



piSmart-Gateway-LC-2

Article number: 911131011



custom
manufacture

Unique Features

- LTE-CAT 1
- GPS
- 2x CAN-Bus
- IP65
- 4x Thermocouple connection
- 4x analog input ($\pm 10V$)

Description

The piSmart-Gateway-LC-2 meets the requirements of modern IoT solutions. It is used as a data interface, as a data logger or as a retrofit module in devices, machines, vehicles and plants.

- › Different 4G variants for an optimal decision between fast data transmission, energy-efficient data transmission or a middle ground
- › Multi-function sensor for a wide range of measured values such as temperatures, inherent motion and rotation as well as analogue voltages of up to $\pm 100V$
- › Multiple digital/analogue IOs for expansion with additional functions
- › AI chip for automated pattern and anomaly detection
- › Encrypted data transmission from low-bandwidth, high-latency environments
- › Cloud platform pironex-iot.de for visualisation and analysis of data

Operating Location

As a module for the Industrial Internet of Things (IIoT) the piSmart-Gateway-LC-2 collects data in the direct environment of machines and systems. Thus, it is an easy-to-use solution for the implementation of Industry 4.0 concepts:

- › Over-the-Air-updates
- › Sensor data acquisition
- › CAN-bus-logger for vehicle data
- › Retrofit module for existing systems

Through the MicroBus interface, the piSmart-Gateway-LC-2 can be customized.

The gateway has been specially developed for extreme environments with limited space and can withstand shocks, vibrations and temperature conditions.

Application-specific modifications are possible - so the form factor, interfaces and performance can be customised.



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Microcontroller/Processor

Processor	ESP32-S3-WROOM-1 32 bit Xtensa LX7 Microprozessor up to 240 MHz, Dual-Core
SRAM	512 KB, 2 MB PSRAM
Flash	16 MB, optional 4 MB or 8 MB
ROM	384 KB
SRAM in RTC	16 KB

Interfaces

USB-C 2.0	1x USB-C for charging of the battery / voltage supply
CAN	2x CAN-Bus transceiver, up to 1 Mbit/s
GSM	Dual-Band GSM 900/1800 MHz
LTE-FDD	B1/B3/B5/B7/B8/B20
GNSS	GPS, GLONASS, BeiDou
Bluetooth LE	Bluetooth 5 and Bluetooth mesh
Wifi	IEEE 802.11b/g/n
Programming Interface	USB-C, UART
Digital Output Optocoupler Relay:	
Operating Voltage	0 V - V _{OPTO} (max. 90 V)
Withstand Voltage	100 V continuous
Nominal Voltage V_{OUT}	V _{OPTO} (max. 90 V)
Low-Level V_L (log. "0")	[0 V ; 3 V]
High-Level V_H (log. "1")	[14.5 V ; U _B]
I @ log. 1	max. 100 mA
Reference Potential	piSmart-Gateway-LC2 Ground potential or Ground potential of another device
Protection	galvanically isolated, 1.5 kV isolation voltage, short-circuit to ground and supply
Analog Input Voltage Measurement	
Operating Voltage	±10 V
Withstand Voltage	30 V continuous
Input Resistance	124 kΩ
Input Current	max. 2 mA
Resolution ADC	12 bit
Conversion Rate ADC	up to 100 kSPS
Differential Nonlinearity ADC (DNL)	±0,5 LSB
Integral Nonlinearity ADC (INL)	±0,5 LSB
Protection	Short-Circuit to ground and supply
Analog Output 5V	
Operating Voltage	5 V
Withstand Voltage	25 V continuous
Output Current	max. 1,5 A
Protection	Short-Circuit to ground and supply, Input voltage up to 25V



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Additional Features

Card Slots	1x microSD/microSDHC
Sensors	3G-Sensor: · 3 axis · 16 bit · $\pm 2 \text{ g}$ / $\pm 4 \text{ g}$ / $\pm 8 \text{ g}$ / $\pm 16 \text{ g}$ Gyroscope · 3 axis · ± 125/ ± 250/ ± 500/ ± 1000/ ± 2000/ $\pm 4000 \text{ dps}$
Optical Elements	3x RGB-LED, 1x green Status-LED for charger (inside Housing)
Control Elements	1x pushbutton reset, 1x pushbutton wakeup

Environmental Conditions

Operating Location	Indoor, Outdoor: only within the limits mentioned below
Operating Temperature	with Voltage Supply: -40°C to $+60^\circ\text{C}$ when used with Battery Pack: -10°C to 40°C
Storage Temperature	-40°C to $+60^\circ\text{C}$, without battery
Transport Temperature	-40°C to $+80^\circ\text{C}$, without battery
Gradient of Temperature	5 K/min (avoid dew)
Relative Humidity	Max. 70%, avoid dew
Height above Sea Level	up to 2000 m
Height above Sea Level (Storage/Transport)	up to 3000 m
Degree of Pollution	Pollution Degree 2

