KARZOQ

The Smarter Way to Build Electronics

Proudly Designing & Making Electronics in India

PRODUCT & DESIGN CATALOGUE

Power Electronics • Embedded Systems • IoT & Connectivity

October 2026

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Why KARZOQ?

The PCBA Advantage

01 Our PCBAs are **designed & made in India**

02 We offer **end-to-end PCBA buildout** – design, sourcing & manufacturing

03 Our proprietary **AI-powered tech** offers PCBAs:

- A **Cheaper** – 20%+ lower cost through better design & sourcing
- B **faster** – Design in days (not weeks), supply in weeks (not months)
- C **Better** – Guaranteed first-time power-up, 100% spec-compliance

Our Focus

01 **Power Electronics**

AC-DC & DC-DC power converters (up to 500 Watts)

02 **Embedded Systems**

Hardware + firmware design & development for consumer & industrial applications

03 **IoT & Connectivity**

Full-stack hardware + software solutions for connected devices, cloud-based services and app design & integration

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01

Power Electronics

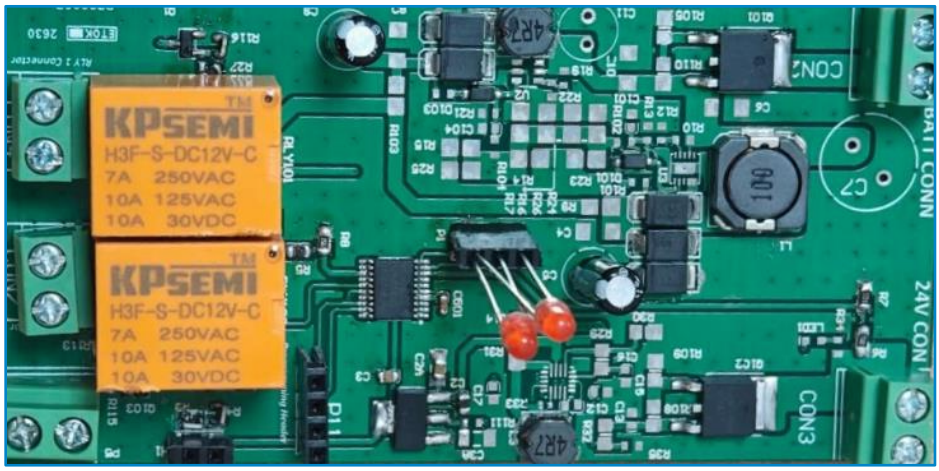
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Power Electronics

LED Driver – AC/DC Light Control PCBA

A single control board that runs a LED light from mains power, keeps a backup battery charged, and switches to battery automatically the moment the power goes out. Includes a light sensor that controls if the LED should on/off.



What It Is

This is a compact circuit board built to power and control LED lighting that keeps working during a power outage. This PCBA sits between the AC mains supply, a 12V backup battery, and the LED light, and manages all the power switching centrally. It's designed as a general-purpose control board, not tied to one fixture or product, so it can be easily customized for multiple applications (detailed below).

What It Does

- Charges the battery — While AC power is present, it charges a 12V battery at 600mA, fully charging 4Ah in about 6 hours.
- Powers the LED light on battery — if AC power fails, a boost converter steps the battery voltage up to 24V to keep the LED light running.
- Senses power and light — it continuously checks whether AC is present and measures ambient brightness through an LDR sensor, so the light only turns on when it's actually needed.

How It Works

AC present? → Dark enough (LDR)? → Charge battery and run the light from AC. If AC supply is disrupted, the board switches to the boost converter and keeps the light running, powered by the battery, without any manual intervention.

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Applications

- Street lighting
- Emergency and backup lighting
- Garden and pathway lights
- Society and campus lighting
- Industrial area lighting
- Any dusk-to-dawn LED fixture

Technical Specifications

Input	AC mains input (with rectification on-board)
Battery	12V Lithium Ion, charged at 600mA
Charge Time	Full charge in approximately 6 hours
Backup Output	24V output for LED load @ 18W for 4 hrs, active only when AC is absent
Ac Sensing	On-board AC presence detection, used to switch between mains and battery mode
Light Sensing	LDR-based ambient light sensor for automatic on/off switching
Load Type	24V LED lighting load
Form Factor	Single PCB, application-agnostic — fits any 24V LED fixture design

