

## SMARTebox IO

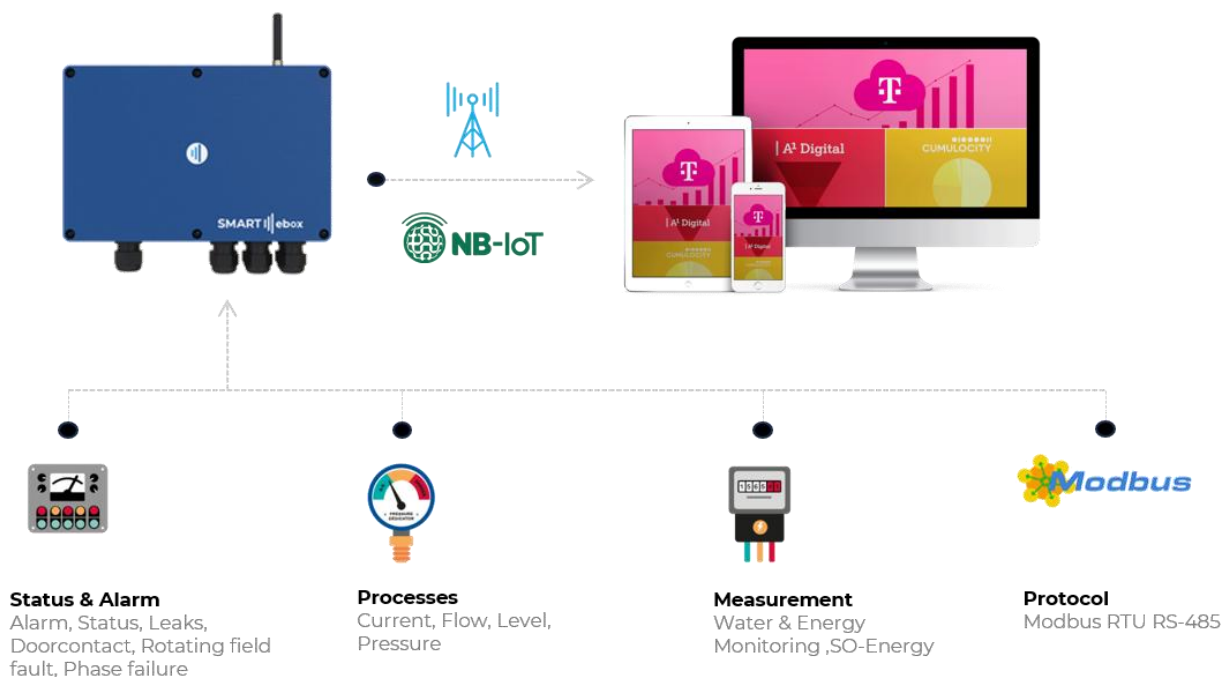
### 10 Universal IO's for connecting analog and digital sensors

SMARTebox is an integrated cellular IoTGateway with up to 20 Universal I/O's to connect a wide range of external sensors. Developed for use in an industrial environment, it offers the ideal solution for retrofitting or new system development. By supporting local protocols, the SMARTebox can communicate with another 10 Modbus subscribers in addition to the external sensors. The SMARTebox leverages Cumulocity's IoT cloud and enables customers to quickly and easily digitize a large number of analog and digital signals.



### Keyfeatures

- 10 Flex Inputs  
(4... 20mA, 0... 10V, PT1000, Alarm Circuit)
- Modbus Sensors / Devices
- IP Class: 67
- Telekom Cloud for easy handling
- Mobile Technology





RADIO

|                      |                                                                |
|----------------------|----------------------------------------------------------------|
| 2G                   | B2 B3 B5 B8                                                    |
| NB-IoT/LTE - M       | B1 B2 B3 B4 B5 B8 B12 B13 B18 B19 B20 B25 B28 B66 B71 B85 B103 |
| Regions              | Worldwide                                                      |
| 4G LTE               | optional LTE Cat 1 B1(2100) B3(1800) B7(2600) B8(900) B20(800) |
| Bluetooth (Optional) | v5.0 (Bluetooth low energy)<br>-94 dBm (1 Mbit/s)              |



