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# CKL Series Serial to Ethernet Gateway

**Serial to Ethernet Transparent Gateway Function**  
**Modbus TCP/RTU Protocol Gateway Function**  
**Modbus TCP/RTU Scheduler with MQTT Data Send Function**

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



CKL Series Serial to Ethernet Gateway is one device with 6 different functions.

**Serial to Ethernet Transparent Gateway Function:**

It can work in TCP Server mode so that TCP client devices can connect to CKL and CKL will act as transparent gateway between TCP devices and field serial devices.

It can work in TCP client mode and CKL can automatically connect remote TCP devices and act as transparent gateway between field serial devices and remote TCP devices.

**Modbus TCP/RTU Protocol Gateway Function:**

Modbus TCP master devices can connect to CKL and CKL will act as converter between Modbus TCP master devices and field Modbus RTU serial devices. Also Modbus RTU master devices can connect to CKL and CKL will act as converter between Modbus RTU master devices and field Modbus TCP devices by connecting them via Modbus Address to Target TCP IP List.

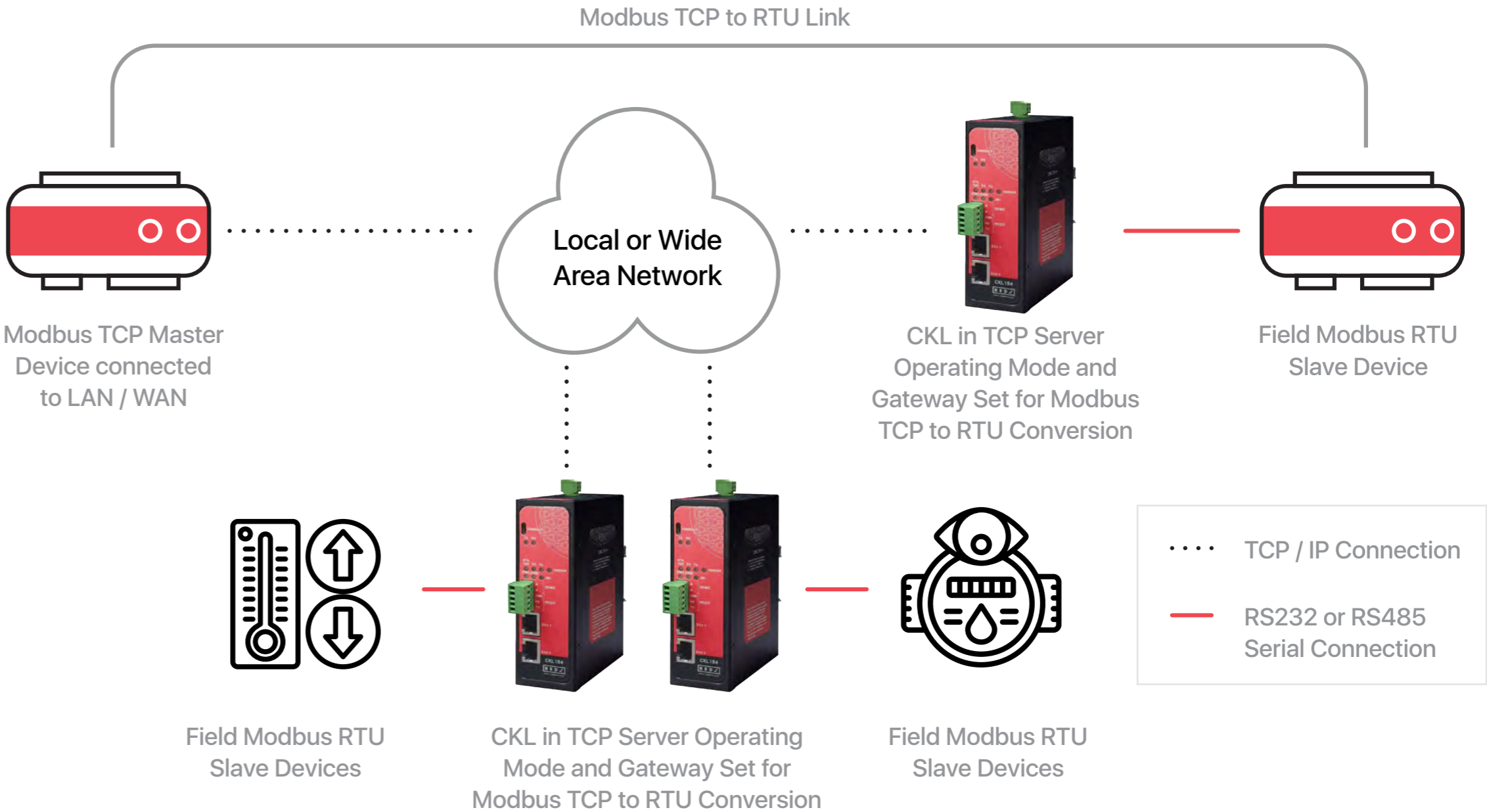
**Modbus TCP/RTU Scheduler with MQTT Data Send Function:**

