REDZ
SMART COMMUNICATION

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KMK Bluetooth Series Bluetooth Optical Probes

Bluetooth Classic and Bluetooth Low Energy (BLE) - dual in one optical probe



- 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 (KMK118, KMK119)
- Command mode for your own software: set the optical line and read the probe's settings and status from your program
- Two Bluetooth links in one probe: the serial port (SPP) for PCs, Bluetooth Low Energy (BLE) for phones

The KMK Bluetooth Series probes connect the optical port of a meter to your software over Bluetooth - the Bluetooth serial port (SPP) and Bluetooth Low Energy (BLE).

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; on KMK119 also 9600 8E1, 19200 8N1, 28800 8N1 or 1200 8N1; on KMK139 4800, 9600 or 19200 8N1 (switch positions 1 - 3).
3. **IEC auto (KMK118, KMK119) - 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 (KMK118, KMK119) - 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 (on KMK138 and KMK139: fixed line); command mode is for integrating the probe into your own program.

KMK118 and KMK138 have no mode switch: the function is stored in the probe and changed with the command 0xD5. KMK119 and KMK139 have a 4-position mode switch, read at power-on.

Key Figures

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

Bluetooth v5.1
serial port (SPP) and Bluetooth Low Energy (BLE) in one probe, both on from the factory

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

About 39.5 hours
on a full charge, a meter read every 10 s (KMK119, KMK139); about 18 hours on KMK118 and KMK138

IEC 62056-21 / ANSI C12.18
optical heads: IEC on KMK118 and KMK119, ANSI Type 2 on KMK138 and KMK139; N38 magnet

10 - 20 s
firmware update over the serial port (SPP), 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).
- Code examples in Python and C# in the user manual.

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.

Bluetooth

- Bluetooth serial port (SPP): a COM port on a PC, for meter reading software and abcZ.
- Bluetooth Low Energy (BLE) for phones and your own apps: the probe is a serial port over GATT, with writes of up to 240 bytes after the MTU exchange.
- Both links are on as the probe leaves the factory; the serial port entry pairs without a PIN.
- Production name: the model and the end of the Bluetooth address, for example KMK119 736e5e.

Firmware update and software

- Firmware update over Bluetooth with abcZ on a Windows PC or ZRobo on an Android phone; the stored settings and the identity are kept.
- With the A/B bootloader the running firmware stays until the new one is complete and checked; an interrupted staged update can simply be started again.
- abcZ for Windows finds the probes, shows what they report about themselves, changes their settings and updates their firmware - of one probe or of many at a time.
- ZRobo, our free Android app, reads IEC 62056-21 meters through the probe, changes the probe settings and updates its firmware (Android 9 or newer).
- Firmware for a particular meter or protocol is available as a project-specific variant.

KMK118 and KMK138 - Torch Board



- No mode switch: the function is stored in the probe and changed with 0xD5.
- POWER switches the probe on and off; TORCH switches the built-in torch, to light up the display of a meter.
- LEDs: battery (on while charging, red when low), power, Bluetooth (on while a client is connected), TX and RX.
- As shipped: KMK118 in command mode, KMK138 in fixed 9600 8N1 for ANSI C12.18 meters.

KMK119 and KMK139 - Mode Switch Board



- 4-position mode switch on the side, read at power-on; the mode LEDs show the position.
- LEDs: VIN GOOD, CHARGE, BT POW., BT LINK, TX, RX; mode LEDs IEC AUTO, DLMS AUTO, MODE 3, MODE 4 (KMK119) or MODE 1 - MODE 4 (KMK139).
- KMK139 is the KMK119 with the ANSI (recessed) optical head and leaves the factory with the ANSI2 variant: positions 1 - 3 are fixed lines (4800, 9600, 19200 8N1), position 4 is command mode.

Power

- Rechargeable battery, 600 mAh (KMK118, KMK138) or 1200 mAh (KMK119, KMK139), 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.

