

Toucan Touchscreen Gauge and CAL Selection Unit User Guide (AlcaTek)

Version 1.2

Disclaimer

Although every care is taken with the design of this product, JT Innovations Ltd. can in no way be held responsible for any consequential damage resulting from the use of Toucan in your vehicle.

Always operate your vehicle safely and do not allow yourself to be distracted by your Toucan display while driving. Minimise the amount of time you spend viewing the screen. Do not access any function requiring prolonged use of the menus whilst driving.

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Introduction

Thank you for purchasing a Toucan display. We hope it will be easy to install and configure, and we recommend you read this guide before you start. It is recommended that you register your product in the JT Innovations website – this way we can keep you advised of any product updates etc.

Installation

Before You Start

Please check the box contents to ensure nothing is missing. You should have:

toucan Unit



Cable Harness



Mount (one of the following)



Installation

Connectors



Mini-DIN	Data connection to AlcaTek ecu
BLACK	Power Ground
YELLOW	Permanent +12V
RED	Switched +12V
ORANGE	Lighting circuit
Multiway	Connects to Toucan unit

ENSURE THE CAR BATTERY IS DISCONNECTED BEFORE ATTEMPTING TO INSTALL YOUR TOUCAN DISPLAY UNIT

IF IN DOUBT, PLEASE CONSULT A QUALIFIED AUTOMOTIVE ELECTRICIAN

Power

The power connectors are provided with "bullet" connectors which may be removed if preferred. Each power feed has an inline fuse holder pre-fitted with a 1 amp 20mm glass fuse. Ensure a good ground connection is provided to the BLACK wire.

To allow Toucan to power up quickly, it is recommended that a connection to both a permanent and switched (i.e. only live when the ignition is on) vehicle battery feed are made. When the ignition is off, Toucan will consume about 40 milliamps from the permanent connection – a typical, healthy, 40 amp-hour vehicle battery will last over a month before being run completely flat by Toucan: but it's your choice.

If you decide not to connect the YELLOW permanent +12 Volt, please make sure it is wired along with the RED connection to the switched ignition feed; otherwise Toucan may not start up when you turn on the ignition.

Toucan will take about 6 seconds to start if the permanent +12 Volt feed is not connected compared to less than a second when the permanent connection is made.

A connection to the vehicle lighting circuit may be made using the ORANGE connector – this will allow the Toucan unit to automatically dim when the vehicle lights are turned on. If not required, please insulate the unused wire to prevent damage to the unit or vehicle.

Mini-DIN ("PS/2") Data Connector

This plugs directly in to the AlcaTek ecu. The same connector is used when mapping the ecu.

Multiway Connector

This connects to the rear of the Toucan unit. Note that it has a latching tab that must be depressed before the connector and cable can be detached.

The connector is intended to allow occasional removal of the unit from the car to allow, for example, firmware updates to be applied.



When detaching the unit, take care not to put unnecessary strain on the wires otherwise they may be damaged.

In-vehicle Mounting

Toucan uses the Herbert Richter™ 4-prong mount system, which provides a secure mount when in the vehicle, but easy removal should it be required.

The default mount supplied is a permanent mount which is intended to be permanently screwed to the vehicle. Make sure the mount is in the location you require before attaching it!

An alternative mount may have been supplied as an option when you purchased your unit, or they may be purchased separately if required: please contact JT Innovations for availability.

Initial Toucan Configuration

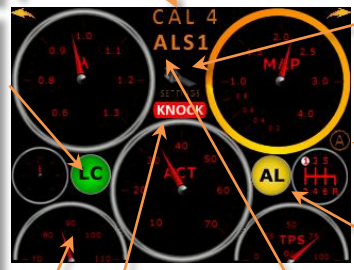
Having checked the installation of your Toucan, ensuring all connectors are fully home and especially that the power wiring is correct, reconnect the vehicle battery and turn on the ignition. After a few seconds, Toucan should power up and display the main gauge screen. A good way to check that Toucan is working is to press the throttle and check that the "TPS" gauge on the main display screen moves.

Doesn't work?

- Double check installation, especially the data connection to the Alcatek unit.
- Toucan will only work with Alcatek (previously known as Simtek) engine management systems that have been upgraded to the new firmware. Contact your AlcaTek dealer to discuss the upgrade options available to you.
- Contact technical support at JT Innovations for assistance.