CKL can read field Modbus TCP or Modbus RTU devices based on predefined Modbus list and send

read Modbus data to MQTT server based on predefined period. Up to 64 Modbus commands can be defined. This functions are not available in LITE Models.

Typical applications: Automated Meter reading, Home – Building – Industrial Automation, Remote Control, Remote I/O, Telemetry...

CKL series with Broadband Power Line (BPL) link allows device to communicate with full transparent TCP/IP standard over Low Voltage power lines and allows easy connection between TCP/IP based terminals without use of extra cables.



# Main Features

- Supports 2 x 10/100Base-T(X) ports
- Supports Full/Half-Duplex, auto MDI/MDI-X on each port
- Supports 1 x RS232 and 1 x RS485 Serial Connection up to 460800 Baud
- Embedded web interface for ease of use
- **6 Different Device Functions:**

**Serial to Ethernet Transparent Gateway Function:** Act as transparent gateway between TCP Master and Serial devices or TCP slave and Serial devices

**Modbus TCP/RTU Protocol Gateway:** Convert Modbus TCP Master devices data to Modbus RTU Protocol or Modbus RTU Master devices data to Modbus TCP Protocol

**Modbus TCP/RTU Scheduler with MQTT Data Send:** Reads field Modbus RTU or TCP devices and send their data to MQTT Server

- Up to 10 remote TCP/IP device connection in Modbus TCP/RTU Protocol Gateway Function
- Up to 64 Modbus Commands can be defined in Modbus TCP/RTU Scheduler with MQTT Data Send Function
- MQTT Publisher with different data transfer options in Modbus TCP/RTU Scheduler with MQTT Data Send Function

## Extra Features for Models with BPL ( Broadband Powerline)

- Supports 2 x 10/100Base-T(X) ports + 1 x BPL link
- Wide range 3 phase AC 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
- Support LDPC-C FEC with 128-bit AES core
- Plug and play with Master/Slave selection via web interface

- DHCP Server Capability
- Easy to follow Serial and Ethernet data packages on web interface
- Black List and White List based IP Filter in TCP Server Mode
- Firmware Upgrade over Web
- 2 firmware storage capability on same device (1 active only)
- AC or DC wide range power options
- Wide operating temperature range from -25 to 70 °C AC and -40 to 85 °C DC power input versions
- Rugged Metal IP-40 housing design
- DIN-Rail mounting

## CKL - Lite Model Differences

- 1 x 10/100 Ethernet Port
- 1 x RS485 Port
- 9-36V DC (max 40V) Power Input
- Console Connection for Logs is not available (UDP Log still available)
- Device Functions: Transparent Serial to Ethernet Gateway, Modbus TCP to RTU Conversion, Modbus RTU to TCP Conversion (MQTT Connectivity is not Available)

# Technical Specifications

## Ethernet Switch Technology

|                    |   |
|--------------------|---|
| Ethernet Standards | IEEE 802.3 for 10Base-T<br>IEEE 802.3u for 100Base-T(X)<br>IEEE 802.3x Flow Control |
| Mac Table          | 1K MAC address entry  |
| Processing         | Store-and-Forward   |
| Memory             | 448K bits packet buffer memory  |

## BPL (Broadband Powerline) Technology for BPL Models

|                       |                                    |
|-----------------------|------------------------------------|
| PHY Data Rate         | Up to 240 MHz                      |
| MAC Layer Protocol    | CSMA/CA                            |
| Modulation Technology | OFDM-432                           |
| VLAN                  | IEEE802.1q/ IEEE802.1p/ IEEE802.3d |

## NTP Time Synchronization

NTP is used to synchronize device time. Device checks if NTP time server is available in every 10 seconds after repower. Device synhcronizes its time if NTP time is available and stops checking after successfull synchronization.

