WSCAN

Atmospheric Sensor, CAN Output

Atmospheric data for engine, vehicle and test-cell logging: measures air temperature, absolute pressure and relative humidity, and delivers up to twelve weather channels over CAN. Designed for data logging; closed-loop corrections are supported where the integrator takes responsibility for the application.



SUPPLY VOLTAGE	CAN OUTPUT	OPERATING TEMP	INGRESS RATING
5–28VDC	**8–12 Channels**	**−20 to +70°C**	**IP50**

FEATURES

- Delivers up to 12 channels: ambient air temperature, absolute pressure, relative humidity, dew point, mixing ratio, absolute humidity, air density, relative air density, density altitude, pressure altitude, specific enthalpy and internal temperature
- AUTONYM™ · Autonomous ECU Recognition · Patent Pending: one part number for every supported ECU. On Holley and Haltech, WSCAN recognizes the ECU and configures its own output, with no device setup and no ECU-specific firmware. The ECU is set up to receive the transmitted channels as its application note describes
- Open CAN output for other ECUs and data loggers; bit rate, identifiers, byte order, broadcast rate and units are user configurable over CAN
- Operates from 5–28 V DC: a regulated ECU sensor supply or switched battery; reverse-polarity protected; 6 mA typical with no fault present
- Monitors itself continuously (Safe Self-Healing); in the event of internal detected fault or invalid data, the device withholds the affected values and recovers on its own, in as little as a few milliseconds, without user intervention
- Every unit is individually configured, calibrated and tested before it ships

APPLICATIONS

- Engine, chassis-dynamometer and vehicle data logging
- Dynamometer correction factors and density-altitude tracking
- Weather channels for motorsport ECUs and data loggers
- Industrial and test-cell monitoring on CAN networks
- Closed-loop ECU corrections from any channel, at the integrator's responsibility

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Ratings and Electrical Data

Ratings apply at 25 °C ambient unless stated.

ABSOLUTE MAXIMUM RATINGS

Parameter	Pin	Min.	Max.	Unit	Conditions
SUPPLY					
Supply Voltage, Continuous	P1 (VCC)	−28	+28	VDC	To P2 (GND). Reverse connection protected
Supply Transients	P1 (VCC)	−150	+100	V	ISO 7637-2 pulses 1, 2a, 3a and 3b: −100, +75, −150 and +100 V
Load Dump	P1 (VCC)	—	—	—	ISO 16750-2 load dump†, 12 V systems
CAN LINES					
CAN Line Voltage	P5, P6	−22	+22	VDC	Each line to P2 (GND), continuous. Covers a short to ground or to a 12 V supply
CAN Differential Voltage	P5 to P6	−40	+40	VDC	CAN High to CAN Low
TEMPERATURE					
Storage Temperature	—	−40	+85	°C	Unpowered

Stresses beyond these ratings may cause permanent damage. Operation is specified only within the recommended operating conditions.

ESD RATINGS

Parameter	Pin	Contact	Air	Unit	Conditions
ESD, Supply Input	P1 (VCC)	±30†	±30†	kV	IEC 61000-4-2
ESD, CAN Lines	P5, P6	±30†	±30†	kV	IEC 61000-4-2

† Design value from component data and the circuit design; not tested in production.

RECOMMENDED OPERATING CONDITIONS

Parameter	Pin	Min.	Typ.	Max.	Unit	Conditions
Supply Voltage	P1 (VCC)	4.9	—	28	V DC	Continuous
Supply Current	P1 (VCC)	—	6	26	mA	Typ.: no fault present. Max.: highest-current LED state, CAN transmitting
Ambient Temperature	—	−20	—	+70	°C	At the sensor (−4 to +158 °F)
Absolute Pressure	—	50.0	—	110.0	kPa	Uncorrected station pressure (14.8 to 32.5 inHg)
Relative Humidity	—	0	—	95	% RH	Non-condensing

Power and ground must come from the same source: a regulated ECU sensor supply (5 V nominal or higher) with its own sensor 0 V, or switched battery with battery ground. Never pair a sensor supply with battery ground. When powered from switched battery, fit an inline 0.5 A fuse.

GENERAL ENGINEERING DATA

Parameter	Value	Note
CAN Output	8–12 channels	Set by the ECU: 8 on Holley, 10 on Haltech, 12 on every other ECU
Enclosure Material	PPS (polyphenylene sulfide)	Flammability: see Environmental ratings
CAN Wiring Faults	Survives short to ground, CAN High / Low swap and missing termination	Transmission resumes automatically once the wiring is corrected

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Measurement Specification

Every value WSCAN reports. Channel numbers follow the default output; Holley and Haltech order theirs as their application notes show.