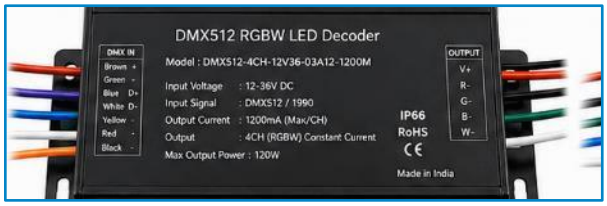
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Power Electronics

DMX Decoder – 4-Channel LED Driver

DMX512 RGBW LED Decoders are designed to deliver highly stable, constant current output with advanced features for professional lighting applications. Available in two variants — potted in a metal extrusion box (IP66, up to 120W) or in a compact sleeve (up to 90W) — as per the installation needs.

Variant #1: In Metal Extrusion Box
Potted — Up to 120W Output Power



Variant #2: In Sleeve
Up to 90W Output Power



What It Is

DMX512 Controller (or Console) sends a differential DMX signal to the DMX512 RGBW Decoder (4-Channels), which drives R, G, B, and W outputs plus V+ to the RGBW LED load. The decoder is powered from a 12–36V DC supply.

Key Features

- DMX512 Compliant, 512 Channels
- 4-Channel Constant Current PWM Output (RGBW)
- High refresh rate: 17kHz, 256 (8-bit) gray scale
- RDM, UCS512C, Group Addressing Supported
- External Current Programmability
- Works with or without DMX Amplifier (≤ 32 Decoders)
- Ambient temperature operating range: From -10°C to +75°C
- RDM, UCS512C, Group Addressing
- High Reliability — built-in protections & surge protection
- Compact & Versatile — two variants to suit different applications
- Easy Integration — works seamlessly with standard DMX systems

Applications

- Architectural Lighting
- Stage & Entertainment Lighting
- LED Pixel Installations
- Facade Lighting

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- Landscape Lighting
- Theme Parks & Attractions
- RGBW LED Strip Systems
- Exhibition & Retail Lighting

Technical Specifications

Parameter	Extrusion Box (IP66) — 120W	In Sleeve — 90W
Input Voltage	12–36V DC	12–36V DC
Input Signal	DMX512	DMX512
Output Channels	4 (RGBW)	4 (RGBW)
Output Current	1200mA/CH (Max)	900mA/CH (Max)
Max Output Power	120W	90W
Gray Scale	256 (8-bit)	256 (8-bit)
Refresh Rate	17kHz	17kHz
Transmission Speed	250K	250K
Decoder Without Amplifier	≤ 32	≤ 32
RDM Feature	Yes	Yes
UCS512C Addressing	Yes	Yes
Group Addressing	Yes	Yes
Current Programmability	Yes (External Device)	Yes (External Device)
Power Consumption	≤ 1W	≤ 1W
Operating Temp. Range	-10°C to +75°C	-10°C to +75°C
Ingress Protection	IP66	—

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02

Embedded Systems

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Embedded Systems

Solar Light Controller & Display

A controller PCBA reads live data from the battery management system (BMS) and coverts it into battery analytics which is displayed on a touch-panel human-machine interface (HMI). The same PCBA has a controller that can independently switch circuits on and off through the HMI.

PCBA



HMII



What It Does

- **Reads BMS Data** — Pulls battery data such as state-of-charge, voltage, and remaining-capacity from the BMS through an on-board communication link.
- **Displays Battery Analytics** — Displays the data on a touch-panel HMI as live readings plus usage and consumption history, so status is visible at a glance.
- **On/Off Control** — The control card can independently switch multiple lighting circuits on/off, directly from the HMI.

Key Features

BMS & HMI System Controller

Central controller bridging battery management, operator interface, and load circuits on one board, using microcontrollers and isolated mains interfacing.

- Dual-microcontroller architecture separating BMS, HMI, and load-control tasks.
- Isolated mains interfacing for safe operator-facing circuits.
- Single-board integration of battery, interface, and load functions.

Solar & Battery Monitoring HMI

Touch-panel interface for energy-management systems, displaying live battery and solar information alongside direct lighting control.

- Battery state-of-charge, voltage, and remaining-capacity readout.

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- Usage and consumption history visualization.
- Independent on/off control of four lighting circuits.
- Driver, system, and settings screens for field configuration.

