Quad-Band GPRS Remote Node K-101

K-101

Best in class ultra-low power consumption node with analog and digital inputs for remote monitoring and control. From the sensor to the Cloud.

The K-101 node is a plug & play solution to remotely measure any analog or digital sensor for any application requiring extremely low power consumption and remote configuration capabilities. In just some configuration steps the information is available in Kunak®Cloud, a powerful cloud based platform where the whole data, alarms, thresholds and remote configuration capabilities are available through the web interface, smartphone App. or its Open API.

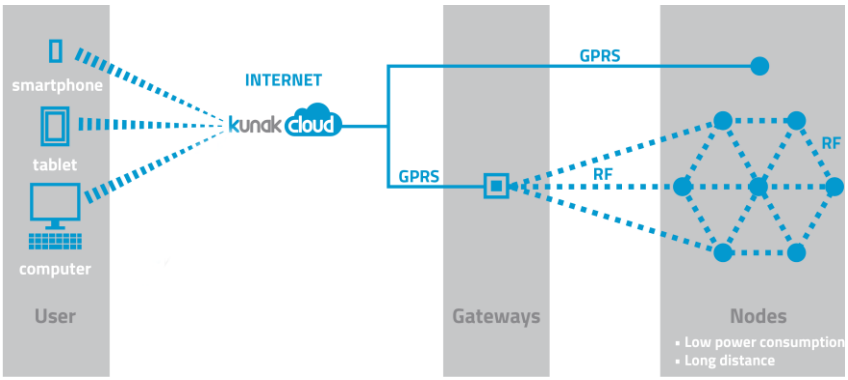
General Data

Main Features

- Plug and play remote monitoring solution.
- Powerful cloud-based platform; Kunak®Cloud.
- Easy to configure through Laptop, Smartphone or Tablet
- Ultra-low power consumption (<10µA in sleep mode)
- 3 digital and 3 analog configurable inputs
- Wide range of power supply options
- 2 independent power supplies for sensors
- Built-in temperature, battery and RSSI sensors
- Remote configurable alarms, thresholds, calibration parameters, sampling and sending periods

Applications

- Remote Monitoring and Control
- Telemetry and Asset Monitoring
- Water & Waste Water Management
- Industry Security and Control
- Smart Utility Networks
- Environment & Agriculture
- M2M
- Smart Cities
- Industrial Internet of Things



Kunak® System Architecture

Radio-frequency and GPRS nodes, GPRS gateway, cloud-based platform "Kunak®Cloud" and user side.

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Technical Data[1]

Electrical Specifications				
Power Consumption	Sleep Mode	Primary Battery	< 27.5 µA @7.2V_{DC} (while sampling digital inputs)	
		Rechargeable	< 50 µA @ 3.7 V_{DC} (while sampling digital inputs)	
	Active Mode	Each GPRS transmission	<1 mAh @ 3.7 V_{DC}	
Power Supplies	Sensors [2]	Main Power Supply Plug-in	3 or 5 V_{DC} @ 200 mA	
		Secondary Power Supply Plug-in	5 V_{DC} @ 200 mA or 12 Vdc @ 60 mA	
	Node	Primary Batteries or External Power Supply	5 – 24 V_{DC} [3]	
		Rechargeable [4] (Li-Ion and Li-polymer)	Charger Input Voltage	From 5 to 17 V_{DC} @ 2 A max.
			Voltage Range	3.4 – 4.2 V_{DC}
Internal Memory	4Mbits (> 46.500 data points + time stamp) Other options upon request			
Real Time Clock	Two independent RTC for time management. Automatic synchronization.			
Operating Temperature Range	-35°C to +80°C			
Input Channels				
Analog [5] (16 bits resolution)	Current	Range	4 – 20 mA	
		Input impedance	249 Ohms	
	Voltage [6]	0 – 10 V_{DC}		
Digital [7]	Pulse Counter	Minimum pulse width: 500 us		
	Frequency Meter (Average)	0 Hz – 4 kHz ($\pm \frac{1}{sampling\ period\ (s)}$ Hz)		
	Frequency Meter (Instantaneous)	0 Hz – 4 kHz (±1Hz)		
	Open/Close State	Minimum pulse width: 2 ms		

[1] Most of the parameters can be customized. For any specific requirements contact sales@kunak.es

[2] Configurable pre-heating time to reduce power leakage to the sensors. Higher current power supplies options available: 5 V @ 450 mA, 12 V @ 220 mA or 24 V @ 100 mA.

