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SMART COMMUNICATION

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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 3 different functions and 6 different working modes.

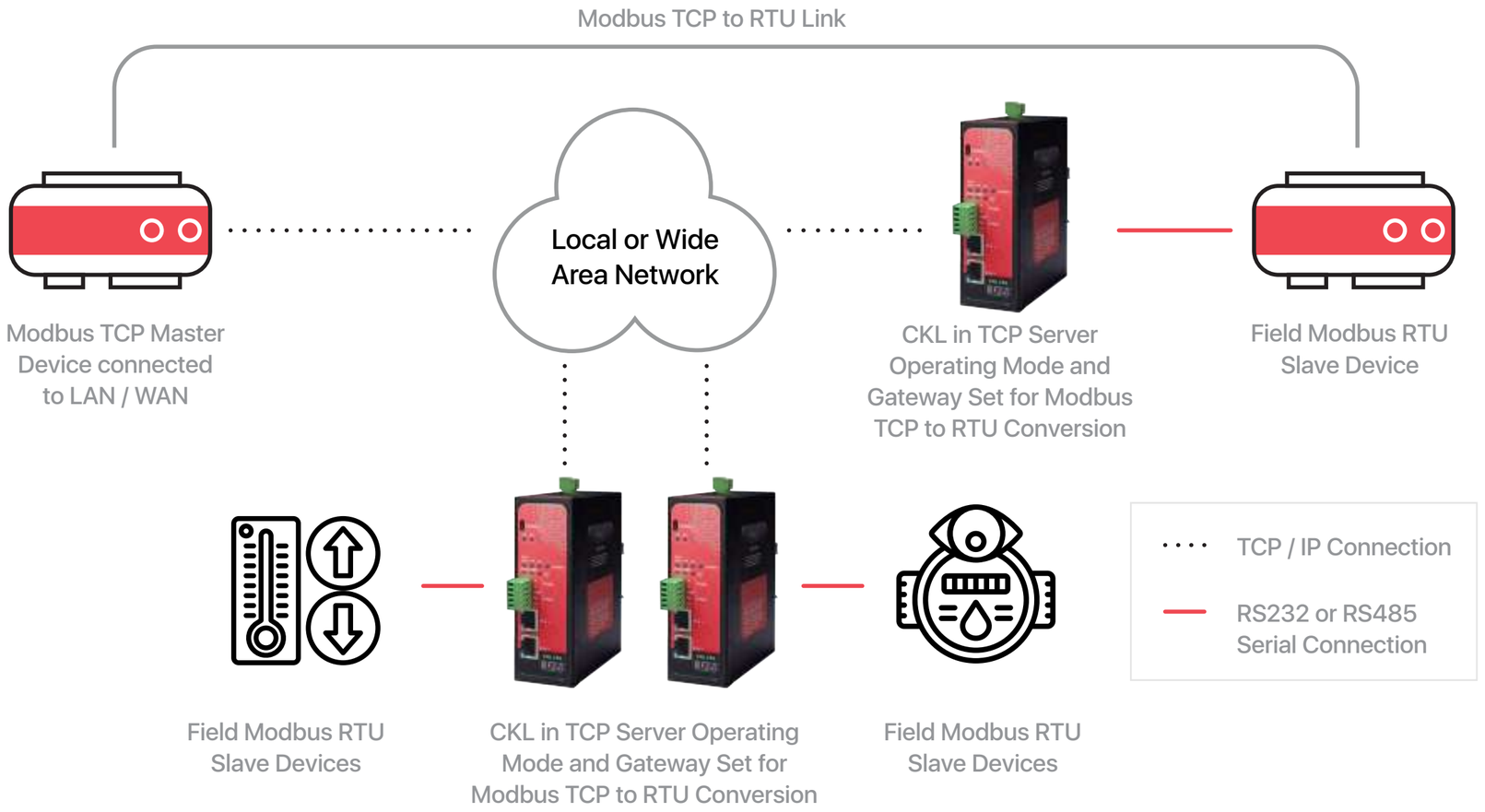
Serial to Ethernet Transparent Gateway Function:
It can work in server mode so that TCP devices can connect to CKL and CKL will act as transparent gateway between TCP devices and field serial devices. It can work in client mode and CKL can automatically connect remote TCP devices and act as transparent gateway between field serial devices and remote TCP devices.

Modbus TCP/RTU Protocol Gateway Function:
It can work in server mode so that 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. It can work in client mode so that Modbus RTU master devices can connect to CKL and CKL will act as converter between Modbus RTU master devices and field Modbus TCP devices.

Modbus TCP/RTU Scheduler with MQTT Data Send Function:
It can work in server mode so that CKL can read field Modbus RTU devices based on predefined Modbus list and send Modbus data to MQTT server based on predefined period. It can work in client mode so that CKL can read field Modbus TCP devices based on predefined Modbus list and send Modbus data to MQTT server based on predefined period. Up to 64 Modbus commands can be defined.

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.



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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
- **3 Different Device Functions and 6 Different Working Modes:**

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

- **Transparent Operating Mode lets device act as Serial to Ethernet Gateway**
- **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 IEEE 802.3u for 100Base-T(X) 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 syncronize 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: ETH1, ETH2 and CKL (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

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

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 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 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 OBIS Values as Modbus Frame: Send just like the response of Modbus query as hex data

Modbus Characteristics

Modbus Protocol	Modbus TCP or RTU 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) Read Input Status (FC=02) Read Holding Registers (FC=03) Read Input Registers (FC=04) Selectable
Modbus Command Setting	Register Adress Total Number of Registers Query Interval Time Out Independently Selectable for each command
Modbus RTU Serial Settings	Serial interface RS232 or RS485 Serial data settings and Baud Rate Independently Selectable for each command
Modbus TCP Settings	TCP/IP and TCP Port Settings Independently Selectable for each command

Power - DC Models

Input Range	5-48V DC wide range Power Input (Allows up to 60 V DC)
Reverse Polarity Protection	Available
Thermal Shutdown and 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), 50Hz to 60Hz AC input
Isolation	Fully Isolated >4200Vrms, 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, 110V–240V 50Hz to 60Hz AC input
Power and Data	AC Power supply use L1-N only. Phase 2-3 connections are used 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 avilable 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

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)

Power - Lite DC Model

Input Range	9-36V DC wide range Power Input (Allows up to 40 V DC)
Reverse Polarity Protection	Available
Insulation Voltage	1500VDC for 1 minute 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

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