CHANNELS DELIVERED

Ch.	Channel	Unit, SI	Unit, Imperial	Holley	Haltech	All Other ECUs
01	Ambient Air Temperature	°C	°F	●	●	●
02	Absolute Pressure	kPa	inHg	●	●	●
03	Density Altitude	m	ft	●	●	●
04	Mixing Ratio	g/kg	gr/lb	●	●	●
05	Dew Point	°C	°F	●	●	●
06	Air Density	kg/m³	lb/ft³	●	●	●
07	Pressure Altitude	m	ft	●	●	●
08	Relative Air Density	%	%	●	●	●
09	Internal Temperature	°C	°F	—	●	●
10	Absolute Humidity	g/m³	gr/ft³	—	—	●
11	Specific Enthalpy	kJ/kg	BTU/lb	—	—	●
12	Relative Humidity	%	%	—	●	●
	Channel count			8	10	12

ACCURACY AND RESOLUTION

Channel	Resolution	Typ. Accuracy [1]	Accuracy at Extremes	Figure
Ambient Air Temperature	0.1 °C	±0.5 °C	±1.25 °C [3]	1
Absolute Pressure	0.01 kPa	±0.10 kPa	±0.17 kPa [3]	2
Relative Humidity	0.1 %	±3 % RH [2]		—
Dew Point	0.1 °C	±1.0 °C	±2.2 °C [4]	7
Mixing Ratio	0.1 g/kg	±0.36 g/kg	±1.4 g/kg [5]	4
Absolute Humidity	0.01 g/m³	±0.43 g/m³	±1.4 g/m³ [5]	6
Air Density	0.01 kg/m³	±0.003 kg/m³	±0.008 kg/m³ [6]	10
Relative Air Density	0.1 %	±0.21 %	±0.64 % [6]	10
Density Altitude	1 m	±22 m (±72 ft)	±57 m (±187 ft) [6]	8
Pressure Altitude	1 m	±8 m (±27 ft)	±25 m (±82 ft) [6]	9
Specific Enthalpy	1 kJ/kg	±1.2 kJ/kg	±3.9 kJ/kg [5]	5
Internal Temperature [7]	0.1 °C	±1 °C	±2 °C	—

[1] Typical: 15 °C, 101.325 kPa, 50 % RH.
[2] Specified at 20–80 % RH and 25 °C. Derived channels and figures assume ±3 % RH across the full range.
[3] Below 0 °C (−20 to 0 °C).
[4] Dry air: 30 °C, 20 % RH. Dew-point error grows as the air gets drier (Figure 7).
[5] Hot, humid air: 35 °C, 101.325 kPa, 75 % RH (a 30 °C dew point).
[6] Worst case across −20 to +65 °C, 50–110 kPa and humidity up to a 30 °C dew point.
[7] Measured inside the device, not ambient.

Accuracy is not specified above +65 °C. Resolution is that of the default output and user configuration; on Holley and Haltech it is set by each channel's transmitting range. Calculated values; product-level verification pending.

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Performance Curves

TIMING

Parameter	Min.	Typ.	Max.	Unit	Conditions
Measurement Rate	—	1	—	Hz	At every broadcast rate
Broadcast Rate	1	—	10	Hz	Set automatically on Holley and Haltech; 1 Hz or 10 Hz by user configuration otherwise
Output Response, 63 %	—	10	—	s	Step change in a measured value; output filtering only (Figure 3)
Output Response, 90 %	—	14	—	s	As above

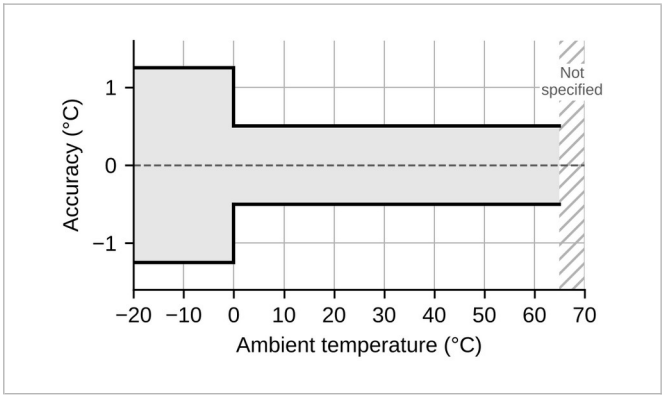

Figure 1 · Temperature Accuracy vs. Ambient Temperature
Typical accuracy band, −20 to +65 °C. Above +65 °C not specified; to be characterized

