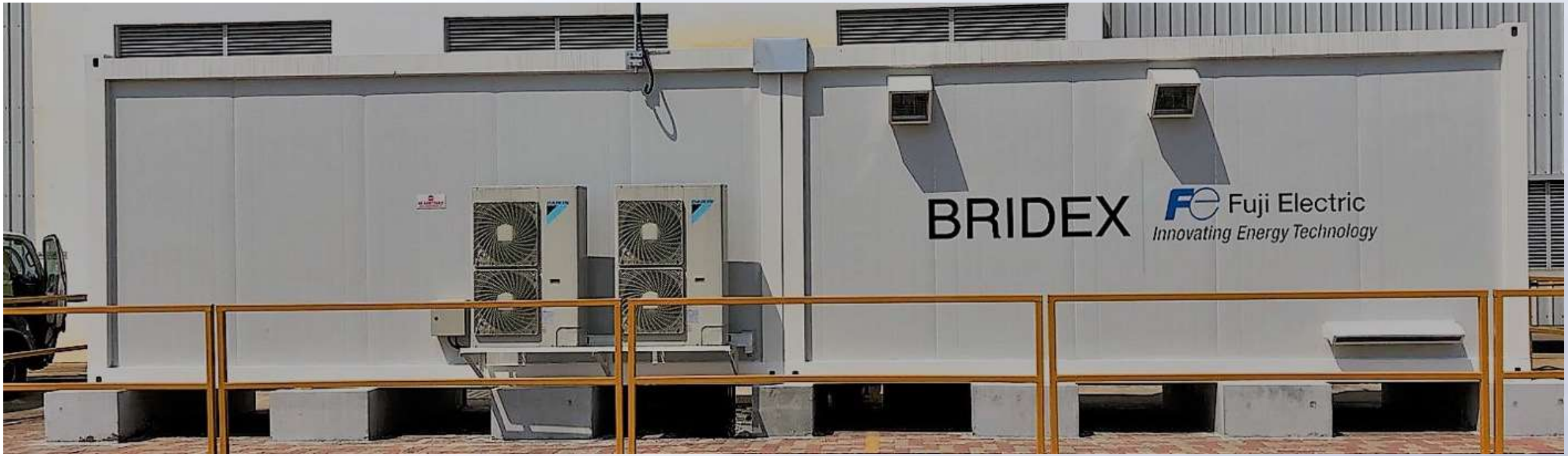
THERMAL WATCH

Wireless Temperature Sensor

BRIDEX | Fuji SMBE

About Fuji Bridex



Founded in 1978, Fuji Bridex is a leading Industrial Solution & Services Provider in the Electrical, Power Quality and Energy Storage System market. Trusted by many customers in the Data Center, Power Utilities and Industrial market, we consistently develop our people and innovate our solutions to meet our client's needs. Today acting as an Electrical Engineering, Procurement & Construction (EEPC) Contractor, we deliver construction and engineering projects, encompassing the entire project lifecycle from design, initial planning to construction and commissioning.

About Fuji Bridex

***Vision** – Be one of the leading EEPC companies in Southeast Asia's industrial electrical market.*

***Mission** – Dedicated to providing optimal solutions that will exceed customer's specifications and requirements with below objectives:*

i. Ensure the best EEPC competitiveness with Human Resource/Technology/Quality that meet international standards.

ii. Continuously focus to improve HSE standards and minimize our ecological footprint.

iii. Apply innovative solutions to deliver Fit-For-Purpose products and services.

iv. Offer integrated services from conceptual design to final commissioning and start-up.

Fuji Bridex Integrated System Solutions

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Power Quality

- Up to 46kV Sag Mitigation Systems
- Statcom / VVO
- HT / MV Transformers

Batteries and Energy Storage

- Saltwater Battery
- Natron Sodium-Ion Battery

Natron Energy

Modular Infrastructure

- Battery Energy Storage Solution
- Containerized/Custom Solution
- Power Skid

Thermal Management

- Industrial Cooling
- Fire Prevention
- Fire Suppression

Limitation of current solutions

- **Not continuous measurement**
- **Messy & complicated** installation
- **No visual indication** of the faulty location
- Not operative with **forced ventilation**
- Not possible to **test in real condition**
- **Complicated setup**
- **Wireless regulations**

THERMAL WATCH

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Wireless Thermal Sensor for Continuous Monitoring

PATENTED TECHNOLOGY

SIMPLE OPERATION FOR USER

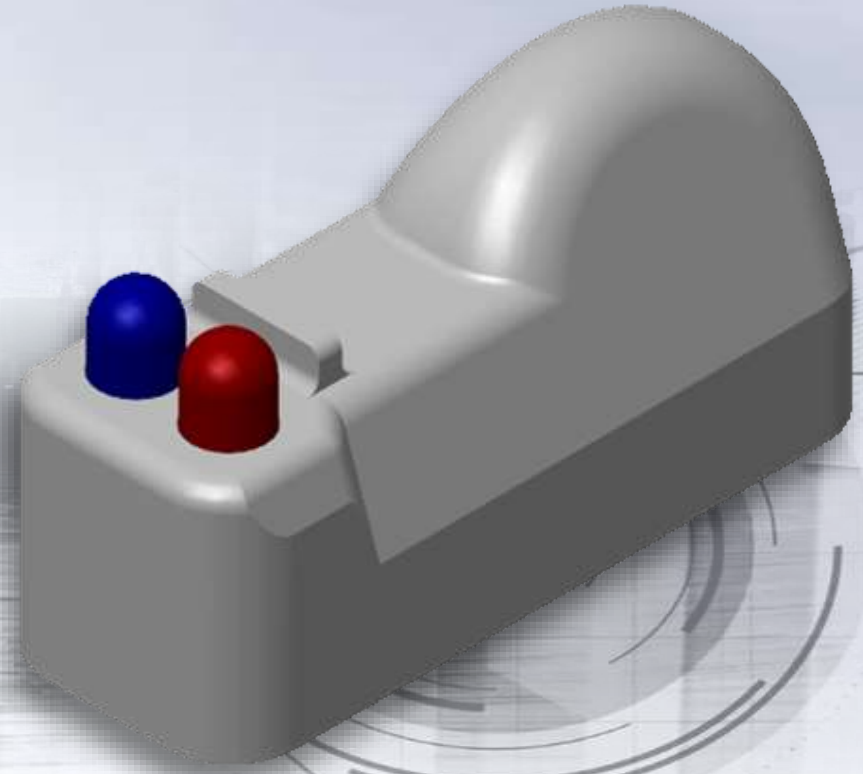
- ❑ 24/7 temperature monitoring
- ❑ Real time temperature alerts
- ❑ Visual indication of fault location
- ❑ Digital display of fault location

EASY INSTALLATION & MAINTENANCE

- ❑ Self-test on installation
- ❑ Operative indoor and outdoor, IP68
- ❑ Up to 6 meters communication
- ❑ Install anywhere 7 x 12 x 24 mm device
- ❑ No wiring - install in seconds
- ❑ Communication setup free
- ❑ License free signaling worldwide

SECURITY

- ❑ Fail safe
- ❑ Redundancy - two Independent temperature monitors
- ❑ Operative till 125 ℃
- ❑ Over 10 years lifespan guaranteed*



