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ZULU-G-UMTS / ZULU-N-UMTS

UMTS & GPS Modem with ARM Cortex M4 32bit Processor,
USB and RS232 Serial Port Interfaces

Key Features

- USB serial port interface
- RS232 serial port interface
- 3G/UMTS global coverage
- GPS receiver (ZULU-G-UMTS)
- ARM Cortex M4 32bit processor
- Wide supply voltage 5 - 42V
- DIN rail mountable
- 36-way connector for all interfaces
- 2000mAh battery option
- 10 GPIO lines
- CAN, 1-Wire and I2C interfaces

General Description

The ZULU range of 3G / UMTS modems are amongst the most advanced and capable modems available today. The range is available as two main versions - with or without GPS. Further options include a 2000mAh battery and an upgrade of flash memory to a total of 128Mbit. The ZULU range can be used as a simple modem, or with application software within the UMTS module. But its real strength, for the user, is as a comprehensive computing platform using its ARM Cortex M4 32bit processor connected to the UMTS engine - all in one package. The ZULU design has been extensively tested and represents amazing value as a UMTS connected powerful 32bit computing engine.

The ZULU modems have an ARM Cortex M4 32bit processor as standard, independent of the wireless module, for customers to develop their software on. The ZULU has both USB and RS232 serial ports with 10 GPIO lines as standard. The ZULU is housed in a tough plastic enclosure that is either screw or DIN rail mountable.

The ZULU-G-UMTS is the 3G / UMTS version with GPS capability.
The ARM Cortex M4 32bit processor manages the Telit

module and is available for the user to program custom applications. The features of the standard ZULU are as below:

- USB serial port interface
- RS232 serial port interface
- Debug serial port interface
- Onboard 600mA solid state relay
- 5 x GPI
- 4 x GPO
- 2 x ADC
- 2 x DAC
- CAN interface
- 1-wire interface
- I2C interface
- Boot load line
- Ignition line
- Accelerometer

All connections to all interfaces of the modem can be made through the 36-way connector with the exception of the antenna(s) and USB. The ZULU also has a separate Mini USB and RS232 socket, and an RJ12 power socket. The status of the ZULU is shown by three easily viewable LEDs all of which are ultimately programmable to the user's needs. The ZULU range also has an internal battery option of a 2000mAh Li-ion battery – this can be specified at the time of ordering or can be retro-fitted (see ZULU-GB-UMTS).

Additionally the ZULU has an integral accelerometer and features an ignition line, other modem control and reset lines on the RJ12 connector making it very suitable for a vehicle tracking and control unit, with a small amount of microcontroller software design. The 600mA solid state relay is also a standard feature of the ZULU range and is accessible via the 36-way connector.

The ZULU series is packaged in a tough blue ABS plastic box that is DIN rail or screw mountable and has dimensions of 134 x 74 x 33mm. In all the ZULU is designed to be your M2M modem and main computing engine in one package using a well understood and very capable microcontroller range that is easy to program with.

The ZULU modem range has been designed for long life and is available in UMTS and GPRS form with LTE coming very shortly - all with the same design and features making it easy for the user to design once, and use the many versions with very little effort.

The ZULU range has a number of accessories available:- JTAG programming cable, OEM power cable, 0.5M and 1M 36way cable and connector with unterminated ends, 12V wallblock power supply with RJ12 connector.