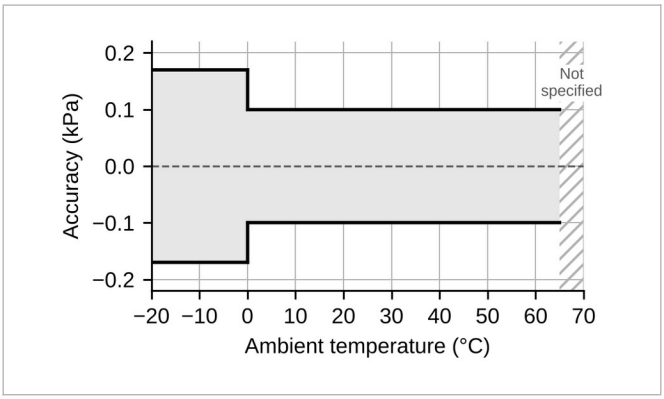

Figure 2 · Pressure Accuracy vs. Ambient Temperature
Typical accuracy band, −20 to +65 °C. Above +65 °C not specified; to be characterized

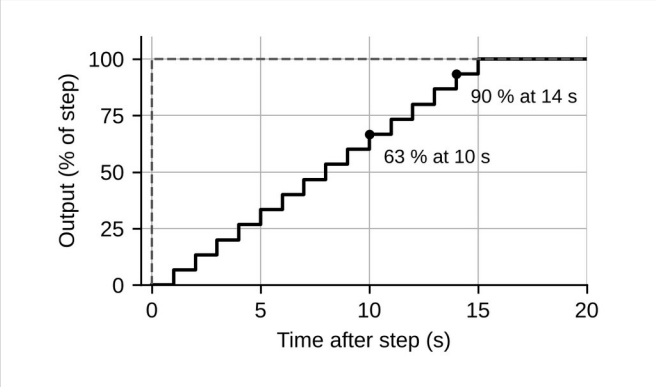

Figure 3 · Output Response to a Step Change
Output filtering only; the enclosure adds thermal lag to temperature

Accuracy Maps

How each calculated channel's accuracy changes with conditions. Find the ambient temperature across and the humidity up; the shade gives the accuracy. Hatched areas carry no accuracy claim: above +65 °C, and air with a dew point above 30 °C, which is not expected at ground level.

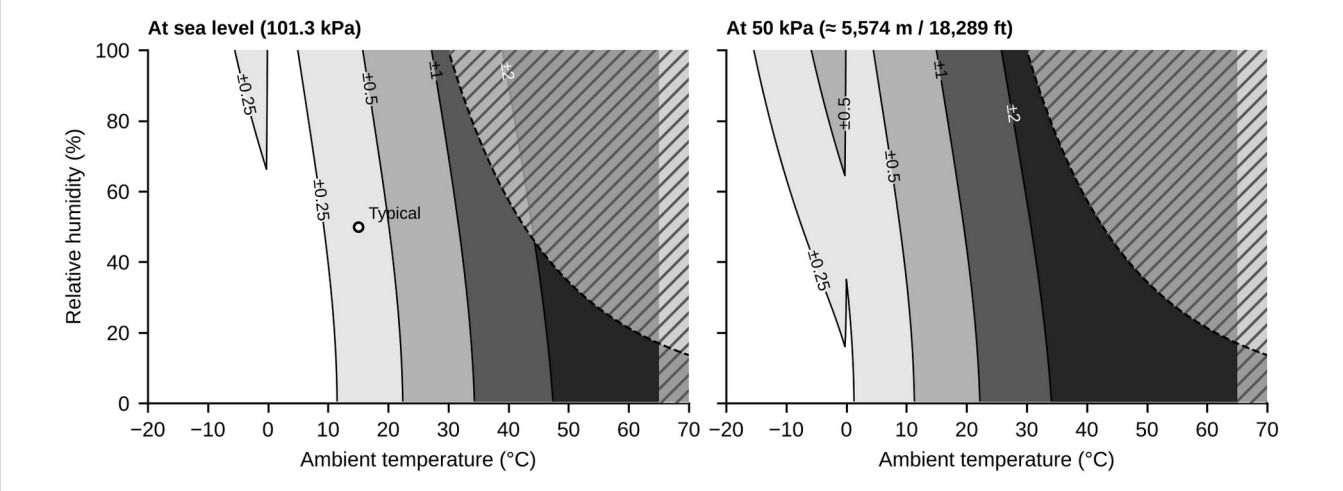

Figure 4 · Mixing Ratio Accuracy
Accuracy in ± g/kg (× 7.0 for ± gr/lb). Bands: 0.25, 0.5, 1 and 2 g/kg.

