infinite

Rail & Train
Wireless IoT Systems

Network Rail

Internet of Things Networks & Technologies

2G/3G/4G

NB-IoT

LTE-M

sigfox

LoRa™

Itron

Silver Spring NETWORKS

Infinite's products are being used in rail & train IoT systems. Continuous monitoring of infrastructure minimizes dangerous conditions and eliminates accidents.

Our solutions include,

Rail line mount sensors

- Vibration monitoring of rail lines and slippers
- Temperature, ice, rain monitoring of rail lines

Alarming

- Visual alarming and monitoring systems

Design Principles

Our systems are wireless autonomous RTUs.

They are designed to operate autonomously using single lithium battery cells achieving maximum reliability, and long term solution robustness with long operational lifetime.

They can work on mains, rechargeable battery or photovoltaic power with automatic failover to internal lithium battery on power shortage.

Functions:

- Measure/Detect train
- Transmit alarm
- Signal visual and sound alarm
- Continous fault monitoring

Power Source:

D-size,
Primary lithium battery
Nominal voltage: 3.6V,
Capacity: 13.0Ah

Rail Temperature Monitoring

2G/3G/4G

NB-IoT

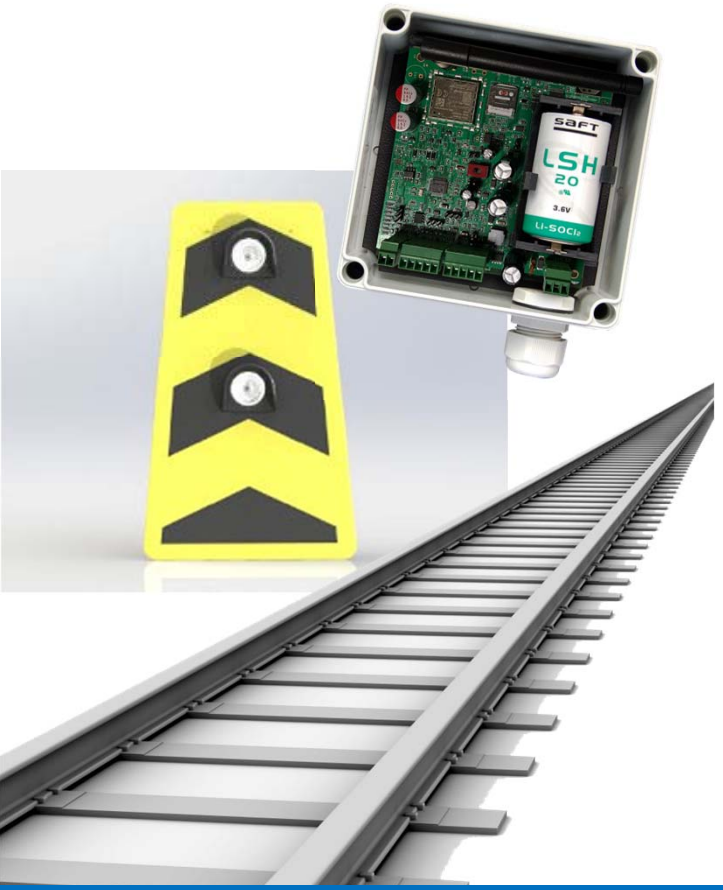
LTE-M

BSC-50D/RTMU MK3, GSM Alarming RTU

Power supply:	3.6V, 13 Ah Lithium Thionyl battery, D-size
	5VDC mains or photovoltaic power
Consumption :	Continuous 18µA
Discrete inputs:	4 x Digital inputs, 0-30VDC
	1 x Analog input, 0-1VDC, 12 bit resolution
	2 x Digital counter, 1 KHz
Transducer excitation	12V/200mA, 5V/200mA
Wireless modem:	Sierra Wireless 2G, 3G, 4G, NBIoT, LTE-Cat M1
Antenna	internal or external
Messages:	Data, Alarm
Temperature:	-20°...+65°C, operating
Dimensions:	79.5 x 125 x 61 mm (with cable gland)
Housing:	IP66, IP68 Nema 4x

Application: Rail Line temperature monitoring and alarming. Directly attached to rail lines.

Emergency Warning Board

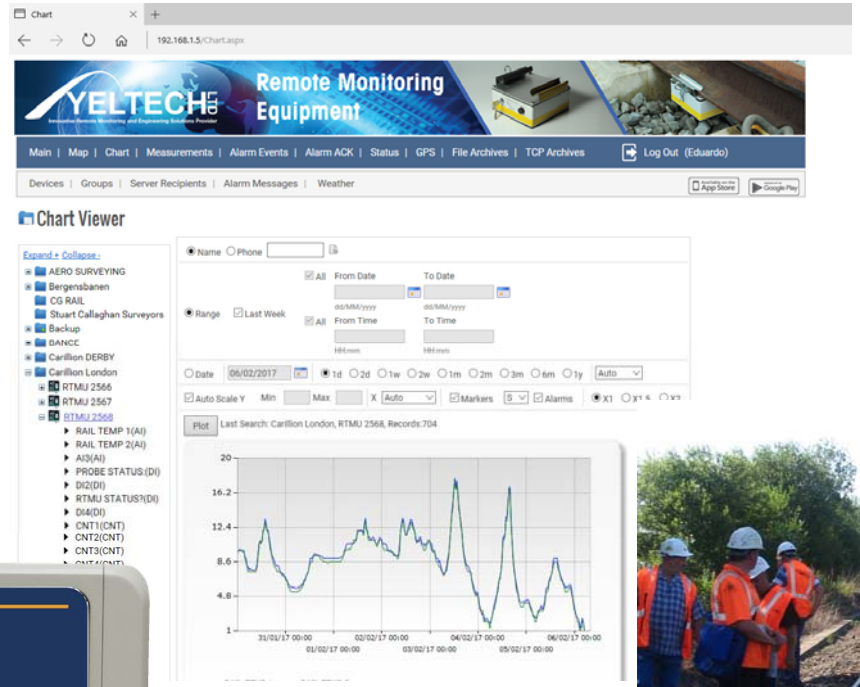


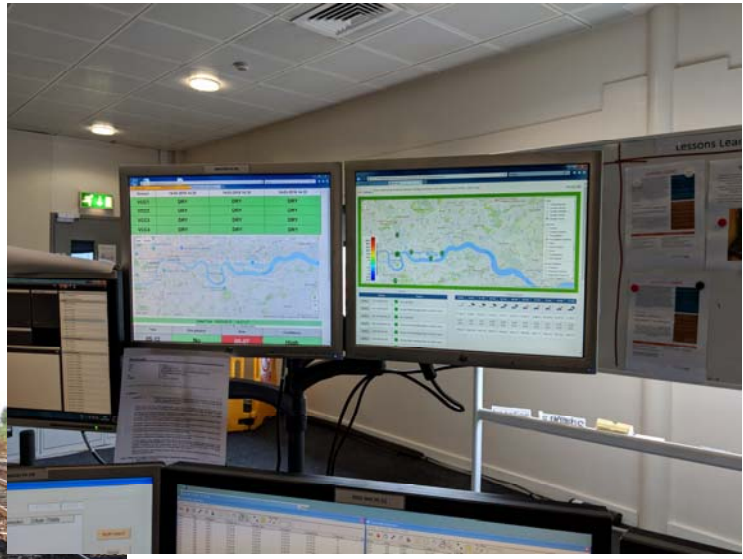
BSC-50 E/EWB, RTU/Data Logger

Supply current:	Continuous: 40µA, Messaging: av. 30mA, 2A peak
Digital inputs:	4, 0-30VDC
Pulse counters:	1, 40Hz, common with DI 4
Analog inputs:	2, 10 bit resolution, 3 gain ranges
Excitation:	7V/140mA or 12VDC/80mA, 5VDC/100mA, 3.5V/200mA
Wireless modem:	Sierra Wireless HL series 2G, 3G or 4G
Messages:	Alarm, Status, Data
Temperature:	-40°...+65°C, operating
Dimensions:	130 x 130 x 75 mm
Housing:	IP66, IP68 Nema 4x