Applications

- Solar Energy Systems — Battery and solar monitoring for off-grid or hybrid setups.
- Battery Storage Units — Standalone or backup battery banks needing status visibility.
- Lighting Control Systems — Solar or battery-fed lighting needing on/off circuit control.
- Remote & Off-Grid Sites — Cabins, towers, and installations relying on stored energy.
- EV & Mobility Applications — Battery packs needing an operator-facing status display.
- Industrial Control Panels — Equipment needing combined battery and load status on one screen.
- Street & Area Lighting — Solar street-light controllers needing usage history and control.
- OEM Energy Products — Embed as a ready-made BMS + HMI + load-control layer.

Technical Specifications

Architecture	Dual-microcontroller — separate BMS, HMI, and load-control tasks
Data Source	Reads battery state-of-charge, voltage, and capacity from the BMS
Display	Touch-panel HMI (resistive touchscreen), live readout + history charts
Load Control	Independent on/off switching for multiple lighting circuits
Mains Interface	Isolated mains interfacing for safe operator-facing circuits
HMI Screens	Home, Control, Battery, Driver, System, Settings
Integration	Single-board design combining battery, interface, and load functions

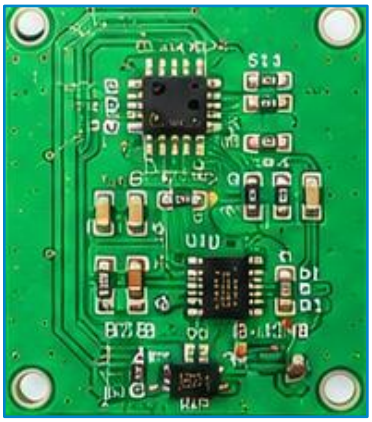
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Embedded Systems

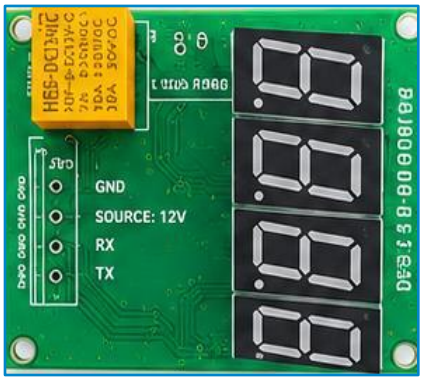
Sensing, Display & Load Control System

This system combines a dedicated differential pressure sensor board with a 4-digit display and control board. Both boards operate on 12V DC, making it ideal for HVAC, air-handling, industrial equipment monitoring applications.

Differential Pressure Sensor Board
(-126 Pa to +125 Pa)



Display & Control Board
(4-Digit Display + Relay Output)



What It Is

Differential Pressure Sensor Board (-126 Pa to +125 Pa → Measured Value → Display & Control Board (4-Digit Display + Relay).

The Display & Control Board drives the 4-digit display and the relay output for load control. Both boards are powered from a single 12V DC supply.

The system provides reliable & accurate measurement, is simple to integrate & provides flexible application support. Operates on low power, (12V DC) and has a modular design.

Key Features

Differential Pressure Sensor Board

Measures low differential air pressure for accurate and reliable monitoring. Measurement range: -126 Pa to +125 Pa.

- High accuracy differential pressure sensing
- Compact and low power design
- Optimized for low-range air pressure
- Easy integration with display/control board

4-Digit Display & Control Board

Displays measured or external data and provides relay-based load control.

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- 4-digit numerical display (0–9999)
- Works with pressure sensor or any 4-digit data
- Relay output for load control
- Simple and flexible configuration
- 12V DC operation
- Data Display – Differential pressure, current, temperature, humidity, CO_2, CO

Applications

- HVAC systems,
- Air handling units (AHU),
- Ventilation systems
- Clean-room monitoring
- Airflow monitoring
- Fan & blower monitoring
- Duct pressure measurement
- Industrial air systems and general equipment monitoring

Technical Specifications

Measurement Range	-126 Pa to +125 Pa
Display	4-digit numeric (0–9999)
Output	Relay-based load control
Supply	12V DC (both boards)