[3] Primary batteries or external power supply up to 42 Vdc is also available under request.

[4] Power path management available. The power path feature allows powering the system from a high efficiency DC to DC converter while simultaneously and independently charging the battery. The power path also permits the battery to supplement the system current requirements when the adapter cannot. This enhances battery life.

[5] Analog input type has to be indicated following the ordering info section.

[6] (-10 – 0), (-10 – +10) and (0 – +5 V) voltage analog input configurations available.

[7] Voltage digital input type also available, for pulse counter, frequencymeter and open/close state applications.

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Quad-Band GPRS Remote Node K-101

Physical Specifications		
Dimensions		87 x 57 x 36 mm
Dimensions including external connectors		100 x 60 x 55 mm
Weight		< 150 g
Material		ABS Plastic
Color		Black RAL 7011
Ingress Protection		IP54
Communications		
Technologies	Transmission	Quad-Band GPRS Class 12
	Configuration	Bluetooth 3.0 + EDR compatible
		Micro USB 2.0
Antenna [8]		MCX-Female connector
Additional Characteristics		
Temperature Sensor	Resolution	12 bits
	Accuracy	± 1°C (from -40°C to 125°C)
LED Indicators		For configuration and status assistance.
GPRS Data Plan		15 or 100 MB data plans, with private IP and private APN to enhance security. Included within Kunak®Cloud services.
Firmware Features		
Scheduling	Sampling	Local and remote scheduling at intervals between 10 seconds and 6 hours.
	Sending	Uploading period to the cloud from 1 minute to 1 day.
Configurable Working Mode	Normal Mode	The node takes readings every sampling period, stores them and sends them to the cloud every uploading period
	Power Safe Mode[9]	The node takes readings every sampling period, and sends only the average to Kunak®Cloud every uploading period.
Thresholds and Alarms		Battery, signal, temperature and any input channel measured have maximum, minimum or asynchronous open/close state configurable thresholds via Kunak®Cloud. If a threshold is exceeded, it immediately triggers an alarm status to the cloud with the data measured since the last sending period (or just the averages in Power Safe Mode) and the overcome value. This feature is available in both the Normal and Power Safe Mode.
Notifications		Email notifications are available when configured via Kunak®Cloud. Smartphone and tablet notifications via Kunak®Watcher.
Open API		Secure RESTful WEB SERVICES

[8] Detachable antenna. Other options under request.

[9] Very useful working mode to reduce power consumption and the amount of data transmitted while maintaining the control over any parameter or event checking the thresholds configured. This operating mode allows configuring higher sending periods and knowing just the average behavior of any parameter, while the thresholds are checked every sampling period for the analog and digital sensors (pulse counters and frequency meters) or when asynchronous open/close state is triggered (at any time).