*for body temperature of sensor not exceeding 70 ℃

Overview System

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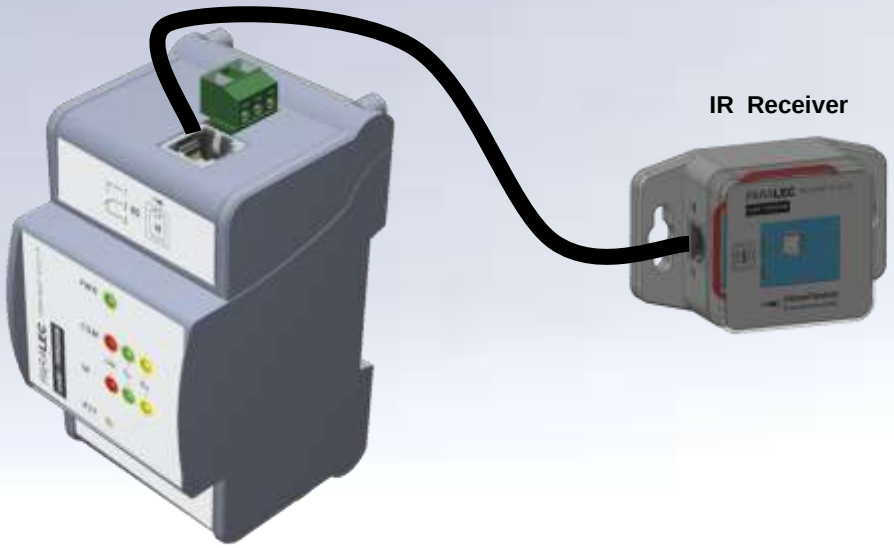
THERMAL WATCH SENSOR - **TWS**

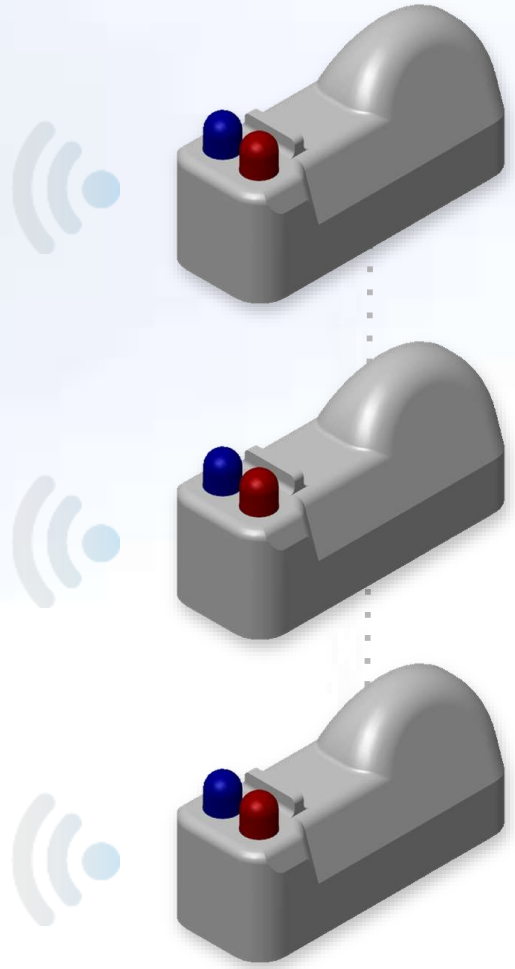
DIN Frame 1 modules receiving devices - **TWR1**

12 VDC | **Digital output** | **RS485 MODBUS** | **LED output**



IR Receiver

up to 6m



X

up to 50 TWS

TWR Architecture DAISY CHAIN RS485

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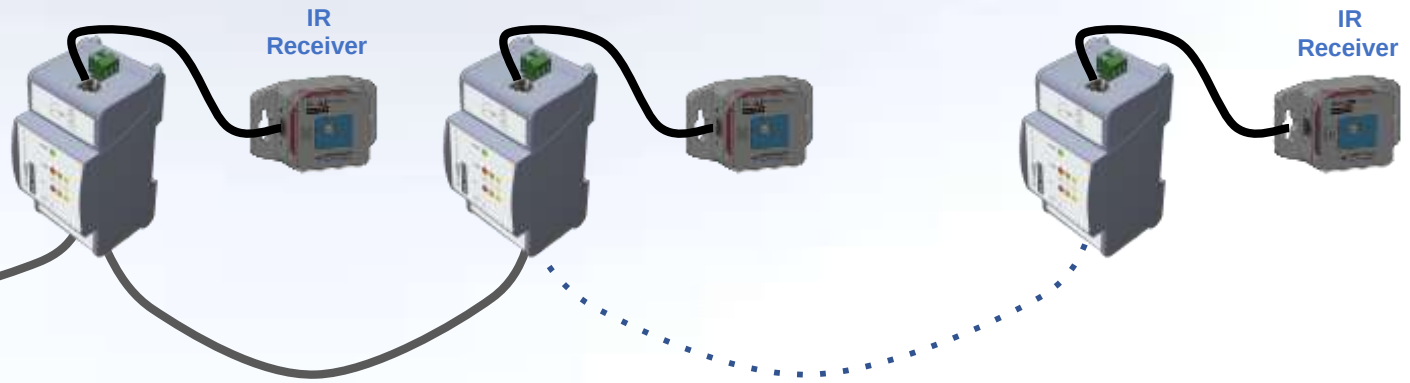
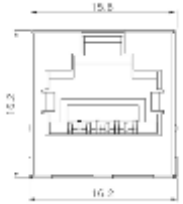
Communicatio
n with upper
level



Data Concentrator
with / without HMI

LAN or WIFI connection
IEC61850 / DNP3 /
MODBUS or REST API

CAT6 cable : RS485 +
12VDC



RJ45 PINS

1: RS485 +
2: RS485 -
3: GND
4:-
5:-
6:-
7: 12VDC+
8: 12VDC-

Thermal Watch - RECEIVER TWR

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Dry contact output
For control / command