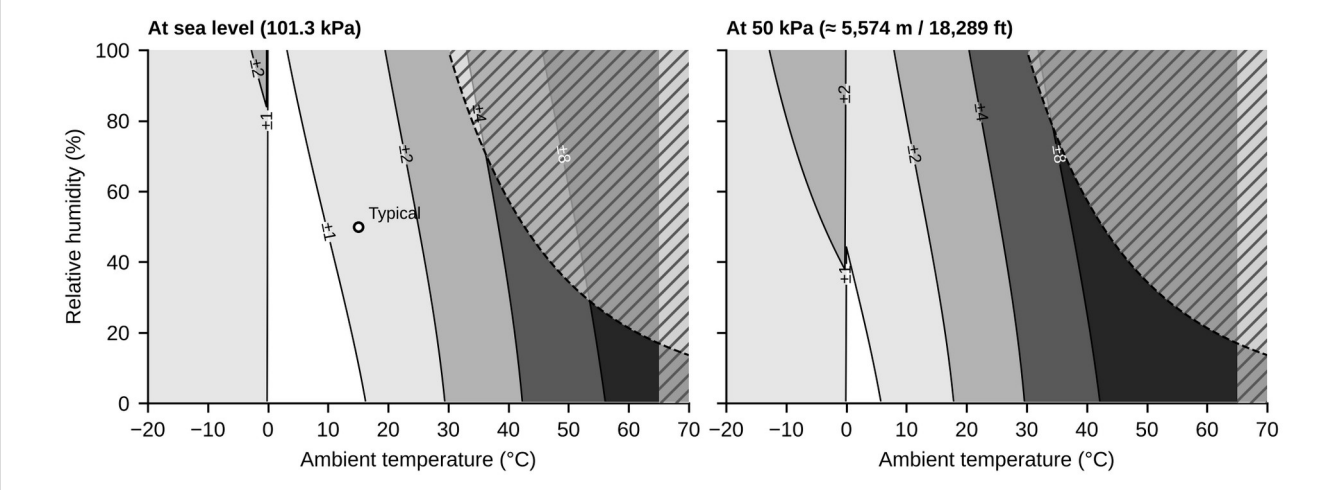

Figure 5 · Specific Enthalpy Accuracy
Accuracy in ± kJ/kg (× 0.43 for ± BTU/lb). Bands: 1, 2, 4 and 8 kJ/kg.

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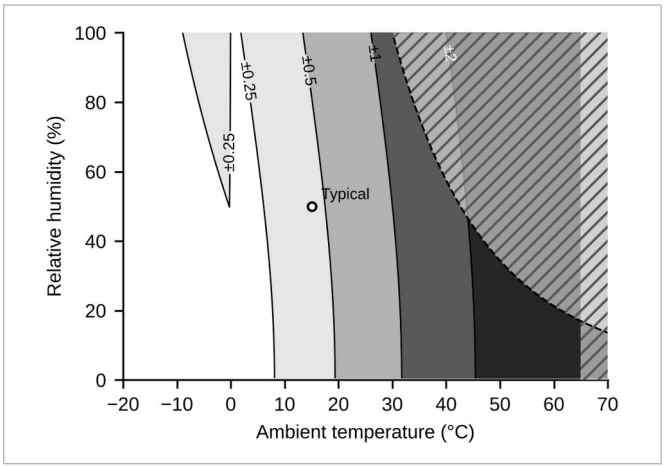

Figure 6 · Absolute Humidity Accuracy
Accuracy in ± g/m³ (× 0.437 for ± gr/ft³). Bands: 0.25, 0.5, 1 and 2 g/m³. Independent of pressure

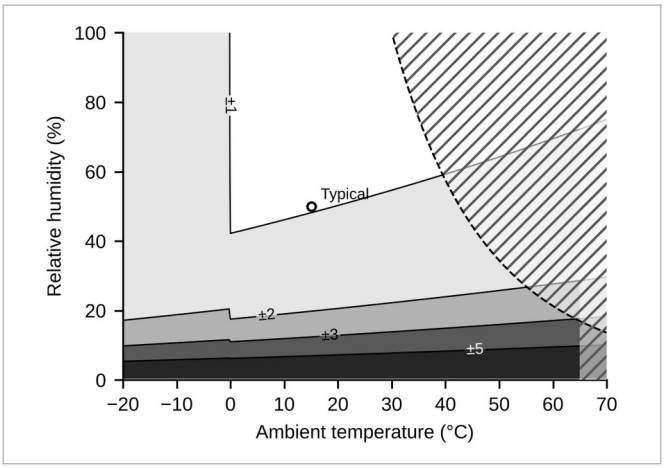

Figure 7 · Dew Point Accuracy
Accuracy in ± °C (× 1.8 for ± °F). Bands: 1, 2, 3 and 5 °C. Independent of pressure

