User Manual & Technical Documentation

Made for MegaSquirt — MicroSquirt / MegaSquirt-2 / MegaSquirt-3 (incl. Pro / EVO+ / Ultimate), with up-to-date firmware.

Use / legal notice

This product is intended for off-road / track use where required by law. You are responsible for compliance with local regulations.

Support

Email: axion.team.qc@gmail.com
Firmware updates are handled via support.

AXION Micro CAN gauge enclosure. Top = M8 (CAN + 12V), bottom = M5 (BTN, OLED2, OLED1).

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Supported ECUs

- MegaSquirt-2 / MicroSquirt with MS2/Extra 3.4.x+
- MegaSquirt-3 (incl. Pro / EVO+ / Ultimate) with MS3 firmware 1.4.x+
- Requires Simplified Dash Broadcast (SDB) enabled in TunerStudio (or equivalent).

What the customer does

- No wiring, no pinout work, no soldering.
- Plug the pre-built harness into the ECU M12 port and the gauge M8 port.
- Connect 1 or 2 OLED screens. If no OLED is detected at boot, Wi-Fi starts automatically.
- Connect the button.

Product overview & kit contents

Kit contents

- AXION Micro CAN gauge enclosure (black, 4 connectors)
- Pre-built 2.5 m harness: M12-5 A-coded (ECU) <> M8 (gauge)
- Button + cable (M5, 2-pin)
- OLED screens (3 total, M5 4-pin connectors):
  - 2 x OLED 128x32
  - 1 x OLED 128x64
- Pre-cut double-sided adhesive (3M type) for OLED and gauge mounting
- Isopropyl alcohol prep pads (x4) for surface cleaning
- Zip ties (assorted) for cable management and strain relief
- Printed documentation pack + QC checklist

Important: Connect at least one OLED (OLED1 or OLED2). Up to two OLEDs simultaneously.

What it does

- Reads MegaSquirt CAN Simplified Dash Broadcast and displays key engine data.
- Supports one or two remote OLED readouts in the cabin.
- Single-button UI for page changes, resets, and access to settings.
- Built-in Wi-Fi Access Point for configuration and diagnostics.
- Selectable 120 Ohm CAN termination via a recessed external switch.

Installation scope

The gauge enclosure, OLEDs, and button are designed for cabin (interior) installation only. Only the ECU-side harness segment routes to the ECU (often through the firewall).

Bottom ports: BTN (M5, 2-pin), OLED2 (M5, 4-pin), OLED1 (M5, 4-pin).

Safety and handling

Electrical safety

- Work with ignition OFF whenever connecting/disconnecting connectors.
- Do not probe ECU pins with power applied unless you know exactly what you are doing.
- The harness has no inline fuse. Protection is internal (PPTC on the PCB).
- Do not use metal tools inside the termination switch window.

If you suspect a wiring fault or a CAN bus short, stop and contact support.

Environmental limits (practical)

- Install in the vehicle cabin (avoid engine bay heat, water, chemicals).
- Avoid direct water spray or immersion.
- Secure cables to prevent chafing and strain on connectors.

Heat and adhesives

If you re-form the OLED cable heat-shrink, use low heat only. Avoid open flame. Keep heat moving to prevent melting plastics.

No regulatory certifications claimed

No FCC / CE / UKCA / RoHS / WEEE claims are made at this time.

Design-level protections (for robustness; not a certification claim):

- Resettable fuse (PPTC/PTC) for overcurrent protection
- Reverse polarity protection (series Schottky diode on PCB)
- 12 V input transient suppression (TVS) + local decoupling capacitors
- CANH/CANL TVS for ESD/transient events
- Common-mode choke on CAN for EMI/noise reduction
- Series damping resistors on CANH/CANL for signal integrity
- Switchable 120 Ohm termination (end-of-bus use)

Physical overview

Ports, switch, and service access.

Top side (M8 + termination)

Top: M8 connector labeled CAN 12V. Front window: termination switch (inf = OFF, 120 Ohm = ON).

Side access (USB-C service)

Side view showing USB-C service port and M8 CAN connector.

Installation (plug-only)

The harness is pre-built. Installation is plug-only.