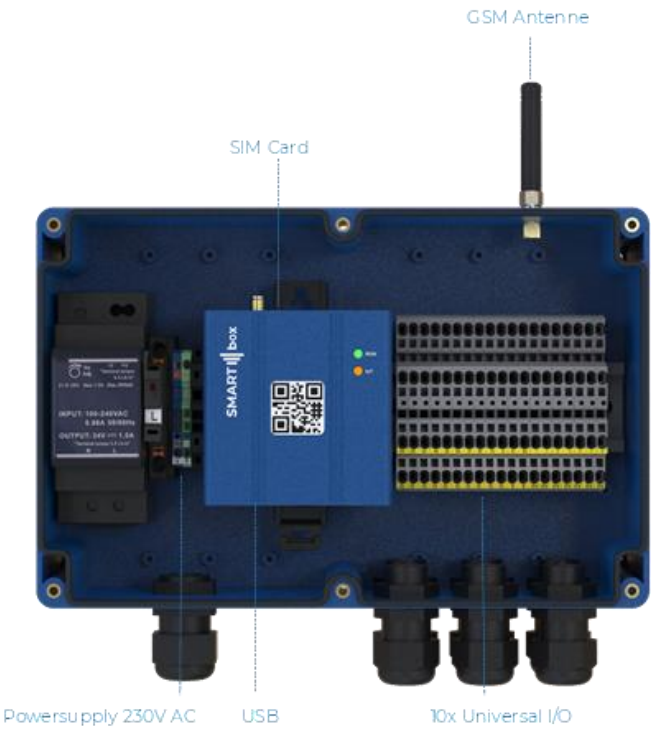
LOCATION SERVICES

|                 |                               |
|-----------------|-------------------------------|
| GNSS (Optional) | GPS, GLONASS, Beidou, Galileo |
|-----------------|-------------------------------|



SENSORS - FIELDBUS

Layout



Modbus

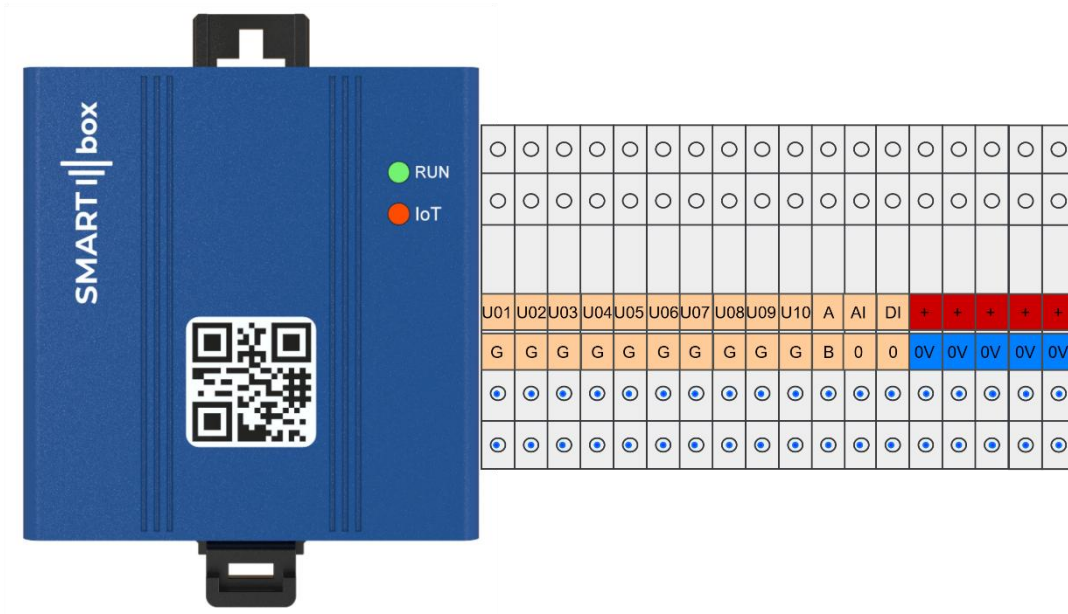


Typ: Modbus RTU Master RS485 / RS232 (optional)  
Transfer Rate: 4800, 9600, 19200, 38400, 57600, 115200 Parity Even, ODD, NONE  
Stopbits: 2,1  
Features: - Works 1 (Read Single Coil)  
          - Funkt 2 (read input status)  
          - Funkt 3 (read stop stop)  
          - Funkt 4 (read input register)  
          - Funkt 5 (Write Coil)  
          - Funkt 6 (describe stop register)