Voltage Supply

Voltage VDC	12 V-48 V $\pm 30\%$
max. Power Pmax	0,65 W
max. Current Imax	160 mA @ Vbat: 4 V
max. Current @ Booting	160 mA @ Vbat: 4 V
Battery	Lithium Polymer Battery Pack, 950 mAh / 3,7 V (optional)
Withstand Voltage	62,4 V continuous
VB(t) - Turn-Off Threshold	5 VDC
VB - Turn-Off Threshold Time	> 10 ms
VB(t) - Turn-On Threshold	5 VDC
VB(t) - Undervoltage Lookout	<4,5 VDC
VB(t) - Overvoltage Lookout	> 62,4 V
Reverse Polarity Protection	yes
Booting Time	< 3 s



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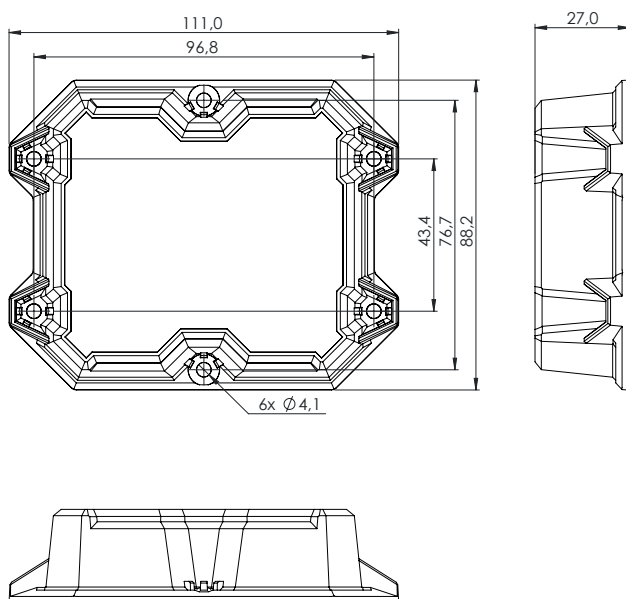
Directives

2014/53/EU	Radio Equipment Directive
2011/65/EU	Restriction of certain Hazardous Substances (ROHS)
2012/19/EU	Waste of Electrical and Eletronic Equipment (WEEE)
EC 1907/2006	Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

Mechanic Specifications

Dimensions	88,2 mm x 111 mm x 30 mm
Weight	<300 g
IP-Class	IP65 (DIN EN 60529:2014-09; VDE 0470-1:2014-09)
Material	ABS and PA6
Resistance of the Housing against aggressive chemicals	resistant (salt water resistant as well as all common cleaning agents and lubricants)
Resistance of the Housing against UV-Light	resistant
Mounting Type	screws

Technical drawing (dimensions in mm)

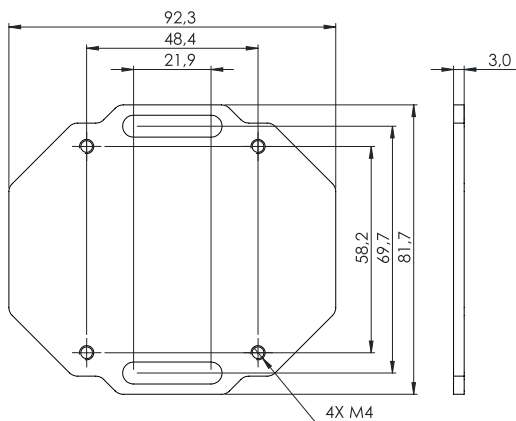
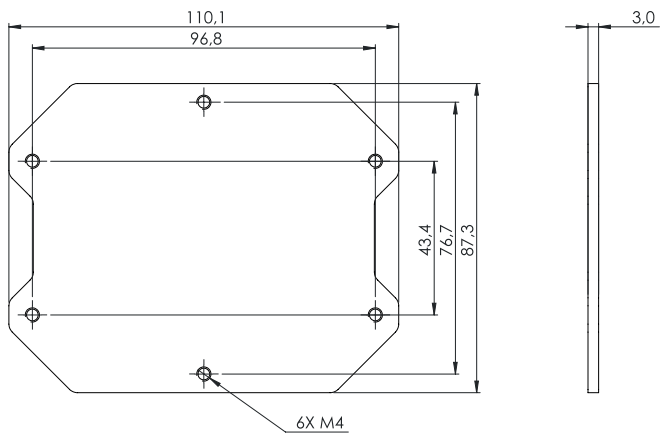
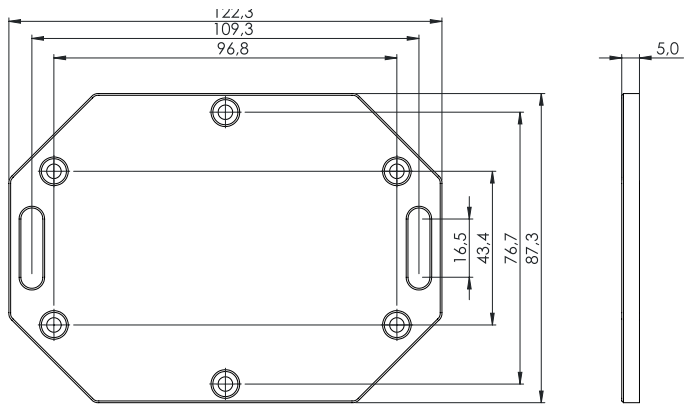


Data Sheet piSmart-Gateway-LC-2



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The height of the bottom plate of the piSmart-Gateway-LC-2 can vary depending on the requirement (0.03mm - 0.05mm).