

K5 BLACK EDITION

Precision Dual Battery & Tank Monitor for Marine, RV, and Off-Grid Solar Systems

AT A GLANCE

Operating Voltage	10V – 75V DC (12V / 24V / 48V systems)
Battery Banks	2 independent channels via external precision shunts
Current Range	±150A continuous per bank (with 100 $\mu\Omega$ shunt)
Tank Sensors	4 universal resistive inputs
Relay Output	1x SPDT, floating dry contacts (10A / 125 VAC, 5A / 30 VDC)
Display	3.5" IPS, 480 x 320, Gorilla Glass, optically bonded, capacitive touch
Controls	4x tactile pushbuttons + capacitive touchscreen
Connectivity	WiFi 802.11 b/g/n • Bluetooth 5.0 • USB-C • VE.Direct
Onboard Sensors	Ambient light • Temperature / humidity • Real-time clock
Data Logging	MicroSD card (SDHC, up to 32 GB), CSV format
Status LEDs	6x addressable RGB
Protection Rating	IP65 (front panel when mounted)
Enclosure	CNC 6061-T6 aluminum, Type III hardcoat anodize, matte black
Dimensions	148.8 x 103.8 x 50 mm (W x H x D)
Weight	480 g

POWER INPUT

Input Voltage Range	10V – 75V DC
Absolute Maximum	80V DC continuous, 100V transient
Reverse Polarity Protection	Yes (Schottky diode)
Transient Protection	600W TVS on input + additional TVS on 5V rail
Input Fuse	Fast-acting SMD fuse, 100V rated
Operating Current	< 120 mA @ 12V typical, < 60 mA @ 24V typical
Standby Current	< 40 mA @ 12V (display off)

BATTERY MONITORING

The K5 monitors two fully independent battery banks using external precision shunt resistors with dedicated Kelvin-sense connections. Each bank uses a high-precision 20-bit delta-sigma ADC for accurate voltage and current measurement.

Number of Banks	2 fully independent
ADC Resolution	20-bit delta-sigma
Shunt Type	External precision shunt (user-supplied or KALION K5-SHUNT-150)
Recommended Shunt	100 $\mu\Omega$ for $\pm 150A$ range
Shunt Connections	4-wire Kelvin sense (separate shunt + bus voltage terminals)
Voltage Measurement	0V – 85V DC per bank
Voltage Accuracy	$\pm 0.1\%$ of reading
Current Accuracy	$\pm 0.5\%$ of reading (with recommended shunt, calibrated)
Sampling Rate	Up to 4,096 samples/second per channel
Calculated Parameters	SOC, SOH, Ah consumed, Wh consumed, time-to-empty

Note: Accuracy reflects system-level performance including shunt and analog front end.

TANK SENSOR INPUTS

Number of Inputs	4 independent channels
Sensor Type	Resistive float-type tank senders
US Standard (SAE J1810)	240 Ω (empty) – 33 Ω (full)
European Standard (DIN)	10 Ω (empty) – 180 Ω (full)
Universal / NMEA	0 Ω (empty) – 190 Ω (full)
Calibration	2-point or multi-point via touchscreen UI
Overvoltage Protection	Zener clamp on each input
Connector	2-pin screw terminal per channel, 3.5 mm pitch

RELAY OUTPUT

Type	Electromechanical SPDT relay
Contact Configuration	NO + COM + NC — true floating dry contacts
NO Contact Rating (AC)	10A @ 125 VAC / 5A @ 250 VAC
NO Contact Rating (DC)	5A @ 30 VDC
NC Contact Rating	3A @ 125 VAC / 3A @ 30 VDC
Contact Isolation	Galvanically isolated from K5 system ground
Connector	3-pin screw terminal, 5.08 mm pitch
Programmable Functions	Generator start, load disconnect, alarm, pump, bilge
Trigger Conditions	Low SOC, low/high voltage, tank level, timer, temperature
Mechanical Life	> 10 million operations

Floating dry contacts compatible with all 2-wire generator start circuits. For DC loads exceeding 5A, use an external contactor driven by the relay.

DISPLAY

Type	TFT LCD with IPS technology
Size	3.5 inches (88.9 mm diagonal)
Resolution	480 × 320 pixels (HVGA)
Color Depth	262,144 colors (18-bit)
Brightness	800 cd/m ² (sunlight readable)
Contrast Ratio	800:1 typical
Viewing Angle	170° horizontal / 170° vertical

Cover Glass	Corning Gorilla Glass, 2.0 mm
Optical Bonding	LOCA — eliminates air gap for sunlight readability
Touch	Projected capacitive (PCAP)
Display Interface	SPI

CONTROLS & FEEDBACK

Input Method	Dual: capacitive touchscreen AND physical tactile buttons
Navigation Buttons	4x tactile switches (UP, DOWN, LEFT, RIGHT)
Haptic Feedback	LRA motor with programmable patterns
Audio Alert	Piezo buzzer, 85 dB @ 10 cm
Status LEDs	6x addressable RGB (top edge behind diffuser)

ONBOARD SENSORS

Ambient Light	0.01 – 83,000 lux (auto-brightness, auto-dimming)
Temperature	±0.1°C accuracy
Humidity	±1% RH accuracy
Real-Time Clock	±2 ppm TCXO with CR2032 backup (> 5 years without main power)
External Temp Probe	3-pin connector for DS18B20 or NTC thermistor

