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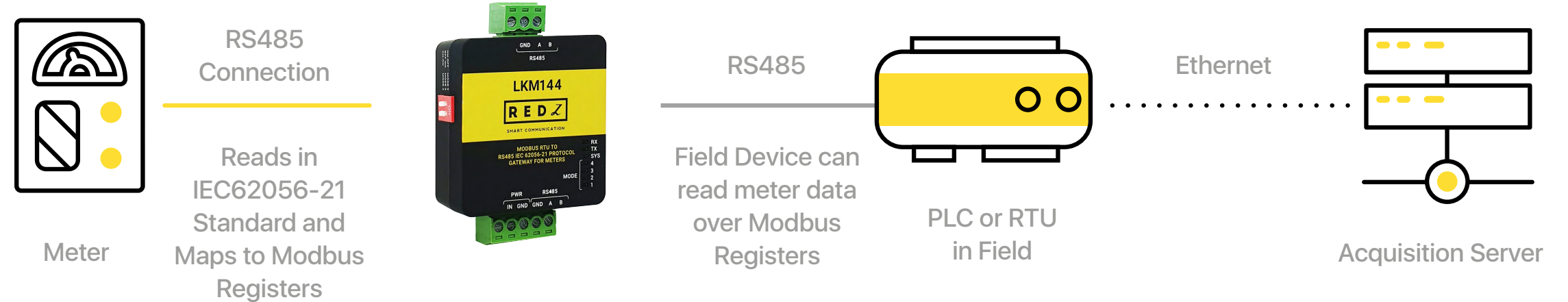# LKM Series Electricity Meter Protocol to Modbus Protocol Gateways

IEC 62056-21 and P1 Companion Standard Protocol Options

With RS485 and/or RS232 Connection Options
On Meter and Modem Side

Main Features

- Auto reads Electricity meters that communicates in IEC62056-21 standard or P1 Companion Standard and maps in predefined MODBUS register table
- Configurable Modbus address via Modbus Commands
- Configurable Reading Period on IEC6056-21 side via Modbus Commands
- Configurable Reading Table Number on IEC6056-21 side via Modbus Commands
- Wide range power input: 5V – 24V (max. 28V) DC
- Wide operating temperature range from -40 to 85 ℃
- Very Small form factor, only 2.1 x 4.2 x 4.4cm
- Customization of reading process and register tables based on client request
- Firmware upgradable over serial line

Meter — RS485 Connection — Reads in IEC62056-21 Standard and Maps to Modbus Registers

LKM144

RS485 — Field Device can read meter data over Modbus Registers

PLC or RTU in Field

Ethernet

Acquisition Server

The meters that supports IEC62056-21 and P1 Companion standard has read out tables that has several data such as import energy, export energy, phase voltages and currents. LKM Series Electricity Meter to Modbus Protocol Gateways automatically reads that values and maps to Modbus registers. Field devices or software systems can easily read data over Modbus RTU protocol so that energy meter reading can easily be integrated to field automation or monitoring systems without need of IEC6056-21 protocol or P1 Companion Standard implementation.

LKM614 is especially designed for EMH LZQJ-XC meters and it is direct replacement for Variomod XC modules.

LKM614 Features

- Especially plug and play designed for EMH LXQJ-XC meters
- Direct replacement for Variomod XC modules for EMH meters
- Gets power directly from meter
- Serial interface directly connected to meter (with 15kV ESD protection)

RS485 Serial Connection

Meter Reading System

EMH Meter with LKM 614

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Technical Details

Interface and Indicators

RS232 Connector	Terminal Connector for 3 wire RS232 connection Tx-Rx-GND
RS485 Connector	Terminal Connector for 2 wire RS485 connection A - B and GND can be used as well.
P1 Interface	Terminal Connector for 3 wire P1 Companion Standard connection: Data, Data Request and GND. Power input pins can be used to get power from P1 Interface.
Operation Mode Selection Switch	Selects the operating mode of the device

Mode Selection	Modem Side Communication Parameters	Meter Side Communication Parameters
Mode 1 (LED 1 ON)	19200 8N1	Starts with 300 baud rate and changes during transmission to target baud rate based on IEC62056-21 protocol
Mode 2 (LED 2 ON)	9600 8N1	Starts with 300 baud rate and changes during transmission to target baud rate based on IEC62056-21 protocol
Mode 3 (LED 3 ON)	19200 8N1	19200 7E1 Fixed
Mode 4 (LED 4 ON)	9600 8N1	9600 7E1 Fixed