Connection for IR receiver
RJ12, up to 3m

ON & Communication
Green/Yellow LED indicator

ALARM
Red LED indicator

Reset button

TWR1-DIN = DIN Receiver

Communication & Power
RJ45 IN and OUT

TWR1-DIN = DIN Receiver

Mounting holes for easy installation
Hole slots

Connection for IR DIN
RJ12, up to 3m

Cleanable receiver

TWR1-IR = IR Receiver

Thermal Watch - RECEIVER TWR

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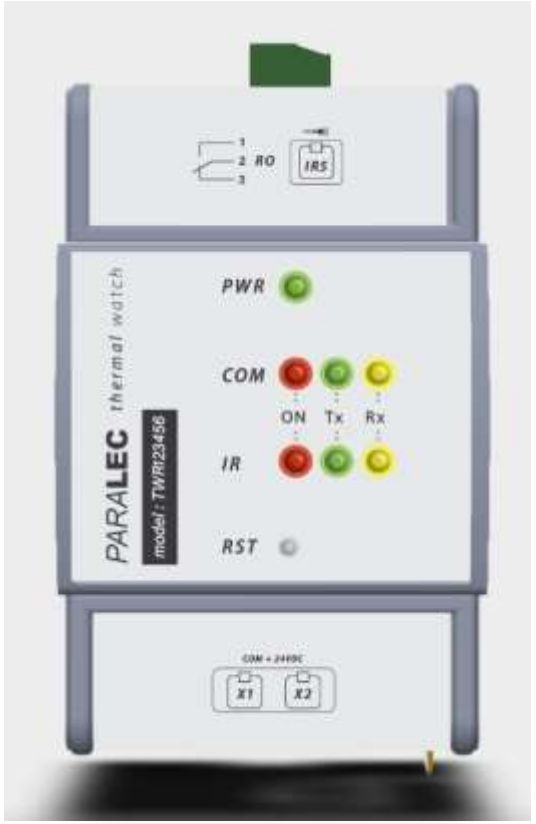
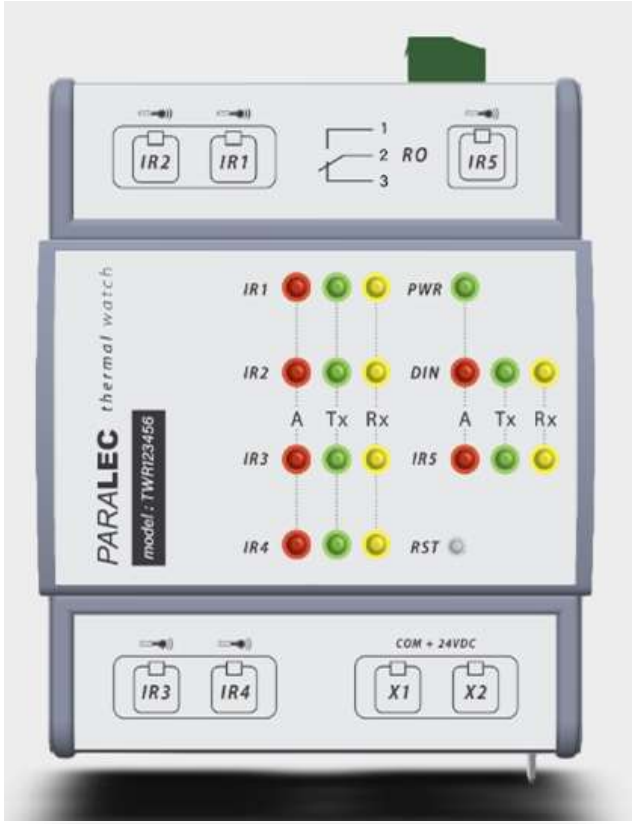
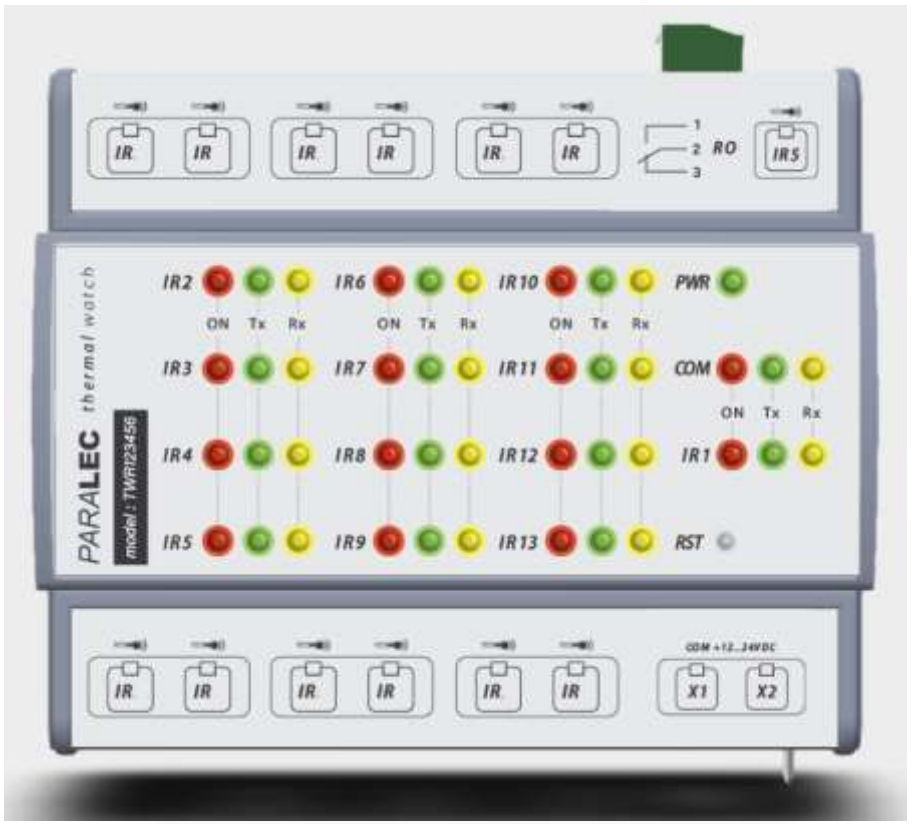


TWR1-DIN = 1 IR receiver

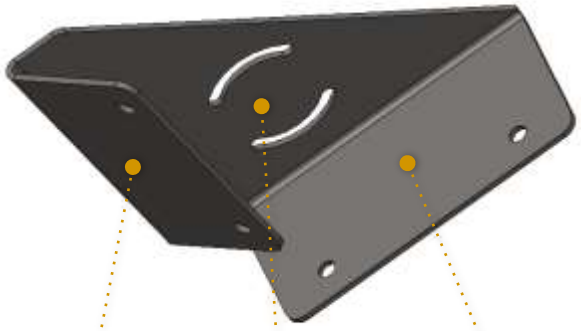


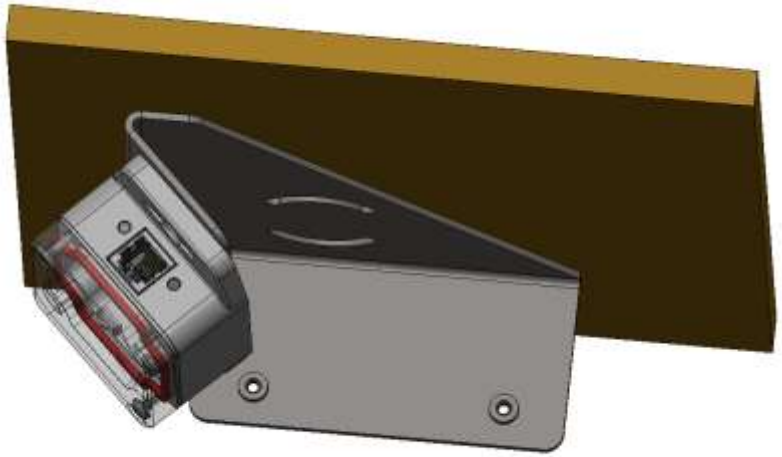
TWR5-DIN = 5 IR receivers



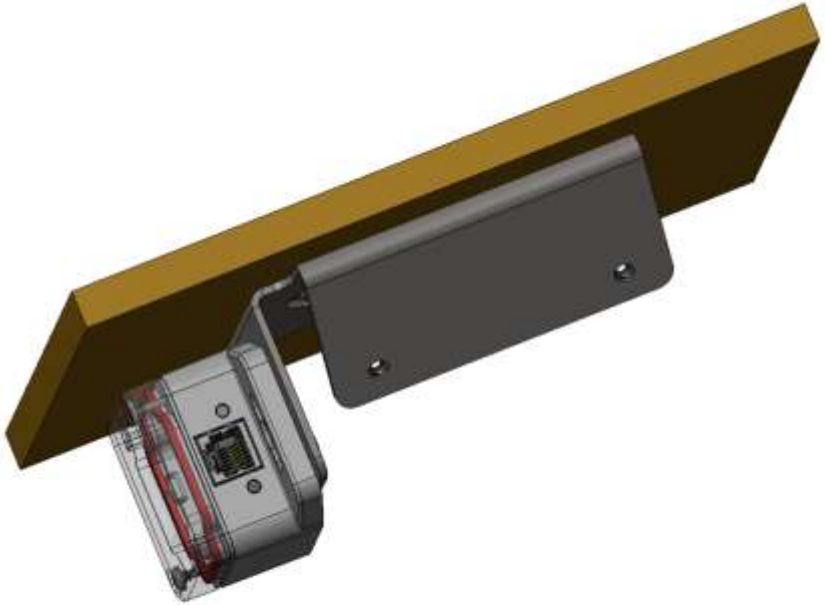
TWR13-IR = 13 IR Receivers

Thermal Watch - RECEIVER IR





45*C angle bracket



90*C angle bracket

Thermal Watch - SENSOR TWS

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Models available :

