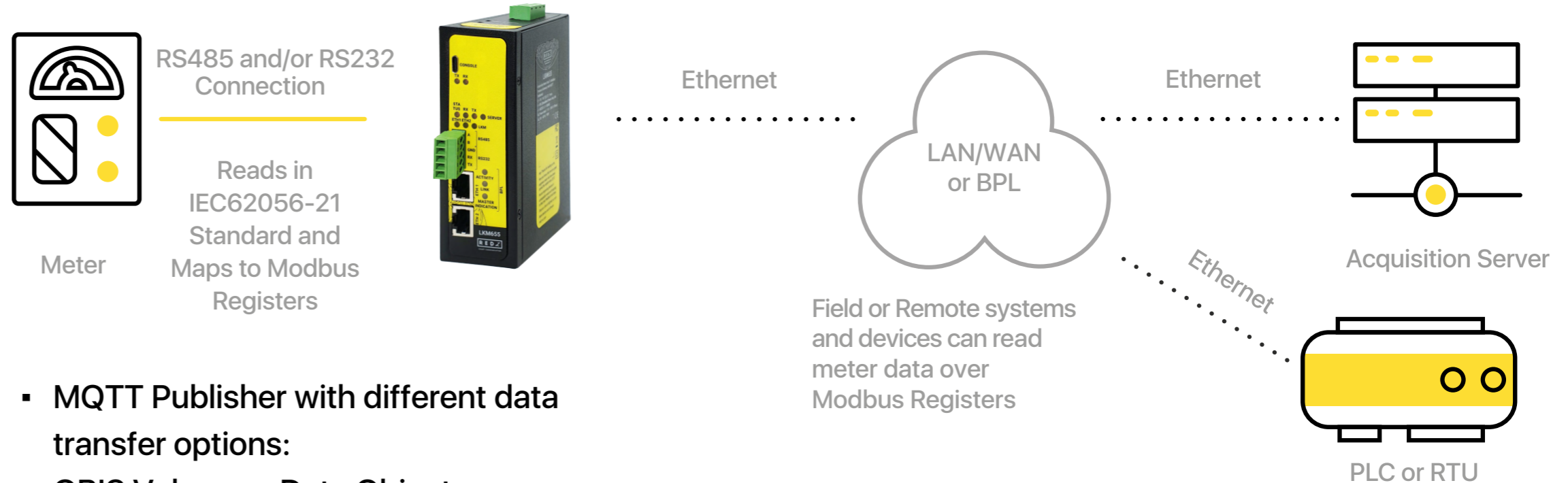
- MQTT Publisher with different data
  transfer options:
  OBIS Values as Data Objects
  OBIS Values as Modbus Frame
- Easy to follow Meter Reading and
  Modbus Communication status
  from web interface
- Easy to follow OBIS to Modbus mapping
  status from web interface
- Easy to follow Meter Read Out Data from
  web interface
- White List or Black List based IP filter
  up to 20 IP Addresses
- Firmware Upgrade over Web
- Wide operating temperature range
  from -40 to 85 °C
- Rugged Metal IP-40 housing design
- DIN-Rail mounting

RS485 and/or RS232 Connection

Reads in IEC62056-21 Standard and Maps to Modbus Registers

Meter

Ethernet

LAN/WAN or BPL

Ethernet

Field or Remote systems and devices can read meter data over Modbus Registers

Acquisition Server

Ethernet

PLC or RTU

The meters that supports IEC62056-21 standard has read out tables that has several data such as import energy, export energy, phase voltages and currents. LKM Series Modbus to IEC62056 - 21 Protocol Gateway automatically reads that values and maps to Modbus registers. Field devices or software systems can easily read data over Modbus protocol so that energy meter reading can easily be integrated to field automation or monitoring systems without need of IEC62056-21 protocol implementation.