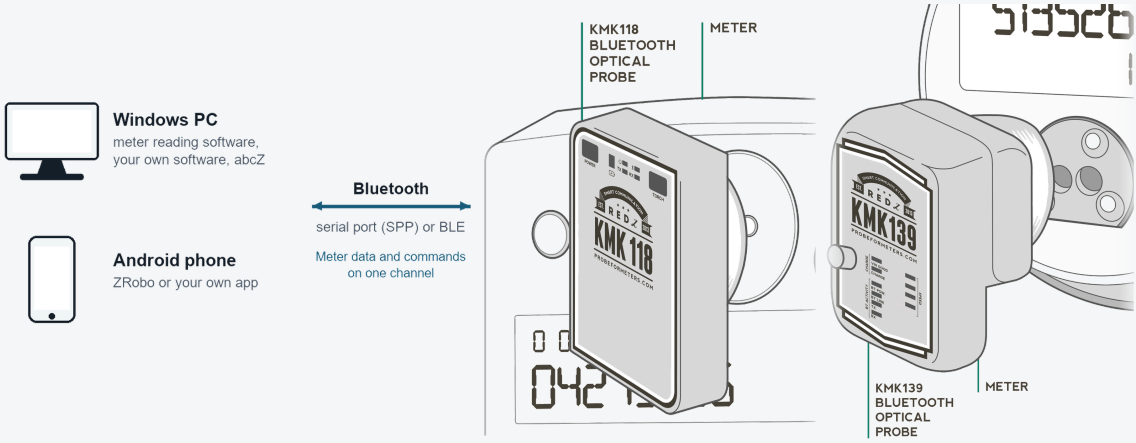
Technical Data

	KMK118 IEC, torch	KMK119 IEC, mode switch	KMK138 ANSI, torch	KMK139 ANSI, mode switch
Optical head	IEC 62056-21 (former IEC 1107)	IEC 62056-21 (former IEC 1107)	ANSI C12.18 Type 2	ANSI C12.18 Type 2
Data rate	300 - 38400 baud	300 - 38400 baud	300 - 38400 baud	300 - 38400 baud
Wavelength	approx. 900 nm	approx. 900 nm	approx. 900 nm	approx. 900 nm
Optical sensitivity	Set by command (0xD0), every working mode	Set by command (0xD0), every working mode	Set by command (0xD0), every working mode	Set by command (0xD0), every working mode
Magnet	N38	N38	N38	N38
Torch	3 mm white LED	-	3 mm white LED	-
Controls	POWER and TORCH buttons	On / off button; 4-position mode switch	POWER and TORCH buttons	On / off button; 4-position mode switch
LEDs	Battery, power, Bluetooth, TX, RX	VIN GOOD, CHARGE, BT POW., BT LINK, TX, RX, IEC AUTO, DLMS AUTO, MODE 3, MODE 4	Battery, power, Bluetooth, TX, RX	VIN GOOD, CHARGE, BT POW., BT LINK, TX, RX, MODE 1 - MODE 4
Working modes	Command mode, fixed line, IEC auto, DLMS auto	Command mode, fixed line, IEC auto, DLMS auto	Command mode, fixed line	Command mode, fixed line
Working mode chosen with	Command 0xD5 (stored)	Mode switch (read at power-on)	Command 0xD5 (stored)	Mode switch (read at power-on)
Battery	600 mAh, rechargeable	1200 mAh, rechargeable	600 mAh, rechargeable	1200 mAh, rechargeable
Charging	USB Type-C or Micro-USB (by hardware version)	USB Type-C or Micro-USB (by hardware version)	USB Type-C or Micro-USB (by hardware version)	USB Type-C or Micro-USB (by hardware version)
Operating hours *	about 18 hours	about 39.5 hours	about 18 hours	about 39.5 hours
Readings per charge *	about 3,200, one every 10 s	about 11,000, one every 10 s	about 3,200, one every 10 s	about 11,000, one every 10 s
Auto power-off	240 s without a connection (set with 0xC3)	240 s without a connection (set with 0xC3)	240 s without a connection (set with 0xC3)	240 s without a connection (set with 0xC3)
Dimensions (w x h x d)	approx. 40 x 55 x 21 mm	approx. 36 x 55 x 42 mm	approx. 40 x 55 x 25 mm	approx. 36 x 55 x 46 mm
Optical head diameter	32 mm	32 mm	32 mm	32 mm
Weight	approx. 95 g	approx. 125 g	approx. 100 g	approx. 130 g
Material	ABS; transparent parts polycarbonate	ABS; transparent parts polycarbonate	ABS; transparent parts polycarbonate	ABS; transparent parts polycarbonate

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

Bluetooth (all 4 models)	
Bluetooth	Bluetooth Classic and Bluetooth Low Energy (BLE), v5.1
Links	Bluetooth serial port (SPP) and BLE, both on from the factory
Pairing	The serial port entry pairs without a PIN
BLE	Serial port over GATT; writes up to 240 bytes after the MTU exchange
Radio	Class 1 radio; 128-bit encryption
Operating distance	Up to 100 m (line of sight; module value)

Typical Application



Typical application: the probe connects the optical port of a meter to your software over Bluetooth - the serial port (SPP) for meter reading software and abcZ on a PC, Bluetooth Low Energy (BLE) for phones and your own apps.

Product Comparison

	KMK118	KMK119	KMK138	KMK139
IEC 62056-21 optical head (flat face)	●	●		
ANSI C12.18 Type 2 optical head (cavity)			●	●
Bluetooth serial port (SPP) and BLE	●	●	●	●
Command mode and fixed line	●	●	●	●
IEC auto and DLMS auto (IEC models)	●	●		
Built-in torch	●		●	
Mode switch and mode LEDs		●		●
Function stored and changed with 0xD5	●		●	
Shipped in command mode	●			
Shipped in fixed 9600 8N1			●	
Shipped with the ANSI2 variant				●
600 mAh battery	●		●	
1200 mAh battery		●		●

Software

abcZ (Windows): finds the probes, reads and changes their settings, updates their firmware - one probe or many at a time; no installation; 64-bit Windows 11, or Windows 10 Enterprise LTSC / IoT Enterprise (the Windows versions .NET 10 supports).

ZRobo (Android): our free Android app: reads IEC 62056-21 meters through the probe, shows its diagnostics, updates its firmware; Android 9 or newer.

Meter reading software: opens the probe's outgoing COM port - 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/