Datapoints: Max. 10 Modbus slaves at 40 data points per device  
or 400 data points with 1 device

## Sensors

12 Flex IOs – 10 Universal Inputs + 1 NTC Temperature Sensor  
+ 1 digital input + 1 output



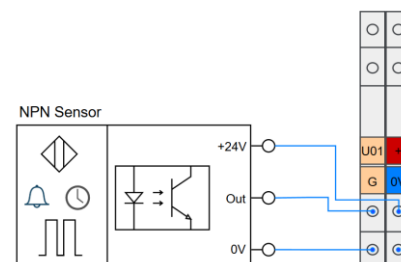
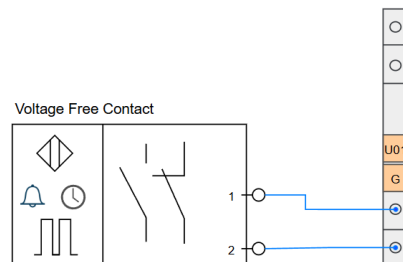
| Default                                                                                | U01 | U02 | U03 | U04 | U05 | U06 | U07 | U08 | U09 | U10 | DI | AI |
|----------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|
| Digital entrance LOSI (Low-Side Input) Potential-Free Contact                          | ●   | ●   | ●   | ●   | ●   | ●   | ●   | ●   | ●   | ●   | ●  |    |
| Digital entrance LOSI (Low-Side Input) NPN output 3- wire                              | ●   | ●   | ●   | ●   | ●   | ●   | ●   | ●   | ●   | ●   | ●  |    |
| HISI digital input (High-Side Input) potentialfreier Kon-takt                          | ●   | ●   | ●   | ●   | ●   | ●   |     |     |     |     |    |    |
| HISI digital input (High-Side Input) PNP output 3- wire                                | ●   | ●   | ●   | ●   | ●   | ●   |     |     |     |     |    |    |
| Pulse Counter High Frequency (LOSI Input) potential-free contact / NPN sensor (3 wire) |     | ●   |     |     |     |     |     |     |     |     |    |    |
| Pulse Counter High Frequency (HISI input) potential-free contact / PNP sensor (3-wire) |     | ●   | ●   |     |     |     |     |     |     |     |    |    |
| S0 interface                                                                           | ●   | ●   |     |     |     |     |     |     |     |     |    |    |

|                                                       |   |   |   |   |   |   |   |   |   |   |   |  |
|-------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|--|
| Voltage Measurement Input (0... 5V/2... 10V/0... 10V) | ● | ● |   |   |   |   |   |   |   |   |   |  |
| Current Loop passive Sensor 0... 20mA/4... 20mA       | ● | ● | ● | ● | ● | ● |   |   |   |   |   |  |
| Current Loop passive Sensor 0... 20mA/4... 20mA       | ● | ● | ● | ● | ● | ● |   |   |   |   |   |  |
| Digital Output                                        | ● | ● | ● | ● | ● | ● |   |   |   |   |   |  |
| PT1000 - Temperature Sensor                           |   |   |   |   |   |   | ● | ● | ● | ● |   |  |
| NTC10K Temperature Sensor                             |   |   |   |   |   |   |   |   |   |   | ● |  |

Type Sensor

Digital entrance LOSI  
(Low-Side Input) Potential-Free ContactDigital entrance LOSI  
(Low-Side Input) NPN output 3- wire

