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XIAO-COMPATIBLE · 36V / 3A · MATTER-READY · AUTOMOTIVE-GRADE DRIVER

TekView Micro Driver MD1

Universal IoT Smart Motor Driver Module

An ultra-compact power-and-control board for brushed DC motors and linear actuators, with the same outline and pin-out as the Seeed XIAO family. Combines wireless smart control with direct manual emergency backup on a single board, suited for smart and care furniture, robotics, and other embedded motion-control applications.

Key Specifications

Driver IC	Automotive-grade H-bridge driver IC with integrated current sense and diagnostics
Supply Voltage	Up to 36 V motor supply
Output Current	3 A continuous
Protection	Input fuse and TVS diode; driver overcurrent and thermal shutdown, reported on nFAULT and over SPI
Diagnostics	SPI interface for digital current sensing and fault diagnostics
Form Factor	Same outline and pin-out as the Seeed XIAO family; the XIAO stacks directly on top
Board Size	21 × 17.8 mm (Seeed XIAO outline)
Wireless (default)	Socketed XIAO ESP32-C6, Matter-ready, Thread support
Wireless (also supports)	XIAO ESP32-C3, XIAO ESP32-S3
Logic Power	Integrated DC-DC module, motor supply down to 5 V for the microcontroller; no separate supply needed
Manual Backup	Manual bypass port for classic up/down buttons, isolated with a Schottky diode
Connectors	2.8 mm (0.110 in) PCB tab terminals for supply and motor
Firmware	Open; implemented by the integrator for the target application

XIAO Pin Mapping

SPI (config / diagnostics)	D8 / D9 / D10
nSLEEP	D0

nFAULT	D1
IPROPI (current sense)	D4
EN / IN1 (PWM)	D5
PH / IN2	D6
DRVOFF	D7
D2	Reserved for Hall sensor input (speed / position feedback)

Pin Functions

SCLK	SPI serial clock input.
nSCS	SPI chip select. An active-low signal on this pin enables serial communication.
SDI	SPI serial data input. Data is captured on the falling edge of SCLK.
SDO	SPI serial data output. Data is updated on the rising edge of SCLK.
EN/IN1, PH/IN2	Controller inputs for half-bridge operation (PWM speed / direction control).
DRVOFF	Controller input that forces the half-bridge outputs into a high-impedance (Hi-Z) state.
nSLEEP	Active-low input to place the driver into low-power sleep mode.
nFAULT	Open-drain fault output; pulled low when a fault condition is detected.
IPROPI	Analog output proportional to the motor load current, for current sensing.

SPI Communication

The driver exposes a standard 4-wire SPI interface (SCLK, nSCS, SDI, SDO) used to configure operating parameters and read back diagnostic information. The interface operates in peripheral (slave) mode against a controller such as the onboard XIAO microcontroller.

Frame format
Each transaction is a 16-bit word: an 8-bit command byte followed by an 8-bit data byte. The command byte's most-significant bit marks the frame type, the next bit selects a read or write operation, and the remaining 6 bits form the register address. The response word returned on SDO consists of a status byte followed by the register data being read (or the register's prior contents, for a write).

Timing rules
• SCLK is held low while nSCS transitions, and nSCS is pulled high between words.
• Data on SDO is updated on the rising edge of SCLK; data on SDI is captured on the falling edge of SCLK.
• The most significant bit is shifted in and out first.
• A full 16 SCLK cycles are required per transaction; an incomplete frame is flagged as a communication error and the data is discarded on a write.

On this module, SPI configuration and diagnostics are mapped to D8/D9/D10 on the XIAO footprint (see Pin Mapping above); the chip-select line shares the rest of the standard XIAO SPI bus pin-out.

Target Applications

Linear actuators for smart, care and medical furniture · Robotics · Smart-home (Matter) motor control · Embedded prototyping

Customization & White-Label

Standard customization — silkscreen logo, solder mask color, firmware branding (device name, default ports, current limits), connector type, and enclosure choice. Available through the order form.

Custom design (NDA) — changes to the schematic or PCB layout, custom interfaces, or mechanical requirements. Requires a signed NDA and a minimum order quantity (MOQ).

This is a public datasheet covering external specifications only. Internal schematic and PCB layout details are proprietary and shared only under a signed NDA. Firmware is left open for the integrator to implement according to the target application. "Matter-ready" means the hardware supports Matter via the XIAO ESP32-C6; official Matter certification has not yet been completed.

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Changes from Rev. 1.1: product name TekView Micro Driver MD1; continuous current rating set to 3 A; board size updated to XIAO outline; protection, connectors and logic power details added.