## Led Indicators

|                       |   |
|-----------------------|---|
| Power indicator       | Power LED   |
| 10/100T(X) Indicators | Activity LEDs:<br>ETH1, ETH2 and CKL (Activity of device itself)  |
| System Indicators     | Status LED,<br>Tx and Rx of data LEDs and Server LED<br>(LED ON: Server Operating Mode, LED OFF: Client Operating Mode) |
| Console Indicators    | Tx and Rx of data LEDs  |

## 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<br>Tx, Rx, GND for RS232<br>A and B for RS485 |
| Reset Buttons         | Reset to Client and Reset to Server Operating modes buttons                   |

MQTT Publisher based on Modbus query is available in Device Function:  
**Modbus TCP/RTU Scheduler with MQTT Data Send**

MQTT Details

|                    |   |
|--------------------|---|
| MQTT Connection    | Broker IP and Port can be entered<br>Client ID , User name and Password can be set<br><br>Publish Topic and Subscribe Topic can be defined from web interface |
| Data Send Interval | User can send Data send interval in seconds<br>Default is 60 seconds and CKL will send Modbus data to MQTT server in that interval                            |
| NTP Server         | NTP server time will be added to each MQTT message  |
| Data Format        | There is 1 predefined format<br><br>OBIS Values as Modbus Frame: Send just like the response of Modbus query as hex data                                      |

Modbus Characteristics

|                            |   |
|----------------------------|---|
| Modbus Protocol            | Modbus TCP or RTU<br>Selectable by User   |
| Modbus Devices             | Up to 64 Modbus commands can be defined by User   |
| Modbus Address             | Independently selectable by User  |
| Modbus Function Code       | Read Coil Status (FC=01)<br>Read Input Status (FC=02)<br>Read Holding Registers (FC=03)<br>Read Input Registers (FC=04)<br>Selectable |
| Modbus Command Setting     | Register Adress<br>Total Number of Registers<br>Query Interval<br>Time Out<br>Independently Selectable for each command               |
| Modbus RTU Serial Settings | Serial interface RS232 or RS485<br>Serial data settings and Baud Rate<br>Independently Selectable for each command                    |
| Modbus TCP Settings        | TCP/IP and TCP Port Settings<br>Independently Selectable for each command   |

## Power - DC Models

|  |   |
|--|---|
| Input Range                                      | 5-48V DC wide range Power Input<br>(Allows up to 60 V DC) |
| Reverse Polarity Protection                      | Available   |
| Thermal Shutdown and<br>Current Limit Protection | Available   |

## Physical & Environmental Characteristics DC Models

|                       |                              |
|-----------------------|------------------------------|
| Enclosure             | Metal, IP 40                 |
| Dimensions            | 43 × 95 × 124 (w × d × h) mm |
| Weight                | ~ 380 gr                     |
| Storage Temperature   | -65 to 150 °C                |
| Operating Temperature | -40 to 85 °C                 |
| Operating Humidity    | 5% to 95% Non-condensing     |

## Power – AC Models

|             |   |
|-------------|---|
| Input Range | 100 - 240V AC (120 – 370V DC),<br>50Hz to 60Hz AC input |
| Isolation   | Fully Isolated >4200Vrms,<br>5mA 1 Min                  |
| Insulation  | Class II  |

## Physical And Environmental Characteristics AC Models

|                       |                              |
|-----------------------|------------------------------|
| Enclosure             | Metal, IP 40                 |
| Dimensions            | 43 x 95 x 124 (w x d x h) mm |
| Weight                | ~400gr                       |
| Storage Temperature   | -40 to 85 °C                 |
| Operating Temperature | -30 to 70 °C                 |
| Operating Humidity    | 10% to 95% Non-condensing    |

# Power – BPL Models

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

# Physical And Environmental Characteristics BPL Models

|                       |                              |
|-----------------------|------------------------------|
| 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     |

BPL Models can be purchased in 2 versions:

1. P-N Model: Phase to neutral model (Standart Model). That version gets power from terminal pins 1 and 2 from phase and neutral. It can also transmit data from that pins and other pins usage is optional (Ex: Master can be connected to all phases and slaves can be connected to relevant phases)

2. P-P Model: Phase to phase model. That version also gets power from terminal pins 1 and 2 from phase and neutral. Data transmission only done through terminal pins 3 and 4. Phase to phase connection can be done to data transmission pins for better performance. If phase to phase connection is not available then phase and neutral can still be connected for data transmission for terminal pins 3 and 4.

