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LPN KM

Highlights

- 8 digital inputs
- Acquisition and processing of wiper signals
- Inputs configurable for pulse counting and operating time counting
- Double point inputs processing (e.g. for valves, power switches)
- Access Control function
- 4 digital outputs working as static or wiper output
- External 24VDC-power supply or powered by building battery
- Autonomy: > 10 years battery operation achievable
- Timestamped transmitted values
- LoRa® or Mioty® radio technology
- QR Code for easy system integration
- Alive message with battery level and device status indication
- Smart housing / IP65
- Wall- and DIN-Rail mounting
- Internal or external antenna for excellent radio performance

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Applications

- Short circuit / earth fault annunciating for medium voltage transformer stations
- Valve, switch, fuse status monitoring
- Property access supervision: authorized / break-in access annunciating
- Pulse counting for consumption acquisition, optimization, accounting
- Operating time counting for motors, pumps, ventilators,..
- Supervision of gates, valves, doors
- Slider valves control and monitoring
- Tap changer position monitoring and control
- Street light control

Description

LPN KM is especially developed for acquisition of short circuit and earth fault status acquisition and transmission out of transformer stations. Build in battery power supply and simple integration in public or private LoRAWan® Networks enables cost inexpensive upgrade of transformer stations for fast fault localization and fast resupply.
Pending local indications can be reset by the build in command outputs remotely.
Due to its flexible and configurable functionalities the device is well suited for numerous applications, where digital data points, operating states and/or counter values art to be acquired and transmitted.

Inputs
LPN KM has 8 digital inputs. Input states can be transmitted cyclic and/or event driven on change, -rising or descending- via LoRAWan®. Each transmitted signal state has an acquisition timestamp attached.
Inputs are debounced, have defluttering and an adjustable annunciating delay.
Defluttering avoids clogging of radio link and unnecessary battery consumption caused by inputs switching incorrectly too often. E.g. motion detectors, loose contact,..
For optimization purposes as well an adjustable transmission delay is implemented. This ensures that rapid successive events, rising or descending signal at the inputs will be packet into single message instead of transmitting several successive messages in short time.
Each signal input can be inverted individually, that's to say can be adapted for normally open or normally close contacts.

Outputs
4 digital outputs, which share the terminals with 4 of the inputs, can be operated as static on /off or as wiper outputs and can be controlled thru the radio down link.

Radio
LPN KM operates in a LoRaWan® network as a Class A device when battery powered and as a Class C device when powered externally.

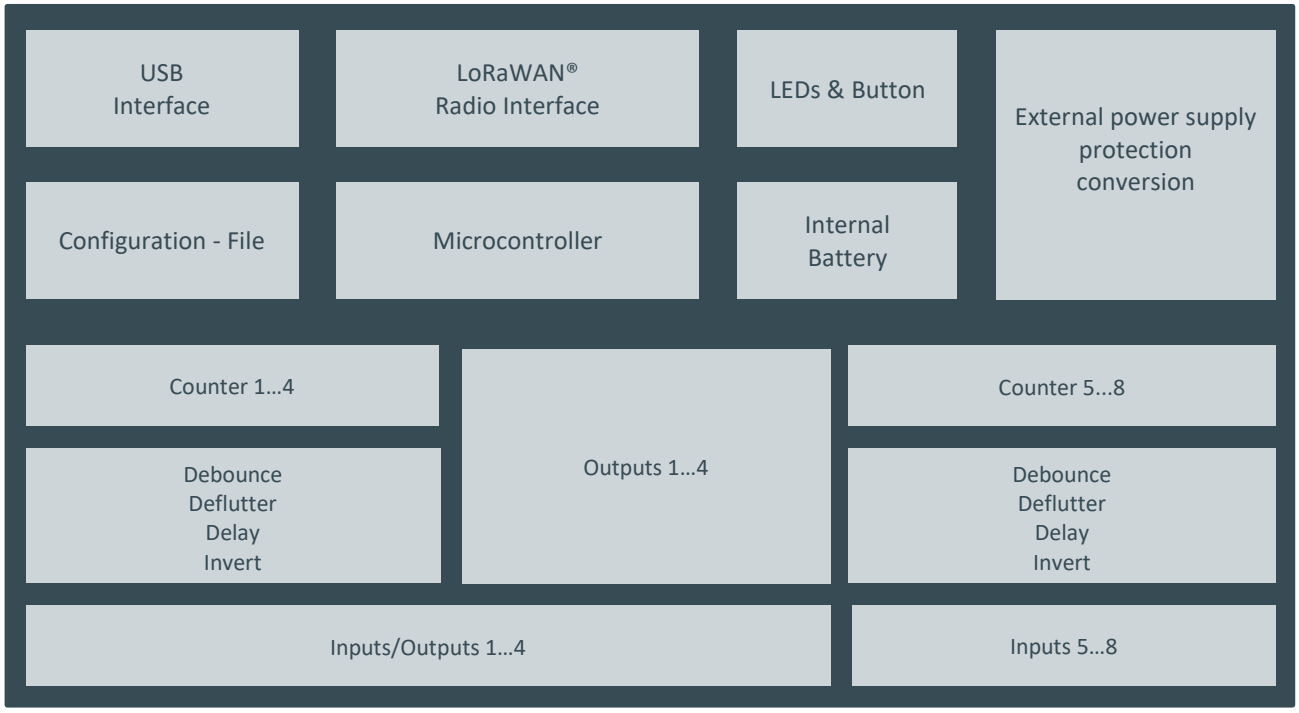
For optimal radio performance LPN KM is equipped with high performance internal antenna, which can be replaced by an external antenna in case of difficult radio conditions.

Configuration
Configuration is of done by a configuration file, which is accessible thru local USB-interface. Parameters can be read and changed over the air es well.

Setup and diagnostic are supported be onboard leds.

Connections
Pluggable terminals and removeable PG-fittings ease wiring and mounting just like the mounting tray for wall- and DIN-rail mounting which is part of the delivery.

Functional Block Diagram



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Technical Specification

Topic	Values	Notes
External power supply	5 … 32VDC	
Operating current	t.b.d	Depends on operating mode
internal battery	3V Lithium Battery, C-Cell	Autonomy depends on configuration
Inputs 1…8		
Threshold	Low =< 1.5V; high> 2.5V	inputs are designed for contacts switching to GND
Input current	-1 mA , pulsed, per input	
Counter width	24 Bit	
Max. puls counting frequency	Battery operation: 2 Hz External power supply: 10Hz	configurable
Counter overflow	16’777’216	Overflow is indicated by statusbit of the inputs
Operating Time Counter,Resolution	1 s ,1min,1 h	
Overrun of operating time counter	0.5 years	overrun is indicated in status bit
Outputs 1…4		
Output voltage (high)	9.5V	Outputs are high side switches
Output current (high), per Output	USB/Ext. DC : 50mA , Battery operation: 50mA. total max. 200mA	
Indicators and Button		
Button	Keypress > 5s: (re-)join Keypress < 5s: Telegramm senden Keypress > 10s: Device Reset	
LED	green: ext. Power source green: USB red: error orange: joined/transmitting	- LED’s not active while devce is battery powered
Terminals		
Antenna	50 Ohm, SMA	Antenna part of delivery
In-/Outputs & ext. Power supply	pluggable, 0.14 - 0.5 mm^2	
configuration	Micro USB	
Housing		
Mounting	DIN-Rail & Wall	Mounting tray part of delivery
Material	Polycarbonat	
Degree of protection	IP65	
Size	W: 55 mm H: 11.5 mm - incl. PG-Fitting H: 9.5 mm (Montagearea) L: 11.5 mm	
Environmental Conditions		
Operating Temperatur Range	-20°C …. +60°C	
Rel. Humudity	0 … 95% (non condensing)	

The product is continuously developed further and improved. The description and technical data are informative and should not be understood as guaranteed product properties .