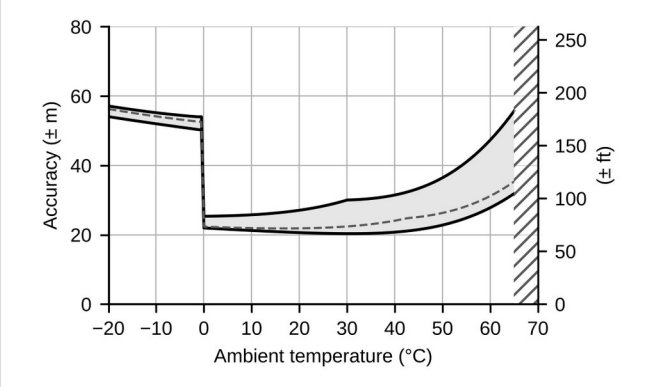

Figure 8 · Density Altitude Accuracy
Shaded: every pressure from 50 to 110 kPa and humidity up to a 30 °C dew point. Dashed: sea level, 50 % RH

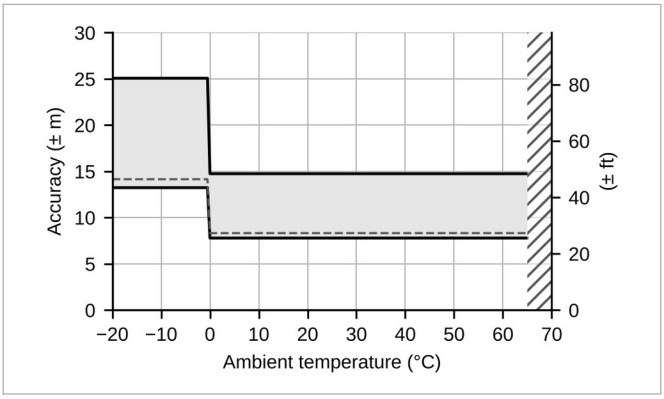

Figure 9 · Pressure Altitude Accuracy
Shaded: every pressure from 50 to 110 kPa. Dashed: sea level

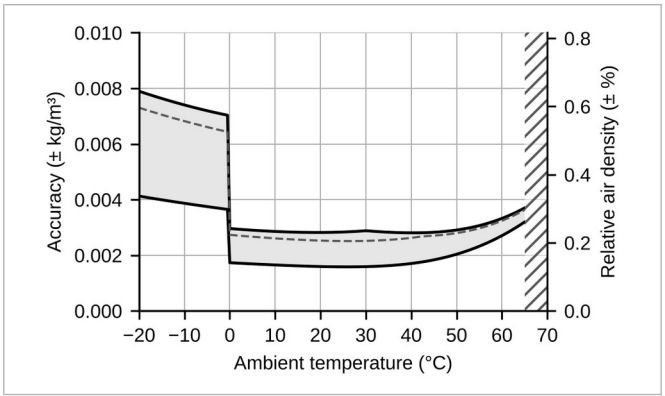

Figure 10 · Air Density and Relative Air Density Accuracy
Shaded: every pressure from 50 to 110 kPa and humidity up to a 30 °C dew point. Dashed: sea level, 50 % RH

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Mounting and Installation

LOCATION

Requirement	Specification
Air Path	Vent open to free-flowing ambient air; never recirculated or stagnant enclosed air
Heat Sources	Away from high heat sources including but not limited to: an engine bay, drivetrain, turbochargers, exhaust, radiators, heat exchangers or ductwork
Sun and Warm Panels	Out of prolonged direct sun. Spaced off panels that get warm (conductive, convective, or radiation “heated” panels)
Orientation	Connector facing down or sideways, so water cannot pool at the connector
Harness Routing	No sharp bends; away from ignition leads and high-current wiring
Mounting Hardware	Supplied hardware; nylon spacers to stand the sensor off warm panels

MOISTURE

- WSCAN has no water rating: the connector terminals are not sealed. It is not waterproof.
- Mount away from direct rain, water spray and standing water.
- Clean only with the sensor unpowered and the connector mated, using a light, momentary mist. Never spray it directly, pressure-wash it or immerse it.