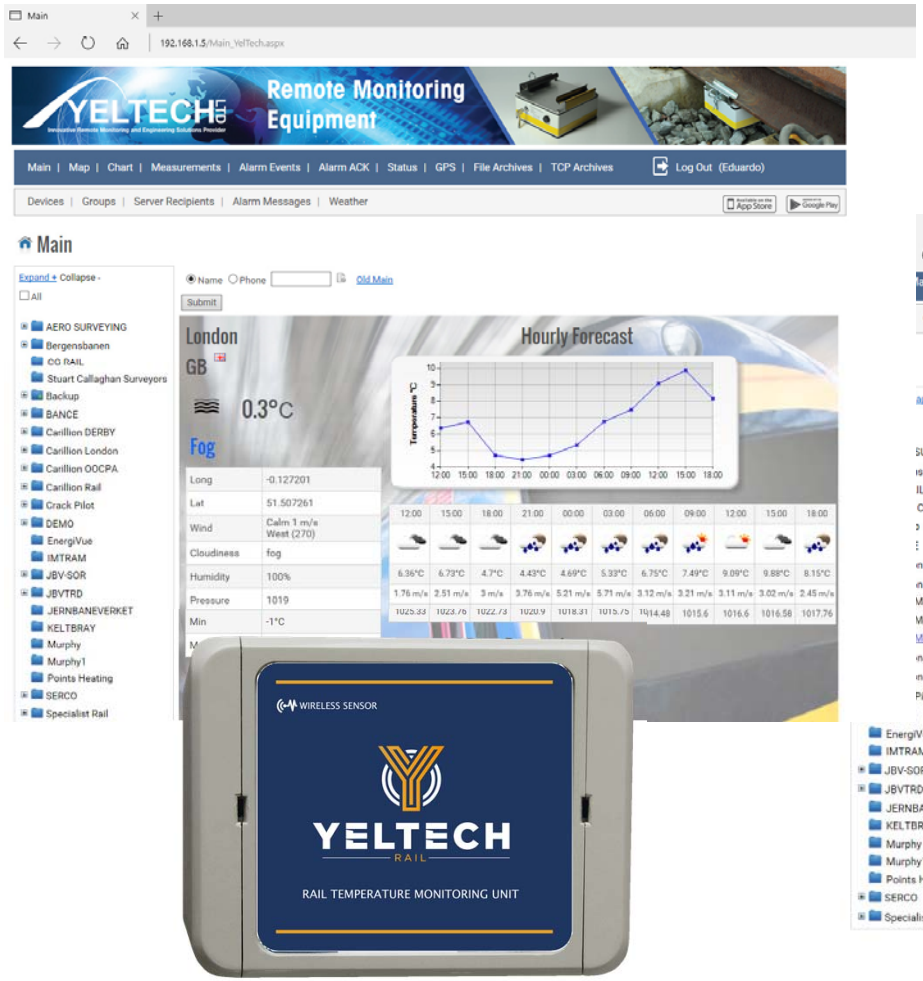
Application: Emergency warning board IoT connected, 14 days autonomy.

