T5 Event Data Recorder

- Built-in 3-axis accelerometer
- Built-in GPS receiver
- CAN-bus
- Up to 13 programmable multifunction inputs
- Up to 4 relay outputs
- Dedicated speed, RPM & ignition sense inputs
- RS-232 & USB 2.0
- Built-in 3G and Wi-Fi for uploading to the cloud
- High-resolution data
- Robust & configurable
- Optional Driver Interface Box (driver identity)
- On-board logic
- Product line proven over two decades

The Tacholink T5 is our on-board, on-line Event Data Recorder with telematics functionality. Now in its fifth generation, and having been introduced almost two decades ago, Tacholink is a proven product line which is in widespread use around the world. In the early 2000's Bowmonk supplied the first generation Tacholink to Norfolk Police, and these units are still in operation to this very day.

The T5 records a wealth of high-resolution data about the vehicle and sends this to Intelligo – the T5's web-based reporting solution. Fleet managers or other staff login to Intelligo and are able to view live or historical data for the entire fleet, including customised reports to quickly highlight their desired information. Intelligo can also pass the data on for integration into third party systems.

The T5 can be used for many purposes, including:

- Event Data Recorder (EDR)
- Driver Behaviour Monitoring
- Vehicle Tracking
- Ensuring Regulatory Compliance (e.g. Health & Safety)
- Monitoring Asset Utilisation
- Maintenance Alerts

The T5 is built into a high impact, chemical resistant, resin enclosure which provides sealing options up to IP68 and meets the environmental standards of J1455. The unit is therefore protected against the harshest of anticipated environments. The enclosure includes 4 anchor points and is self-locking, providing vibration protection and tamper resistance.

What does it do?

In a nutshell, the T5 gathers high-resolution data, records it locally, and uploads data to the Intelligo cloud-based reporting system.

What data does the T5 gather?

The T5 has a wealth of inputs and sensors which allow it to record the following information:

- Vehicle location, using a built-in GPS receiver
- Heavy braking, acceleration or cornering, using a built-in 3-axis accelerometer. This allows the T5 to detect erratic driving as well as more serious events such as vehicle impacts. The G-force data gathered by the T5 is invaluable in building up a detailed picture of events that
- occur before and during an incident.
- Vehicle speed, via a dedicated analogue sense wire.
- Engine RPM, via a dedicated analogue sense wire.
- Ignition status, via a dedicated sense wire. By monitoring the ignition input the T5 can provide start/stop times of trips.
- Multifunction inputs – up to 13 programmable inputs for recording virtually any type of event, such as doors opening/closing and activation of indicator or warning lights. The T5's inputs can capture frequency, analogue voltage or digital input emulation.
- CAN-bus events – any CAN events which are broadcast on the network in question can be detected and recorded. Includes support for J1939 & OBDII over CAN.
- RS-232 data from external systems can be captured and reported back to Intelligo (e.g. weight data from on-board weighing systems, or data from a TPMS system).
- Driver identity – the optional Driver Interface Box records the identity of the driver through the use of tags, including log-in / log-out times.
- Time & date, courtesy of the T5's built-in Real Time Clock which is synchronised via GPS.

The T5 also has 4 x relay outputs which can be controlled using on-board logic

How detailed is the data?

The T5 differentiates itself from other telematics products on the market by reporting at very high resolutions. Data is typically reported at 1 Hz (i.e. once per second), but during and shortly before an "incident", where a pre-defined G-force threshold has been exceeded, the reporting rate rises to up to 25 Hz (i.e. 25 readings per second).

This high level of detail is invaluable in reconstructing an accident – e.g. to prove that your driver was not at fault.

What does the T5 do with the data?

The T5 records data, along with time and date stamps, in its robust and non-volatile on-board flash memory. If a serious accident should occur and power is lost to the T5, any information that has been captured and stored up until that moment will be retained for later analysis.