Step-by-step installation

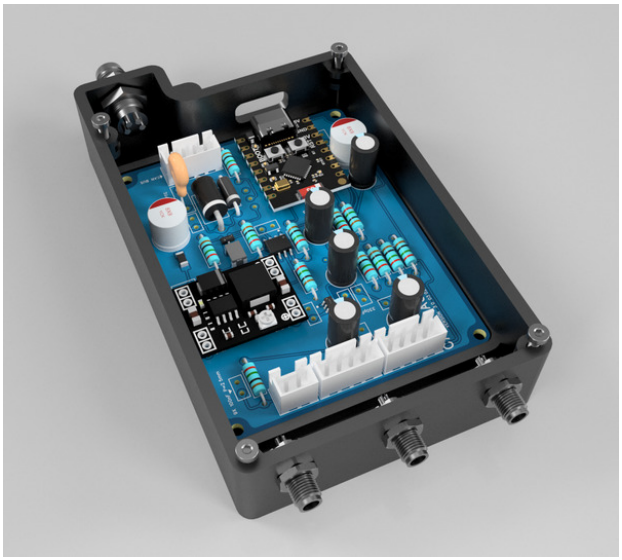
1. Confirm your ECU is MegaSquirt / MicroSquirt with SDB enabled and firmware MS2/Extra 3.4.x+ or MS3 1.4.x+.
2. Mount the gauge enclosure in the cabin (secure location). Use the supplied double-sided adhesive or the enclosure mounting loop with a zip tie.
3. Route the harness through an existing pass-through (firewall grommet) to the ECU.
4. Connect M12-5 A-coded to the MegaSquirt CAN port (hand-tighten, do not cross-thread).
5. Connect the harness M8 to the gauge CAN 12V port.
6. Connect 1 or 2 OLEDs to OLED1 and/or OLED2.
7. Connect the button to BTN.
8. Secure cables with zip ties approx. 5-10 cm from each connector for strain relief. Do not leave cables under tension.
9. Turn ignition ON. The gauge powers only when ignition is on.

Cabin-only reminder

Install the gauge, OLEDs, and button inside the cabin. Only the ECU-side harness routes to the engine bay.

If the display shows "BAD BUS / BAD BIT"

CAN wiring/termination issues or mismatched bitrate. See Troubleshooting.



Internal view (reference). Factory assembled and sealed; do not open.

CAN bus termination check

Measure termination with a multimeter between CANH and CANL on the ECU private CAN port.

M12 port (ECU) — used pins

Pin 1	Switched 12 VDC (used)
Pin 2	Not used by AXION harness (varies by ECU)
Pin 3	Ground (used)
Pin 4	CAN H (used)
Pin 5	CAN L (used)

The customer does not wire pins. This table is for the resistance check only.

Quick multimeter procedure

1. Ignition OFF. Wait for modules to power down.
2. Disconnect the M12 connector to access pins (if needed).
3. Set the multimeter to Ohm (resistance).
4. Measure between Pin 4 (CAN H) and Pin 5 (CAN L).
5. Use the table below to decide ON or OFF.

Danger / caution

Some MegaSquirt ECUs may present constant 12 V on an M12 pin. Avoid bridging pins with probe tips.

Resistance interpretation (CANH-CANL)

~54-66 Ohm	Two 120 Ohm terminators present. Set gauge to OFF.
~108-132 Ohm	One terminator. Leave factory setting 120 Ohm (ON).
OL / inf	No termination / open circuit. Check wiring.
~0 Ohm	CANH-CANL short. Do not power. Inspect harness/ECU.

Rule of thumb: CAN bus typically terminated with 120 Ohm at each end.

OLED installation options

Two installation styles: surface routing or pass-through (hidden cable).

OLED types (included)

OLED 128x64 (large)

OLED 128x32 (small)

OLED installation (continued)

Pass-through mounting (hidden cable)

Pass-through mounting hides the cable behind the dash panel.

- Drill a 6.25 mm hole (approx. 1/4 in) in the panel.
- Hole passes M5 connectors (outer diameter approx. 6.1 mm).
- Pass connector through, then mount the OLED to cover the hole.