Menus and Operation

Gauge Screens



Touch here to go to previous gauge page

Touch here to change current calibration

Touch here to go to next gauge page

Touch here to enter SETTINGS menus

Only shown when launch control is enabled on your ecu. Touch to request launch control.

- Not present, not active
- Red - disarmed
- Yellow – active, not engaged
- Green – active
- Green flashing – semi-active
- Red – false arm

Shows which gauge screen is showing: A, B, C or D.

Only shown when antilag is enabled on your ecu. Touch to turn antilag on or off.

- Not present – not active
- Red - off
- Yellow flashing – ALS requested but request cannot be respected
- Green – active with requested ALS map
- Green flashing – active but with the alternative ALS map

Touch here to change ALS map in use

Touch the centre of any gauge to display the full screen version and then cycle through all gauges or reset the peak marker.

Return to the main gauge screen by touching the centre of the large gauge.

Shows Knock ignition retard has exceeded set value on any 1 or more cylinders. Also shows sensor alarm.

Four gauge screens are available as follows:

Ⓐ Air Charge Temperature, MAP/Boost, Water Temperature, Battery Volts, RPM, Gear and Throttle Position

Ⓑ Lambda, Oil Temperature, Oil Pressure, Exhaust Gas Temperature, RPM, Speed, Gear

Ⓒ Oil Pressure, Oil Temperature, MAP/Boost, Air Charge Temperature, Lambda, Water Temperature, Battery Volts

Ⓓ Oil Pressure, Oil Temperature, MAP/Boost, Exhaust Gas Temperature, Lambda, Fuel Temperature, Fuel Pressure

Only data from sensors that are actually connected to the ecu and are configured correctly can actually be displayed.

Settings Menu

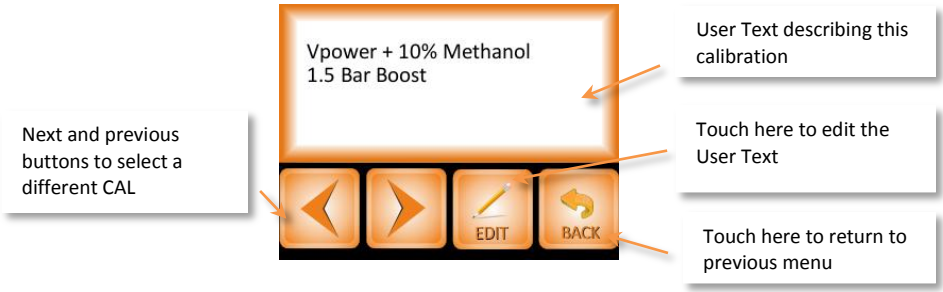


If the "illumination" wire has been wired to the vehicle's lighting circuit, the manual day and night buttons will temporarily override the brightness as controlled from the vehicle lighting stalk.

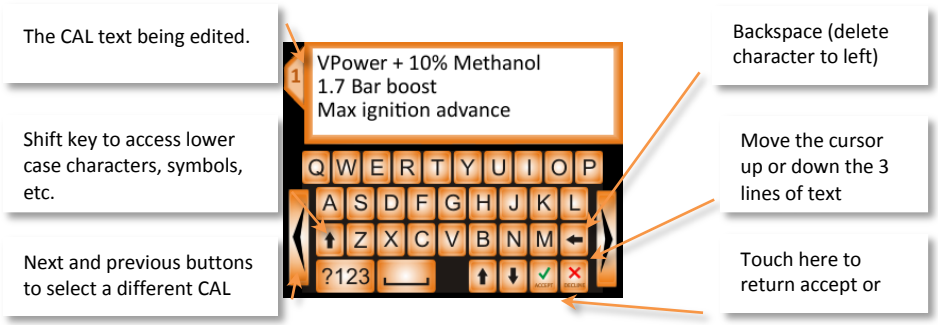
Setup Menu



CAL Selection Menu



Editing CAL Text



Editing ALS text

If enabled on your ecu, the required ALS map can be selected from the main gauge screens by touching the ALS text at the top of the screen. As with CALs, the ALS maps can be named, using the same methodology as described above for CAL text.

CAL PIN Protection.