Technical Details

Meter Reading Details

Up to 20 meters can be read and mapped to Modbus Registers

Serial Interface	Freely selectable serial interface for each meter in list RS232 RS485
Baud Rate	Freely selectable start baud rate for each meter in list 300 600 1200 2400 4800 9600 19200 38400 57600 115200
Table Code	Freely selectable reading table code for each meter in list

Init String Count and String Itself	Freely definable init string for each meter in list If meter needs an init string to "wake up", user can define the string itself and number of times that it will be sent
Query Interval	Freely selectable query interval for each meter in list That depends on meter reading list, since each meter will be read 1 by 1 over RS485 bus (or directly from RS232), reading interval depends on number of meters in list and read out reading time for each meter (based on its read out list)
Time Out	Freely selectable time out value for each meter in list LKM will continue with next meter in list in case there is no response from meter in predefined time out duration
OBIS Codes	Up to 48 OBIS codes can be defined and enabled to be read from all meters in list User can open 2 web pages side by side and check readout list from meter and simply add OBIS codes to LKM as per need

MODBUS Characteristics

Up to 20 meters can be read and mapped to Modbus Registers

Up to 48 OBIS values can be mapped into Modbus Registers

Gateway Modbus Address	Default value is 1 User can change from web interface
Modbus Data and Addresses	Data can be read via Function Code 3 Read Holding Registers (4x) all registers are "long" data

Adress of 1st Meter Data:

Hex: 0x00 00
Decimal: 0
Quantity: 96 (only available if 48 registers are enabled, it changes based on enabled regsiters quantity)

Adress of 2nd Meter Data:

Hex: 0x01 00
Decimal: 256
Quantity: 96 (only available if 48 registers are enabled, it changes based on enabled regsiters quantity)

Adress of 3th Meter Data:

Hex: 0x02 00
Decimal: 512
Quantity: 96 (only available if 48 registers are enabled, it changes based on enabled regsiters quantity)

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Adress of 20th Meter Data:

Hex: 0x13 00
Decimal: 4864
Quantity: 96 (only available if 48 registers are enabled, it changes based on enabled regsiters quantity)

MQTT Details

MQTT Publisher can be enabled and can be used in parallel with Modbus conversion (or stand alone)

MQTT Connection	Broker IP and Port can be entered Client ID , User name and Password can be set Publish Topic and Subscribe Topic can be defined from web interface
Data Send Interval	User can send Data send interval in seconds Default is 60 seconds and LKM will send meter data to MQTT server in that interval
NTP Server	NTP server time will be added to each MQTT message
Data Format	There are 2 predefined formats OBIS Values As Objects: Sends OBIS values and then mapped values in ASCII readable fromat OBIS Values as Modbus Frame: Send just like the response of Modbus query as hex data (smaller data size)