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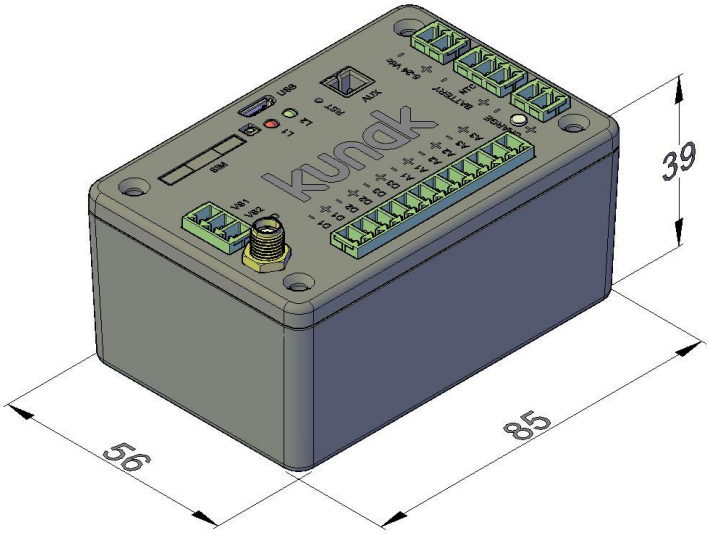
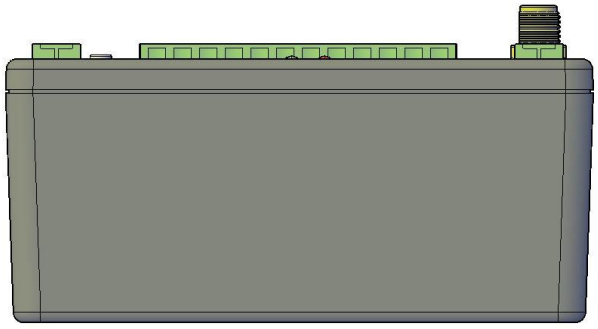
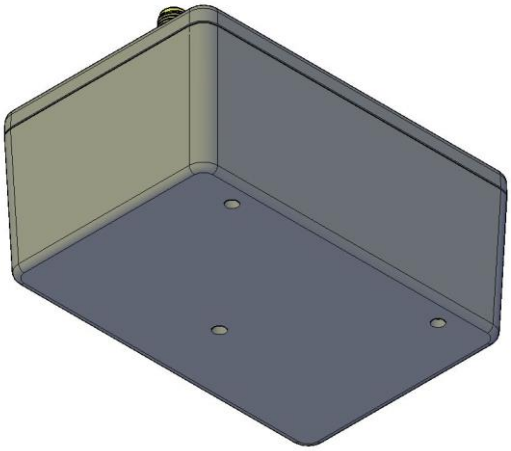
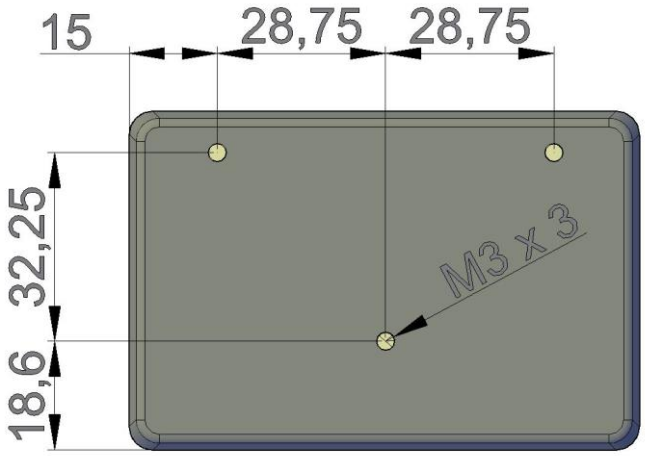
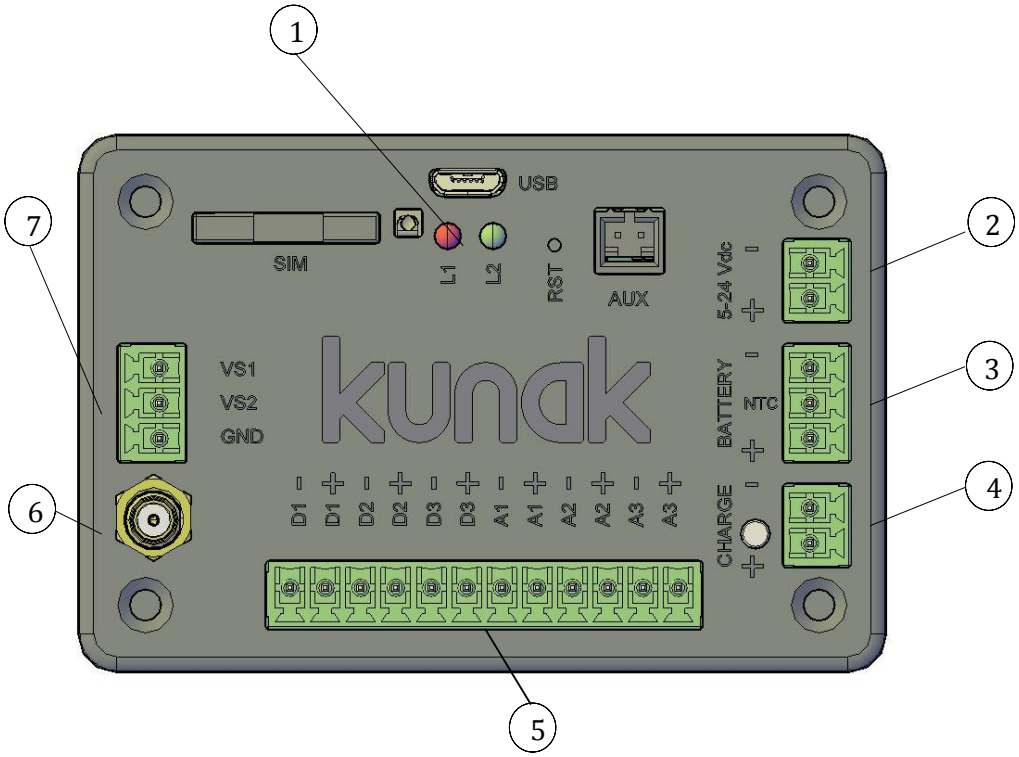
Drawings











