1. LOW COST, VERSATILE AND RELIABLE GPS/GLONASS TRACKING

The Dart is a compact 2G or 3G tracking device with ignition plus 2 x digital inputs and 1 x output, to cater for entry-level tracking applications, without sacrificing tracking and communications performance and reliability. Its compact housing contains the GPS and cellular antennas, and the 12 wire connector means that all of the Dart's functionality can be easily accessed to make installation a breeze. The internal backup battery provides alerts and tracking operations even when external power is removed.

The Dart can simultaneously use GPS and GLONASS satellites, providing double the number of positioning satellites than standard tracking products, and use offline satellite aiding technology. The result is faster acquisition and more accurate and reliable tracking in locations where other devices just give up.

1.1. Applications

Ideal for tracking assets where a compact 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
- Under the dashboard in vehicles
- Boats and jet-skis
- Motorbikes, quadbikes and golf carts
- Plus many other applications

1.2. Dart Hardware Features

Hardware Features	
Compact housing	The housing clips together to make provisioning devices simple and efficient. Dimensions: 95mm x 55mm x 17mm Weight: 150 grams
Harness	A standard 12 wire harness is supplied with the Dart See the user manual for harness details
Automotive power	**Voltage** 8V to 36V DC (max) **Operating Current** 10mA average (battery fully charged) 145mA average (battery charging) **Sleep Current** <1mA The Dart 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 Remora tracker with extended temperature range battery options.
Concurrent GPS and GLONASS tracking	Concurrent GPS and GLONASS tracking 72 channel high sensitivity receiver -169dBm 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 (LNA)	The Dart's GPS signals are boosted by a special low-noise amplifier (LNA). This allows the Dart to operate where normal units will fail to receive GPS signal Even when designing a low-cost device Digital Matter is not prepared to compromise on the performance of the product. You will see the difference if you compare device performance in low signal environments.
2G, 3G or 4G	The Dart can be manufactured for specific markets around the world with cellular modem modules approved by all the major networks **2G Modem** Quad Band GSM/GPRS Class 10 850 / 900 / 1800 / 1900 MHz

	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	Pending	
Internal Antenna	Internal GPS and cellular antennas Having the antennas inside the housing makes for very simple and quick installation. The Dart has had its antennas tuned by the top laboratories to ensure optimal performance.	
Backup battery	The 400mAh LiPo backup battery allows the Dart to continue to operate when external power is removed for up to 5 days, depending on the amount of movement	
3 x Digital Inputs	1 x Ignition line 2 x digital inputs with configurable pull-up / pull-down Numerous configuration options including switches, duress/panic alerts, pulse counting and other applications	
1 x Digital Output	1 x switched ground digital output, easily wired up to switch external lights, relays, buzzers, sirens, motors and other devices Can be used to immobilise a vehicle	
Internal Buzzer (optional)	The Dart can be manufactured with an internal buzzer as a high volume option (not standard). This provides an audible alert without requiring the installation of an external buzzer. Can be used for speeding alerts, harsh driving alerts, reminders to swipe RFID tags, error conditions and other events	
3 axis accelerometer	The 3 axis accelerometer allows the Dart 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 Dart to go to 'sleep' when not moving, resulting in extremely low standby current.	
Serial Port	The TTL serial interface allows the Dart to interface with external devices and peripherals, including a low-cost RFID tag reader for driver identification	
Switched Power Out	The Dart can provide power to external sensors and devices via this power line, allowing for easy installation and doing away with the need for additional external power supplies. Voltage: 3.5v to 4.5v Maximum current: 200mA	
Flash memory	The Dart 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, geo-fences and other important information that needs to be securely stored.
Warranty	One year manufacturer's warranty

1.3. DART Firmware Features

Firmware Smarts	
Auto-APN	Auto-APN allows the Dart 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 Dart can be shipped world-wide without requiring specialist setup for SIMs.
Text Message Setup	The Dart can also be sent text messages to setup the APN, server and other details
Multi-APN	The Dart can be configured to roam across multiple networks and to automatically use the different APN details for the roaming networks.
AssistNow Offline	The Dart 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 Dart 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 Dart 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 Dart 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 Dart along with additional event statistics that allow back-end server platforms to perform sophisticated driver profiling and scoring.

Accident Data	The Dart 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 Dart supports a low-cost external RFID reader to read cards and keyfobs in order to identify drivers
Driver Lists	The Dart 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 Dart 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 Dart 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.
Geo-Fences	The Dart has the capacity to hold hundreds of geo-fences that can be downloaded to it from the server. The Dart can use this geo-fence information to: • Implement arrival and departure alerts • Implement speeding zones with audible warning alerts • Implement "No-go" and "Keep-out" areas • Automatically control outputs, for example to switch on warning lights when inside a special area • Warn drivers when approaching dangerous intersections • Disable data communications within intrinsically safe areas
Emulated Ignition	This setting allows the Dart 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 Dart 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 Dart to monitor the system voltage and to detect changes in the voltage that indicate if the engine is running or not.

1.4. Peripherals

The Dart 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 peripheral plug on the Dart 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

1.5. Device Management – OEM Server

All Digital Matter 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 Digital Matter's own Telematics Guru and GPS Log Book platforms.

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

If you would like to integrate the Dart into a software system then please contact Digital Matter 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 Digital Matter 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.digitalmatter.com.au