Once data has been recorded it is then transmitted to Intelligo (via either Wi-Fi or 3G) in near real-time.

Sending data via 3G is the most popular option, which involves the T5 being shipped with a built-in M2M SIM which has the option of roaming across all UK networks for optimum coverage. EU-wide options, including multi-network roaming, are also available. Thanks to Bowmonk's partnership with a leading M2M data provider, data pricing is extremely low and there is no need for the customer to take out an additional contract – data costs are simply included in the Intelligo subscription charge.

Alternatively, for customers who have on-board routers in their vehicles, or who have a depot wide Wi-Fi network and do not need access to live data, the T5 can send data by connecting to any Wi-Fi access point.

Although not recommended, due to the effort of capturing data, the T5 can simply record data to its on-board memory without onward transfer to Intelligo. Data can be collected when required by connecting a USB mass storage device to the T5, and we provide a PC-based application to view this data. The PC application can upload data to Intelligo, but not all Intelligo features will be available for manually uploaded data.

Intelligo

Intelligo is a web-based reporting and management utility for T5 devices. All data collected by T5 devices can be uploaded automatically to the cloud, via either Wi-Fi or 3G, and Intelligo lets you view this data - or notifies you proactively of pre-configured exception events or incidents.

Exception Reports

Exception reports allow fleet managers to be notified of pre-defined events within minutes of them happening, allowing them to take immediate action if required. Such events could include non-use of a seatbelt, excessive speed, harsh acceleration, vehicle roll-over or entering/exiting defined locations (geo-fencing).

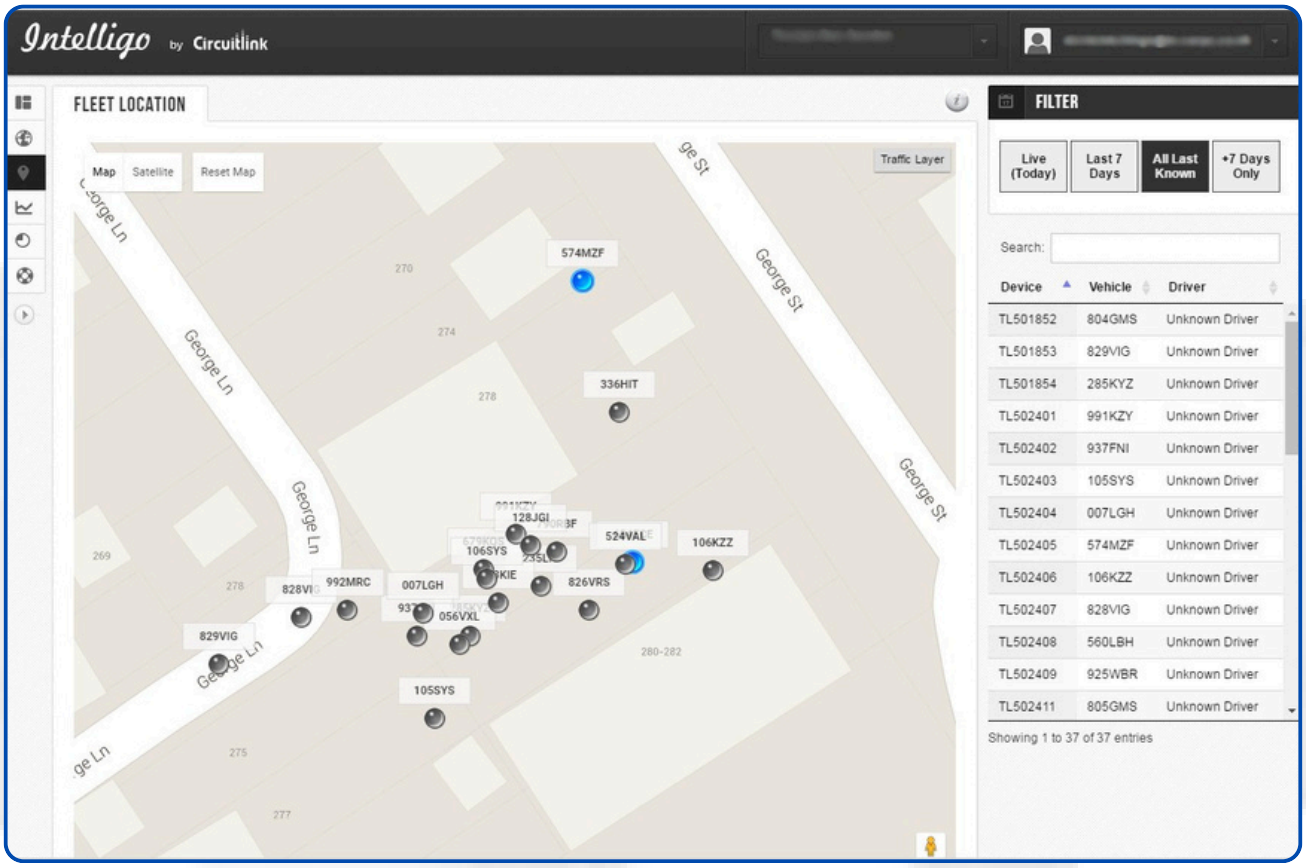
Condition Based Monitoring & Maintenance