Before drilling

Verify clearance behind the panel (wiring, airbags, harnesses). Drilling is at your own risk.

Re-forming the heat-shrink (optional)

The OLED cable is sleeved with adhesive-lined heat-shrink. For a clean pass-through, gently re-form the cable exit toward the rear (~90 deg).

- Use low heat (example: household hair dryer on low).
- Warm gradually until slightly pliable.
- Reposition to desired angle and hold until cool.
- Do not overheat; avoid any open flame.

If not comfortable applying heat, skip — surface routing is valid.

Adhesive mounting

Use the supplied isopropyl alcohol prep pads before applying adhesive:

- Clean back of OLED housing and vehicle surface with a prep pad.
- Let both surfaces dry completely.
- Apply the pre-cut double-sided adhesive to the OLED housing.
- Position and press firmly for ~20 seconds. Avoid re-positioning.

Button controls

One-button interface. Gestures control pages, resets, Wi-Fi, and settings.

Button gestures (quick reference)

1 click	Next page
Long press	Previous page
2 clicks	Change focus zone (if page has multiple zones)
3 clicks	Open/close the on-screen menu
4 clicks	Enter extrema view (min/max for current focus)
1 click + long	Reset maxima for current focus
5 clicks	Toggle display sleep mode ON/OFF
7 clicks	Enter Wi-Fi mode (AP + portal)
Hold 10 sec	Fail-safe full restart (last resort)

Exact behavior can vary slightly by firmware revision.

Wi-Fi exit shortcut

In Wi-Fi mode, long press to request exit. Confirm with 1 click within 5 seconds.

Lock / unlock shortcut

Three clicks arms a lock gesture. Press-and-hold: ~2s = lock, ~3s = unlock.

Menu navigation

Menu navigation uses the same button.

Enter / exit menu

- 3 clicks opens the menu.
- 3 clicks again closes the menu.

Navigate inside menu

1 click	Forward
Long press	Backward
2 clicks	Select / Enter

What the menu is for

- Screen/page layout (page setup)
- Reset of recorded maxima
- Device setup (display, CAN, units)
- Wi-Fi mode and diagnostics
- Factory reset (last resort)

Factory reset

Factory reset clears configuration and returns defaults. Use only if instructed by support.

Menu tree

Menu hierarchy for quick reference (firmware-based).

MENU	DESCRIPTION
Settings	Main settings menu
Page Setup ▸	Submenu name depends on the active page (e.g., “Boost Setup”, “Oil Setup”, etc.)
Unit •	Units: Metric / Imperial
Max •	MAX alerts: On / Off
Minimum •	MIN alerts: On / Off
Maximum Threshold •	MAX alert threshold
Minimum Threshold •	MIN alert threshold
Hide •	Hide this page
Back ↩	Return to Settings
Save Screen •	Save the displayed pages/zones (restored on next boot)
Reset Air Max\Air Min •	Reset current page extremes (MAX/MIN)
Device Setup ▸	Device configuration
Display •	Screen configuration
CAN Setup •	Mode: Demo / Normal CAN
CAN Diagnostic •	CAN frames / errors
Flip OLED 1 •	Rotate display #1 by 180°
Flip OLED 2 •	Rotate display #2 by 180°
Unhide all pages •	Unhide all pages
Oil sensor swap •	Swap Oil Pressure ↔ Oil Temp (sensors 1↔2)
Barometric recalibrati...	Barometric recalibration (correct MAP/Boost)
Factory reset •	Restore factory defaults
Back ↩	Return to Settings
Wi-Fi mode •	Enable Wi-Fi mode
About •	Info (release version, etc.)

Some items are for advanced diagnostics or support.

Fail-safe action (10-second hold)

If the UI becomes unresponsive, hold the button for 10 seconds to force a full restart.

Wi-Fi portal

Wi-Fi mode provides configuration and diagnostics. Firmware updates via support.

Enter Wi-Fi mode

- Use 7 clicks, or use the Wi-Fi Mode item in the 3-click menu.
- The gauge starts a Wi-Fi Access Point (AP).

