REDZ
SMART COMMUNICATION

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KMK179
WiFi Optical Probe

Smart WiFi optical probe - auto protocol detection

- Works with the meter reading software you already have: in IEC auto and DLMS auto the probe handles the optical line like a cable probe
- Command mode for your own software: set the optical line and read the probe's settings and status from your program
- Joins your Wi-Fi network: one TCP connection carries meter data and commands

The KMK179 connects the optical port of a meter to your software over Wi-Fi, on one TCP connection.

Working Modes

1. **Command mode - for your own software:** your software sets the line (300 - 38400 baud; 7E1, 8N1, 8E1, 8O1, 8N2) and can ask the probe about itself.
2. **Fixed line - for software with a fixed speed:** passes data both ways at a fixed speed - 9600 8N1 unless changed to 9600 8E1, 19200 8N1, 28800 8N1 or 1200 8N1.
3. **IEC auto - for your existing meter reading software:** starts at 300 baud 7E1 and follows the IEC 62056-21 baud change-over by itself (mode C or E).
4. **DLMS auto - for your existing meter reading software:** starts at 300 baud 7E1 with the IEC opening and changes to DLMS/COSEM by itself.

For reading meters with existing software choose IEC auto or DLMS auto; command mode is for integrating the probe into your own program.

The 4-position mode switch selects the working mode and is read only at power-on; the MODE 1 - MODE 4 LEDs show the position.

Key Figures

Command mode
for your own software: set the optical line and read the probe's settings and status - in every working mode

Wi-Fi, one TCP connection
802.11a/b/g/n, dual band; WPA2, AES; TCP port changeable (2015 as shipped)

300 - 38400 baud
optical line speed, set by your software in command mode

About 9 hours
on a full charge, a meter read every 10 s over Wi-Fi

Up to 250 m
range outdoors (802.11n), 35 m indoors

100 - 210 s
firmware update over Wi-Fi with abcZ, measured; staged - the probe keeps running until the new firmware is checked

Main Features

Command mode and your own software

- Meter data and commands on one channel: the probe recognises its 12-byte command frame in every working mode, answers it itself and does not pass it on.
- You can query the probe without stopping a reading session; 0xDA reads every setting in one reply, and a refused command tells why (0xDC).
- A reply can arrive several seconds late: allow about 10 s before you treat a command as unanswered.
- Code examples in Python and C# in the user manual.

Wi-Fi connection

- The probe joins your Wi-Fi network as a client and waits for one TCP connection, on port 2015 as it leaves the factory.
- Address from your router (DHCP); the probe joins the network by itself at power-on.
- Network name (SSID) and password are set with abcZ, on its Wi-Fi module page.
- The WiFi module drops an association after about 120 s without traffic and joins again later: keep some traffic on the link.
- There is no serial port to fall back on: a probe that is not on your network cannot be reached.

Optical line

- IEC 62056-21 optical communication goes up to 19200 baud; up to 19200 baud the probe was measured byte-exact in both directions. 28800 and 38400 baud are outside the standard: test with your meter first.
- Optical sensitivity set by command (0xD0) in every working mode.
- In the IEC and DLMS auto modes a new connection restarts the automatic sequence at 300 baud.
- In command mode the stored line settings are applied again at every new connection; store yours with 0xE0 for a long job.

Firmware update and software

- Firmware update over Wi-Fi with abcZ on a Windows PC; the stored settings and the identity are kept.
- Staged update with the A/B bootloader: the running firmware stays until the new one is complete and checked; an interrupted update can simply be started again.
- ZRobo connects to probes over Bluetooth only: with the KMK179 use ZR meter reading software or your own TCP client.
- Firmware for a particular meter or protocol is available as a project-specific variant.

Front Panel

- The button switches the probe on; press it again to switch it off.
- VIN GOOD: a charger with a good voltage is connected. CHARGE: on while the battery charges, red when it is low.
- POW.: on while the probe is on.
- LINK: blinks fast while the probe is not on a Wi-Fi network, slowly when it is on the network and no client is connected, on while a client is connected.
- TX and RX flash when data goes to and comes from the meter; MODE 1 - MODE 4 show the switch position.

