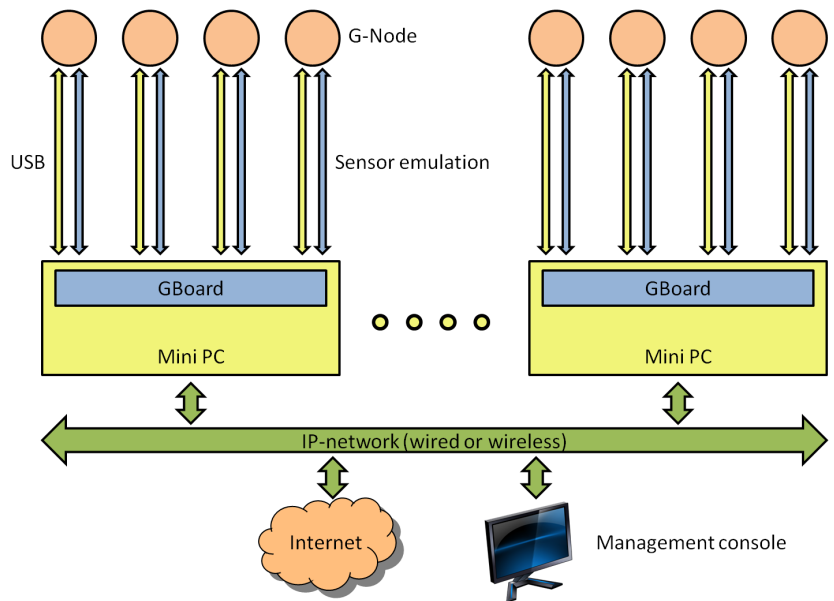


SOWNet Technologies T301 Testbed

Emulating sensors is the latest innovation in Wireless Sensor Networks testbed technology.

A new testbed platform developed by SOWNet Technologies (SOWNet) in collaboration with the Technical University of Delft offers a complete package of hardware and software solutions which provides flexibility and can be tailored to specific customer needs.



The SOWNet Technologies T301 Testbed is primarily a **Wireless Sensor Network testbed** consisting of SOWNet G-Node G301 Wireless Sensor Nodes (for details see separate product whitepaper). Each Wireless Sensor Node is attached to a G-Node Testbed Adaptor (GTA301) module for connecting the sensor emulation feature. Up to 4 G-Nodes and GTA301 modules can be interfaced to a single mini PC. The mini PC provides 2 USB ports with the integrated GBoard adding 2 more USB ports and 4 sensor emulation ports. The mini PC is connected to an IP network using its wired or wireless networking capability. This allows many mini PCs and a vast number of G-Nodes to form a Wireless Sensor Networking testbed together and still be managed from a single management console, possibly over the internet. The T301 Testbed is in production and available for purchase today. The G-Node G301 is available at a price of **only € 59,- ex. VAT**.

The **sensor emulation** feature allows you to feed the testbed with generated sensor data or even data gathered in live experiments. This allows convenient and repeatable testing with various algorithms, radio speeds and transmission power levels using exactly the same firmware as a sensor node with real sensors. This **saves time and development effort**. To accomplish this goal, the mini PCs forming a back-end for the testbed can emulate almost any sensor

using a direct SPI/I2C/UART/ADC/interrupt interface to each G-Node.

Out-of-band debugging is another use for the sensor simulation connection. With 4 bidirectional pins directly accessible from the MiniPC it is easy to debug and benchmark certain events on every G-Node.

With **8KB RAM, 116KB ROM and 16MHz top speed** the SOWNet G-Node G301 stands its ground. Fully supported by **TinyOS 2.0** with SOWNets platform definitions it is easy to develop software for this open platform. A fully preconfigured virtual machine with all required tools and libraries is available on DVD along with a getting started manual. All this can be up and running within half an hour.