Connection



Specification

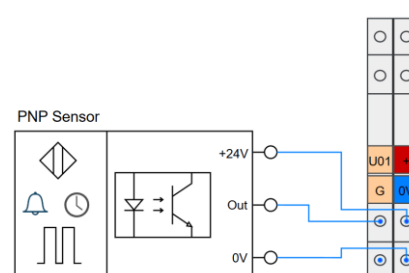
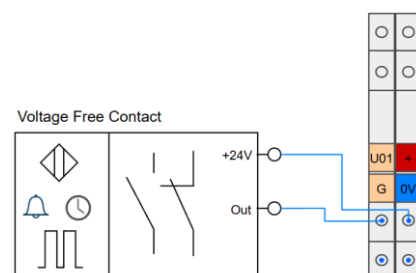
- (NO / NC) (between Un and G n=1...10)
- U01-U06: Refresh Rate Fast 10ms (U01, U02) /100ms (U02-U06)
- U07-U10: Slow 540ms Refresh Rate
- Functions: Alarms, operating hours, counters, switching states

- (NO / NC) (between Un and G n=1...10)
- U01-U06: Refresh Rate Fast 10ms (U01, U02) /100ms (U02-U06)
- Contact/NPN Output Request
- Voltage Rating  $\geq 24V$  | Current Rating  $\geq 30mA$
- U07-U10: Slow 540ms Refresh Rate
- Contact/NPN Output Request
- Voltage Rating  $\geq 3,6V$
- Current Rating  $\geq 1mA$
- Functions: Alarms, operating hours, counters, switching states

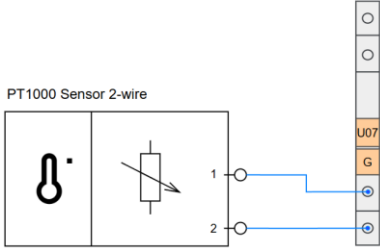
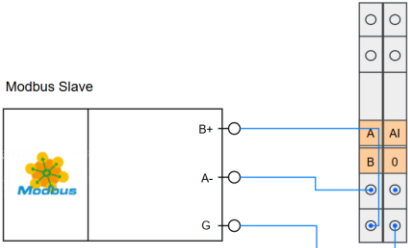
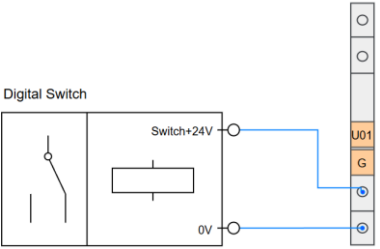
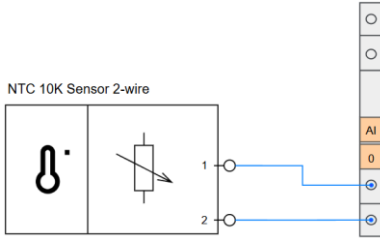
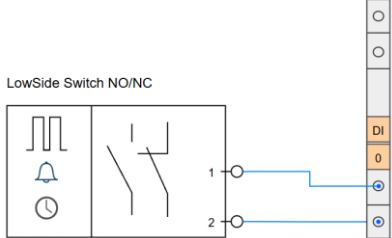
Type Sensor

HISI digital input  
(High-Side Input) Potential-free contactHISI digital input  
(High-Side Input) PNP output 3- wire