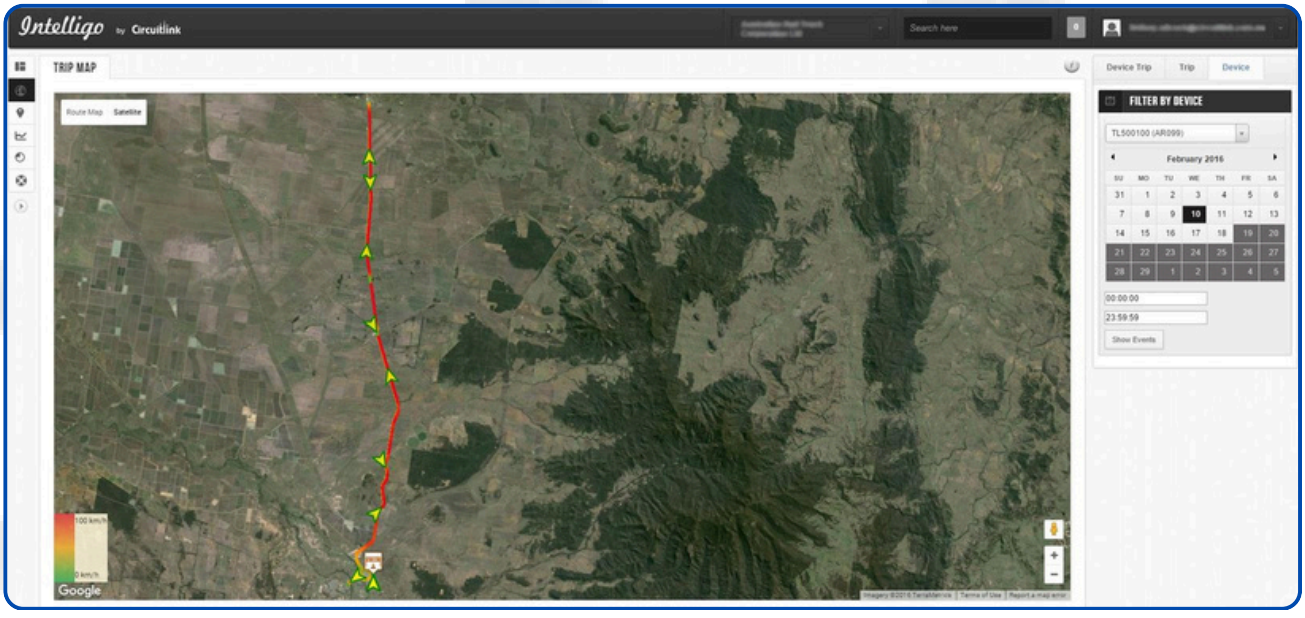
Intelligo can report any desired inputs as and when they occur. Such inputs could include real-time monitoring of a TPMS system, oil pressure, or engine & bearing temperature.