Default network

SSID	AXION-MCG
Password	AMCG1234
Portal IP	192.168.4.1

Exit Wi-Fi mode

1. Long press to request exit.
2. Confirm with 1 click within 5 seconds.

Security note

To change the Wi-Fi password, use the Reset Wi-Fi Password menu item or contact support. Password: 8-16 characters, configurable from the portal.

What the portal provides

Wi-Fi also starts if no OLED is detected at boot.

- Live status (CAN state, bitrate, frame counters, sensor values)
- Gauge configuration (pages, units, brightness, update rate, CAN)
- Alerts: enable/disable and set per-sensor thresholds
- Extremes: view min/max history and reset
- Export: download CSV report of recorded extremes
- Diagnostics bundle: download logs/support package
- Device personalization: boot text and welcome message
- Maintenance: factory reset and profile re-selection

Firmware updates: contact axion.team.qc@gmail.com.

Troubleshooting

Most issues are CAN wiring/termination or incompatible ECU config.

Common symptoms

Blank / no power	Confirm ignition is ON. Check ECU power and harness seating.
"BAD BUS"	CAN physical layer issue. Re-check CANH-CANL resistance and connectors.
"BAD BIT"	Bitrate mismatch. Ensure SDB enabled, firmware MS2/Extra 3.4.x+ or MS3 1.4.x+.
OLED not detected	Check OLED plugged into OLED1/OLED2. Wi-Fi AP starts automatically if no OLED at boot.
Wi-Fi not visible	Enter Wi-Fi mode (7 clicks). Keep phone nearby. Look for SSID AXION-MCG.
UI stuck	Use the 10-second hold fail-safe restart.

When to contact support

Persistent BAD BUS/BAD BIT, CAN resistance open/short, or factory reset fails: contact axion.team.qc@gmail.com with description and photos.

Technical specifications

Summary specifications for installation planning.

Mechanical

Gauge enclosure	115 x 62 x 23 mm (H x W x T)
OLED 128x64 housing	30 x 30 x 8 mm
OLED 128x32 housing	40 x 15 x 8 mm
Connector pass-through	Recommended hole: 6.25 mm (~1/4 in)
OLED 128x64 diagonal	0.96 in
OLED 128x32 diagonal	0.91 in

Electrical / communications

Input	Vehicle switched 12 V via ECU CAN port (through harness)
CAN bitrate	Default 500 kbps (configurable; auto-baud supported)
Termination	Selectable 120 Ohm (ext. switch). Factory default: ON.
12 V input current	50-100 mA (internal 3.3 V rail: 150-300 mA approx.)
Wi-Fi AP	SSID AXION-MCG, default pass AMCG1234, portal 192.168.4.1

Warranty

12-month limited warranty from purchase date, covering gauge, harness, OLEDs, and button.

Exclusions: water damage, misuse, physical damage, improper installation, excessive heat, racing beyond typical cabin use, modifications, accidents.

Support

Email: axion.team.qc@gmail.com

Firmware updates, issues, debugging, questions, comments, suggestions: all via email.

Factory QC checklist

Factory-only document. Print and include with each shipped unit.

Unit identification

☐ Serial No.: _____
☐ Date: _____
☐ Technician: _____

Visual / mechanical

☐ Enclosure screws installed / torqued
☐ Enclosure visual inspection (cosmetic / cracks / label)
☐ Connectors seated and aligned (M8 + 3xM5)
☐ Termination switch operates (inf / 120 Ohm)
☐ USB-C access opening clear
☐ Harness/cables (threads, jacket, strain relief)
☐ Connector inspection (M12, M8, 3xM5)
☐ OLED housings OK + adhesive included
☐ Accessories (harness, button, 3xOLED, adhesive, pads, ties, docs)
☐ Button cable OK

Electrical / functional

☐ Power-on functional test (ignition-simulated)
☐ 3.3 V rail health check (stable / no resets)
☐ CAN traffic detected (MegaSquirt dash stream)
☐ OLEDs functional (all 3 tested)
☐ Button functional (click/long/3-click menu)
☐ Wi-Fi AP reachable (SSID AXION-MCG) + portal loads

Final disposition

☐ PASS - ready to ship
☐ FAIL - rework required

Notes:

Signature: