



IoT

DEVICES



AGRICULTURE



SAFE&SECURITY



SMART METERING

www.solidustech.cz
www.iotcluster.cz



MiniUNI platform

Concept of the MiniUni platform meets the most demanding requirements of the dynamically developing Internet of Things industry (known as IoT). Sensors connected to the MiniUni device detect different physical values e.g. temperature, humidity, various gases and others, or the unit can just react to a closed contact or similar. MiniUni can process information from external sources such as GPS, devices with MBUS, RS485 or UART. All major MiniUni components have country of origin in the EU or on the America's continent. Development, assembly and distribution of Solidus Tech s.r.o. devices are managed in the Czech Republic, EU.

Application of devices in industry

Devices based on the MiniUNI platform can be used in various areas of human activity

- **Agriculture** - weather stations, industrial thermometers, humidity meter, soil moisture detector, gas detectors
- **Safety&security** - contact switches, RFID readers, float switches, flood detector, thermometers, accelerometers
- **Smartmetering** - Reading units for water meters, electrometers and gas meters, impulse counters
- **Transportation** - creation of temperature map of roads and bridges, measurement of traffic density, planning and monitoring of transport
- **Healthcare** - monitoring of temperature during transport of biological samples/blood, legionella prevention



MiniUNI Thermometer&humidity meter with small shield

Sensor for temperature measurement (-55°C to +125° C) with accuracy of 0.5° C, relative humidity 0-100% RH with an accuracy of 5% Rp. Small shield reduces the effect of direct sunlight. Designed for both, outdoor and indoor use - with IP65 or IP20 protection. Available for networks LoRaWAN, Sigfox, NB-IoT.



MiniUNI Weather station

The device with sensor for temperature measurement (-55° C to +125° C), relative humidity (0-100% RH), atmospheric pressure sensor, rain gauge and leaf moisture measurement. Designed for outdoor use with IP65 protection. Compact solution in radiation shield. Available for networks LoRaWAN, Sigfox, NB-IoT.



MiniUNI Thermometer with soil moisture sensor

4 segments of temperature sensors bar, each segment measures temperature in range of -40°C to +120°C. This sensor is terminated with soil moisture sensor. Can be used in smart agriculture for temperature and soil moisture profile measurement. Available for LoRaWAN, Sigfox or NB-IoT network.



Multiple thermometer bar

5 segments of temperature sensors bar, each segment measures temperature in range of -40°C to +120°C. Can be used in smart agriculture for temperature profile evaluation in a silo. materiálech. Available for LoRaWAN, Sigfox or NB-IoT network.



RFID reader

the reader with two to four functional keys, accelerometer, thermometer, humidity meter, SOS button integration or external contact integration Degree of protection IP20. Available for LoRaWAN, Sigfox or NB-IoT network.



MiniUNI Meteo

the device with sensor for temperature measurement (-55° C to +125° C), relative humidity (0-100% RH), atmospheric pressure sensor and rain gauge. Designed for outdoor use with IP65 protection. Available for networks LoRaWAN, Sigfox, NB-IoT.



MiniUNI Thermometer&hygrometer

Sensor for temperature measurement (-55° C to +125° C) with accuracy of 0.5° C, relative humidity 0-100% RH with an accuracy of 5% Rp. Designed for both, outdoor and indoor use - with IP65 or IP20 protection. Available for networks LoRaWAN, Sigfox, NB-IoT.



MiniUNI Thermometer

Sensor for temperature measurement (-55° C to +125° C) with accuracy of 0.5° C. Designed for both, outdoor and indoor use - with IP65 or IP20 protection. Available for networks LoRaWAN, Sigfox, NB-IoT.



MiniUNI UltraSonic sensor

Sensor for distance measurement from 20cm up to 765 cm with an accuracy of 2cm. Suitable to measure distance from "objects" such as water surface and it's height/ level. Designed for outdoor use with IP65 protection. Available for LoRaWAN, Sigfox, NB-IoT networks.



MiniUNI flooding sensor

Sensor reacts to change of height level through float switch. When a change is made the sensor will send an alarm message. Outdoor use with IP65 protection of device, float cover IP68. Available for LoRaWAN, Sigfox, NB-IoT networks.



MiniUNI water meter reader

Remote reader of the Sensus (420, 620), Itron Flodis, usually up to DN25. Detection of: min / max flow, removing of head, backflow and temperature at the place. Designed for outdoor use with IP65 protection and with IP68 for reading head. Inductive and optical sensing principles available. Available for LoRaWAN, Sigfox, NB-IoT networks.



MiniUNI industrial water meter reader

Remote reader of industrial meters WPD, WSD, MEISTREAM. Detection of: min / max flow, removing of head, backflow and temperature at the place. Designed for outdoor use with IP65 protection and with IP68 for reading head. Available for LoRaWAN, Sigfox, NB-IoT networks.



MiniUni precision thermometer

MiniUni precision thermometer - device with precise temperature measurement from -40 °C to 105 °C with an accuracy of 0,1 °C. Designed for outdoor & indoor use, box protection IP65, sensor with protection IP65, suitable for legionella prevention. Available for LoRaWAN, Sigfox, NB-IoT networks.



MiniUni impulse counter

Up to two channel pulse counter with logic level of 3V, dry contact or S0. Maximal pulse frequency is 30Hz. Designed for both outdoor and indoor use with IP65 protection. Available for LoRaWAN, Sigfox, NB-IoT networks.



MiniUni GPS tracker

Device for tracking and position evaluation. GPS tracker is equipped with an accelerometer for movement activities detection. Designed for both outdoor and indoor use with IP65 protection. Available for LoRaWAN, Sigfox and NB-IoT networks.



MiniUNI environmental sensor

Device for fundamental environmental quantities measurement such as temperature, relative humidity, air pressure and CO2. The device is powered from external power supply and built-in accumulator.



MiniUNI soil moisture sensor

Device for soil moisture and temperature measurement independent from soil composition. Based on gypsum granulate sensor. Aimed to smart agriculture for watering optimization.

Application and visualisation

Application server (AS) forms an integral part of the IoT ecosystem. Primary task of AS is to interpret the scanned data to the end user.

The basic features are:

- Final processing of generated data
- Graphical visualization of requested data and alarm states
- System notification sending
- Parameterization of each sensor/device - using downlink messages
- Interface for external info systems via the APIs
- Backup for data received

Supported networks & technologies

Depending on the appropriate transceiver mounted in MiniUNI platform these transmission technologies/networks are supported:

- **LoRaWAN** - a network that is built on an open platform that guarantees the ability of a sensor to operate under different infrastructures. Typical network parameters are: range up to 40km for direct "visibility", up to 3km indoor. The transmission message length is up to 220Bytes uplink and downlink direction. Max. number of messages/day is 420 in any uplink / downlink ratio.
- **Sigfox** - a network built on a closed platform owned by the French company Sigfox. In the Sigfox network, roaming is provided between countries where network is available. Typical network parameters are: range up to 60km for direct visibility, up to 3km indoor, transmission message length is 12Bits in uplink and 8Bits in downlink direction. The maximum number of messages/day in the uplink direction is 140 and 4 in the downlink direction.
- **NB-IoT** - NarrowBand - a network of major mobile operators based on LTE technology that guarantees very good availability within country coverage. NB-IoT is operated in the licensed frequency band, which guarantees high availability of network. Typical parameters are: reach up to 80km for direct visibility, up to 6km indoor, transmission message length is 1280Bytes.

MiniUNI parameters

MINI UNI v2	LoRa	Sigfox	NB-IoT	Notes
INPUTS AND HW EQUIPMENT				
7 configurable optional inputs (1)	•	•	•	
4 digital inputs	•	•	•	
3 analogue inputs/16bit ADC	•	•	•	
I2C bus (TWI) devices support	•	•	•	
1 WIRE sensors support	•	•	•	
1 UART	•	•	•	
RTC support	•	•	•	
S0 - input insulated by optocoupler	•	•	•	Optionally
POWER AND CONSUMPTION				
Units powered with up to 2 batteries 2600mAh (2)	•	•	•	
Possible to use soldered batteries	•	•	•	
Transportation mode	•	•	•	Sensors disconnected, sustain sleep mode w < 1 uA
Reverse polarity protection	•	•	•	
Battery nominal power	3.6 V	3.6 V	3.6 V	
Sleep mode consumption	<2uA	<2uA	<2uA; 12uA	NB-IoT 12uA in attached state to network
RADIO UNIT				
Internal/external antenna possible	•	•	•	
Radio frequency power	14dbm	14dbm	23dbm	
Nr.of channels to use	16			
Frequency	868MHz	868MHz	Global band	
ADR	•	•	•	Automatic data rate
Certifications	•	•	•	
Max payload up/downlink				
ENCRYPTION				
OTAA/ABP	•			
Two-level encryption	AES128	on demand	on demand	
HOUSING				
ABS plastic, own design	•	•	•	
Protection IP20/IP65	•	•	•	
Protection IP68				On demand
FIRMWARE				
Configuration by downling (3)	•	•	•	
RealTime possibility	•	•	•	
Real Calendar possibility	•	•	•	
Full controll on radio part	•	•	•	
Sensors self check	•	•	•	
Configuration of tresholds/limits	•	•	•	
(1) Possible combination for peripheral inputs. FW adjustment mandatory acc. to sensors selected - not part of the price				
(2) One battery is included in the price				
(3) Sleep and scan time configuration, other parameters based on sensor type				