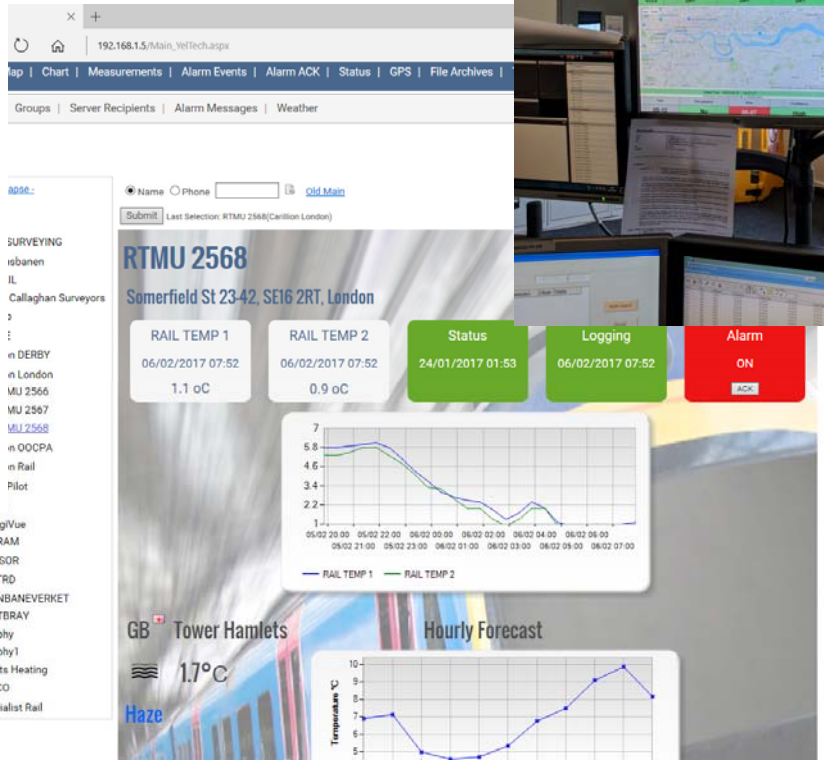
RTMU, Rail line temperature monitoring



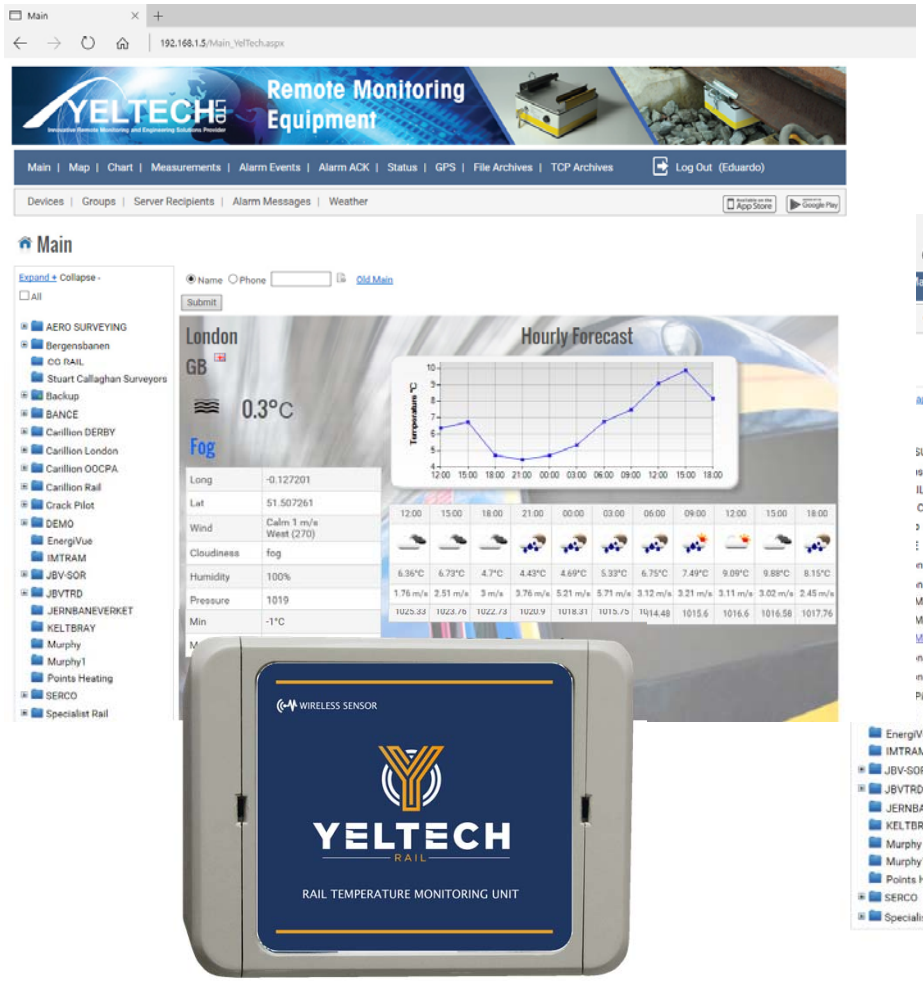


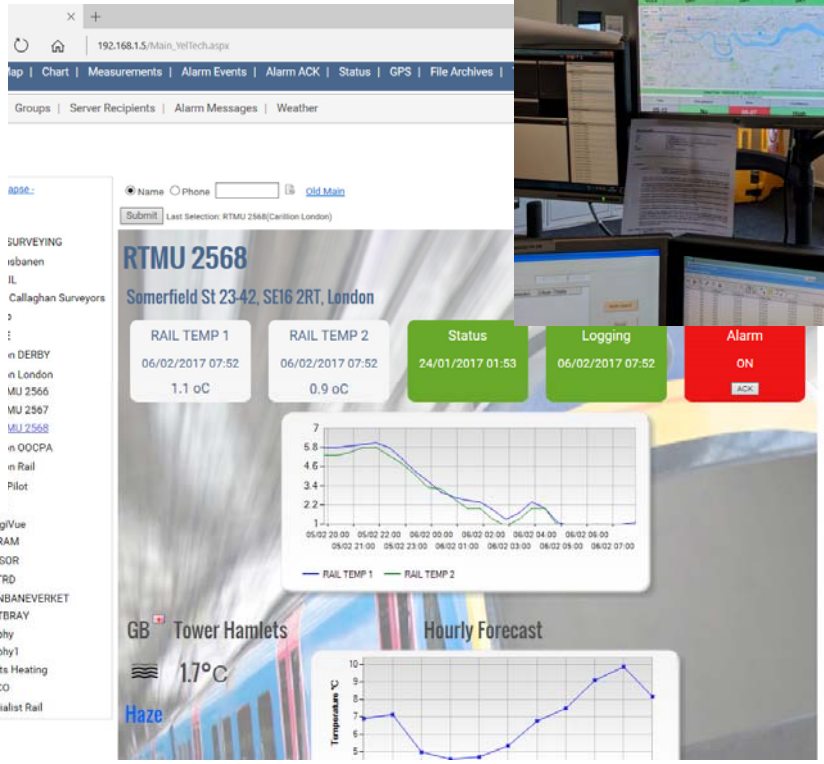
RTMU, Rail line temperature monitoring



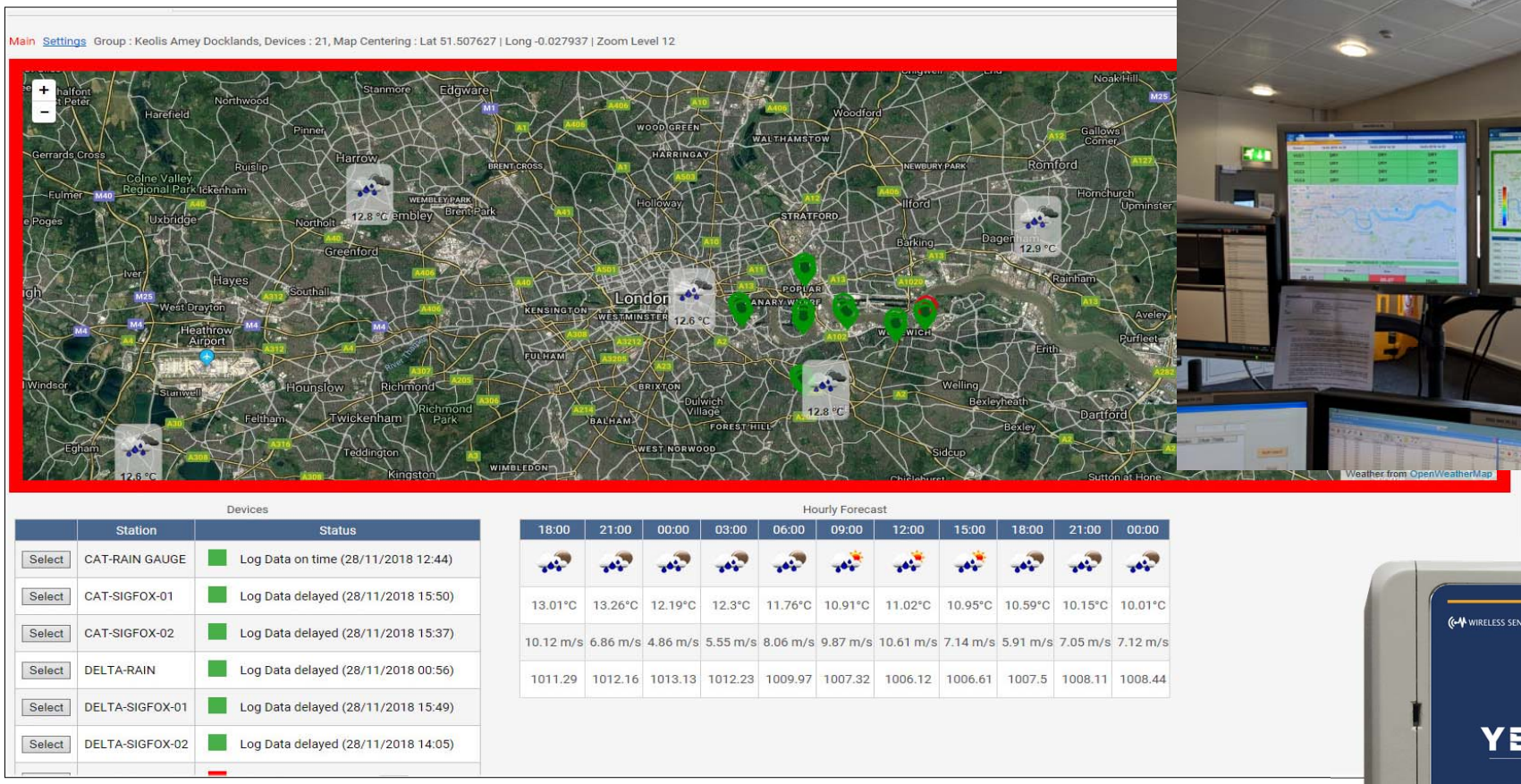


RTMU, Rail line temperature monitoring

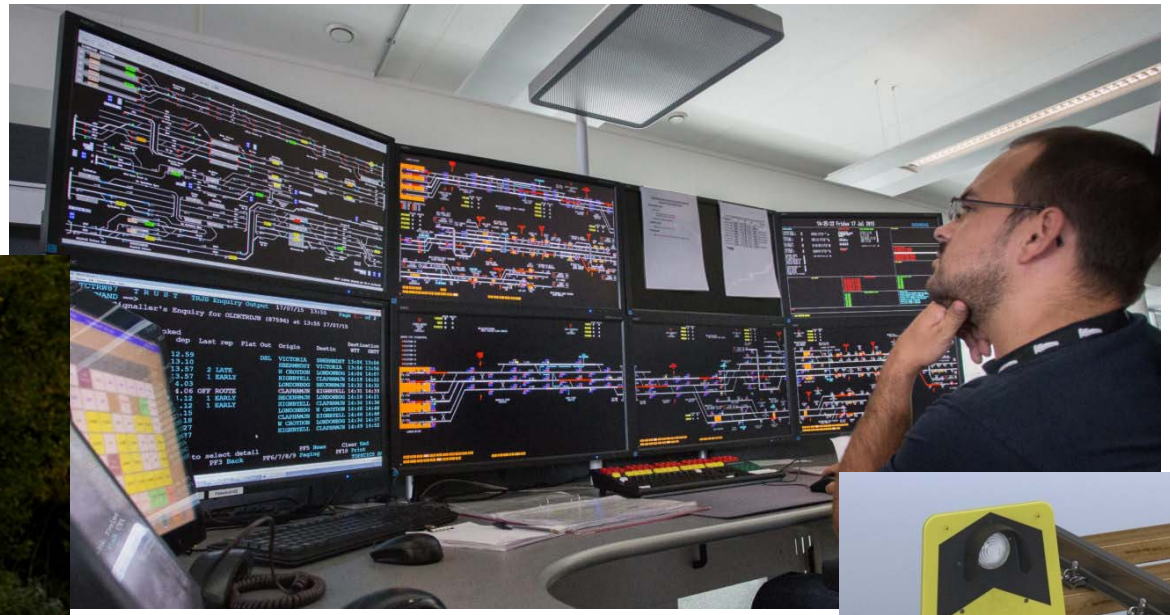


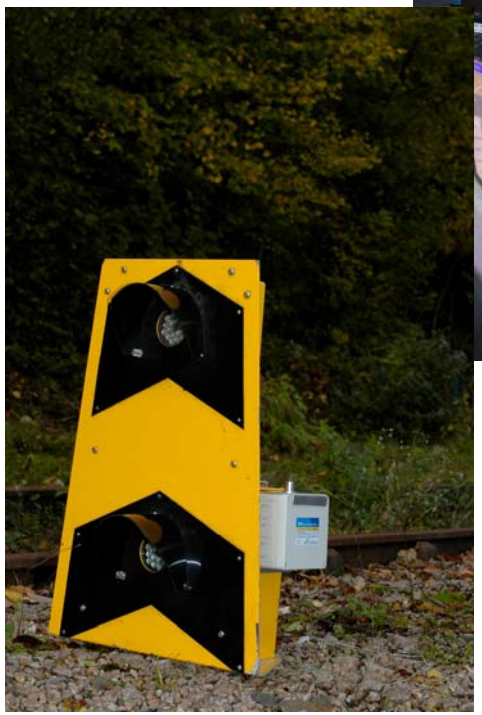


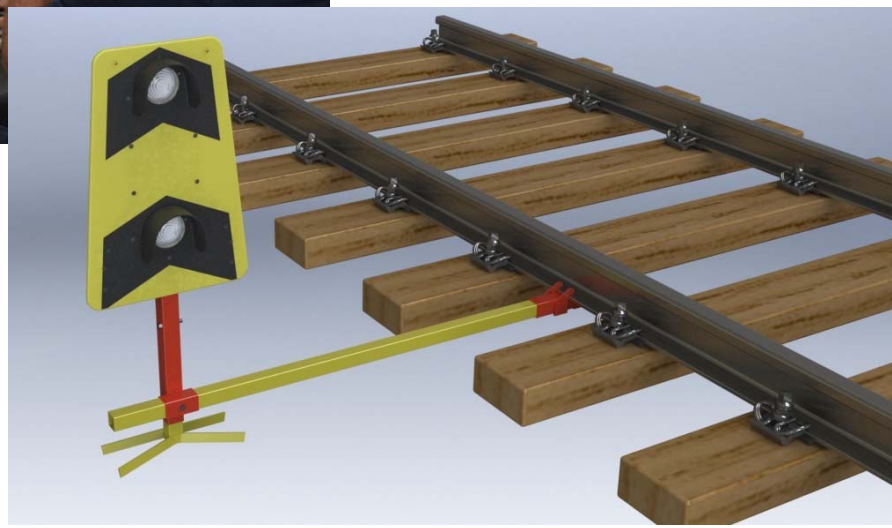
RTMU, Rail line temperature monitoring



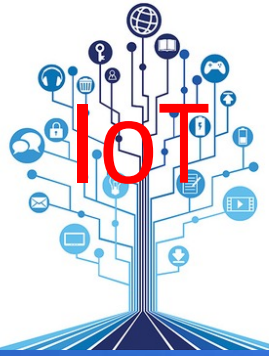
Rail & Trains







infinite



Construction Engineering

IoT Systems

Internet of Things Networks & Technologies

2G/3G/4G

NB-IoT

LTE-M

sigfox

LoRa™

Itron

Silver Spring NETWORKS

Environmental Monitoring

Air quality measurements

- Ozone, nitrogen dioxide, sulphur dioxide, carbon monoxide

Impact measurements in rivers

- pH, dissolved oxygen, conductivity, turbidity, color

Soil quality and sustainability

- Soil moisture, electrical conductivity, temperature

Cathodic Protection

- Voltage DC
- Voltage AC
- Current
- Transient voltage drop

IoT Autonomous devices

NB-IoT

LTE-M

2G/3G/4G

ADU-500, RTU/Data Logger

Power supply:	3.6V, 13-18 Ah Lithium Thionyl battery, D-size
	12VDC mains or photovoltaic power
Consumption :	Continuous 18µA
SDI12:	up to 16 SDI-12 sensors with up to 48 channels
RS485:	up to 10 Modbus ASCII/RTU up to 10 channels
Digital inputs:	3, 0-30VDC
Pulse counters:	2, 2KHz, common with DI 2&3
Analog inputs:	2, 12 bit resolution, differential, 1-200 programmable gain
Transducer Excitation:	12VDC/400mA, or 9V/500mA or 5VDC/200mA, 3.3V/1A
Battery monitoring:	built in battery gauge continous consumption monitoring
Wireless modem:	Sierra Wireless HL series 2G, 3G or 4G
Messages:	Alarm, Status, Data
Temperature:	-40°...+65°C, operating
Dimensions:	130 x 130 x 75 mm
Housing:	IP66, IP68 Nema 4x