Connection



|               |                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Specification | <ul style="list-style-type: none"> <li>• (NO / NC) (between Un and G n=1...6)</li> <li>• Vin_low_max = 5V / Vin_high_min = 12V</li> <li>• U01-U06: Refresh Rate Fast 100ms</li> <li>• Functions: Alarms, operating hours, counters, switching states</li> </ul> | <ul style="list-style-type: none"> <li>• (NO / NC) (between Un and G n=1...6)</li> <li>• Vin_low_max = 5V / Vin_high_min = 12V</li> <li>• U01-U06: Refresh Rate Fast 100ms</li> <li>• Contact/PNP Output Request</li> <li>• Voltage Rating &gt;=24V   Current Rating &gt;=30mA</li> <li>• Functions: Alarms, operating hours, counters, switching states</li> </ul> |
| Type Sensor   | Pulse Counter High Frequency<br>(LOSI Input) potential-free contact / NPN sensor<br>(3 wire)                                                                                                                                                                    | Pulse Counter High Frequency<br>(HISI input) potential-free contact / PNP sensor (3-wire)                                                                                                                                                                                                                                                                           |
| Connection    | <p>High Frequency counter LowSide<br/>(potentialfreier Kontakt)</p>                                                                                                                                                                                             | <p>High Frequency counter HighSide<br/>(potentialfreier Kontakt)</p>                                                                                                                                                                                                                                                                                                |
| Specification | <ul style="list-style-type: none"> <li>• U02</li> <li>• 2000ms gate time, max. 32kHz, min. 1Hz</li> </ul>                                                                                                                                                       | <ul style="list-style-type: none"> <li>• U02/U03</li> <li>• 2000ms gate time, max. 32kHz, min. 1Hz</li> </ul>                                                                                                                                                                                                                                                       |
| Type sensor   | S0 interface                                                                                                                                                                                                                                                    | Voltage Measurement Input (0... 5V/2... 10V/0... 10V)                                                                                                                                                                                                                                                                                                               |
| Connection    | <p>S0-Schnittstelle EN62053-31 ClassA 27V</p>                                                                                                                                                                                                                   | <p>active Sensor 0...10V/2...10V/0...5V</p>                                                                                                                                                                                                                                                                                                                         |
| Specification | <ul style="list-style-type: none"> <li>• U01/U02</li> <li>• S0 Interface EN62053-31</li> <li>• ClassA 27V</li> </ul>                                                                                                                                            | <ul style="list-style-type: none"> <li>• U01/U02</li> <li>• Input Impedance: 100kΩ</li> <li>• HW measuring range is 0...10V:</li> <li>• Resolution: 3mV</li> <li>• Accuracy: +/-0.5%</li> </ul>                                                                                                                                                                     |
| Type sensor   | Current Loop passive sensor                                                                                                                                                                                                                                     | Current Loop passive sensor                                                                                                                                                                                                                                                                                                                                         |
| Connection    | <p>passive Sensor 4...20mA/0...20mA</p>                                                                                                                                                                                                                         | <p>active Sensor 0...20mA/4...20mA</p>                                                                                                                                                                                                                                                                                                                              |

|               |                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                         |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Specification | <ul style="list-style-type: none"> <li>• U01... U06</li> <li>• Accuracy typ. +/- 0,5%</li> <li>• 0... 20mA/4... 20mA</li> </ul>                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>• U01... U06</li> <li>• Accuracy typ. +/- 0,5%</li> <li>• 0... 20mA/4... 20mA</li> </ul>                                         |
| Type Sensor   | PT1000 - Temperature Sensor                                                                                                                                                                                                                                                                                                             | Modbus                                                                                                                                                                  |
| Connection    | <p>PT1000 Sensor 2-wire</p>                                                                                                                                                                                                                            | <p>Modbus Slave</p>                                                                   |
| Specification | <ul style="list-style-type: none"> <li>• U07... U10</li> <li>• 2- Wire PT1000</li> <li>• -120°C... 160°C, Res.: 0,1K, Acc.: ±0,5K f.s</li> </ul>                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>• Modbus RTU</li> <li>• RS485 (A, B)</li> <li>• Cabling: See: AN_PS2504.0-ModbusWiring</li> </ul>                                |
| Type Sensor   | Digital Output                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                         |
| Connection    | <p>Digital Switch</p>                                                                                                                                                                                                                                 |                                                                                                                                                                         |
| Specification | <ul style="list-style-type: none"> <li>• U01... U06</li> <li>• + 24V/max. 20mA</li> <li>• Control of small signal relays with coil current less than 20mA (with freewheeling diode)</li> <li>• Digital input of a PLC</li> </ul>                                                                                                        |                                                                                                                                                                         |
| Type Sensor   | NTC10K Temperature Sensor                                                                                                                                                                                                                                                                                                               | Digital entrance LOSI<br>(Low-Side Input) Potential-Free Contact                                                                                                        |
| Connection    | <p>NTC 10K Sensor 2-wire</p>                                                                                                                                                                                                                         | <p>LowSide Switch NO/NC</p>                                                         |
| Specification | <ul style="list-style-type: none"> <li>• Linearization for B = 3988K</li> <li>• Measuring range:</li> <li>• 40°C ... 105°C</li> <li>• Resolution.:</li> <li>• 0,6K @ -40°C</li> <li>• 0,1K @ 20°C</li> <li>• 0,7K @ 100°C</li> <li>• Accuracy of Input:</li> <li>• -20°C ... 60°C: +/-0,5K</li> <li>• -40°C ... 105°C +/- 2K</li> </ul> | <ul style="list-style-type: none"> <li>• NO / NC</li> <li>• Refresh Rate Fast 10ms</li> <li>• Functions: Alarms, operating hours, counters, switching states</li> </ul> |

|     |                    |                                                        |
|-----|--------------------|--------------------------------------------------------|
| LED | Run/Net<br>IoT/GSM | Cloud connection state<br>Sensor processing data state |
|-----|--------------------|--------------------------------------------------------|

