1. IP67 RATED, RUGGED AND RELIABLE GPS TRACKING

The **Rugged** is a compact 3G *(NextG)* GPS tracking device with a variety of inputs and outputs to cater for the most demanding applications. Its rugged housing is IP67 rated to withstand the harshest environments, without sacrificing tracking and communications performance. With the internal GPS and cellular antennae installation is a breeze. The internal backup battery provides alerts and tracking operations even when external power is removed.

1.1. Applications

Ideal for tracking assets where a compact and rugged device is required with simple installation

- Equipment tracking and monitoring of run hours

- Mining equipment, lighting towers, pumps and generators

- Concealed installation in vehicles or assets for stolen asset recovery

- Monitoring temperatures and compressors in refrigerated trucks, freezers and cold chain applications

- Installation in engine bays, or areas cleaned by spraying

- Under the dashboard in vehicles

- Boats and jet-skis

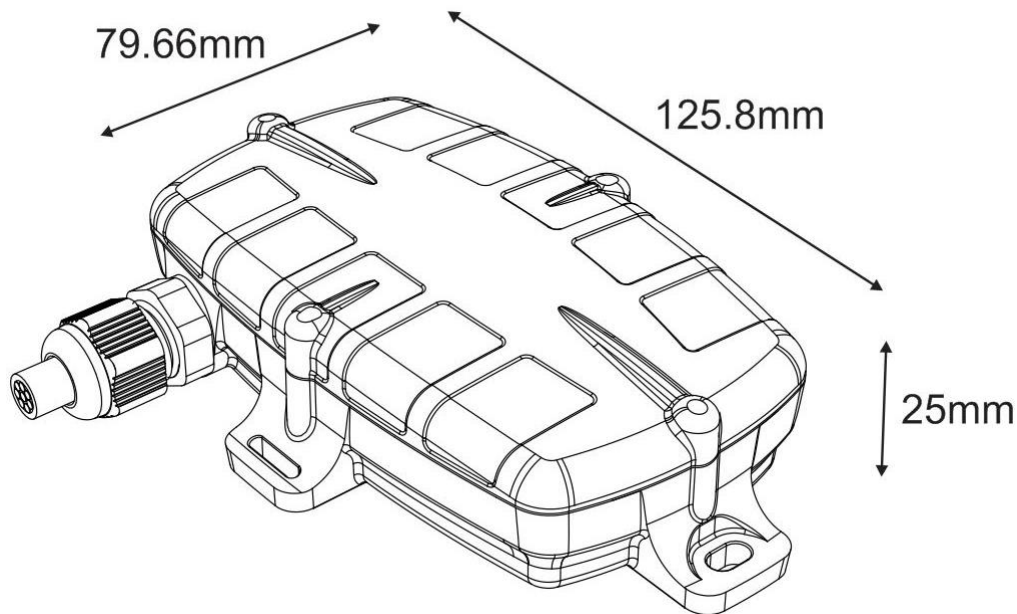- Motorbikes, quadbikes and golf carts

- Plus many other applications

Rugged GPS-DS

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Rugged GPS Datasheet

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1.2. Rugged Hardware Features

Hardware Features	
Compact rugged IP67 rated housing	Made of sturdy Nylon/Glass composite plastic the housing is extremely tough and UV resistant, is resistant to oils and can easily handle high temperatures The housing is sealed using 4 screw and has 2 convenient mounting tabs. Dimensions: 125mm x 80mm x 25mm Weight: 250 grams
Harness Options	The **Rugged** is manufactured with various harness options. Because of the nature of the housing the wire harness is soldered to the PCB at production 3-wire *(power, ground, ignition)* 12-wire harness

Automotive power	**Voltage**	8V to 45V DC (max)
	Operating Current	10mA average (battery fully charged)
		145mA average (battery charging)
	Sleep Current	<1mA

	The **Rugged** passes stringent automotive power *'load dump'* tests to ensure that it will continue to operate in the harshest electrical systems. A built-in self-resetting fuse makes installation easy and safe.

Operating Temperature	-20°C to +75°C [1] 1) On external power. Below 0°C the standard internal backup battery's ability to deliver sufficient power to operate the cellular modem is reduced. Below 0°C and above +45°C the internal backup battery will not be charged as a safety precaution due to dangers associated with charging batteries at extreme temperatures. For battery powered tracking in extreme temperatures enquire about our Outback tracker with extended temperature range battery options.
High sensitivity GPS	UBLOX MAX7 GPS module Supports GLONASS and other GNSS systems 72 channel high sensitivity receiver -167dBm industry leading tracking performance Battery backed up for optimal hot-start performance AssistNow Offline aiding data for extremely fast time-to-first-fix and performance in urban canyon environments
Low noise GPS amplifier	GPS signals are boosted by a special low-noise amplifier *(LNA)* This allows the **Rugged** to operate where normal units will fail to receive GPS signal
3G *(NextG)*	The **Rugged** can be manufactured for specific markets around the world with cellular modem modules approved by all the major networks

