insigh.io

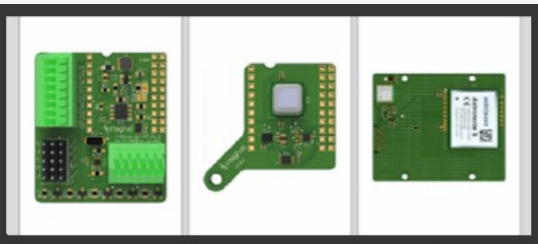
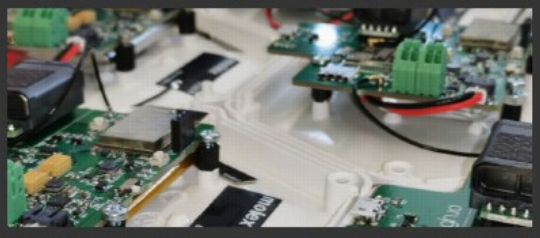
embedding intelligence

insigh.io IoT solution
Overview

insigh.io offers a quick and affordable way to develop and smoothly scale new IoT solutions from scratch:

- Start with a flexible and modular development board
- Pick and place an existing or design a new shield tailor-made to your application and sensors
- Optionally add a connectivity expansion shield when WiFi and Cellular are not enough
- Configure the devices with our open-source Micropython firmware
- Power on, connect to our Cloud Platform and check measurements
- Place the board to the provided outdoor enclosure, attach peripherals, deploy, scale, and forget
- Manage your deployment remotely, access and visualize data from your office





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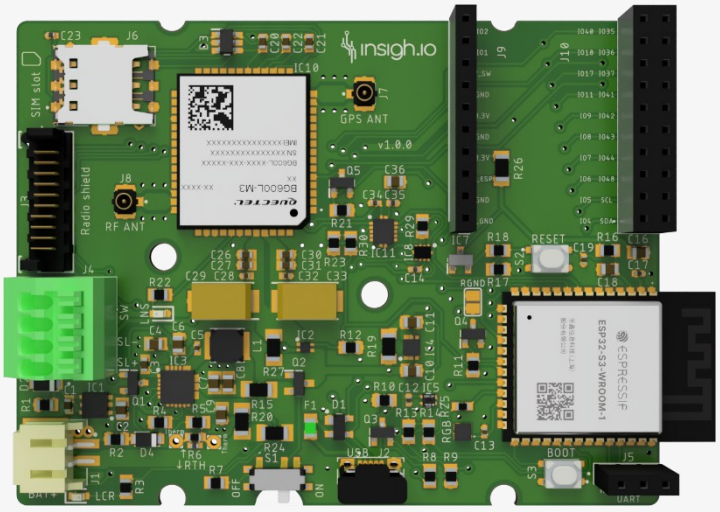
insigh.io IoT solution
Hardware – Overview

insigh.io board is a generic and affordable board for accelerating IoT adoption by companies, makers and non-experts.



Out of the box features:

- programmable microcontroller
- multiple power supply options
- USB/solar charging
- Integrated WiFi & Cellular
- on-board temp/hum sensor
- embedded GPS
- device access via USB/Serial port
- local or remote configuration via Web based UI
- live data transmission or in batches
- memory for measurement storage

Build to last for years:

- ultra-low power design
- energy consumption profiling
- automatic power management

One product - infinite applications:

- exposed IOs for breadboard tests
- tailor-made sensor shields
- additional connectivity shields
- open-source firmware
- cloud-platform ready

Connectivity

- WiFi/Bluetooth
- Cellular
- LoRa
- Satellite IoT

Energy sources

- Battery
- Solar Power harvesting
- USB

Sensors

- Analog
- Digital
- Industrial Protocols

Scenarios

- Agriculture
- Smart Cities
- Smart Offices
- Machines

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Hardware – Main Board

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Main Board Specifications

General Information (SKU: INS-B-MAN)	
Dimensions (L x W x H)	77.47(83.5*) x 62.23 x 16.7 mm * *including WiFi antenna*
Weight	28 g

Operating Conditions	
Operational Temperature	0 – 50°C
Charging Temperature	0 – 50°C
Charging Current Limit	440 mA
Maximum Drawn Current (sensors)	250 mA

Power Supply					
USB	Port	Input Voltage			
	Micro USB Female	Min.	Typ.	Max.	Units
		4.5	5	5.5	V
Battery	Port	Nominal Characteristics			
	JST PH 2.0	1 x Rechargeable LiPo/Li-Ion 1S1C 3.7-4.2 V			
Solar Panel	Port	Input Voltage			
	Fixed Terminal Block with push-in connection (no tools required)	Min.	Typ.	Max.	Units
		5.5	6	7	V

Connectivity	
Integrated Radio Modules	WiFi, Bluetooth, Cellular IoT (NB-IoT) & 2G (GSM) fallback
Extensions	LoRa, Satellite IoT