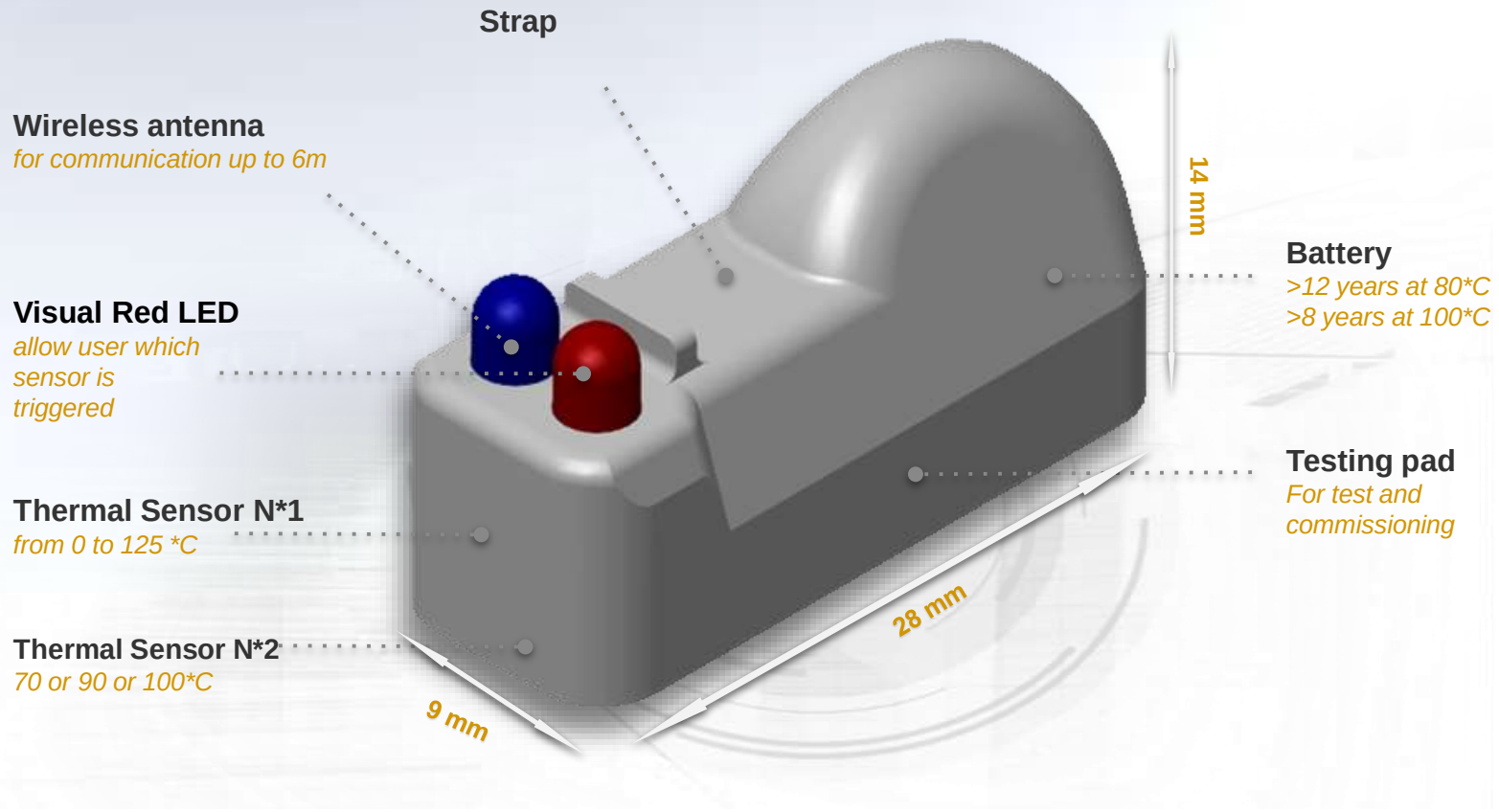
TWS70, TWS90, TWS100

Thresholds available* :

70°C, 90°C, 100°C

4 operating modes

- ❑ Test
- ❑ Commissioning**
- ❑ Alarm
- ❑ Health Check



*thresholds are factory set
**available Q2 2024

Thermal Watch - SENSOR TWS

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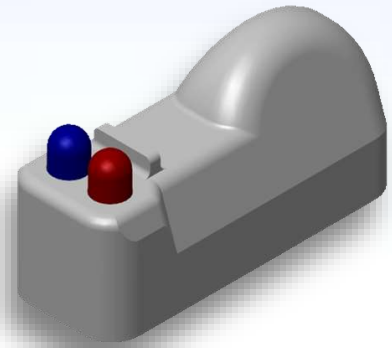
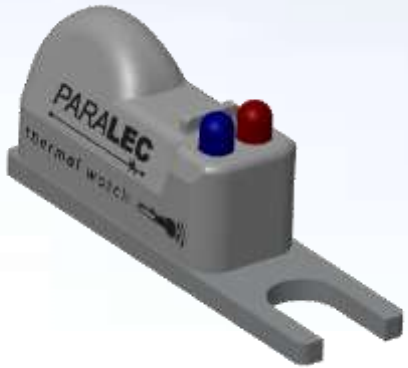
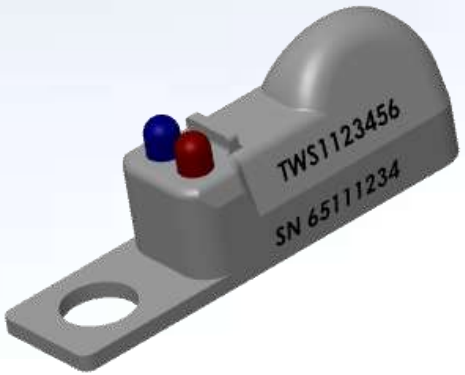
3 mounting versions



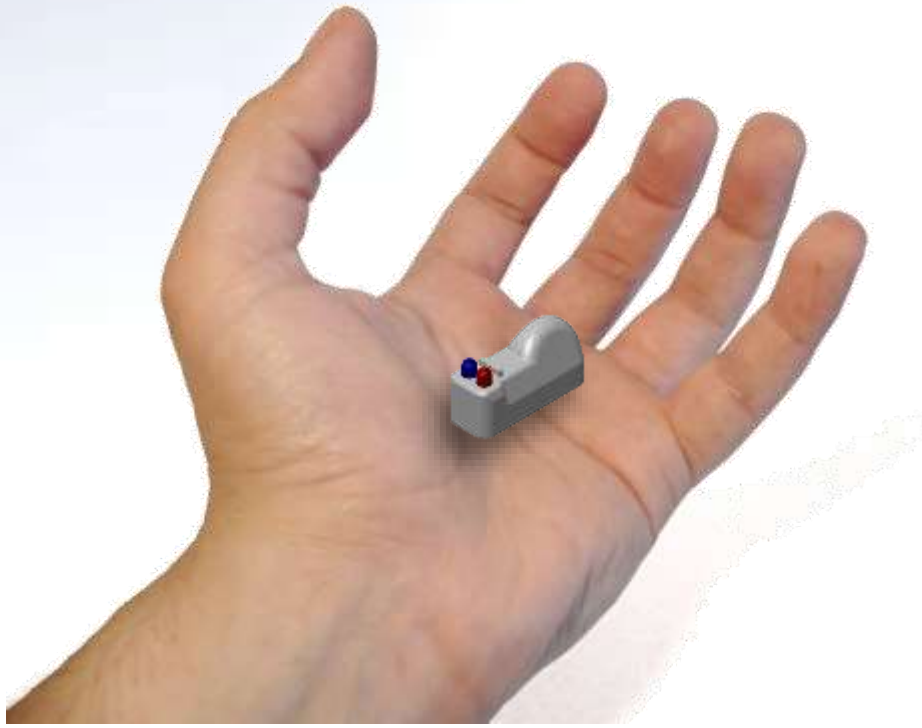
Strap or cables ties
For limited access locations
For low diameter conductors