All dimensions in millimeters.

1. LED Indicators.
2. Primary battery or external power source (5-24Vdc)
3. Rechargeable battery
4. Charger (5-17Vdc)
5. Analog/Digital Inputs
6. Female SMA connector
7. Power supply for sensors

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Ordering Information

Different parameters from the K-101 can be customized. Please, read the following ordering information to adapt the K-101 to your requirements. The basic code for this product is:

K-101-1-

The next two groups of four characters correspond to the inputs configuration:

Inputs						
Analog				Digital		
Current	Voltage	Codification		Dry Contact	Voltage	Codification
3	0	3C0V	-	3	0	3D0V
0	3	0C3V		0	3	0D3V
2	1	2C1V		2	1	2D1V
1	2	1C2V		1	2	1D2V

For example, the part number up to this point for a device with 2 current and 1 voltage analogue inputs, and 3 dry contact digital inputs would be:

K-101-1-2C1V-3D0V-

The following group of four characters of the part number corresponds to the two sensors power supply outputs (VS1, VS2). The possible configurations of these outputs are indicated on the following table:

Sensors Power Supply		
VS1	VS2	Codification
3	5	S3S5
	12	S3S12
5	5	S5S5
	12	S5S12

For example, the part number up to this point for a device with 2 current and 1 voltage analogue inputs, and 3 dry contact digital inputs, with the VS1 output at 3V and the VS2 output at 12V would be:

K-101-1-2C1V-3D0V-S3S12-

The next group of the part number corresponds to the node power supply input. According with the following table, it could be:

Node Power Supply		
Primary Battery or External Power Supply	Secondary Battery (Rechargeable)	Codification
Installed	Not Installed	PB24
Not installed	Installed	SB

For example, the part number up to this point for a device with 2 current and 1 voltage analogue inputs, 3 dry contact digital inputs, with the VS1 input for 3V and the VS2 input for 12V and only the primary battery connector installed would be:

K-101-1-2C1V-3D0V-S3S12-PB24-

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The next character of the part number is always 0 for this device.

The last character of the part number corresponds to the accessories, as it is indicated in the following table:

Accessories	
Without Accessories	0
DIN Rail	D
Flanged Kit	F

For example, the part number up to this point for a device with 2 current and 1 voltage analogue inputs, 3 dry contact digital inputs, with the VS1 input for 3V and the VS2 input for 12V, only the primary battery connector installed and without accessories would be:

K-101-1-2C1V-3D0V-S3S12-PB24-0-0

Finally, the complete part number for this example would be:

K-101-1-2C1V-3D0V-S3S12-PB24-0-0

The default configuration for K-101 node is:

- 3 current analog inputs
- 3 dry contact digital inputs
- VS1 and VS2 outputs at 5 and 12 V
- Primary power supply up to 24V available.
- No accessories installed

Therefore, the default part number is:

K-101-1-3C0V-3D0V-S5S12-PB24-0-0

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Accessories

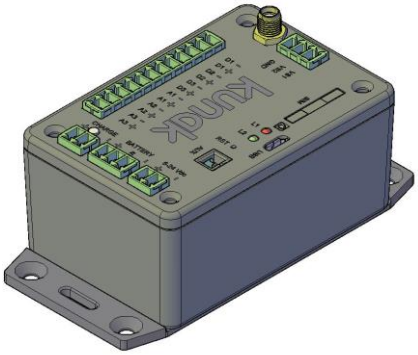

Figure 1

Mounting Accessories
Flanged Kit (Figures 1, 2 and 3)
DIN Rail (Figures 4, 5 and 6)