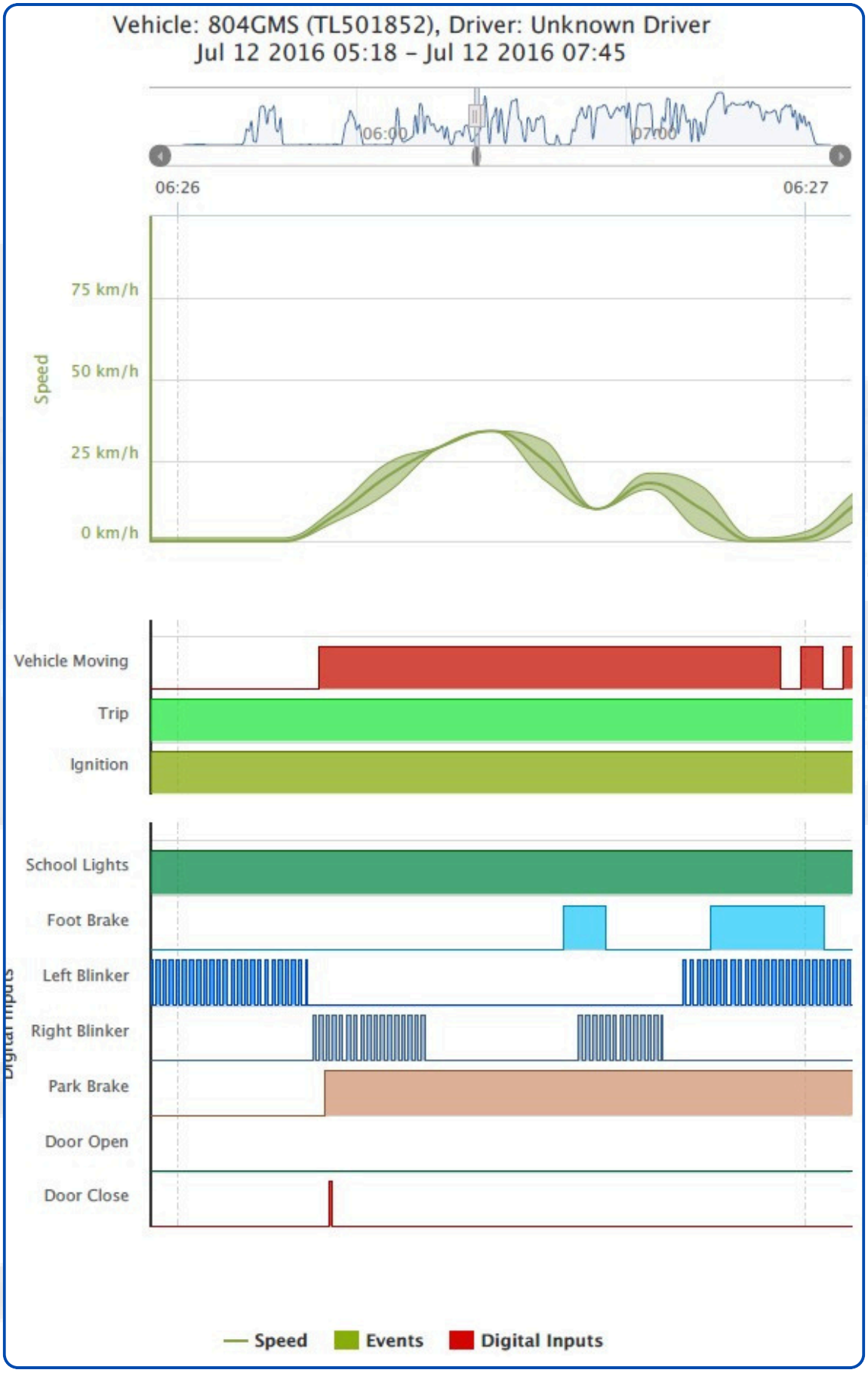
Configuration and Updates

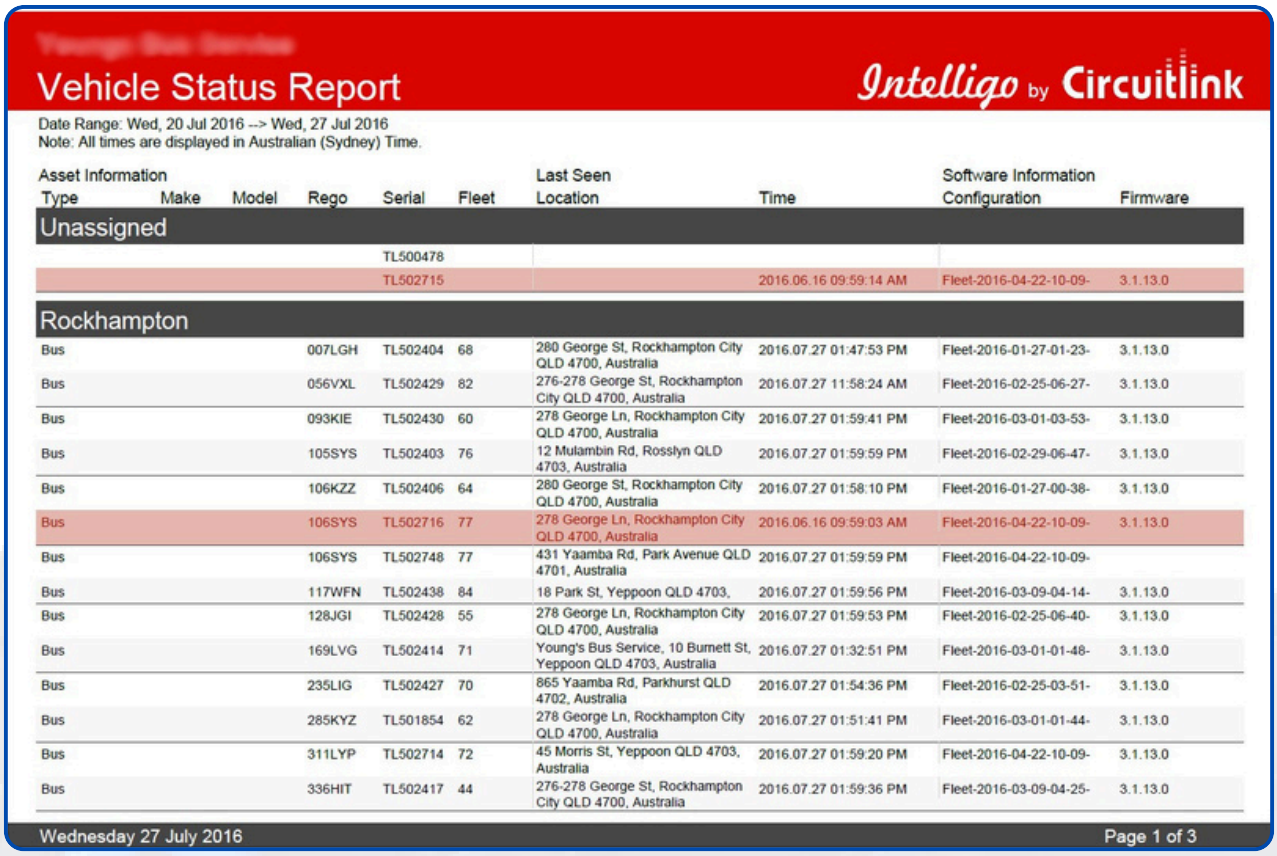
As well as allowing you to view data, Intelligo is also able to remotely update the configuration of any T5 in your fleet, including updating its firmware, thereby eliminating the need for an engineer to visit each vehicle in the event that the configuration needs to be changed.