ZULU Power Connector

ZULU 36-Way Connector

ZULU Mini USB and RS232 Connector

ZULU LEDs, GSM and GPS Antenna Connector and SIM Card Slot

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UMTS & GPS Modem with ARM Cortex M4 32bit Processor,
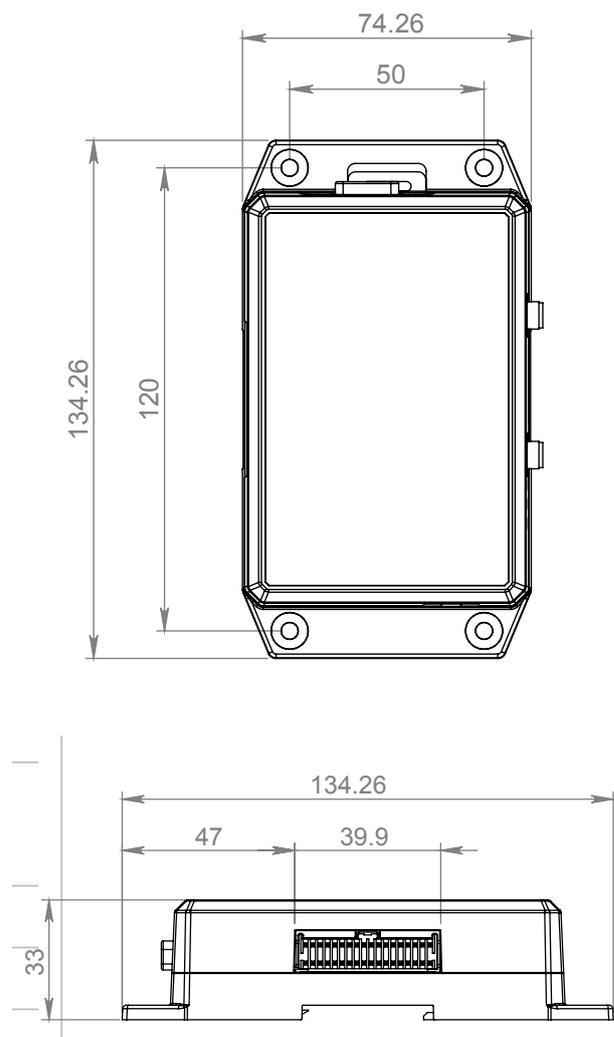USB and RS232 Serial Port Interfaces

Electrical Specifications

Temperature Range:	-30 to +80°C
Operating Frequencies:	Quad Band GSM - 850, 900, 1800, 1900MHz UMTS / 3G - 850, 900, 1700, 1900, 2100MHz
HSPA+:	Upload 5.76Mbps Download 21.0Mbps
Power Supply:	5 - 42V
Battery (Optional):	2000mAh Li-ion
GPIO Input Voltage:	35V
GPIO Output Voltage:	0 - 42V
Relay:	600mA

GPS Specifications (ZULU-G-UMTS)

Frequency Band:	GPS (L1)
Sensitivity:	RX -164dBm Cold start autonomous -147dBm Hot start autonomous -161dBm Tracking mode -166dBm
Accuracy:	3m
TTFF:	Cold start 42sec Warm start 30sec Hot start 1.8sec
Output Format:	GPS NMEA 0183
Power Consumption:	Acquisition 46.4mA @ 3.8V Tracking 37.8mA @ 3.8V Low power tracking 25.7mA @ 3.8V