	3G Modem – EU	850 / 900 / 2100 EMEA / APAC / Latin America
	3G Modem - NA	850 / 1900 / AWS North America
	3G Modem *(Global Option)*	800 / 850 / 900 / AWS / 1900 / 2100 Global coverage at a higher cost
	*enquire for other bands and LTE / 4G options	
Certifications	CE, C-TICK, ICASA, ACMA, ISO 7637-2	
Internal Antennae	Internal GPS and cellular antennae Having the antennae inside the housing makes for very simple and quick installation. The **Rugged** has had its antennae tuned by the top laboratories to ensure optimal performance.	
Backup battery	The standard 850mAh LiPo backup battery allows the **Rugged** to operate when external power is removed for up to 7 days, depending on the amount of movement	
4 x Digital Inputs	1 x Ignition line 3 x digital inputs with configurable pull-up / pull-down Numerous configuration options including switches, duress/panic alerts, pulse counting	
3 x Digital Outputs	3 x switched ground digital outputs, easily wired up to switch external lights, relays, buzzers, sirens, motors and other devices Can be used to immobilise a vehicle	
Sensor Interface	The **Rugged** has an I2C interface which can be used to power and communicate with external sensors including temperature probes, humidity sensors and other sensors.	
3 axis accelerometer	The 3-axis accelerometer allows the **Rugged** to detect harsh driving events *(harsh acceleration, braking and cornering)* and this information can be used to monitor driver behaviour and unsafe driving. It also allows the **Rugged** to go to *'sleep'* when not moving, resulting in extremely low standby current.	
iButton	Communicate with common one-wire iButton devices	
RS232	RS232 receive and transmit allow the **Rugged** to communicate with external RS232 devices. These can include fuel monitoring, Garmin FMI, tyre pressure monitoring The RS232 interface can also be used to configure the device and to test and debug.	
Switched 3.3V out	The **Rugged** can provide power to external sensors via this 3.3V power line, allowing for easy installation and doing away with the need for additional external power supplies. Maximum current: 200mA	

Switched 5V out	The **Rugged** can provide power to external peripherals via this 5V power line, allowing for easy installation and doing away with the need for additional external power supplies. Maximum current: 300mA
DMCAN peripheral port	ITRAKasset partners have a range of peripherals that connect to the **Rugged** via the DMCAN peripheral port. Peripherals such as the RFID Driver ID reader, 5 digit keypad, data console and RF gateway use the DMCAN port.
Flash memory	The **Rugged** has sufficient memory to store over 50,000 records in its flash memory. Normally the data will be sent to the server immediately but if the device is out of range then there is sufficient space to ensure that no data is lost – for many weeks of driving! The flash memory is also used to store parameters, GPS aiding data, accident data, driver lists and other important information that needs to be securely stored.
Garmin FMI	Coming soon
Warranty	One year manufacturer's warranty

1.3. G60 Firmware Features

Firmware Smarts	
Auto-APN	Auto-APN allows the **Rugged** to analyse the SIM card and select the correct APN details from a list that is pre-loaded in the device's firmware. This means that the **Rugged** can be shipped world-wide without requiring specialist setup for SIMs.
Text Message Setup	The **Rugged** can also be sent text messages to setup the APN, server and other details

Multi-APN	The **Rugged** can be configured to roam across multiple networks and to automatically use the different APN details for the roaming networks.
AssistNow Offline	The **Rugged** will track successfully where other devices just give up. This fantastic technology allows the GPS to predict which satellites are in orbit above it and to dramatically reduce the time-to-first-fix of the GPS, and the overall performance of the GPS, especially in *'urban canyon'* or forested environments.
Flexible Logging Parameters	The **Rugged** trip logging is flexible and can be configured to log based on a variety of parameters including: • Elapsed time • Distance travelled • Change in heading • Change in speed • On Stationary • Accelerometer events *(harsh driving)*
Accident and Rollover Detection	The **Rugged** uses the built-in accelerometer to detect high G impacts such as accidents and rollovers and reports these events to the server for emergency alerting.
Harsh Driving	The **Rugged** automatically calibrates its built-in 3-axis accelerometer and uses this to detect harsh driving events: • Excessive acceleration • Harsh braking • Cornering at speed These events are logged in the **Rugged** along with additional event statistics that allow back-end server platforms to perform sophisticated driver profiling and scoring.
Accident Data	The **Rugged** keeps a second-by-second *'black box'* recording of valuable GPS and accelerometer data for a two-hour window. This data can be automatically uploaded to the server when an accident is detected, or it can be requested manually.
Driver Identification	The **Rugged** supports several ways to identify a driver: • RFID reader and a card or key-fob • 5 digit key-pad to enter a PIN code • Console with built-in RFID reader • iButton 1-wire reader
Driver Lists	The **Rugged** can be updated from the server with lists of Drivers that are allowed to drive the vehicle that it is installed in. When a driver or operator registers on the **Rugged** it will check the Driver List to see if that person is authorised to drive the vehicle. The list also includes information about the driver such as whether they can perform supervisor functions. The **Rugged** can be installed to immobilise a vehicle and only allow authorised drivers / operators to drive it, or to annoy an unauthorised driver with a loud buzzer.