Metal mounting plate
with fork hole for M6 bolt
Aluminum plate for ideal heat transfer
Ideal for busbar



Molded mounting hole
In built M6 hole



TWS Mounting

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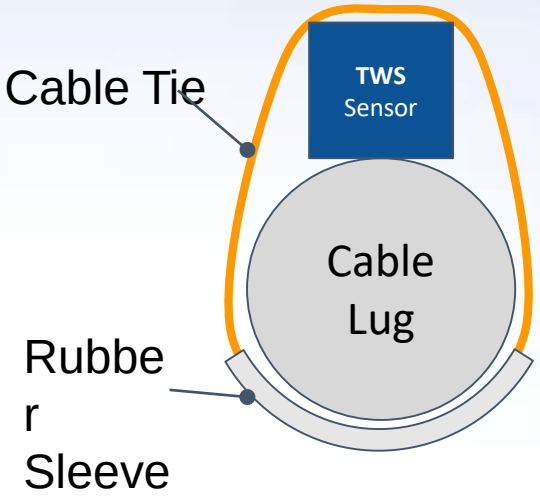

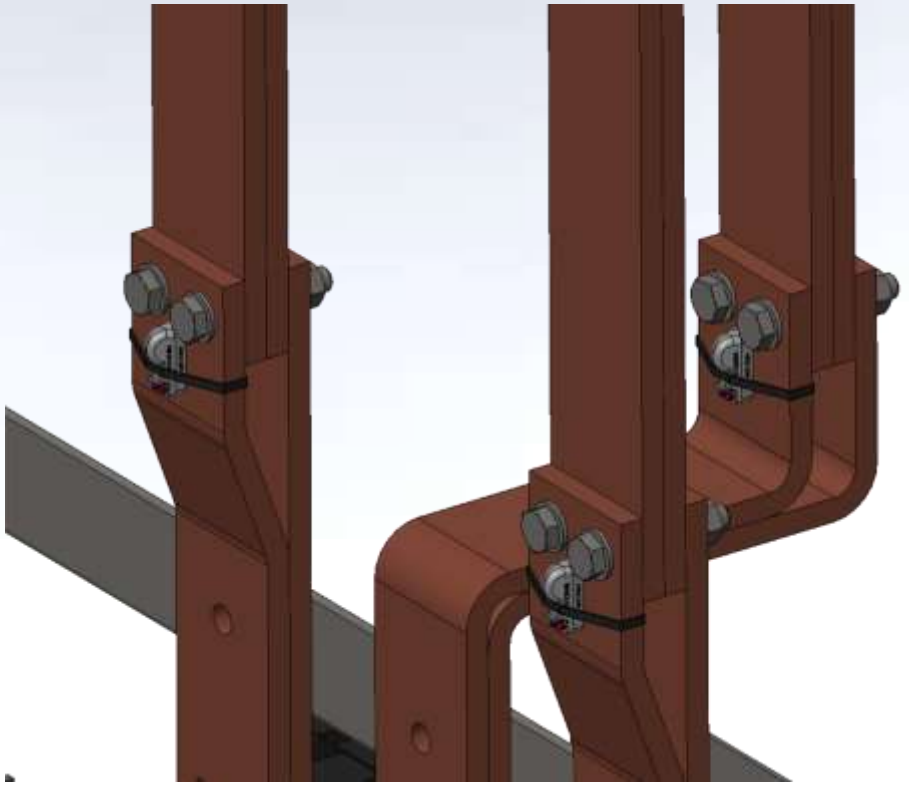

ALARM Mode

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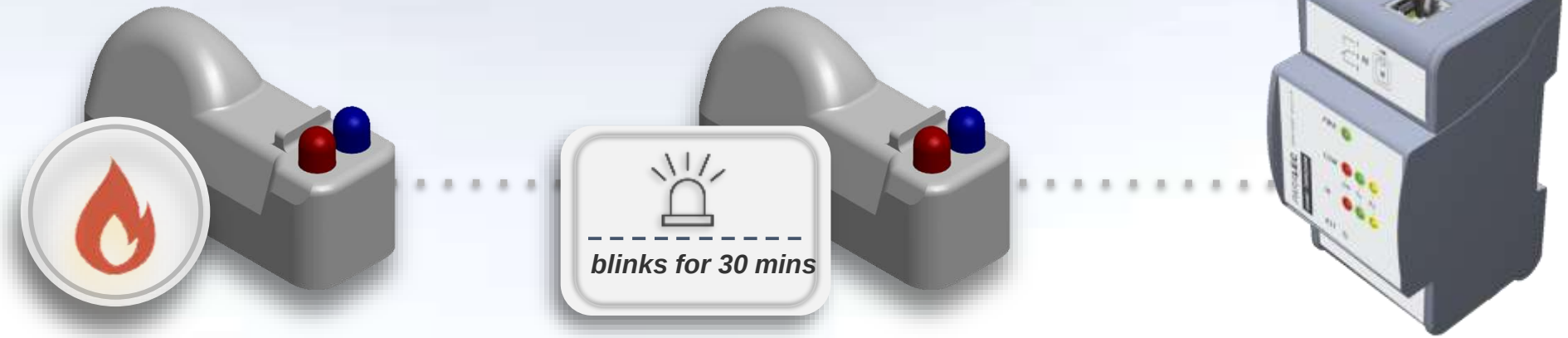

T℃ > Threshold

ID 00001

ID of device	00001
Temperature *C	100℃
Mode	Alarm
Battery left	OK

TESTING Sensor

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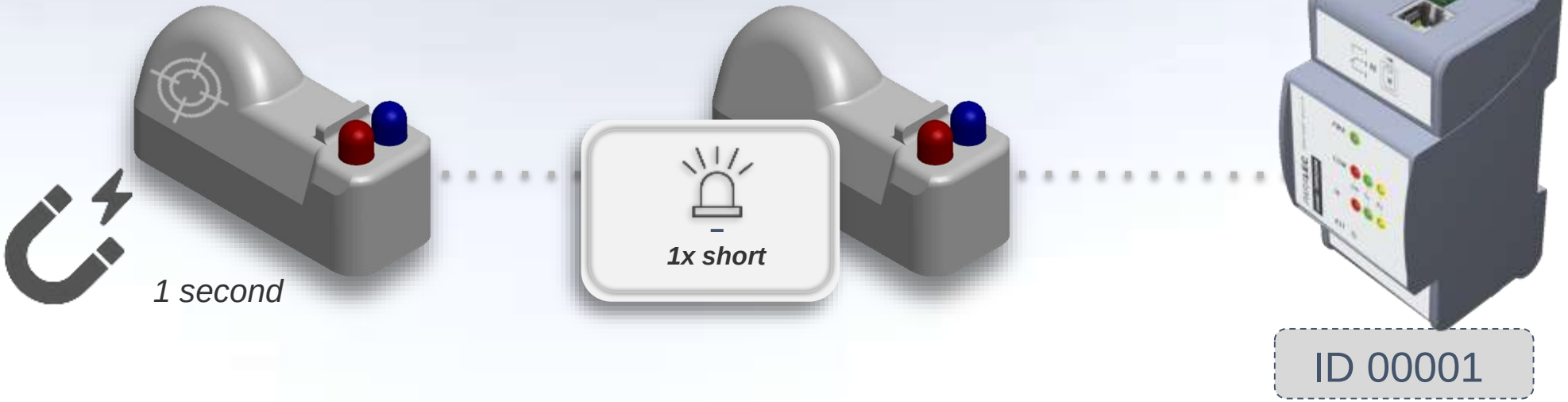