IoT Autonomous devices

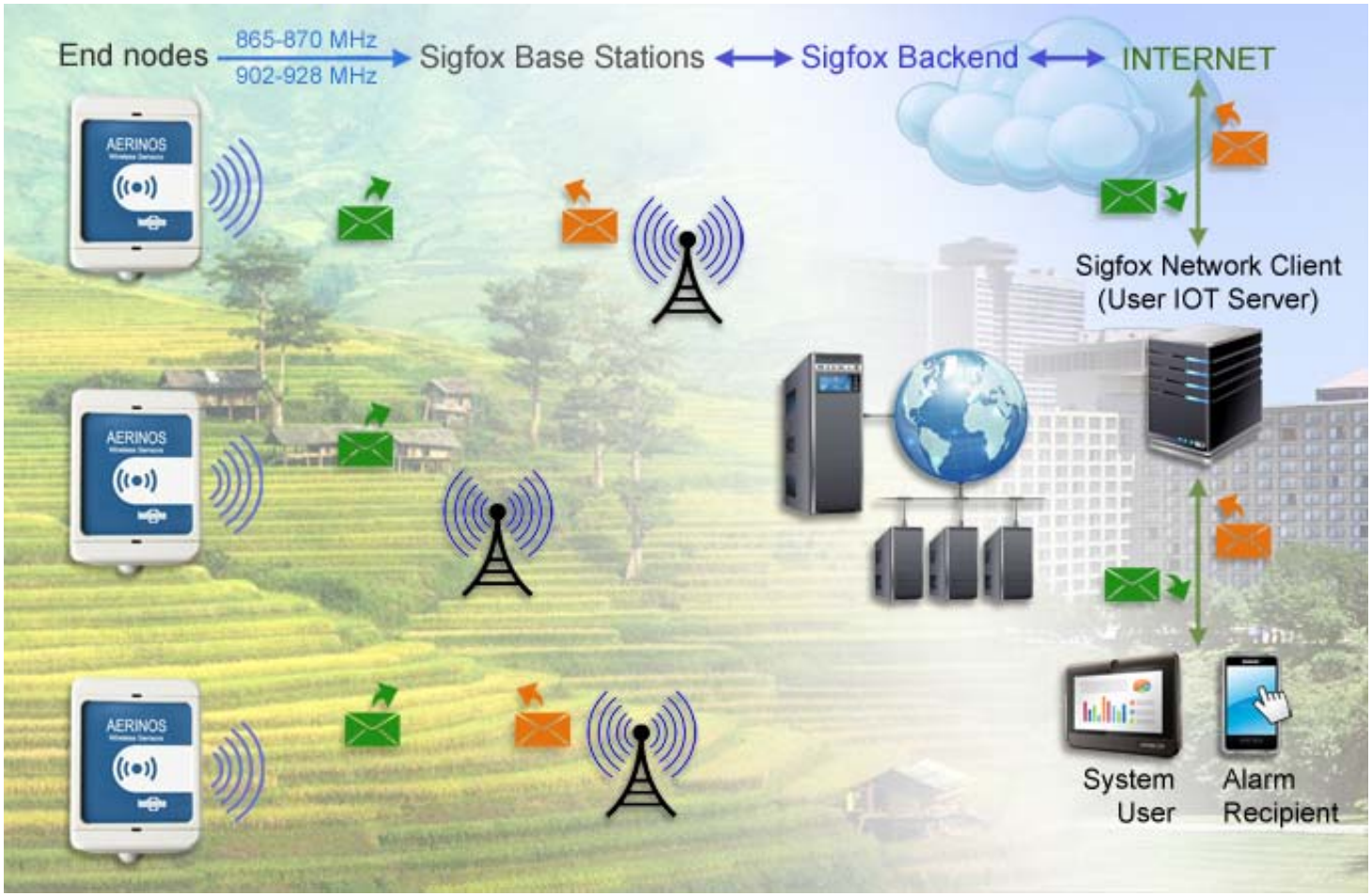
NB-IoT
LTE-M

2G/3G/4G

BSC-50D, GSM Alarming RTU

Power supply:	3.6V, 13 Ah Lithium Thionyl battery, D-size
	5VDC mains or photovoltaic power
Consumption :	Continuous 18µA
Discrete inputs:	4 x Digital inputs, 0-30VDC
	1 x Analog input, 0-1VDC, 12 bit resolution
	2 x Digital counter, 1 KHz
Transducer excitation	12V/200mA, 5V/200mA
Wireless modem:	Sierra Wireless 2G, 3G, 4G, NBIoT, LTE-Cat M1
Antenna	internal or external
Messages:	Data, Alarm
Temperature:	-20°...+65°C, operating
Dimensions:	79.5 x 125 x 61 mm (with cable gland)
Housing:	IP66, IP68 Nema 4x

SIGFOX


End nodes
865-870 MHz
902-928 MHz
Sigfox Base Stations
Sigfox Backend
INTERNET
Sigfox Network Client
(User IOT Server)
AERINOS
AERINOS
AERINOS
System
User
Alarm
Recipient

IoT Autonomous devices

ADS-26x, Sigfox IoT wireless end nodes

Power supply:	3.6V, 13-18 Ah Lithium Thionyl battery, D-size
	5VDC mains or photovoltaic power
Consumption :	Continuous 18µA
Discrete inputs:	IN1, configurable as:
	Digital input, 0-30VDC
	Analog input, 0-1VDC, 12 bit resolution
	Digital counter, 1 KHz
SDI-12 Bus:	8 Channels, up to 3 sensor support.
RS-485, MODBUS:	8 Channels, up to 3 sensor support, ASCII/RTU.
Transducer excitation	12V/250mA, 5V/200mA
Wireless modem:	Radiocrafts Sigfox RC1,2,4
Antenna	internal or external
Messages:	Data, Alarm
Temperature:	-20°...+65°C, operating
Dimensions:	79.5 x 125 x 61 mm (with cable gland)
Housing:	IP66, IP68 Nema 4x

IoT Autonomous devices

ADS-27x, LoraWan IoT wireless end nodes

Power supply:	3.6V, 13-18 Ah Lithium Thionyl battery, D-size
	5VDC mains or photovoltaic power
Consumption :	Continuous 18µA
Discrete inputs:	IN1, configurable as:
	Digital input, 0-30VDC
	Analog input, 0-1VDC, 12 bit resolution
	Digital counter, 1 KHz
SDI-12 Bus:	8 Channels, up to 3 sensor support.
RS-485, MODBUS:	8 Channels, up to 3 sensor support, ASCII/RTU.
Transducer excitation	12V/250mA, 5V/200mA
Wireless modem:	Microchip LoraWan 433/868/915
Antenna	internal or external
Messages:	Data, Alarm
Temperature:	-20°...+65°C, operating
Dimensions:	79.5 x 125 x 61 mm (with cable gland)
Housing:	IP66, IP68 Nema 4x