WEB Monitoring Details

Meter Communication Status	User can see reading status of each meter in reading list Last Query Time and Last Serial Package also available in this list
Modbus Communication Status	User can see reading status of each Modbus client connected Last Query Time and Last Received and Sent Packages also available in this list
Meter Reading to Modbus Mapping (Gateway) Status	User can see modbus mapping status of each meter in reading list Data can be checked in realtime or status can be set for any specific meter in list Ex: Show mapping status of Meter Number 2 in meter reading list only
Data Format	There are 2 predefined formats OBIS Values As Objects: Sends OBIS values and then mapped values in ASCII readable fromat OBIS Values as Modbus Frame: Send just like the response of Modbus query as hex data (smaller data size)
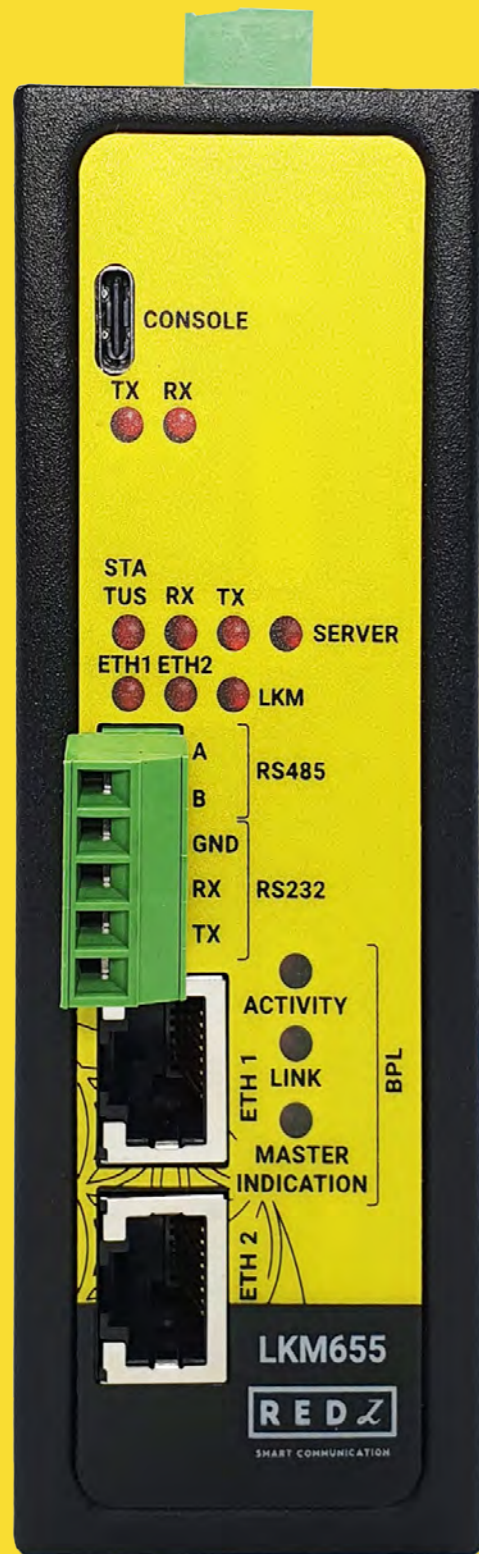
Connectors and Ports

Console Port	Micro USB or USB Type-C connection for LOG in 115200 baud
10/100T(X) RJ45 Ports	Ethernet Connection on 2 ports
Serial Ports	5 pin wired Terminal Connection Tx, Rx, GND for RS232 A and B for RS485
Reset Buttons	Reset to Client and Reset to Server Operating modes buttons

LED Indicators

Power indicator	Power LED
10/100T(X) Indicators	Activity LEDs: ETH1, ETH2 and LKM (Activity of device itself)
System Indicators	Status LED, Tx and Rx of data LEDs and Server LED (LED ON: Server Operating Mode, LED OFF: Client Operating Mode)
Console Indicators	Tx and Rx of data LEDs
BPL LEDs	Activity, Link and Master Indication LEDs (LED On: Master, LED OFF: Slave)

Power

Input Range	3 Phase Input, 110V–240V/50-60Hz
Power and Data	AC Power supply use L1-N only. Phase 2-3 connections are used for BPL signal transmission.

Physical & Environmental Characteristics

Enclosure	Metal, IP 40
Dimensions	43 x 95 x 124 (w x d x h) mm
Weight	~400gr
Storage Temperature	-65 to 150 °C
Operating Temperature	-40 to 85 °C
Operating Humidity	5% to 95% Non-condensing

LKM655
MODBUS to IEC62056-21 Protocol Meter Gateway,
2 x 10/100 T(x) ETH ports, 1 x RS232 & 1 x RS485,
3 Phase AC Power Input, 110V–240V/50-60Hz

Product Selection

Model	5-48V (max. 60V) DC Power Input	100 – 240V AC (120 – 370V DC), 50Hz to 60Hz AC Power Input	3 Phase AC Power input, 110 V – 240 V / 50 – 60 Hz AC Power Input	Read Meters and Convert Data to Modbus	OBIS Codes to look for can be changed by user	Web Interface for monitoring meter reading status and much more	BPL (Broadband Power Line) Link
LKM154	●			●	●	●	
LKM254		●		●	●	●	
LKM655			●	●	●	●	●

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