All dimensions in millimeters

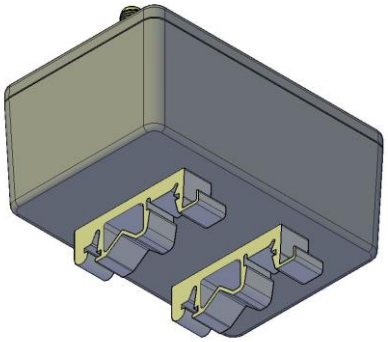

Figure 4

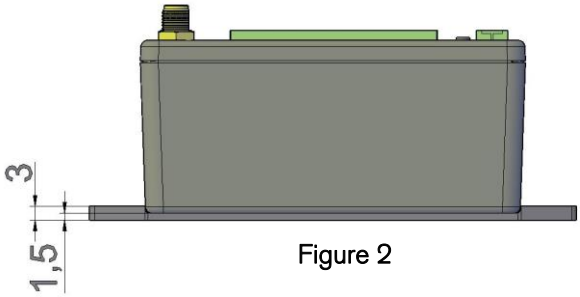

Figure 2

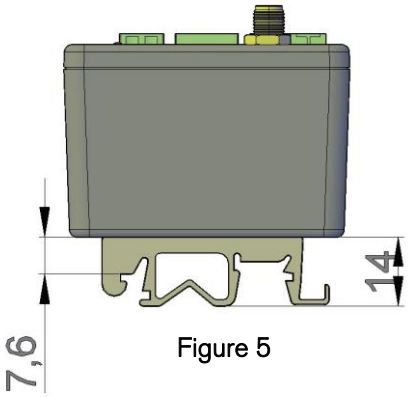

Figure 5

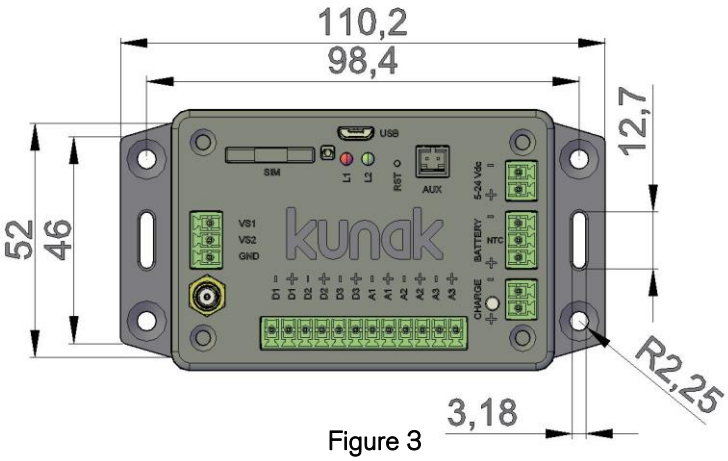

Figure 3

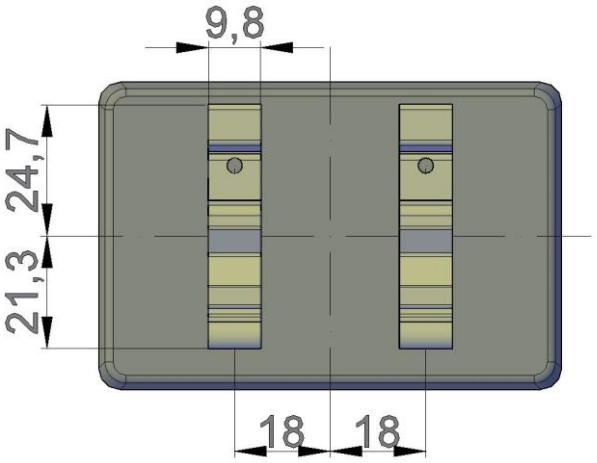

Figure 6

KUNAK – Sensing Anywhere

Kunak® designs and sells products and services for ultra-long range, low power and difficult to access scenarios, for wireless machine to machine (M2M) communications and Industrial Internet of Things (IIoT) markets.

The ultra-low power consumption electronics, long range wireless communications and the cloud platform Kunak®Cloud, which enable sensors interoperability as well as information compatibility, make Kunak® the best in class system for companies that build and/or operate local, national and international infrastructure assets or companies with remote assets requiring monitoring and management.

www.kunak.es // www.kunakcloud.com

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