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03

IoT & Connectivity

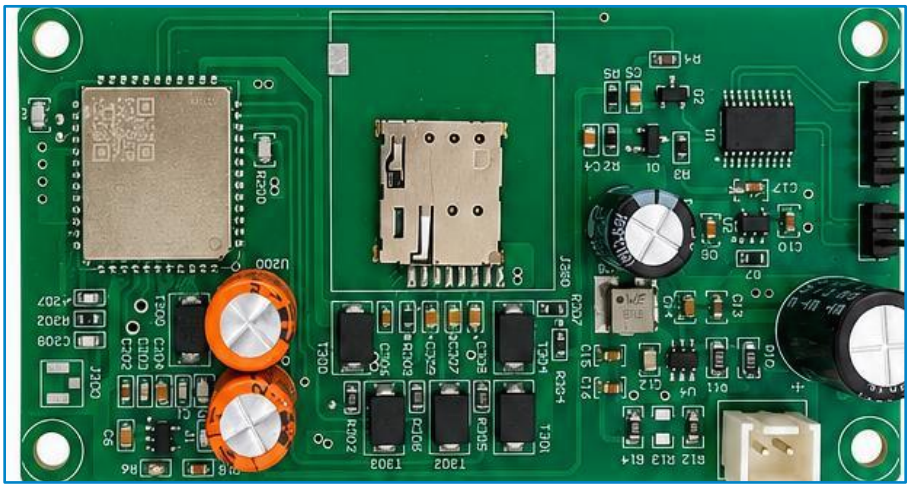
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IoT & Connectivity

4G/LTE IoT Telemetry Device

A compact telemetry device designed for real-time asset monitoring and secure data transmission over 4G/LTE networks. It integrates a 4G/LTE cellular module with a high-performance microcontroller, offering plug-and-play solution with industrial-grade reliability.



What It Does

Sensors / Machine Signals → MCU → LTE Cat-1 → MQTT Cloud (Broker) → Database / Analytics → Web/mobile dashboard.

- **Remote Monitoring & Control** — A 4G/LTE-based IoT board that connects sensors and machines to the cloud, so equipment can be monitored and controlled remotely from anywhere, with no local network needed.
- **Firmware Customization** — Firmware can be tailored to the application, with custom sensor logic, GPIO behavior, and data formats.
- **Cloud & Web App Support** — Comes with support for setting up the cloud backend and building the web or mobile dashboard/app, enabling end-point data visualization & control.

KEY FEATURES

- LTE Cat-1 Connectivity — Reliable coverage across B1 / B3 / B5 / B8 bands.
- MQTT Protocol Support — Lightweight and efficient cloud messaging.
- Wide Input Voltage (8–36V DC) — 12V / 24V compatible.
- Ultra-Low Power Operation — < 15 mA idle, < 150 mA active.
- Flexible GPIO & UART Interfaces — Easily integrates with external sensors.

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Applications

- Vehicle & Fleet Telemetry — vehicle status, diagnostics, utilization.
- Industrial Machine Monitoring — status, alarms, runtime, counters.
- Remote Equipment Monitoring — pumps, compressors, generators, HVAC.
- Energy Monitoring — power / voltage / current (with external meters).
- Smart Infrastructure — remote cabinets, lighting controllers, utility assets.
- Cold-chain / Environmental Monitoring — temperature, humidity (with external sensors).
- Agriculture & Irrigation — pumps, tank levels, soil / environment.
- Security & Access Systems — door/status inputs, alarms, remote reporting.
- Solar / Battery Systems — operating status, voltage / current (with external sensing).
- OEM Connected Products — embed as a cellular communication mod

Technical Specifications

Cellular Module	LTE Cat - 1
LTE Bands	B1 / B3 / B5 / B8
SIM Interface	Nano SIM (1.8V / 3V)
Interfaces	UART, GPIO, I2C
Communication Protocol	MQTT
Input Voltage	8V – 36V DC (12V / 24V compatible)
Operating Voltage	3.8V regulated rail
Peak Current (TX Burst)	2A
Active Current	< 150 mA
Idle / Sleep Current	< 15 mA

Note: Ensure the power supply can handle 2A transient bursts during LTE transmission. Insufficient capacity may cause unexpected resets.

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IoT & Connectivity

RF Remote & Receiver PCBA

Am integrated RF remote-control solution — transmitter (remote) and receiver — that can be designed around any product needing wireless on/off, mode, or speed control.

The fan remote shown here is one example; the same platform can be re-purposed and re-programmed for lighting, air conditioners, toys, appliances, and other consumer or industrial products.