COMMON LOCATIONS

- Vehicle: taillight panel or license-plate area under an overhanging wing or panel; behind the front bumper with a path to free ambient air; under a drag-style flat wing on nylon spacers; open or well-ventilated cabins near the door jamb
- Engine or chassis dynamometer cell: in the air supplying the engine inlet, away from exhaust extraction, fan discharge and the engine itself
- Industrial and test-cell installations: in free-flowing room air, away from heat-producing equipment and cooling outlets

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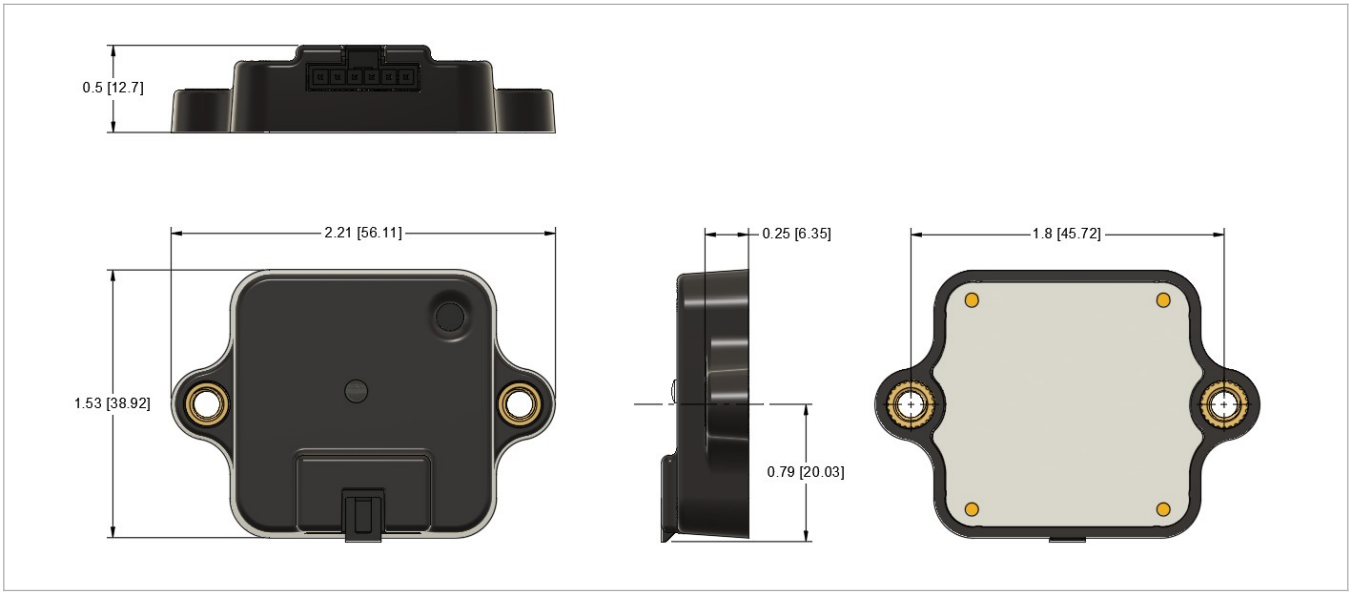
Mechanical Drawings and Wiring



Dimensions: in [mm]. Top, front, side and back views of the complete assembly.

KEY DIMENSIONS

Feature	in [mm]
Length, Overall	2.21 [56.11]
Width, Overall	1.53 [38.92]
Height, Overall	0.5 [12.7]
Mounting Holes	2× #10-32 UNF threaded insert [Ø4.83 major diameter]. Use #10-32 UNF screws
Mounting Hole Centers	1.8 ±0.01 [45.72 ±0.254]
Weight	25 g [0.9 oz]

Reference dimensions. Untoleranced dimensions are nominal; due to tolerances, measurements of an actual assembly may vary. Weight is the device only, pigtail excluded.

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PINOUT

Device Pin	Signal	Function	Pigtail Pin (ATM / DTM 4-Way)
P1	VCC	Supply, 4.9–28 V DC	1
P2	GND	Ground. Same source as the supply	2
P3	—	Not used. Do not connect	—
P4	—	Not used. Do not connect	—
P5	CAN_L	CAN Low (−)	3
P6	CAN_H	CAN High (+)	4

A 120 Ω termination resistor is fitted in the supplied pigtail, under the CAN High boot. There is no termination in the device, so the bus stays terminated if the sensor is unplugged.