	Modem Side Connection	Meter Side Connection	Meter Side Protocol
LKM111	RS232	RS232	IEC62056-21
LKM114	RS485	RS232	IEC62056-21
LKM124	RS485	P1 Interface	P1 Companion
LKM141	RS232	RS485	IEC62056-21
LKM144	RS485	RS485	IEC62056-21
LKM614	RS485	Meter Own Interface (Directly connects to Meter)	IEC62056-21

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Indicators

LED Indicators   Following LEDs available to show system status.
1 – Mode 1 LED
2 – Mode 2 LED
3 – Mode 3 LED
4 – Mode 4 LED
5 – System LED: Blinks every second
6 – Tx LED: Sending data from Modem Side to Meter Side
7 – Rx LED: Receiving data from Meter Side to Modem Side

Firmware Upgrade

Upgrade over Serial Line   **Available from Modem side Serial Line**
Ex: RS485 on LKM144

Device must be on operating mode 19200 8N1 for firmware upgrade process.

Modbus RTU and IEC62056-21 Characteristics

Modbus RTU Address	Default value is 0x01 Changeable via Modbus Command
Reading Period on IEC62056-21 Protocol Meter Side	Default Value is 10 (in seconds) Changeable via Modbus Command
IEC62056-21 Protocol Meter Read Out Table	Default value is 0x30 = '0'in ASCII Changeable via Modbus Command
IEC62056-21 Protocol Meter Reading Method	Reads each line of table and registers data during reading
IEC62056-21 Protocol Meter Read Out Data	Date, Time Import and Export Active Energy Import and Export Reactive Energy Reactive Energy in 4 Quadrants Import and Export Maximum Demands Active Power Phase Currents for each phase Phase Voltages for each phase Frequency Error Code Extendable/Changeable via firmware change
Monitoring Parameters	IEC Read counter Time Counter (in seconds) FW Version Query via Modbus Commands

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Power

Power Input	5V - 24V DC
Reverse Polarity Protection	Available
Thermal Shutdown Protection	Available

Power – LKM614

Power Input	Gets power directly from Meter

Power - LKM124

Power Input	Same with 5-24V DC models Can also be get from P1 Standard Interface

Physical & Environmental Characteristics

Enclosure	ABS, IP40
Dimensions	21 x 42 x 44 (h x w x d) mm
Weight	~ 60 g
Storage Temperature	-55 to 125 °C
Operating Temperature	-40 to 85 °C
Operating Humidity	5% to 95% Non-condensing

Physical & Environmental Characteristics – LKM614

Enclosure	ABS, IP51
Dimensions	105 x 45 x 27 (h x w x d) mm
Weight	~ 60 g
Storage Temperature	-55 to 125 °C
Operating Temperature	-40 to 85 °C
Operating Humidity	5% to 95% Non-condensing

Ordering Information

LKM111: Electricity Meter Protocol to Modbus RTU Protocol Gateway, Modem Side RS232 and Meter Side RS232, 5-24V DC Power Input

LKM114: Electricity Meter Protocol to Modbus RTU Protocol Gateway, Modem Side RS485 and Meter Side RS232, 5-24V DC Power Input

LKM124: Electricity Meter Protocol to Modbus RTU Protocol Gateway, Modem Side RS485 and Meter Side P1 Interface, 5-24V DC Power Input

LKM141: Electricity Meter Protocol to Modbus RTU Protocol Gateway, Modem Side RS232 and Meter Side RS485, 5-24V DC Power Input

LKM144: Electricity Meter Protocol to Modbus RTU Protocol Gateway, Modem Side RS485 and Meter Side RS485, 5-24V DC Power Input

LKM614: Electricity Meter Protocol to Modbus RTU Protocol Gateway, Modem Side RS485 and Meter Side is Direct Connection to Meter, Powered from Meter Interface

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Product Selection

Model	5-24V DC Power Input	Plug into Meter and Play, No external Power Needed	Operating Mode Selections	Modem Side RS232 Connection	Modem Side RS485 Connection	Meter Side RS232 Connection	Meter Side RS485 Connection	Meter Side P1 Companion Standard	IEC62056-21 Protocol	P1 Companion Standard	Firmware Upgrade Over Serial Line
LKM111	●		●	●		●			●		●
LKM114	●		●		●	●			●		●
LKM124	●		●		●			●		●	●
LKM141	●		●	●			●		●		●
LKM144	●		●		●		●		●		●
LKM614		●	●		●				●		●