LoRa™ WAN

IoT Autonomous devices

ADS-410, Itron IoT wireless end nodes

Power supply:	3.6V, 13-18 Ah Lithium Thionyl battery, D-size
	5VDC mains or photovoltaic power
Consumption :	Continuous 18µA
Discrete inputs:	IN1, configurable as:
	Digital input, 0-30VDC
	Analog input, 0-1VDC, 12 bit resolution
	Digital counter, 1 KHz
SDI-12 Bus:	8 Channels, up to 3 sensor support.
RS-485, MODBUS:	8 Channels, up to 3 sensor support, ASCII/RTU.
Transducer excitation	12V/250mA, 5V/200mA
Wireless modem:	Milli 5 Itron Silver Spring networks
Antenna	internal or external
Messages:	Data, Alarm
Temperature:	-20°...+65°C, operating
Dimensions:	79.5 x 125 x 61 mm (with cable gland)
Housing:	IP66, IP68 Nema 4x

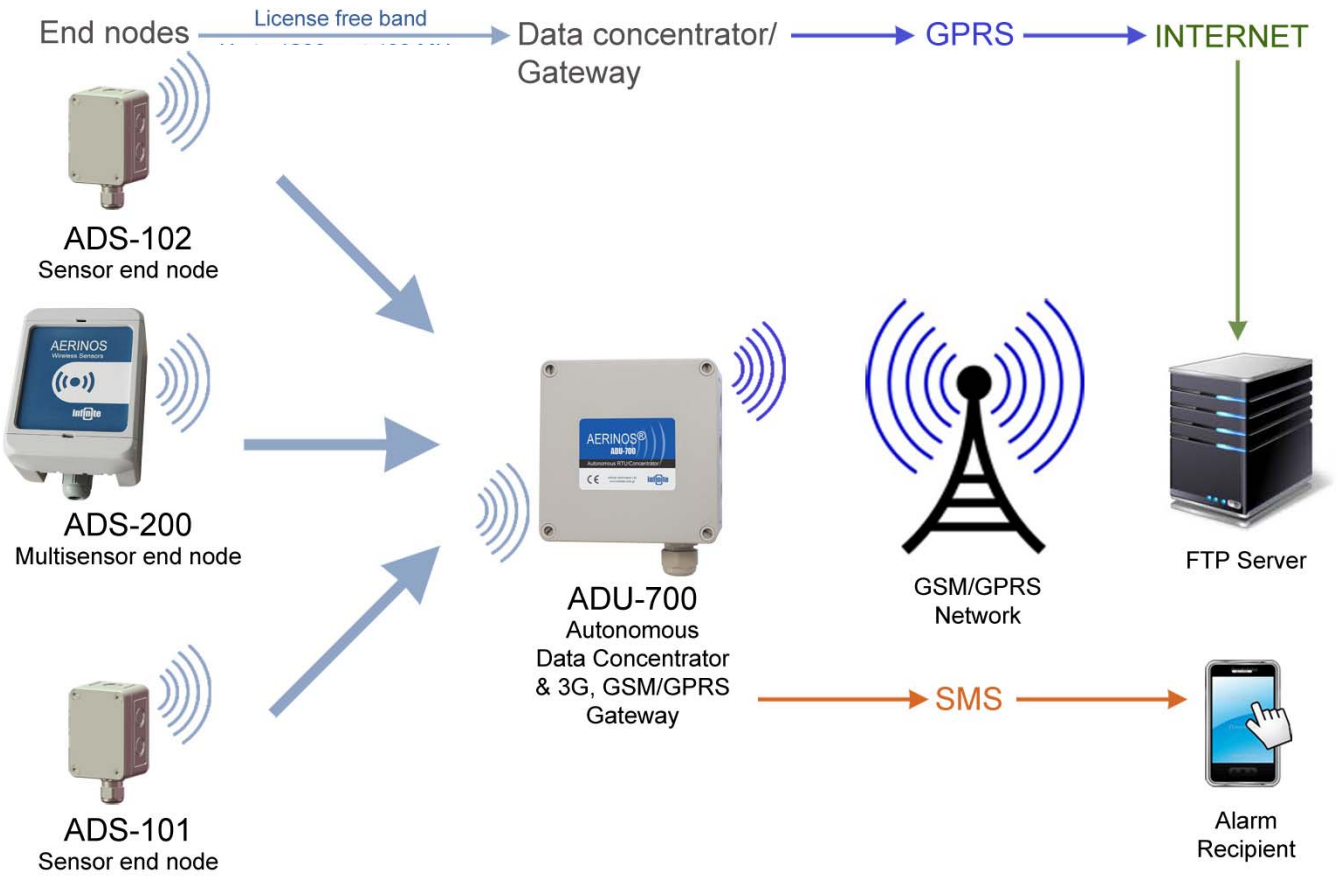
IoT Autonomous devices

ADU-700, Wireless Gateway RTU/Data Logger

NB-IoT
LTE-M
2G/3G/4G

Power supply:	3.6V, 13-18 Ah Lithium Thionyl battery, D-size
	12VDC mains or photovoltaic power
Consumption :	Continuous 18µA
RS485:	For future use
Digital inputs:	3, 0-30VDC
Wireless RF:	Radiocrafts 433.05-433.79 4+Km line of sight
Wireless modem:	Sierra Wireless HL series 3G or 4G
Messages:	Alarm, Status, Data
Temperature:	-40°...+65°C, operating
Dimensions:	130 x 130 x 75 mm
Housing:	IP66, IP68 Nema 4x

IoT Autonomous devices



IoT Autonomous devices

ADS-200, IoT wireless end nodes

Power supply:	3.6V, 13-18 Ah Lithium Thionyl battery, D-size
	5VDC mains or photovoltaic power
Consumption :	Continuous 18µA
Discrete inputs:	IN1, configurable as:
	Digital input, 0-30VDC
	Analog input, 0-1VDC, 12 bit resolution
	Digital counter, 1 KHz
SDI-12 Bus:	8 Channels, up to 3 sensor support.
RS-485, MODBUS:	8 Channels, up to 3 sensor support, ASCII/RTU.
Transducer excitation	12V/250mA, 5V/200mA
Wireless tranceiver:	Radiocrafts 433.05-433.79 Mhz
Antenna	internal or external
Messages:	Data, Alarm
Temperature:	-20°...+65°C, operating
Dimensions:	79.5 x 125 x 61 mm (with cable gland)
Housing:	IP66, IP68 Nema 4x

ADS-200

Soil sensors

Serial data line

12V line

Ground line

SDI12 Serial Bus

Humus

Topsoil (A horizon)
often rich in humus and minerals

Subsoil (B horizon)
poor in humus, rich in minerals

Weathered rock fragments (C horizon)
little or no plant or animal life

Bedrock (D horizon)

IoT Autonomous devices

ADS-210, IoT wireless end nodes

Power supply:	3.6V, 13-18 Ah Lithium Thionyl battery, D-size
	5VDC mains or photovoltaic power
Consumption :	Continuous 18µA
Discrete inputs:	1 Digital input, 0-30VDC
	1 Digital counter, 1 KHz
	1 Analog input, 0-1VDC, 12 bit resolution
Outputs :	1 Valve Channels
Transducer excitation	12V/250mA, 5V/200mA
Wireless tranceiver:	Radiocrafts 433.05-433.79 Mhz
Antenna	internal or external
Messages:	Data, Alarm
Temperature:	-20°...+65°C, operating
Dimensions:	79.5 x 125 x 61 mm (with cable gland)
Housing:	IP66, IP68 Nema 4x