If enabled via the "more" menus, Toucan can be set to prevent the current CAL being changed unless you enter a 4 digit PIN. This can be useful if you have a "valet" CAL (with reduced rpm limit for example) or an anti-theft CAL. You can also set PIN protection to *only* apply to the last CAL – for the AlcaTek ecu this is equivalent to "CAL 9", and is a dedicated ecu immobiliser function.

There are a few things to be aware of if you choose to use this option:

- The default PIN is 0000 and it is recommended that you change this to something else.
- Once PIN protection is enabled, the (correct) PIN will need to be entered before you can change the PIN, or to disable PIN protection again.
- If the PIN is entered incorrectly 3 times, PIN entry will be prevented for the next 10 minutes. Note that this 10 minute timeout will be reset if power is removed from the unit.
- In the event that you forget the PIN it can be reset using a PC programme, connecting to Toucan via USB. This programme is available from the JT Innovations website, or contact technical support for assistance.



Alarm Configuration

The Alarms configuration menu allows you to determine which parameters will cause alarm events. A setting allows the audible alarm to be muted if the engine is not running.

An alarm event will:

- Cause an audible warning, unless Toucan is muted
- Cause the bezel of the relevant gauge to change to a flashing orange
- If enabled, cause the relevant gauge to be displayed full screen.

In addition, there is a low oil temperature warning that can be enabled. This will not sound the audible alarm, but will display a non-flashing orange bezel until the oil temperature exceeds the configured temperature. Obviously this function only works if an oil temperature sensor is connected to your ecu.

When an alarm is activated, the relevant large gauge has a mute button. This may be used to temporarily mute that specific alarm. It will remain muted until either that alarm condition clears or Toucan is repowered. Alarms for other fault conditions will not be supressed or muted.

Available Alarms

- MAP. Any value from 1.0 to max, in 0.05 bar increments. Alarm is triggered if alarm value is exceeded. Default 2.5bar
- Boost. Any value from 0 to max, in 0.05 bar increments. Alarm triggered if alarm value is exceeded. Default 1.5bar.
- TPS. Any value 0-100%, 5% steps. Alarm triggered if alarm value is exceeded. Default 50%.
- Lambda. Any value in range, in 0.01 steps. Alarm triggered if alarm value is exceeded. Default 1.05.
- Coolant temperature. Any value in range in 1°C steps. Alarm triggered if alarm value is exceeded. Default 95C.
- Battery voltage. Any value in range in 0.25V steps. Alarm triggered if current value is below alarm threshold. Default 11.5V
- ACT. Any value in range, in 1°C steps. Alarm triggered if alarm value is exceeded. Default 50C.
- Oil Pressure. Any value in range in 0.1bar steps. Alarm triggered if current value is below alarm threshold. Default 2 bar.
- Injector Duty Cycle. Any value up to 100% in 1% steps, default 85%. Alarm triggered if injector duty cycle exceeds the alarm threshold.
- Wheel speed. Any value in range in 1mph or 1kph steps. Alarm triggered if alarm value is exceeded. Default 70mph/120km/h
- RPM. Any value in range 0-10,000 rpm in 100rpm steps. Alarm triggered if alarm value is exceeded. Default 7500.
- Oil Temperature. Any value in range in 1°C steps. Alarm triggered if alarm value is exceeded. Default 120C.
- Fuel Pressure. Any value in range in 0.1bar steps. Alarm triggered if current value is below alarm threshold. Default 2 bar.
- Exhaust Temperature. Any value in range in 10°C steps. Alarm triggered if current value is above alarm threshold. Default 850C.
- Fuel Temperature. Not available for the AlcaTek ecu.
- Oil Temperature Low Warning. Any value in range in 1°C steps. Warning triggered if current value is below threshold. Default 70C.
- Knock. Any value in range 0-20 degrees of ignition retard in 0.5° steps. Default 5° (looks at all engine cylinders).
- Sensor Alarms. If the ecu determines any connected sensor is faulty, an alarm can be enabled. If the Sensor Alarm “large” gauge is enabled, the large alarm display will show how many sensors are in error, and the name(s) of the failed sensor(s).