Key Features

- Reliable RF Link — Stable transmitter-receiver pairing with good range through walls, furniture.
- Low Power Design — Coin-cell / low-power transmitter, low idle draw on the receiver side.
- Configurable Button Map — Buttons and functions (speed, timer, mode, swing, light) can be reassigned as per the product requirement.
- Multi-Channel Support — Multiple remotes/receivers can co-exist in the same room without cross-triggering.
- KARZOQ's Proprietary RF protocol –No license fees required + Quick turnaround time with customization as per product requirement.

Applications

- Ceiling & Pedestal Fans — Speed, timer, swing, and sleep mode control (as shown).
- Indoor Lighting — On/off, dimming, and color or scene control for lamps and fixtures.
- Air Conditioners — Temperature, mode, and fan-speed control as an alternative to IR.
- Ride-On & RC Toys —Low-cost drive and function control for kids' ride-on vehicles and toys.
- Small Appliances — Mixers, coolers, and similar products needing simple remote control.
- Access & Gate Control — Simple remote-triggered locks, gates, and barrier systems.

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- Curtains & Blinds — Open/close and position control for motorized window coverings.
- OEM Connected Products — Embed as a ready-made RF control layer in your product.

Technical Specifications

Remote (Transmitter)	Battery-powered handheld remote, custom button layout per application
RF Protocol	Proprietary, in-house designed command & pairing protocol
Range	Typical indoor range sufficient for room-level control (no line-of-sight needed)
Customization	Buttons, casing, functions, and receiver firmware adapted per product
Cost Position	Low-cost design, suited to high-volume consumer products
Origin	100% designed in India, including the RF data protocol

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04 

AI-Powered Offerings

Driven by KARZOQ's Proprietary Technology

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AI-Powered Offerings

KARZOQ Spec2Build.ai

Specs in, finished PCBA out — quicker & cheaper.

Design & sourcing powered by our proprietary AI, manufactured by vetted EMS partners.

Our offerings span topology & IC selection, optimized component procurement, circuit architecture, schematic design, PCBA layout, firmware, prototyping, design validation and scale manufacturing.

For connected products, we also offer Cloud services, APIs, web & mobile apps – one team engineers the hardware, the firmware and the UI/UX ensuring a seamless, cohesive experience.

KARZOQ Spec2Build.ai works in three simple steps:

- Share your PCBA requirements and get confirmation within 1 business day.
- A sample PCBA—designed and made in India—shipped to you in days, not weeks.
- Commercial lot delivery in weeks, not months.

If you want to get a custom-built PCBA – cheaper, faster & better, contact us, now!

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AI-Powered Offerings

KARZOQ Dezign.ai

Specs in, PCBA design out — in hours, not weeks.

AI-powered rule engines & proprietary IP create first-pass, power-up designs in hours, not weeks.

Custom AI models and rule engines determine the appropriate topology and IC selection based on given specs (end-use application, ambient conditions).

AI-powered component selection and BOM validation are enabled by our proprietary component library – offering two options "best performance" and "lowest price" while meeting the given specs.

Proprietary IP is deployed to convert the BOM into schematic, and then the final PCBA layout.

KARZOQ Dezign.ai provides:

- The right topology and IC selection for your specifications.
- Proprietary AI generates the detailed BOM, layout, schematics and Gerber files.
- Get two design options:
    - Optimized for performance, and
    - Optimized for BOM cost

Launching soon! For early access, contact us.

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AI-Powered Offerings

KARZOQ Komponent.ai

Right component, optimum price & lead time — always.

KARZOQ Komponent.ai connects Design Engineers, Component Distributors and Purchasers / Planners to improve component discovery, availability, price and lead time.

For Design Engineers

- AI-powered search and selection across a proprietary library of 7M+ components.
- Validate critical BOM components and find suitable alternatives.
- Find the right available SKU at an optimum price and lead time.

For Component Distributors

- Connect with Design Engineers and Purchasers / Planners looking for components.
- Improve component discovery and support sales to qualified buyers.

For Purchasers / Planners

- Discover component availability, pricing and lead times in one place.
- Connect component sourcing with purchasing and planning needs.

Contact us for a demo!

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KARZOQ
The Smarter Way to Build Electronics

Proudly Designing & Making Electronics in India

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