For tests, LED emission is set at lowest battery in order to simulate the “worst case”

ID of device	00001
Temperature *C	82*C
Mode	Test
Battery left	OK

COMMISSIONING**

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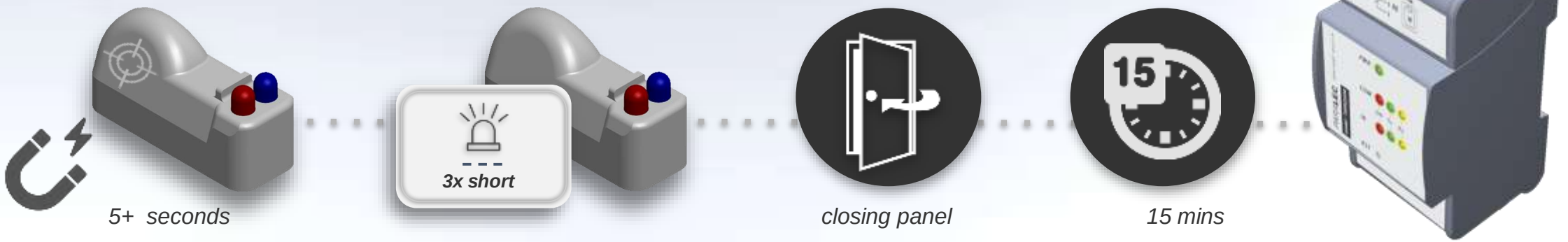
**available Q2 2024



For commissioning tests, LED emission is set at lowest battery in order to simulate the “worst case”

ID of device	000001
Temperature *C	82*C
Mode	Commissioning
Battery left	OK

TEMPERATURE Reporting

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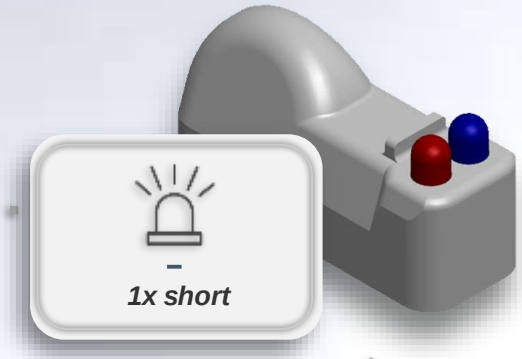
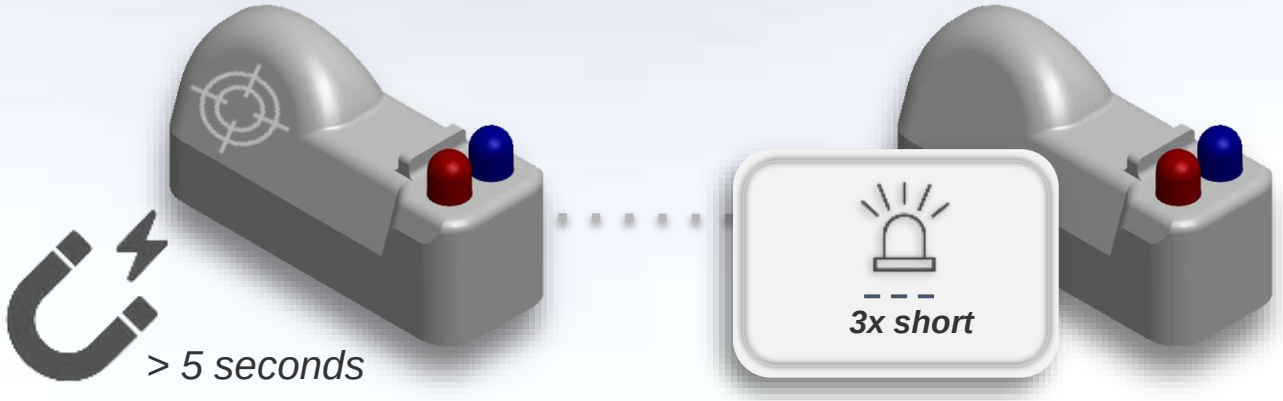
*2 hours**



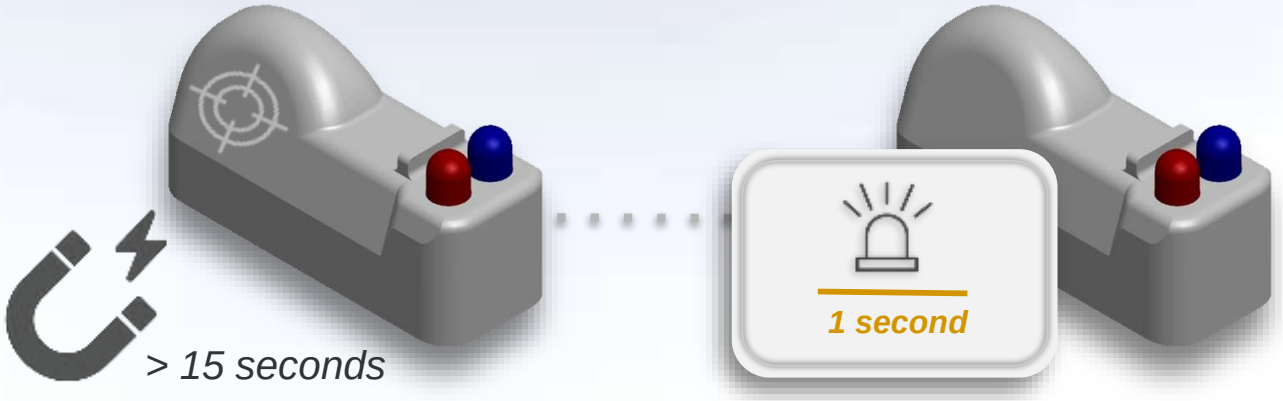
ID 00001

ID of device	000001
Temperature *C	82*C
Mode	Health Check
Battery left	OK

*available in 1min, 30mins, 1h ou 2h


> 5 seconds
3x short

SLEEP Mode



Communication

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- Distance ***up to 6m eye of sight or indirectly***
- Operates in

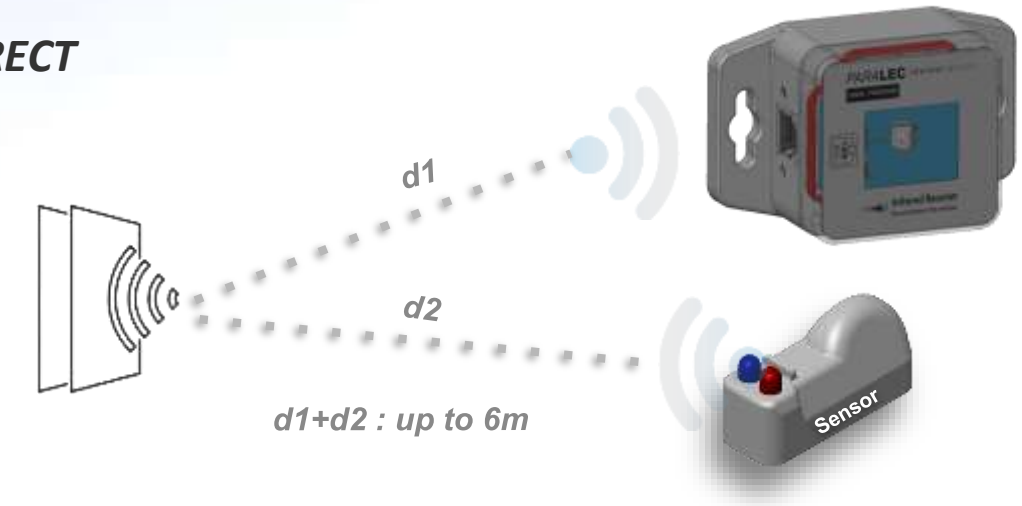
  daylight* ☼ ***or in the dark*** ☾

  Receiver operates a dedicated algorithm to differentiate IR noise from signal
- Transmitted data