"More" Menus

The more menus allow you to select

- Whether a Manifold Absolute Pressure (MAP) or Boost gauge is displayed. Boost is calculated by taking a pressure reading at power up and referencing MAP to this, so it is not as accurate as MAP. It will also not work reliably if Toucan is not provided with a permanent connection to +12V as the initial reading will probably be taken after the engine starts (in which case a default value is used).
- Whether a narrow or wideband lambda sensor is in use. If narrow band is selected, the rich/lean values received are averaged to give a representation of the current fuelling. A wideband sensor is recommended.
- Gauge units – metric or imperial.
- Speed – mph or kph
- Whether the full screen gauge should automatically be displayed if an alarm condition is detected.
- Whether changing the CAL should be PIN protected
- Change the CAL PIN
- Select Absolute or Relative Fuel Pressure.
- Enable/Disable the display of peak markers on gauges. Peaks are remembered until manually reset on the large gauge display.
- Enable/disable dynamic peak markers. Dynamic peak markers maintain the current peak for just a few seconds and then drop back to the current reading. The hold period can be adjusted.
- Turn the audible touchscreen feedback beep on/off
- Determine which large gauges will be displayed when you cycle through them. This is useful to hide gauges when the appropriate sensor hasn't been fitted.
- Mute alarms if the engine is not running - useful if the vehicle is not being driven, but the ignition is switched on.
- Choose between CAN, RS232 "STACK" or Syvecs RS232 datastreams.
- Display CAN termination on/off, software version.
- Enable jump to RPM gauge when Launch Control is enabled, and becomes active to allow the launch RPM adjustment

CANbus Termination

It may be necessary to enable the bus termination if Toucan is the last device on the CANbus network. By default the termination is switched off, but it may be enabled by sliding the small switch on the rear of the unit towards the 4-prong mounting plate. You may need to use a small screwdriver to access the switch through the rear cover.

You can confirm the status of the termination switch via the "more" menus.

Sensor Alarms

If the sensor alarm is enabled, any failed sensor will cause a small “sensor alarm” icon to be displayed in the main gauge screen. If the sensor alarm large gauge is enabled, a large alarm indicator will be shown, and this then shows how many sensors have failed, and the name of the sensor that has failed.

If more than one sensor has failed, the list can be stepped through using the next arrow on the gauge/alarm.

Launch Control

If enabled on your ecu, launch control can be requested on or off via the main gauge pages by pressing the launch control button on the left. Launch RPM can be adjusted via the large RPM gauge in 50 rpm increments, with a marker to show the current setting. There is a setting in in the “more” menus that allows the RPM gauge to be automatically displayed when launch control is armed and you’re ready to launch – the display will revert to where it was once the launch status changes.

Firmware Updates

Occasional firmware updates will be made available to add new features. These may be downloaded from the Downloads section of the JT Innovations website.

Updates are applied using a PC program (also available from the website) and a standard “mini” USB cable.

It is recommended that you register your Toucan with us on the website – that way we can keep you informed when firmware upgrades are available.

Multiple Toucan Units

It is possible to run multiple Toucans, allowing more than one gauge screen to be visible at a time. A simple daisy-chain cable is available from JT Innovations that interconnects data from the master Toucan unit to the slave unit: please contact us for availability.

Technical

Data Interface	CAN 2.0B at 1Mbit/s with selectable termination, or RS232 at 9600 baud or 115.2kbaud
Expansion Connector	RS232, CAN, Power Out and Ground. Allows connection of expansion accessories.
Power	8-20V <200mA typ. <40mA in standby mode Connections to permanent, switched and illumination power, via 1A fused connections.
Memory	Non-volatile storage of all parameters
Firmware Updates	Via rear-panel USB connector, using PC programme.
Compliance	Directives: 2002/96/EC, 72/245/EC, EN50498:2010
Warranty	1 year
Dimensions	100x83x16mm
Weight	200g
Display	3.5" QVGA TFT, 320x240 pixels, 24 bit colour, with touchscreen
Processing system.	190MHz 32 bit ARM9, 8Mbytes Flash memory, 8Mbytes SDRAM.
Package contents	Toucan unit, power/data cable harness, mount, installation guide.

Glossary

Term	Description
ACT	Air Charge Temperature
CANbus	"Controller Area Network" bus – a serial interconnect common in vehicles.
ECT	Engine Coolant Temperature
EGT	Exhaust Gas Temperature
EOP	Engine Oil Pressure
EOT	Engine Oil Temperature
FP	Fuel Pressure
MAP	Manifold Absolute Pressure – the air pressure in the manifold, atmospheric pressure is 1bar, total vacuum is 0bar.
TPS	Throttle Position Sensor