Emulated Ignition	This setting allows the **Rugged** to determine that a trip has started based on accelerometer and GPS data and to automatically set the *'ignition'* input on the device to emulate the ignition line. This means that the **Rugged** can be installed with the option of not wiring in the ignition line and *'emulating'* the ignition based on movement.
Run Detect	This setting allows the **Rugged** to monitor the system voltage and to detect changes in the voltage that indicate if the engine is running or not.

1.4. DMCAN Peripheral Expansion

The **Rugged** interfaces to a range of peripherals that further extend its capabilities.

Peripheral Options	
RFID Driver ID Reader 	Compact 125kHZ RFID Reader reads cards and keyfobs 5cm typical read range *(can read through plastic / dashboard)* Plugs into the DMCAN peripheral plug on the **Rugged** harness for easy installation Includes a LED and buzzer for reminding drivers to swipe their card Compatible with the EM4001 RFID standard Optional 125kHz HID reader option
5 digit keypad 	Compact 5-digit keypad *(keys 1 through 5)* Includes a LED, backlight for night-time input and buzzer Use for • Driver Identification *(using a PIN code)* • Select the trip type *(business versus private)* • Map to digital inputs for other functions like panic button, logging point of interest, changing driver state *(on / off duty)* etc. • Long-press option for alternate functions Plugs into the DMCAN peripheral plug on the **Rugged** harness for easy installation

Console
 	
	Rugged data entry console
	
	• 4 x 20 character display with backlight
	• 12 key sealed keypad
	• RFID reader under the keypad
	• Built-in buzzer
	• Application examples:
	   o Operator login with machine pre-check questions
	   o Work allocation to project codes and cost codes
	   o Login with OH&S questions
	   o Time and attendance recording
	   o Driver fatigue management

	• Firmware can be customised Plugs into the DMCAN peripheral plug on the **Rugged** harness for easy installation
RF Gateway	Provides the interface to allow the **Rugged** to receive data from iTRAKassets low cost range of RF asset tags and wireless sensors 868MHz and 900-928MHz options Transmit and Receive Plugs into the DMCAN peripheral plug on the **Rugged** harness for easy installation

1.5. Device Management – OEM Server

All iTRAKasset devices are fully managed Over-The-Air *(OTA)* via our OEM Server web interface. The OEM Server seamlessly manages:

- Device firmware – firmware updates can be done remotely

- Network *(administrator)* parameters relating to critical communications

- System parameters, including GPS parameters, IO configuration, logging options and general device behaviour settings

- GPS AssistNow Offline aiding data files

- Remote debugging of devices, including being able to trace data, view detailed debug message logs, and view a live trace of the server debug messages

- Remote disconnect and reboot of devices

- Driver list downloads to devices – this allows for the Driver Identification on the device to check if the RFID tag / username / PIN is valid, and for specific drivers to be allowed to drive / operate particular vehicles, for example based on licences or permits.

- Geo-fence syncing with the devices – this allows the device to do advanced in-cab alerting and monitoring such as geo-fence arrival and departure, speed limit alerting, dangerous intersection warnings, turn on warning lights inside a geo-fence, and disable communications inside intrinsically safe zones such as gas plants.

- Provides a command and message queueing platform to the devices and is incorporated into the remote management and debugging applications

Data Connectors

The OEM Server provides Data Connectors that forward data records on to the software platform of your choice, including iTRAKasset partners own Telematics Guru and GPS Log Book platforms.

More information on the OEM Server can be found at http://www.itrakassets.com

If you would like to integrate the **Rugged** into a software system, then please contact iTRAKassets for more information on our integration protocols.

1.6. Committed to Quality

We take pride in designing each of our products with the goal of providing the best performance and reliability possible in the price range of that product. *'Engineered to outperform'.*

Not all GPS tracking devices operate with the same level of performance or reliability, especially when exposed to extreme conditions in the field. In addition we only use the highest quality parts and the latest assembly and quality control techniques to ensure the reliability and long life of our products.

Every device is individually tested at production, and our batteries are individually tested with full charge / discharge cycle tests before being fitted into our devices.

All iTRAKasset devices are covered by a one year manufacturer's warranty.

1.7. Contact Information

For the latest version of this document plus other product information please visit our website at www.itrakassets.com