The screenshots below show some of Intelligo's features:






Vehicle: 804GMS (TL501852), Driver: Unknown Driver
Jul 12 2016 05:18 - Jul 12 2016 07:45
06:00
07:00
06:26
06:27
Speed
75 km/h
50 km/h
25 km/h
0 km/h
Vehicle Moving
Trip
Ignition
School Lights
Foot Brake
Left Blinker
Right Blinker
Park Brake
Door Open
Door Close
Digital Inputs
Speed
Events
Digital Inputs



Vehicle Status Report

Intelligo by Circuitlink

Date Range: Wed, 20 Jul 2016 --> Wed, 27 Jul 2016
Note: All times are displayed in Australian (Sydney) Time.

Asset Information						Last Seen		Software Information	
Type	Make	Model	Rego	Serial	Fleet	Location	Time	Configuration	Firmware
Unassigned									
				TL500478					
				TL502715			2016.06.16 09:59:14 AM	Fleet-2016-04-22-10-09-	3.1.13.0
Rockhampton									
Bus			007LGH	TL502404	68	280 George St, Rockhampton City QLD 4700, Australia	2016.07.27 01:47:53 PM	Fleet-2016-01-27-01-23-	3.1.13.0
Bus			056VXL	TL502429	82	276-278 George St, Rockhampton City QLD 4700, Australia	2016.07.27 11:58:24 AM	Fleet-2016-02-25-06-27-	3.1.13.0
Bus			093KIE	TL502430	60	278 George Ln, Rockhampton City QLD 4700, Australia	2016.07.27 01:59:41 PM	Fleet-2016-03-01-03-53-	3.1.13.0
Bus			105SYS	TL502403	76	12 Mulambin Rd, Rosslyn QLD 4703, Australia	2016.07.27 01:59:59 PM	Fleet-2016-02-29-06-47-	3.1.13.0
Bus			106KZZ	TL502406	64	280 George St, Rockhampton City QLD 4700, Australia	2016.07.27 01:58:10 PM	Fleet-2016-01-27-00-38-	3.1.13.0
Bus			106SYS	TL502716	77	278 George Ln, Rockhampton City QLD 4700, Australia	2016.06.16 09:59:03 AM	Fleet-2016-04-22-10-09-	3.1.13.0
Bus			106SYS	TL502748	77	431 Yaamba Rd, Park Avenue QLD 4701, Australia	2016.07.27 01:59:59 PM	Fleet-2016-04-22-10-09-	
Bus			117WFN	TL502438	84	18 Park St, Yeppoon QLD 4703,	2016.07.27 01:59:56 PM	Fleet-2016-03-09-04-14-	3.1.13.0
Bus			128JGI	TL502428	55	278 George Ln, Rockhampton City QLD 4700, Australia	2016.07.27 01:59:53 PM	Fleet-2016-02-25-06-40-	3.1.13.0
Bus			169LVG	TL502414	71	Young's Bus Service, 10 Burnett St, Yeppoon QLD 4703, Australia	2016.07.27 01:32:51 PM	Fleet-2016-03-01-01-48-	3.1.13.0
Bus			235LIG	TL502427	70	865 Yaamba Rd, Parkhurst QLD 4702, Australia	2016.07.27 01:54:36 PM	Fleet-2016-02-25-03-51-	3.1.13.0
Bus			285KYZ	TL501854	62	278 George Ln, Rockhampton City QLD 4700, Australia	2016.07.27 01:51:41 PM	Fleet-2016-03-01-01-44-	3.1.13.0
Bus			311LYP	TL502714	72	45 Morris St, Yeppoon QLD 4703, Australia	2016.07.27 01:59:20 PM	Fleet-2016-04-22-10-09-	3.1.13.0
Bus			336HIT	TL502417	44	276-278 George St, Rockhampton City QLD 4700, Australia	2016.07.27 01:59:36 PM	Fleet-2016-03-09-04-25-	3.1.13.0