Mechanical Specifications

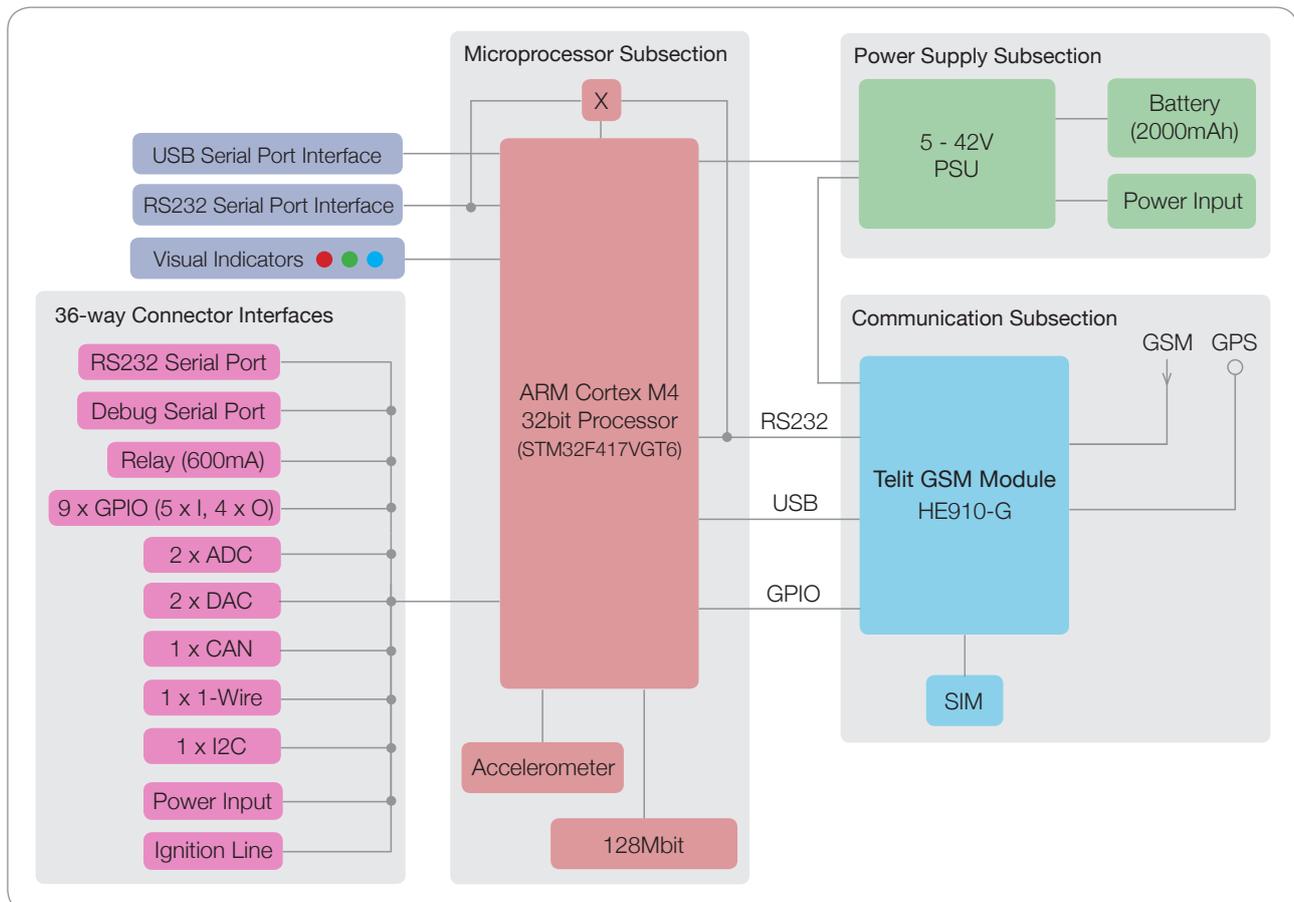|	
Dimensions:	134 x 74 x 33mm
Weight:	125g
Antenna Connectors:	x 1 SMA Female (GSM) x 1 SMA Female (GPS)
Mounting Method:	DIN Rail or Screw Mount

74.26
50
134.26
120

134.26
47
39.9
33

STM32F4 Microcontroller

The ZULU is driven by the ARM Cortex M4 32bit processor, which has 192KB of RAM and 16Mbit of flash memory for customer use, which is expandable to 128Mbit. The ARM Cortex M4 32bit processor is a popular and well known microcontroller with a considerable amount of code already written for it. The ARM Cortex M4 32bit processor 'Discovery Board' is also a popular development platform and has considerable documentation to help with code development.

The ZULU itself can emulate the 'Discovery Board' and therefore be used in this mode for easy code development by the customer, similar to a standalone Discovery Board. The ARM Cortex M4 32bit processor is a very low power micro and within the ZULU consumes around 50mA when fully loaded and running. Conversely it can be put into deep sleep thereby taking a few microamps. The processor itself is capable of considerable multithreading with a number of layers of software. Many of the ZULU peripheral interfaces are native to the ARM Cortex M4 32bit processor. As a result they can be easily configured as required and will be a known quantity to anyone familiar with the STM32 processor family.

ZULU-G-UMTS System Diagram

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UMTS Modem with ARM Cortex M4 Processor,
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ZULU-N-UMTS System Diagram

Microprocessor Subsection
- USB Serial Port Interface
- RS232 Serial Port Interface
- Visual Indicators ● ● ●
- X
- ARM Cortex M4 32bit Processor (STM32F417VGT6)
- Accelerometer
- 128Mbit

36-way Connector Interfaces
- RS232 Serial Port
- Debug Serial Port
- Relay (600mA)
- 9 x GPIO (5 x I, 4 x O)
- 2 x ADC
- 2 x DAC
- 1 x CAN
- 1 x 1-Wire
- 1 x I2C
- Power Input
- Ignition Line

Power Supply Subsection
- 5 - 42V PSU
- Battery (2000mAh)
- Power Input

Communication Subsection
- GSM
- Telit GSM Module HE910-D
- SIM
- RS232
- USB
- GPIO