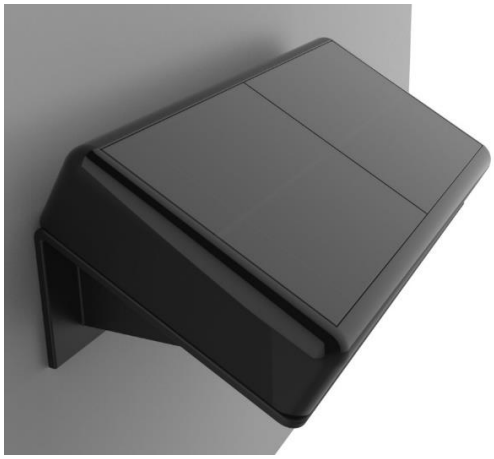
STONELIN COMMUNICATIONS

solar node



Description

Historically a bluetooth (BT) system is limited in its use due to range and the power it consumes being prohibitive for mobile devices, each device is termed a node, each node can only “talk” to the central node and distance is very limited to typically to 10 metres. A typical node system is shown in figure 1

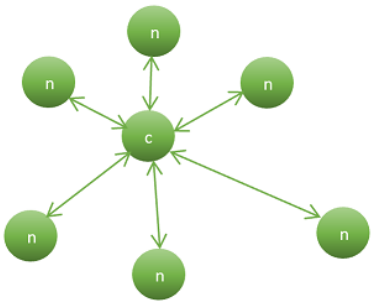


Fig 1

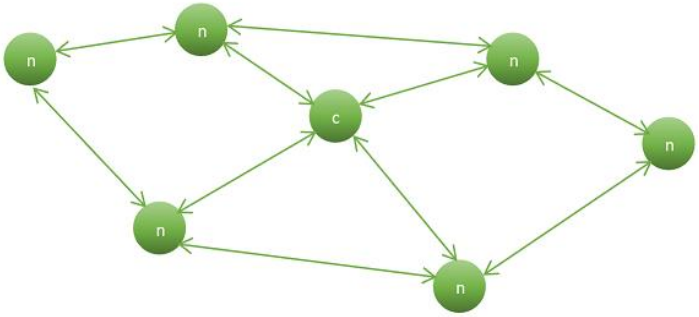


fig 2

Mesh networks as shown in fig 2 comprise of peripheral nodes which can be cascaded in chains in order to form a mesh network, utilising BT 5 the distance in outdoor space can be up to 1km between nodes and by chain cascading, this distance can be extended throughout the mesh to many

kms. Using a further GPS/GPRS base station similarly powered remote monitoring of the entire mesh can be achieved.

The solar node

Often the problem with such remote system applications is how to power the device, batteries alone do not allow for extended lifetime use, the exclusive use of Solar panels is also often prohibitive due to size and the simple “un-managed” combination of the two is in many applications does not have the capacity

The solar node looks combines Solar power, Battery support and a Software algorithm to provide monitoring of critical characteristics not only within the resident node but also for the entire mesh network and daylight conditions.

The solar node is a device which combines both the use of a custom designed **sun** solar panel, power supported by a custom designed lithium ion battery.

The unique feature of the device is the purposely developed algorithm (embedded firmware (software)) which not only continuously monitors critical factors in the host solar node such as battery life, solar contribution and the BT5 consumption, but also monitors the mesh network power management.

During daylight the solar cell recharges the battery and provides power to the BT5 node, at night the battery takes over providing the power.

The embedded software continuously analyses all the functionality and manages the system, including data rate accessibility as a function of power and “down nodes” within the mesh etc. providing maintenance scheduling information.

Principle features

Intelligent data transmission rate calculated according to battery level and sun light.

500mah battery backup.

Bluetooth Low Energy communicating with a GPS/GPRS central node to transmit data to the stonelin server or customer dedicated server

Integrated temperature sensor
Integrated giro
Integrated accelerometer (all on one IC)

Firmware is customisable through the D-Type connector.

Long range over standard Bluetooth, up to 500 metres in direct line of sight.

fast data transfer rate, 1.4Mbit/s.

ultra-low power ARM Cortex-M4 (1Mb Flash, 256Kb RAM).

Average power consumption in Active mode is ~4mA.

D-Type connector for access to many different ports of the Nina-B1, such as debugging, 4 analogue ports and 5 digital.

Pre-configured to work with the stonelin platform for data recovery

GPIO Ports

SWD debugging(2pins)

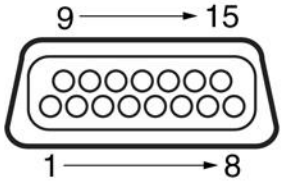
Accessories Power – 1.8V

Options: I2C, I2S, SPI, UART, Digital (PWM, PDM,QDEC) Can be assigned to any pin.

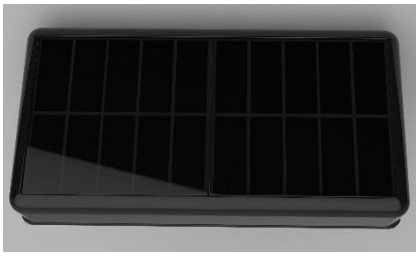
Analog compatible, 8-Chanel ADC, Analog comparator and a Low-Power comparator.

USB 2.0

Configured and accessible via an external female 15-way D-Type connector

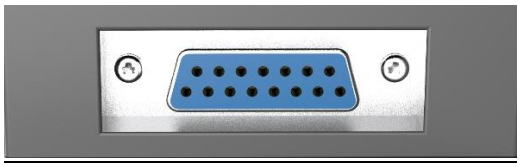


D-Type connector pin	UBLOX B302 pin	Description
1	9	Vcc
2	6	Gnd
3	10	Vcc-in
4	11	SWD Debug
5	15	SWD Debug
6-8	1,2,3	Gpio (general purpose I/O)
9-12	16,17,18,19	Analogue input
13	31	USB 5V in
14-15	54,55	USB data



Mechanical specification

(D-Type connector IP67 0nly)



Applications

- Remote fire detection “Forest fires”
- Remote basic weather measurement
- Humidity measurement
- Wind speed
- Flood and overflow
- Chemical detection
- Vibration
- Asset integrity
- Industrial Automation
- Industrial Monitoring
- Smart building and cities
- Sensors
- Healthcare

  To name but a few

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