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Hardware Varients

The T5 is available in three versions as follows:

	T5 Trakka	T5 Standard	T5 Extended
3-Axis Accelerometer	Yes	Yes	Yes
GPS	Yes	Yes	Yes
CAN-bus	Yes	Yes	Yes
Dedicated speed, RPM & Ignition Inputs	Yes	Yes	Yes
Support for Driver Tag Reader	Yes	Yes	Yes
Mulitfunction Inputs	None	8	13
Relay Outputs	None	4	4
RS-232	No	Yes	Yes
Communications	3G Only	3G & Wi-Fi	3G & Wi-Fi

Driver Tag Reader

The optional Driver Tag Reader is a dashboard-mounted box which reads a driver's tag, thereby identifying the driver to the T5. Driver log-ins are date/time-stamped, enabling driving hours information to be calculated. The dashboard box contains an LED which indicates a successful driver log-in, and a built-in buzzer which can prompt the driver to login by beeping either briefly or continuously. In addition the buzzer can be used to notify the driver of pre-programmed exceptions – such as exceeding a maximum vehicle speed or engine RPM.

Customisations

The T5 is a highly flexible platform that can be customised depending on customer requirements. Features that can be developed could include:

- Support for CAN protocols other than J1939 and OBDII over CAN
- PWM outputs in addition to relay outputs
- Support for two CAN channels instead of one
- Even higher resolution of data logging
- Own-branding of the Intelligo cloud reporting platform
- Identify drivers using an inventory of existing RFID tags
- Provision of real-time and detailed feedback to the driver
- More than 13 multifunction inputs
- Integration work to capture and report data from another on-board system (e.g. TPMS or on-board weighing).
- Integration with third party back-office systems (e.g. to use T5-captured data in a client's own web application, such as a bus company showing live ETA information for each bus stop on its own website or app)
- Removal of cellular modem (i.e. Wi-Fi only) to reduce cost

These are all features that can be implemented depending on volume. Please contact us to discuss your requirements.

Specifications

Power:

- Input Voltage: 9-34 V DC (42V & 72V peak respectively)
- Power Consumption: <16W with cellular modem

Communications:

- RS-232
- USB 2.0
- CAN 2.0
- Wi-Fi 802.11n
- Cellular Modem (3.5G/3G/2G, penta-band, worldwide coverage)

Sensors:
- 3-axis accelerometer (2G/4G/8G/16G selectable, 50G optional)
- GPS operating at up to 10 Hz

Inputs:
- RPM (dedicated analogue sampled)
- Speed (dedicated analogue sampled)
- 8 x mixed signal analogue inputs (programmable frequency capture, analogue voltage, digital input emulation)

Outputs:
- 4 x relay outputs (open collector 200 mA)

Functions:
- RTC +/- 3ppm over -10 to 65 degrees C, 95 second per year free drift, corrected via GPS time sync
- Backup battery with >10 years life
- Networking (DHCP client, DNS client, HTTP server)
- Firmware updates: on-board bootloader allowing remote updating
- Data reporting & downloading via on-board HTTP server and USB mass storage
- Device configuration via on-board HTTP server and USB mass storage

Storage:
- On-board 64 GB non-volatile flash memory

Environmental:
- Dimensions: 153 x 140* x 39 mm (*not including cables)
- Weight: <500 g
- Operating Temperature: -40 to 85 degrees C dependent on selected options
- Ingress Protection: IP54 as standard, up to IP68 optional
- Resistant to fluids found in typical industrial applications

Additional Image