CONNECTIVITY

Wireless

WiFi	IEEE 802.11 b/g/n (2.4 GHz) — Station, AP, or both
WiFi Security	WPA / WPA2 / WPA3 Personal
Bluetooth	Bluetooth 5.0 (BLE)
NMEA Integration	Via Signal K (WiFi)
OTA Updates	Over-the-air via WiFi
Mobile App	KALION Connect (iOS & Android) — Free

Ports

USB-C	USB 2.0 — firmware update, configuration, data export
MicroSD	SDHC up to 32 GB — data logging (CSV, FAT32)
VE.Direct	Victron MPPT / charger integration (UART)
External Temperature	DS18B20 / NTC probe connector

DATA LOGGING

Storage	MicroSD card (SDHC, up to 32 GB)
File Format	CSV (Excel & NMEA analyzer compatible)
Logging Interval	Configurable: 1 second to 1 hour
Logged Parameters	Timestamp, voltage, current, power, SOC, tank levels, temp, humidity
Log Capacity	Approx. 1 year at 1-minute interval on 8 GB card
Data Export	MicroSD removal, USB-C download, WiFi transfer

TERMINAL CONNECTIONS

Terminal	Function	Wire
POWER IN (- / +)	Power input, 10 – 75V DC	14–22 AWG
SHUNT 1 (- / +)	Bank 1 shunt Kelvin sense	18–24 AWG
VBUS 1 (- / +)	Bank 1 bus voltage sense	18–24 AWG
SHUNT 2 (- / +)	Bank 2 shunt Kelvin sense	18–24 AWG
VBUS 2 (- / +)	Bank 2 bus voltage sense	18–24 AWG
RELAY OUT (NO / COM / NC)	Programmable relay, floating contacts	12–18 AWG
LEVEL 1 – 4 (- / +)	Tank sensor inputs (x4)	18–24 AWG
VE.DIRECT	Victron VE.Direct UART	22–26 AWG
TEMPERATURE	External DS18B20 / NTC probe	22–26 AWG
USB-C	Firmware, config, data export	—
MicroSD	Data logging (SDHC, FAT32)	—

All screw terminals feature rising-clamp design for secure wire retention under vibration.

MECHANICAL SPECIFICATIONS

Dimensions

Enclosure Body	148.8 × 103.8 × 50 mm (W × H × D)
Bezel Frame	153 × 108 × 7.5 mm
Total Depth (Surface Mount)	57.5 mm
Panel Cutout	140 × 95 mm (±0.5 mm)
Display Visible Area	85.6 × 56.2 mm
Min. Wiring Clearance	60 mm behind panel
Weight	480 g

Materials & Construction

Front Bezel	CNC machined Aluminum 6061-T6, Type III Hardcoat, Matte Black
Cover Glass	Corning Gorilla Glass, 2.0 mm, optically bonded (LOCA)
Enclosure Body	PA12 Nylon (HP Multi Jet Fusion), Black
IP Gasket	Silicone rubber, 2 mm
Fasteners	Stainless Steel A2-70
Salt Spray	> 1,000 hours (ASTM B117)

ENVIRONMENTAL RATINGS

Ingress Protection	IP65 (front panel when mounted)
Operating Temperature	-20°C to +70°C
Storage Temperature	-40°C to +85°C
Humidity	5% to 95% RH, non-condensing
Vibration	10 – 500 Hz, 2g
Shock	15g, 11 ms half-sine
Salt Fog	96 hours minimum
UV Resistance	1,000+ hours accelerated aging

COMPLIANCE

CE (EMC, LVD)	Pending Q2 2026
FCC Part 15B	Pending Q2 2026

RoHS 3	Compliant (EU 2015/863)
REACH	Compliant (EC 1907/2006)
IP65	Designed & tested
MIL-A-8625F	Hardcoat compliant

PACKAGE CONTENTS

- K5 Black Edition Monitor (assembled, tested)
- CR2032 Backup Battery (pre-installed)
- Panel Mounting Template (1:1 scale)
- Spare M2 Mounting Screws (stainless steel) × 4
- Spare Silicone Gasket (IP65)
- Quick Start Guide (EN, DE, FR, ES, IT)

OPTIONAL ACCESSORIES

Part Number	Description
K5-SHUNT-150	Precision 100 $\mu\Omega$ shunt — $\pm 150A$, 4-wire Kelvin sense
K5-SHUNT-500	High-current 500A shunt
K5-TEMP-3M	Waterproof DS18B20 probe (3 m), stainless steel
K5-TEMP-10M	Waterproof DS18B20 probe (10 m), stainless steel
K5-GASKET	Replacement gasket kit (set of 2)
K5-COVER	Terminal bay dust cover (snap-on, UV-resistant)
K5-FLUSH	Flush mount kit for thinner panels
K5-BRACKET	Surface mount bracket (stainless, adjustable)

WARRANTY & SUPPORT

2-Year Limited Warranty — KALION Systems LLC warrants the K5 Black Edition against defects in materials and workmanship for two (2) years from the original purchase date. Covers normal use in marine, RV, residential solar, and off-grid applications.

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KALION
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