INTERCONNECT

Item	Specification	Notes
Device Connector	Molex Nano-Fit, 6-position, latching, crimp terminals	20–22 AWG TXL
Pigtail	Amphenol ATM or Deutsch DTM 4-way, 120 Ω fitted	Supplied. See Ordering Information

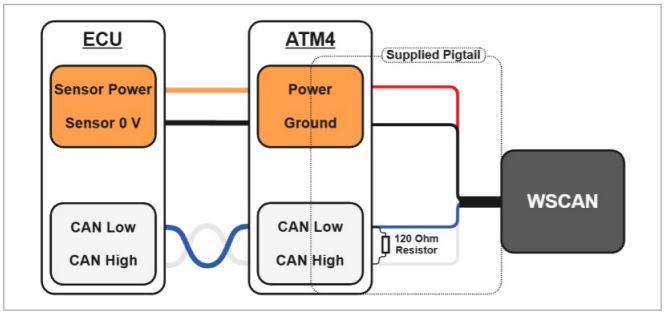

Figure 11 · Typical Wiring, ECU Sensor Supply
Ground to the same supply's sensor 0 V

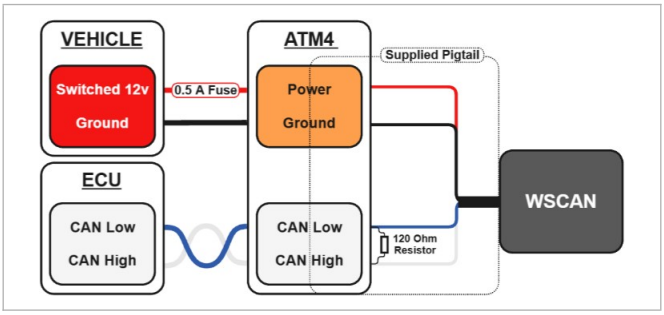

Figure 12 · Typical Wiring, Switched Battery
Fuse: 0.5 A inline. Ground to battery ground

A 120 Ω termination is also required at the far end of the bus (not shown).

Status LED

The LED color names the fault category and means the same on every Plimpton Innovations product. A blink is a brief flash, not a steady light.

What good looks like: at power-up the LED shows red, green and blue once; it holds cyan for up to one second while it listens to the bus; then it blinks green once a second.

	Color	Pattern	Meaning	Data
	Red, Green, Blue	Each once, about 750 ms in all, at power-up and after a configuration change	Start-up self-test of the LED	Not yet transmitting
	Cyan	Solid, up to about 1 s	Start-up: listening to the CAN bus before transmitting	Not yet transmitting
	Green	Blink once per second	All good: data transmitted	Transmitting
	Blue	Blink once per second	The device is OK. The problem is between the device and the ECU: CAN wiring, termination or bit rate	Stopped until the bus is restored
	Yellow	Solid	Internal issue: the device is recovering on its own	Paused while it recovers
	Magenta	Blink once per second	Service: factory calibration missing	Continues
	Magenta	Double blink once per second	Service: stored configuration was corrupt and has been reset to defaults	Continues
	Red	Solid	Serious fault: the device resets itself up to 3 times, then holds red until power is cycled	Stopped
	Off	Dark with power applied	No supply reaching the device	None

Troubleshooting for each state is in the application notes.

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CAN Interface

Holley and Haltech: WSCAN recognizes the ECU and sets its own output. Every other ECU or logger receives the default output, or the output chosen by user configuration over CAN; the application notes give the frames and the configuration procedure.

Capability	Value	Note
Protocol	CAN 2.0B; 11-bit and 29-bit identifiers	—
Bit Rate	125, 250, 500 or 1000 kbit/s	Set automatically on Holley and Haltech; user configurable otherwise
Broadcast Rate	1 Hz or 10 Hz	User configurable
Channels	8–12	12 in the default output and user configuration
Data Format	Raw values, or 0–5000 mV channels	User configurable
Byte Order	Big-endian or little-endian	User configurable
Units	SI or imperial	User configurable; raw values only
Identifiers	Start identifier, 11-bit or 29-bit	User configurable; three consecutive frames
Default Output	11-bit, start ID 0x720 (three frames), big-endian, 1 Hz broadcast, 1000 kbit/s, SI	Any ECU that is not recognized and has no user configuration
Factory Reset	Restores every default and re-enables recognition	Command over CAN
Termination	None in the device	120 Ω fitted in the supplied pigtail
Start-Up	Listens before transmitting	Up to about 1 s after the LED sweep