IoT Autonomous devices

ADS-102, IoT wireless end nodes

Power supply:	3.6V, 13-18 Ah Lithium Thionyl battery, D-size
	5VDC mains or photovoltaic power
Consumption :	Continuous 18µA
Discrete inputs:	1 Digital input, 0-30VDC
	1 Digital counter, 1 KHz
	2 Analog input, 0-1VDC, 12 bit resolution
Transducer excitation	3.6V/120mA
Wireless RF :	Radiocrafts 433.05-433.79 Mhz
Antenna	internal or external
Messages:	Data, Alarm
Temperature:	-20°...+65°C, operating
Dimensions:	79.5 x 125 x 61 mm (with cable gland)
Housing:	IP66, IP68 Nema 4x

Sensors

Structural Engineering SDI12 sensors

Crack Propagation

Inclination

Critical Structure Monitoring

Bridge suspension

Sensors

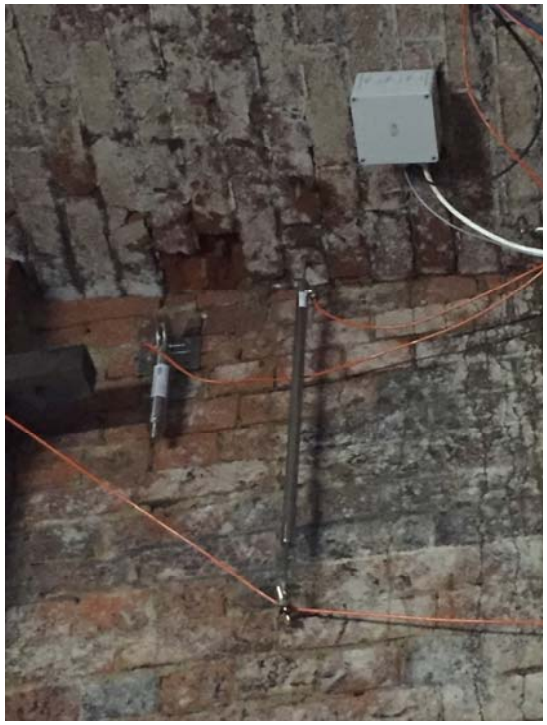
Structural Engineering SDI12 sensors

Inclination Crack Propagation