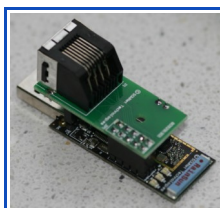
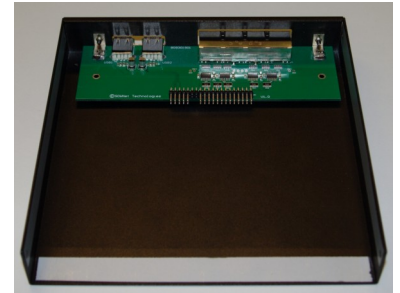
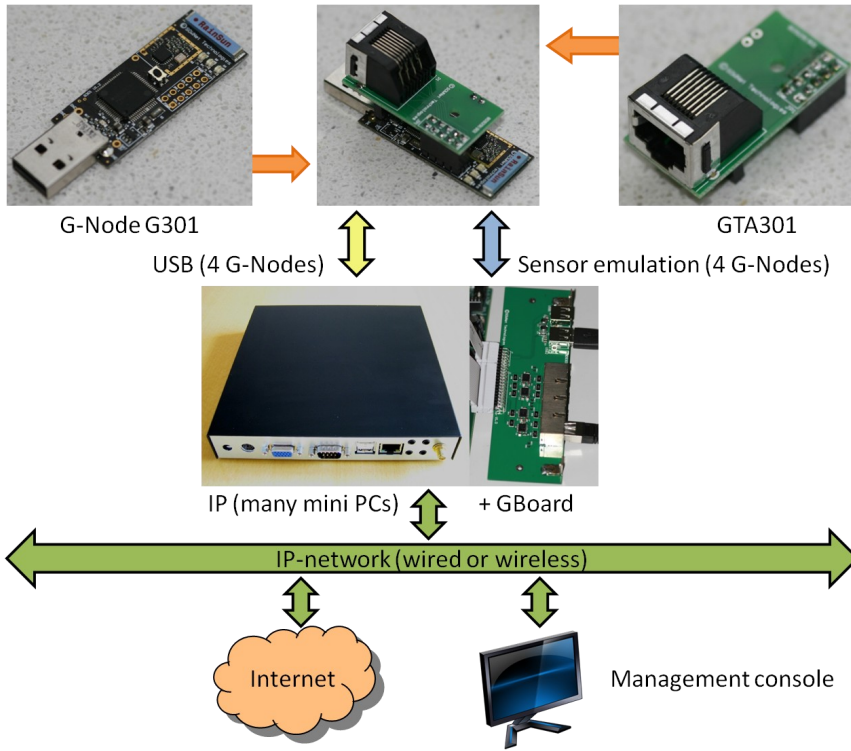
Mass in-place reprogramming is possible thanks to the USB reprogramming capability. A dedicated link to every G-Node allows for fast reprogramming of the entire testbed from a central management console. The USB connection can also be used as a bidirectional UART connection allowing **quick debugging and data logging**. This system has been developed with and is used by the Technical University of Delft. Middleware for accessing and reprogramming this platform is freely available.



G-Node G301

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G-Node G301 + GTA301

Key Features	
Main features:	<ul style="list-style-type: none"> - Texas Instruments MSP430F2418 microcontroller - Texas Instruments CC1101 radio chip - FTDI FT232RQ USB chip - 116 KB ROM - 8 KB RAM - 256B internal + AT45DB081D 8Mbit external FLASH
Communication:	<ul style="list-style-type: none"> - Output power can scale from +10dBm to -30dBm - Optimized for high density multi-hop usage - 10 to 20 m Indoor use*, over 30m in free space (+10dBm) - Over 400m possible with passive antenna, 112dBm receiver sensitivity - 0.8kbps up to 500 kbps data rates possible *exact range dependant on building structure and environment
Sensing:	<ul style="list-style-type: none"> - Internal temperature sensor of microcontroller - 12 bit ADC (1 channel external, contact us for more)
Interfaces:	<ul style="list-style-type: none"> - 8 I/O pins: SPI/I2C (3), UART (2), Interrupt (2), ADC (1) - 6 I/O pins on GTA301: SPI/I2C (3), Interrupt (2), ADC (1) - 2 pins for powering sensors: 3V (max. 70 mA), GND - 3 user programmable LEDs, 1 USB power LED - USB connection (reprogrammable over both USB and JTAG)
Technical Specifications	
<u>Physical</u>	
Housing:	Transparent ABS available for G301 only
Colour:	Black PCB for G301, Green PCB for GTA301
Dimensions:	60 x 6 x 19 mm (wxhxd) for G301 only, GTA301 adds 22mm height
Weight (packed):	Less than 50 g
Environment:	Temp. -10° to 50°C RH 10% to 90% - non condensing
Antenna:	Onboard, connection can be used for external antenna
<u>Electrical</u>	
Input Voltage:	5V DC through USB
Battery:	Battery connector for 1.8-3.6V input
Battery life time:	>3 months (2xAAA 1000mAh, 1% duty cycle/400 µA avg.)
USB Supply current:	<ul style="list-style-type: none"> 2 µA (node) + 15mA (USB) = 15mA (Sleep) 30 µA (node) + 15mA (USB) = 15mA (Idle) 35 mA (node) + 15mA (USB) = 50mA (Active) 50 mA (node) + 15mA (USB) + 70mA (I/O) = 135mA (Max)



Mini PC with GBoard integrated

Key Features	
Main features:	<ul style="list-style-type: none"> - AMD Geode LX-800 500MHz processor - 256 MB RAM - 4GB or more flash memory - Ethernet and WLAN option integrated - Embedded Linux platform
Interfaces:	<ul style="list-style-type: none"> - 2x USB (rear) - 2x USB on GBoard (front) - 4x sensor emulation on GBoard (front) - 6 I/O pins per G-Node available*, of which 4 bidirectional *SPI/I2C (3), Interrupt (2), ADC (1)
Technical Specifications	
<u>Physical</u>	
Colour:	Black
Dimensions:	176 x 174 x 30 mm (wxhxd)
Weight (packed):	Less than 1 kg
Environment:	Temp. -10° to 50°C RH 10% to 90% - non condensing
Antenna:	SMA connector for external 2.4GHz antenna present
<u>Electrical</u>	
Input Voltage:	12V DC, 230V AC adaptor available
Power:	1A @ 12V or less with 4 G-Nodes attached

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