## SUPPLY

|                 |                                                                                                                                                                                                                                                                                 |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General         | This type of SMARTebox is powered by 85V-265V AC. Through continuous monitoring, the SMARTebox can constantly check for alarms. This allows Connect sensors to detect alarms more quickly and never miss an event that may have occurred between scheduled sensor measurements. |
| Further reading | Supply:<br><ul style="list-style-type: none"> <li>• 230 V AC ±20%, 50 Hz ±5% (EU/UK)</li> <li>• 120 V AC ±20%, 60 Hz ±5% (US)</li> <li>• Max. 300mA</li> </ul>                                                                                                                  |



## MANAGEMENT PLATFORM

|                     |                                                                             |
|---------------------|-----------------------------------------------------------------------------|
| Supported Platforms | Telekom Cloud, Cumolocity IoT, A1, Mindsphere, ooredoo, Telia, ... und mehr |
| Communication       | MQTT, LWM2M OMA, https, TLS, TCP, UDP, HTTP                                 |
| Access              | Bi-directional communication                                                |
| OTA                 | yes                                                                         |
| FOTA                | yes                                                                         |



## GENERAL

|               |                                                                                                                                                                          |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions    | 231 x 125 x 90 mm                                                                                                                                                        |
| Weight        | 849g                                                                                                                                                                     |
| Antenna       | SMA Female Connector                                                                                                                                                     |
| Fortification | Wall bracket or pole mounting, stainless steel V2A, uncoated                                                                                                             |
| SIM card      | 4FF                                                                                                                                                                      |
| Operation T/H | -40°C. 85°C / Max. 85%                                                                                                                                                   |
| Warehouse T   | -40°C. 85°C / Max. 85%                                                                                                                                                   |
| IP Class      | IP 66/IP 68 (1.2 m – 2 h) DIN EN 60529                                                                                                                                   |
| Color         | Graphite grey, similar to RAL 7024                                                                                                                                       |
| Case          | PC V-0 material is flame retardant, self-extinguishing and suitable for outdoor use; (fl UL 746C Listing), PU Gasket, Foamed                                             |
| Approval      |   |

|                    |                                                                                                                                                                                                                                                                                                                  |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Conformance</b> | 2014 / 53 / EU (Radio Equipment Directive)<br>Funk<br>EN301511 v12.5.1<br>EN301908 v13.1.1<br>EMC (Electromagnetic Compatibility)<br>EN301489-1 v2.2.0 General Part<br>EN 301489-52 v1.1.0<br>DIN EN 61326-1 – 2018-09<br>Safety<br>DIN EN 61010-1:2020-03, VDE 0411-1:2020-03<br>Cybersecurity<br>EN 18031:2024 |
| <b>Guarantee</b>   | 1 year                                                                                                                                                                                                                                                                                                           |

## Remote Manager

(Remote Management) Third-Party

IoT Platforms

### Fleet management:

Activate, monitor and diagnose

Your devices from a single point of view –  
your desktop or mobile app.

Monitor the health of your networked

by creating diagrams of various

Evaluate widgets. Here you will find a large  
selection of evaluation options available.

### Cockpit:

Creating a threshold monitor,

Events, critical alarms, alerts, and reports.

### Open API:

Generate notifications or use

simply use the REST API from the cloud platform to

Provide your third-party systems with all the data.



**Telia | A<sup>1</sup> Digital** ... and more

The information and instructions contained in this datasheet have been compiled with the greatest possible care. However, we accept no liability for any errors, inaccuracies, or omissions in this datasheet. The use of the datasheet is at your own risk.