BPL Models can be purchased in DC model as well:  
This model will be same as "P-P Model" (Phase to phase model) on data connection and gets 9-36V DC power from terminal pins 1 and 2 to power up device itself. Data transmission only done through terminal pins 3 and 4.



# CKL – Lite

## Power - Lite DC Model

|                             |   |
|-----------------------------|---|
| Input Range                 | 9-36V DC wide range Power Input<br>(Allows up to 40 V DC) |
| Reverse Polarity Protection | Available   |
| Insulation Voltage          | 1500VDC for 1 minute<br>with leakage current <1mA.        |

## Physical And Environmental Characteristics Lite DC Model

|                       |                              |
|-----------------------|------------------------------|
| Enclosure             | Metal, IP 40                 |
| Dimensions            | 43 x 95 x 124 (w x d x h) mm |
| Weight                | ~400gr                       |
| Storage Temperature   | -55 to 125 °C                |
| Operating Temperature | -40 to 85 °C                 |
| Operating Humidity    | 5% to 95% Non-condensing     |

CKL Lite Models are cost effective solutions for Transparent and Modbus, Serial to Ethernet conversion communication needs.

CKL - Lite model hardware difference:

- 1 x 10/100 Ethernet Port
- 1 x RS485 Port
- 9-36V DC (max 40V) Power Input
- Console Connection for Logs is not available (UDP Log still available)

CKL - Lite model functional difference:

- Device Functions: Transparent Serial to Ethernet Gateway, Modbus TCP to RTU Conversion, Modbus RTU to TCP Conversion (MQTT Connectivity is not Available)



# Ordering Information

**CKL154:** Serial to Ethernet Gateway, 2x 10/100 T(x) ETH ports, 1 x RS232 & 1 x RS485, 5-48V (max. 60V) DC Power Input

**CKL254:** Serial to Ethernet Gateway, 2x 10/100 T(x) ETH ports, 1 x RS232 & 1 x RS485, 100 - 240V AC (120 - 370V DC), 50Hz to 60Hz AC Power Input

**CKL655:** Serial to Ethernet Gateway, 2x 10/100 T(x) ETH ports + 1 x BPL (Broadband Power Line) Link, 1 x RS232 & 1 x RS485, 3 Phase AC Power Input, 110V-240V/50-60Hz

**CKL154 - Lite:** Serial to Ethernet Gateway, 1x 10/100 T(x) ETH port and 1 x RS485, 9-36V (max. 40V) DC Power Input

## Product Selection

| Model         | 9–36V<br>(max. 40V)<br>DC Power<br>Input | 5–48V<br>(max. 60V)<br>DC Power<br>Input | 100 - 240V<br>AC (120 –<br>370V DC),<br>50Hz to 60Hz<br>AC Power Input | 3 Phase<br>AC Power<br>Input,<br>110V240V/<br>50-60Hz AC<br>Power Input | Transparent<br>Gateway<br>Function<br>Between<br>Serial and<br>Ethernet | Modbus TCP<br>(Master) to RTU<br>and Modbus RTU<br>(Master) to TCP<br>Gateway<br>Function | Read Modbus<br>RTU or TCP<br>Devices and<br>send to<br>MQTT Server | BPL<br>(Broadband<br>Power Line)<br>Link |
|---------------|--|--|--|---|---|---|--|--|
| CKL154        |  | ●  |  |   | ●   | ●   | ●  |  |
| CKL254        |  |  | ●  |   | ●   | ●   | ●  |  |
| CKL655        |  |  |  | ●   | ●   | ●   | ●  | ●  |
| CKL154 - Lite | ●  |  |  |   | ●   | ●   |  |  |