Power

- 1200 mAh rechargeable battery, charged over USB Type-C or Micro-USB depending on the hardware version.
- Auto power-off after 240 s without a connection and without activity (factory value, set with 0xC3).
- Battery voltage and charge readable by command (0xA1, 0xA9); the charge LED turns red below 3000 mV.

Technical Data

KMK179	
Optical head	IEC 62056-21 (former IEC 1107)
Data rate	300 - 38400 baud
Wavelength	approx. 900 nm
Optical sensitivity	Set by command (0xD0), every working mode
Magnet	N38
Controls	On / off button; 4-position mode switch
LEDs	VIN GOOD, CHARGE, POW., LINK, TX, RX, MODE 1 - MODE 4
Battery	1200 mAh, rechargeable
Charging	USB Type-C or Micro-USB (by hardware version)
Operating hours *	about 9 hours
Readings per charge *	about 1,400, one every 10 s
Auto power-off	240 s without a connection (set with 0xC3)
Dimensions (w x h x d)	approx. 36 x 55 x 42 mm
Optical head diameter	32 mm
Weight	approx. 125 g
Material	ABS; transparent parts polycarbonate

* Our battery test: a PC read an IEC meter through the probe every 10 seconds over Wi-Fi (one TCP connection, working mode IEC auto; the meter was simulated). How long a charge lasts depends on the work.

Wi-Fi	
Standard	802.11a/b/g/n, dual band
Output power	+23 dBm
Security	WPA2, AES
Range	Up to 250 m outdoors (802.11n), 35 m indoors
Network	Client (STA), address from the router (DHCP), TCP port 2015 as shipped, changeable
Firmware update	Over Wi-Fi with abcZ, staged, about 100 - 210 s for one probe (measured)

Software

abcZ (Windows): connects by IP address, reads and changes the settings, sets the Wi-Fi network and updates the firmware over Wi-Fi.

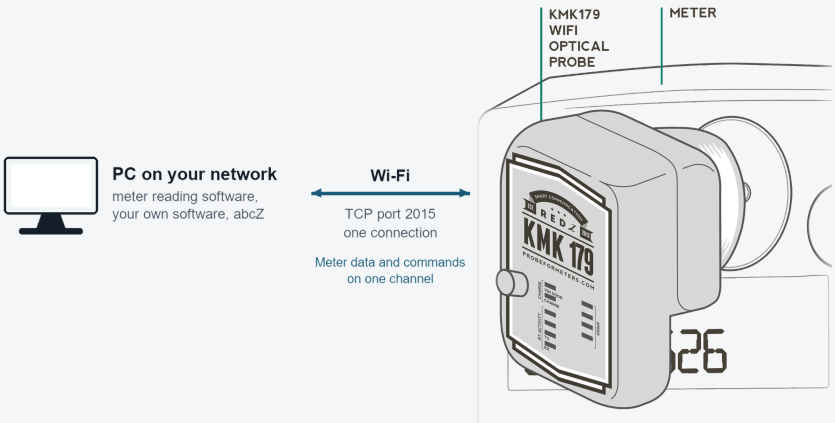
Meter reading software: any software that can open a TCP connection - for example our ZR meter reading software.

Your own software: the command frame, every command and code examples are in the user manual.

ZRSoftware.Cloud for Electricity Meters

- Reads electricity meters and keeps their values on the PC: a Windows service you work with in a web browser on the same PC.
- Lines: serial (COM port) - optical probe or RS-232 / RS-485 - or TCP (gateway or modem); up to four lines at once.
- Protocols IEC 62056-21 and DLMS; 7 meter types read on real meters with the program's meter drivers.
- Load profile analysis, tariffs, formulas and custom reports; schedules that read meters by themselves, and exports to a folder, by e-mail or to an FTP, FTPS or SFTP server.
- 30-day trial with every feature open. See the ZRSoftware.Cloud datasheet; download: redzsoftware.com/zrsoftware-cloud/

Typical Application



Typical application: the KMK179 joins your Wi-Fi network; meter reading software, your own software or abcZ on a PC opens one TCP connection to it, on port 2015, for meter data and commands.