Switches	
S1	Controls power supply to the micro-controller (the battery charging process is not affected)
S2	Tactile switch for rebooting the micro-controller
S3	Tactile switch for activating the micro-controller's bootloader (needed only for fw upgrade)
J4	Port for connecting external switch (S1 should be in OFF state)

On-board diagnostics, protection & features	
On-board Sensors	1 × Temperature/Humidity Sensor (based on the SHT40 chip) 1 × GPS (using embedded modem's functionality)
Energy Profiling	Accurate Measurement of battery voltage even at charging state
Embedded Protection	4 x Resettable Fuses for protecting battery, solar panel and USB ports, 3.3V regulator 1 x Thermistor protecting charging
Expansion	3 x 10 Female Headers Pin Connector 1 x 10 Molex Connector & Ribbon Cable (Part numbers: 90325-0010, 92317-1012)
Storage	Internal micro-controller flash with up to 8/16MB capacity

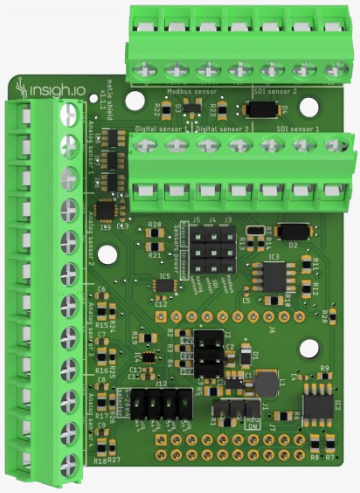
LED Indicators			
Usage	Type	Status	Indication
Charging	RED	ON	Battery is charging
		OFF	Battery charged
		FLASH	Battery not present (USB on)
Modem	RED	OFF	Disabled by micro-controller
		FLASH	Activity (connecting, sending)
Scenario	RGB	BLUE	Boot & sensor measurement
		RED	Connecting to network
		GREEN	Sending Data
		MAGENTA	Configuration

Additional Peripherals	
Battery	WiFi: At least 1200 mAh NB-IoT: At least 1200 mAh GSM: At least 2200 mAh Recommendation: 4000 mAh for permanent deployment operation
Solar Panel	Open Circuit Voltage: Up to 7V Power: 1-6W

Sensor Expansion Shields

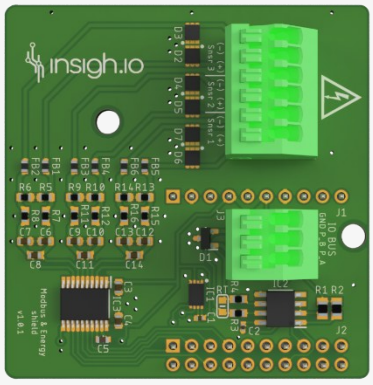
- Swappable
- Built-in firmware
- Rapid testing
- Power and Data Connectors
- Ready for final product
- Power management

Enviro Sensor Shield (INS-S-S-ENV)



Number of Sensor Ports	9
Sensors Supply Voltage	5V/9V/12V (controlled by jumper)
Sensor Ports	2 × SDI12 | 1 x Modbus RTU | 2 x Digital/Pulse Input | 4 x Analogue Input (used as 4-20mA also)
Power Supply	On-demand or Always-On (controlled by firmware & jumpers)
Example sensors *built-in firmware*	Meter Teros-12 (VWC, EC, Temp)
	Meter ATMOS41 (Weather Station)
	Kisters HyQuant (Non-Contact Water Level Sensor)
Example applications	Agriculture, Weather, Water Monitoring

Machine Sensor Shield (INS-S-S-MAC)



Number of Sensor Ports	4
Sensors Supply Voltage	None (External needed)
Sensor Ports	1 x Modbus-RTU | 4 x 2-wire 4-20mA
Example sensors *built-in firmware*	PLCs with Modbus slave RTU interface
	Laser Distance Sensor, pH Sensor
	Split Core Transformers with 4-20mA output
Example applications	PLC communication, Weather stations, Electricity metering in buildings / machines

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Outdoor Node & Operational Conditions

- IP-rated enclosure
- Indoor/Outdoor Deployment
- Unattended Operation
- Minimal Installation Effort
- Easy configuration
- Data Plan

Parameters	
Enclosure Material	ABS or Polycarbonate (depending on application requirements)
Enclosure Protection	IP65 or IP67 (depending on application requirements)
Enclosure Dimensions	120mm x 120mm x 60mm
External Switch	Yes, with proper IP rating
External Connectors	Glands or Specialized Connectors (WeiPu)
Antennas	Included
Additional Protection	Hydrophobic Ventilated Plug (option)
Mounting Kit	Included (if required)
Environmental Conditions	Standard Outdoor operation
Peripherals	Rechargeable Battery, Solar Panel 6V/6W, External Switch
Cellular Connectivity	Integrated 500 MB data pla (optional)
Support	
Warranty	2-years. Defective parts are replaced.
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