ID of device	**000001**
Temperature *C	**82*C**
Mode	**Commissioning**
Battery left	**OK**

EYE OF SIGHT

INDIRECT



*High infrared environment shall still be tested but due to filtering they can't create nuisance alarm

InfraRED - COMMUNICATION

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- It provides adequate speeds—up to 16Mbps.
- Infrared devices use less power and therefore don't drain batteries as much.
- Infrared is a secure medium. Infrared signals typically are a direct-line implementation in a short range and therefore do not travel far outside the immediate connection. This eliminates the problem of eavesdropping or signal tampering.
- Infrared is a proven technology. Infrared devices have been available for some time and as such are a proven, nonproprietary technology with an established user and support base.
- It has no radio frequency interference issues or signal conflicts.
- It replaces cables for many devices, such as keyboards, mice, and other peripherals.
- It uses a dispersed mode or a direct line-of-sight transmission.
- Transmissions travel over short distances.

Advantages

- Simple to implement
- Low power consumption
- Invulnerability to interference from traditional sources such as RF
- Signals cannot be jammed (diffused)
- User can move his/her station without reconfiguring the network
- Infrared frequencies are free and available to anyone who wants to use them
- One time cost of equipment and installation

Power supply & Life expectancy

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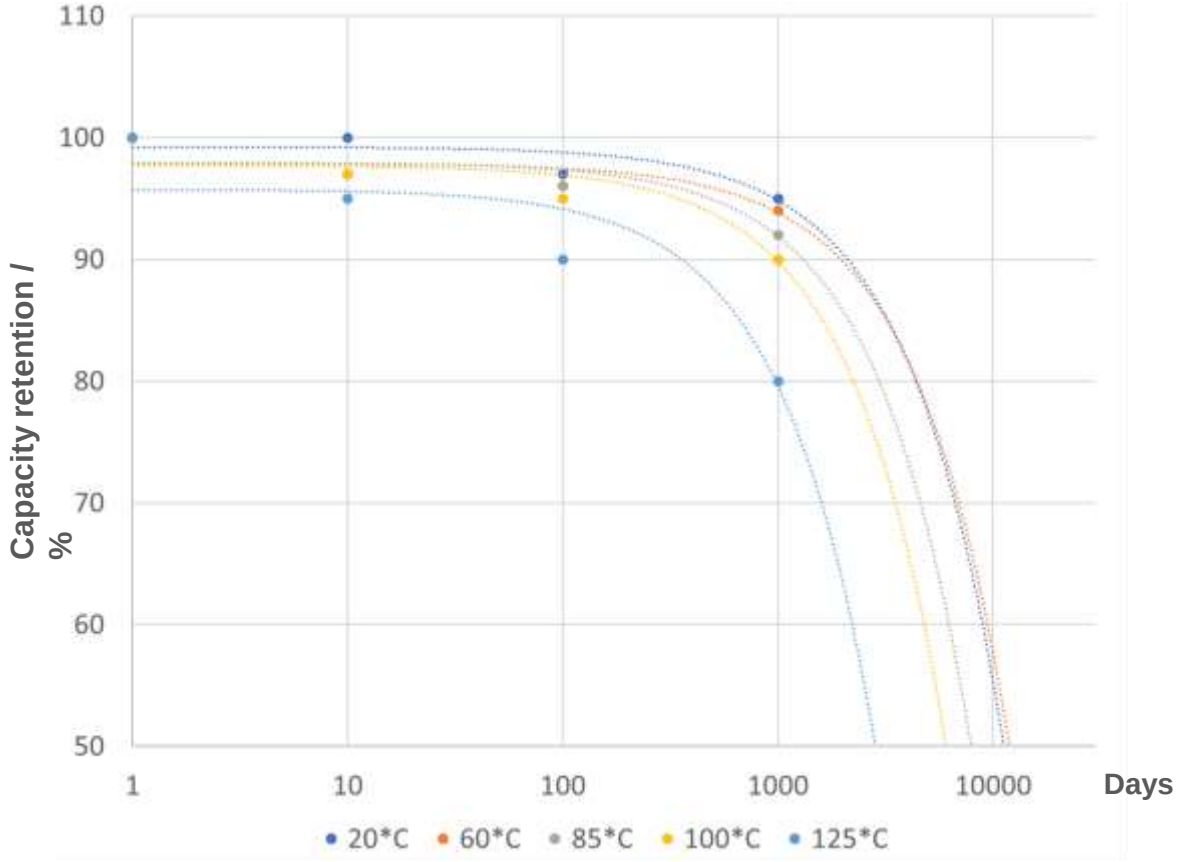
- Power supply through **battery**
- **Real long duration tests** have shown the following discharging trends
- Discharge with 30k Ohm resistance and 2.5V cut off
- Actual **cut off is 1.8V**
- Device **report battery level every 2 hours**

LIFE EXPECTANCY RESULTS

Up to 100*C : >10 years
125*C : > 6 years



Triggering Time vs Temperature Rise Rate

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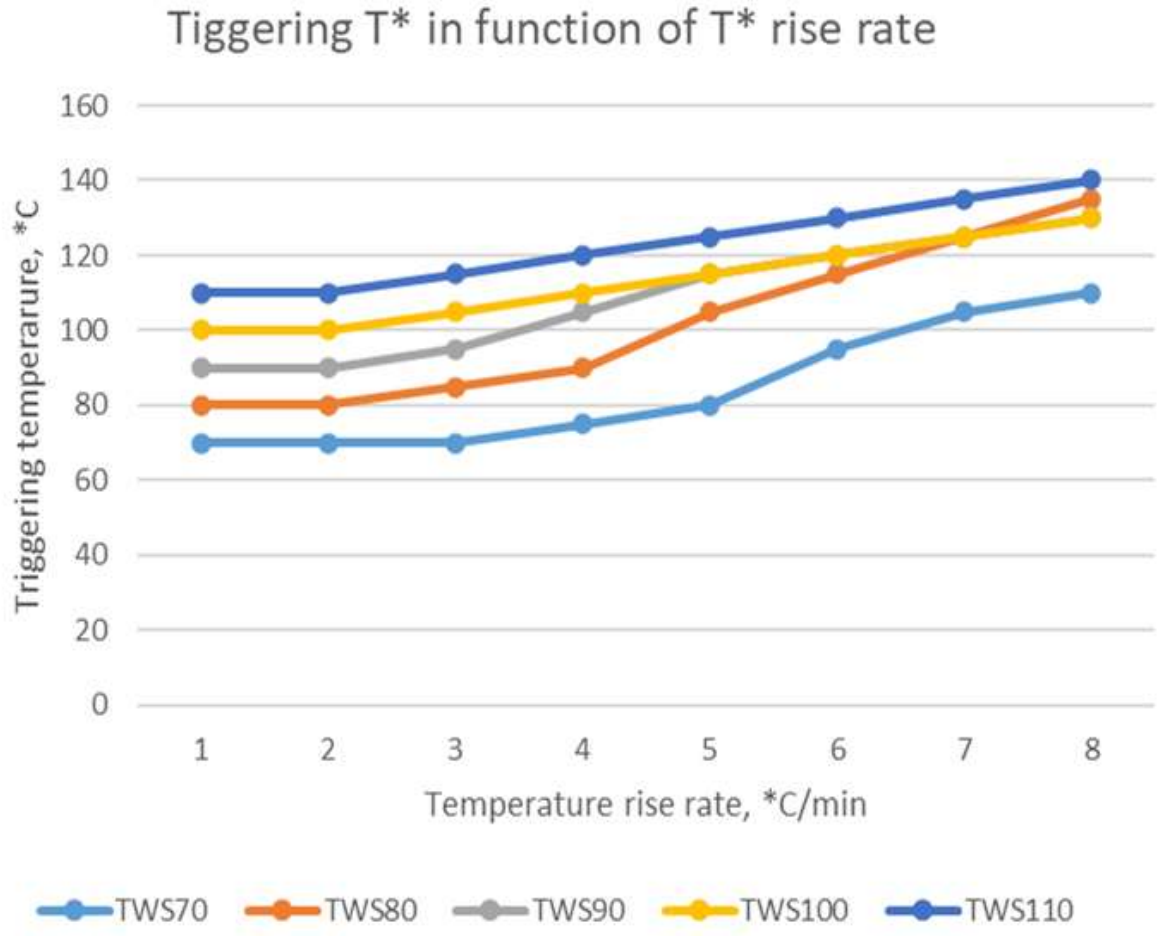