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Standards, Environment and Test Conditions

APPROVALS, COMPLIANCE AND TRADE

Item	Scope	Status
RoHS	EU 2011/65/EU as amended by (EU) 2015/863	Annex III exemptions 6(c) (brass mounting inserts†) and 7(a) (high-melting-temperature solder in some diodes).
REACH	EC 1907/2006, SVHC Candidate List	Contains lead (SVHC, CAS 7439-92-1) above 0.1 % w/w in the brass mounting inserts† and in some diodes; SVHC details on request.
Patent	Autonomous ECU Recognition	Patent Pending
ECCN	US export control classification	EAR99
HTS	US Harmonized Tariff Schedule	9025.80.1000*

* Under review. Listed for planning; subject to change or removal.

† Brass mounting inserts. Contact Plimpton Innovations for alternative mounting insert options.

ENVIRONMENTAL RATINGS

Parameter	Specification	Test Method / Profile
Protection Degree	IP50: dust-protected; no water rating	IEC 60529
Flammability	Enclosure and lens materials UL 94 V-0	UL 94, material rating

CONDITIONS OF CONFORMITY

Condition	Requirement
Supply Protection	Inline 0.5 A fuse when powered from switched battery
Bus Termination	60 Ω between CAN High and CAN Low with power off: one 120 Ω resistor at each end of the bus

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Ordering Information

PART NUMBER

Product Code	Description	Supplied With
WSCAN	WSCAN Atmospheric Sensor, CAN Output, 8–12 channels	4-way pigtail with 120 Ω termination (Amphenol ATM or Deutsch DTM); mounting hardware with nylon spacers

ACCESSORIES

Accessory	Notes
Replacement Pigtail, ATM/DTM 4-Way	120 Ω fitted
Replacement Connector Kit	Included: Connector, TPA, Crimp Terminals
Replacement Mounting Hardware	With nylon spacers

APPLICATION NOTES

ECU	How WSCAN Connects	Document
Holley	Autonomous ECU Recognition	PI-WSCAN-AN-ECU-HOLLEY-RA
Haltech	Autonomous ECU Recognition	PI-WSCAN-AN-ECU-HALTECH-RA
MoTeC M1	Default output, or one configuration message	PI-WSCAN-AN-ECU-MOTEC-RA
FuelTech FT700	Default output	
Emtron / Link	Three configuration messages	PI-WSCAN-AN-ECU-EMTRON-RA
Other CAN ECUs and Loggers	Default output or user configuration	PI-WSCAN-AN-ECU-UNIVERSAL-RA

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Application Cautions and Legal

APPLICATION LIMITS

- WSCAN is designed for data logging. Using any channel for closed-loop control (fuel, ignition, boost or any other correction) is at the user's risk: the user is responsible for validating that application and for its safe behavior if WSCAN data stops or is wrong.
- No water rating. Do not mount where water strikes the sensor directly; never pressure-wash it.
- Mount away from heat sources and warm panels. Heat-soaked or stagnant air reads high and lags ambient change.
- Power and ground from the same source. Fit an inline 0.5 A fuse when powered from switched battery.
- Terminate the CAN bus outside the device: one 120 Ω resistor at each end (fitted in the supplied pigtail).
- Absolute pressure is uncorrected station pressure. Published weather figures are normally corrected to sea level.
- Not certified or designed for aeronautical use or any flying vehicle.

FAILURE-MODE STATEMENT

WSCAN monitors itself continuously and never transmits a value it cannot validate: when a measurement fails its checks, or the device is recovering from a fault, the affected values are withheld rather than sent. Detect a device fault in the receiving system with a data timeout on the WSCAN channels, set to five transmit periods (5000 ms at 1 Hz, 500 ms at 10 Hz); the status LED then shows the cause. WSCAN sends no keep-alive frame. The receiving system must remain safe if WSCAN stops transmitting.

HANDLING AND INSTALLATION

- Do not cover or puncture the vent, or clean it with solvents or compressed air.
- Leave the sensor unplugged from its pigtail until the ECU configuration has been uploaded.

IMPORTANT NOTICE

Plimpton Innovations products are intended for use within the ratings in this data sheet. The purchaser is responsible for determining suitability for the end application, including integration, validation and any regulatory approval it requires. Information in this document is believed accurate but may change without notice. No license under any Plimpton Innovations, LLC patent or other intellectual property is granted. Warranty and limitation of liability are governed by the Plimpton Innovations, LLC Terms of Sale.

REVISION HISTORY

Rev	Date	Description of Change
RA	2026-11-10	Initial release

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