Thermal Watch Sensor - Part Numbers

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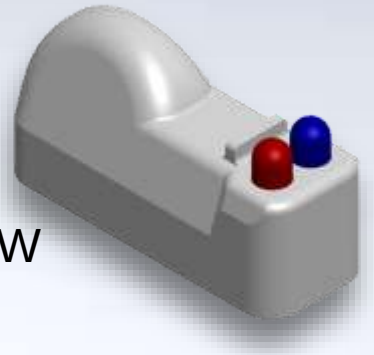
TW
S



1091 _ _ _ _ _ _

5 6 7 8 9 10

5	6	7	8	9, 10
Temperature	Commissioning delay	Health check period	Mounting	Spare
1 : 100*C **2** : 90*C **3** : 70*C	**1** : 15mins **2** : 30mins **3** : 5mins	**1** : 2 hours **2** : 1 hour **3** : 30 mins **4** : 1 min	**1** : strap **2** : metal plate **3** : embedded hole	**11** : default

Thermal Watch Receiver - Part Numbers

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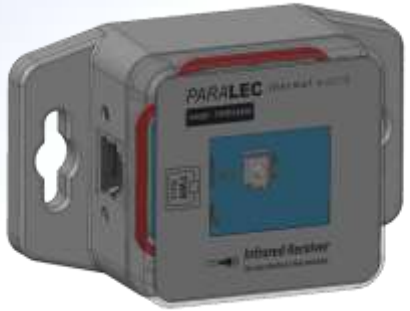
1101 _ _ _ _ _ _

5 6 7 8 9 10



5	6	7	8	9, 10
Temperature	Number of corded sensors	Cable Length	Modbus Connector	Spare
1 : DIN-Receiver **2** : IR-Receiver **3** : RJ12 cables **4** : LAN CAT6 RJ45 cables **5** : Adapters	**1** : 1 x IR receiver **2** : 5 x IR receivers **3** : 13 x IR receivers	**1** : None **2** : 1m **3** : 2m **4** : 3m	**1** : RJ45 **2** : DB9 **3** : Terminal	**11** : default

Thermal Watch Concentrator - Part Numbers

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1111 _ _ _ _ _ _

1 2 3 4 5 6

1 2	3 4	5 6
Spare	Spare	Spare
11 : All functions **12** : Simplified	**11** : default	**11** : default

Roadmap & Availability

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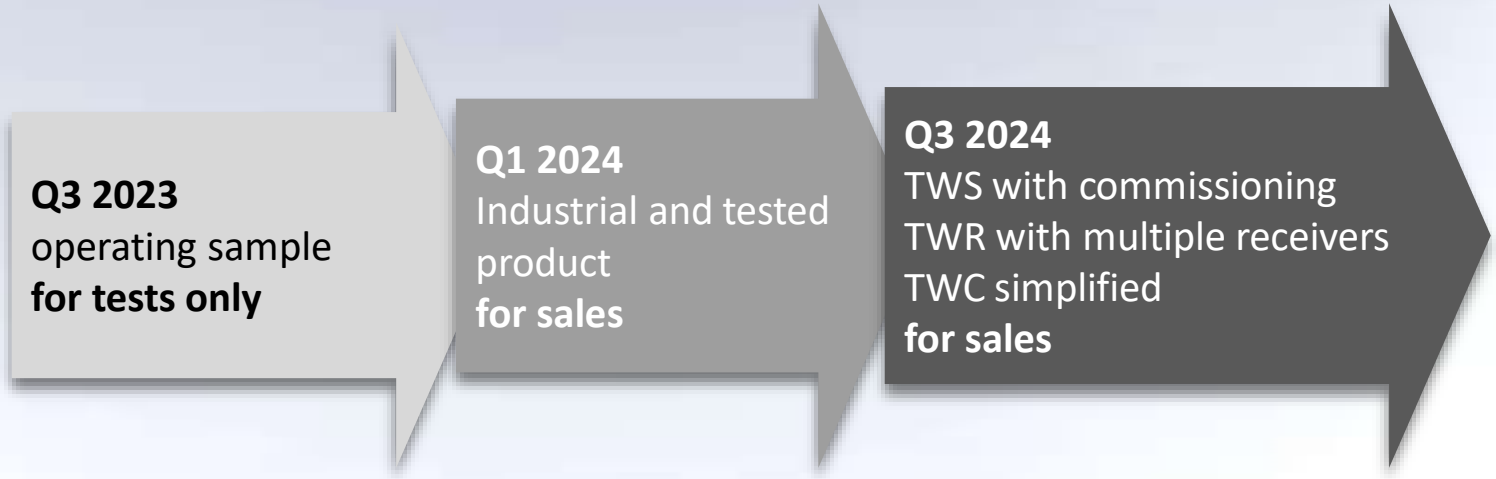

TWS1-test

TWR1-test

TWS1
1091 xxxxxx

TWR1
1101 111111

TWC
1111 111111

TWS2
1092 xxxxxx

TWR1
1101 121111
1101 131111

TWC
1111 121111

Exertherm Arguments against Wireless

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Why are Exertherm Sensors hardwired, not wireless?	Why Thermal Watch answers these claims
❑ The most important issue is that wireless sensors create a potential threat to critical infrastructure operations because such systems are hackable. Exertherm sensors avoid any cyber security risks	Infrared can't be hacked, it is inside the cabinet ONLY
❑ Sensors described as wireless often have a very limited transmission distance – sometimes as low as 30 cm (SAW technology).	6m, which also operate with bouncing signal
❑ Wireless sensors require antenna to pick up the wireless signal –usually several antennas will be required per vertical column	True but a factor 6 to 10 as compared to Sensor
❑ The antenna are hard wired !- so perceived savings are actually not available.	Antennas are much easier to deploy as even compared to Exerterm Sensors
❑ Wireless sensors operate on a limited number of frequencies – which can result in confusion if antenna pick up two sensors on same frequency – causes commissioning problems	Solved at receiver level
❑ The wireless systems can only normally be commissioned on-site	Clearly not for the IR sensors as they do not suffer from electromagnetic interferences
❑ Wireless sensors require power to transmit the signal – that creates problems such as battery replacement costs / insufficient power to generate energy harvesting on LV equipment / requirement for re-calibration etc etc.	10Y and battery level at each communication!
❑ Exertherm sensors avoid ALL these issues + Exertherm sensors come with a Lifetime Warranty/ zero maintenance guarantee – something wireless sensors cannot guarantee.	10Y and battery level at each communication!

Thank You.

Corporate Website

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