Critical Structure Monitoring

Sensors

Structural Engineering SDI12 sensors



Critical Structure Monitoring

Crack Propagation

Sensors

Structural Engineering SDI12 sensors

Critical Structure Monitoring

Vibrating wires

Crack Propagation

Structural Engineering SDI12 sensors

Rock and ground monitoring
Switzerland

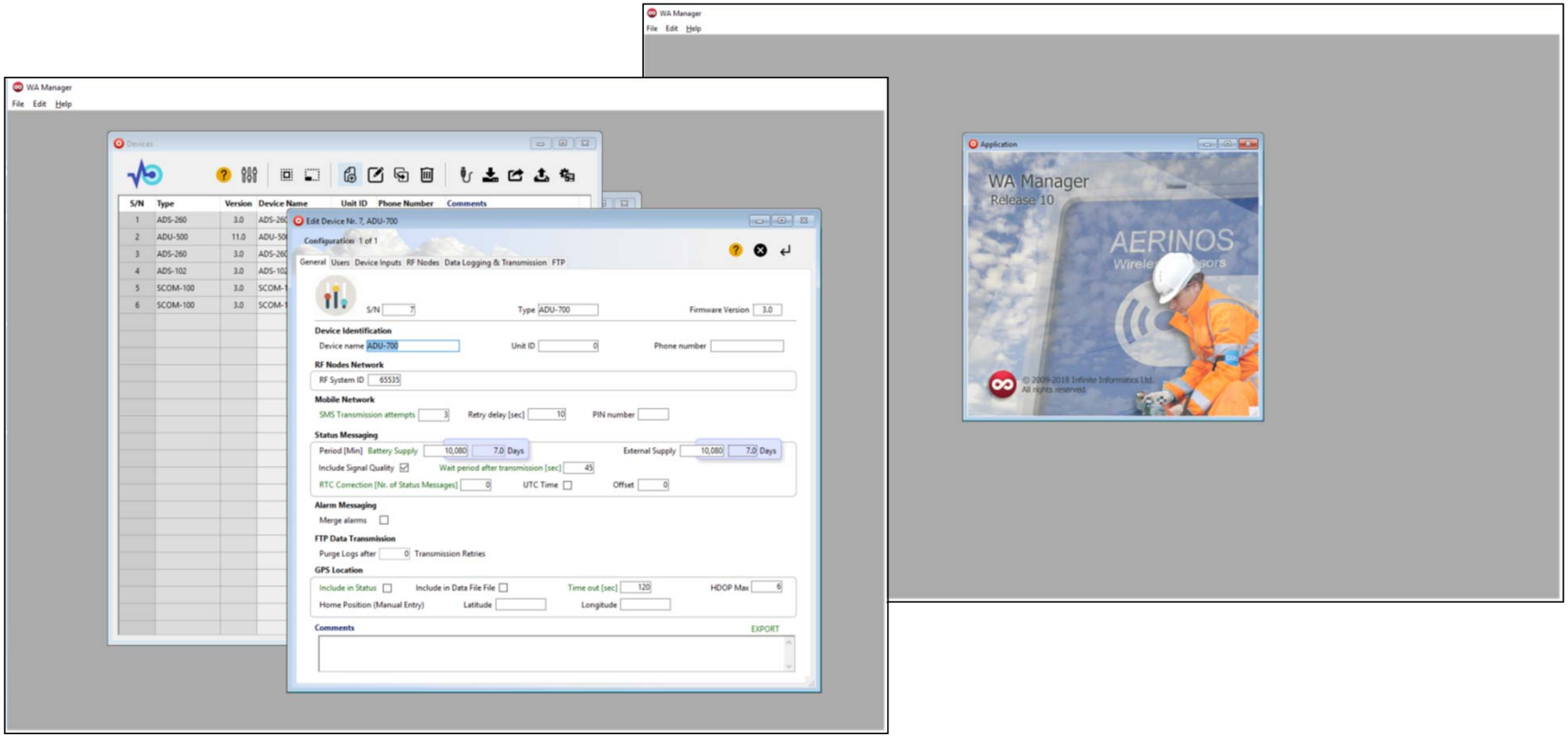
Bank collapse UK

Sensors

Waves monitoring Istanbul port

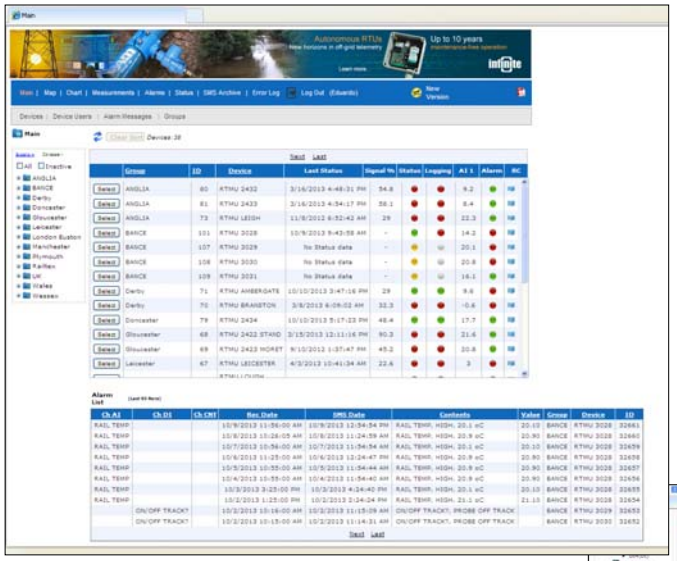
Raffles Lighthouse Singapore

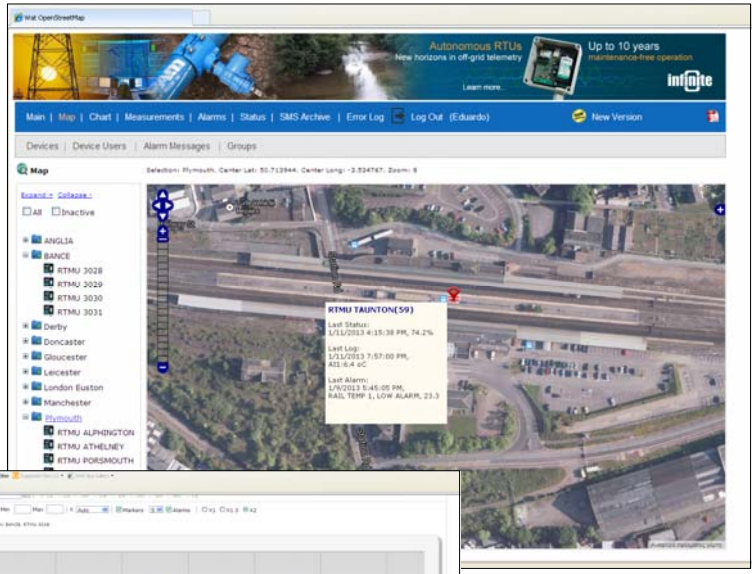
WA Manager – Windows software to configure devices

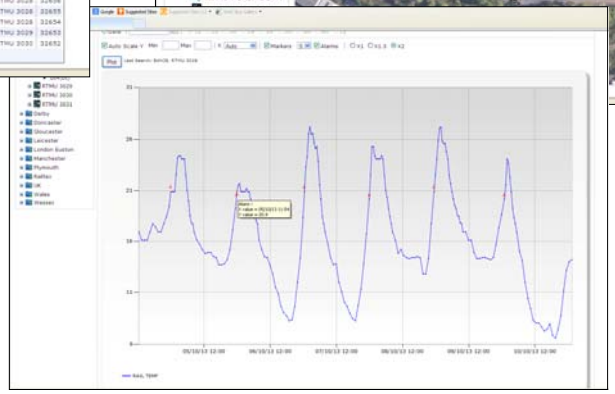


WaT - Web aided Telemetry

Cloud telemetry platform with GIS information







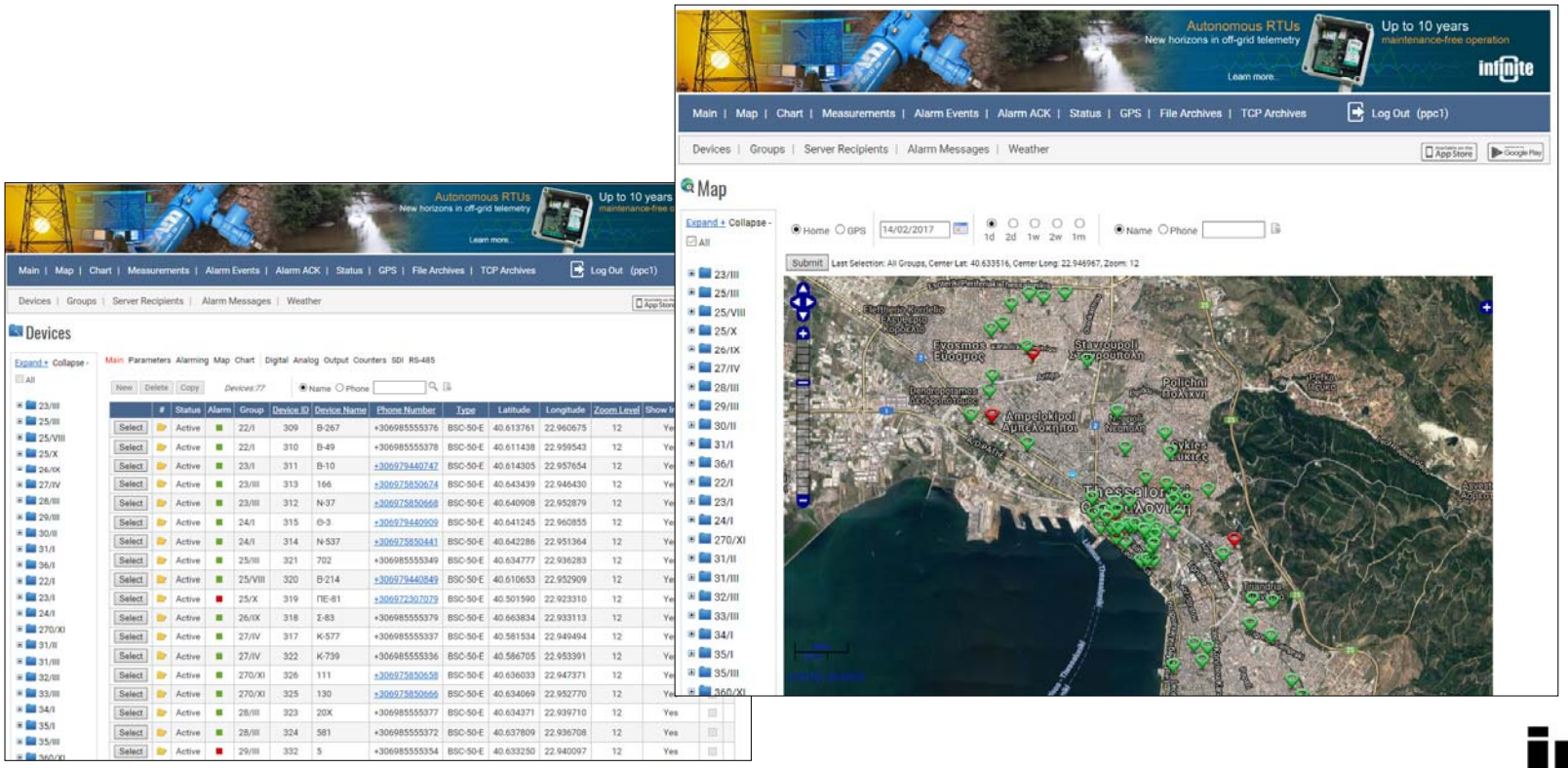
ANDROID APP ON Google play

Download on the App Store

infinite

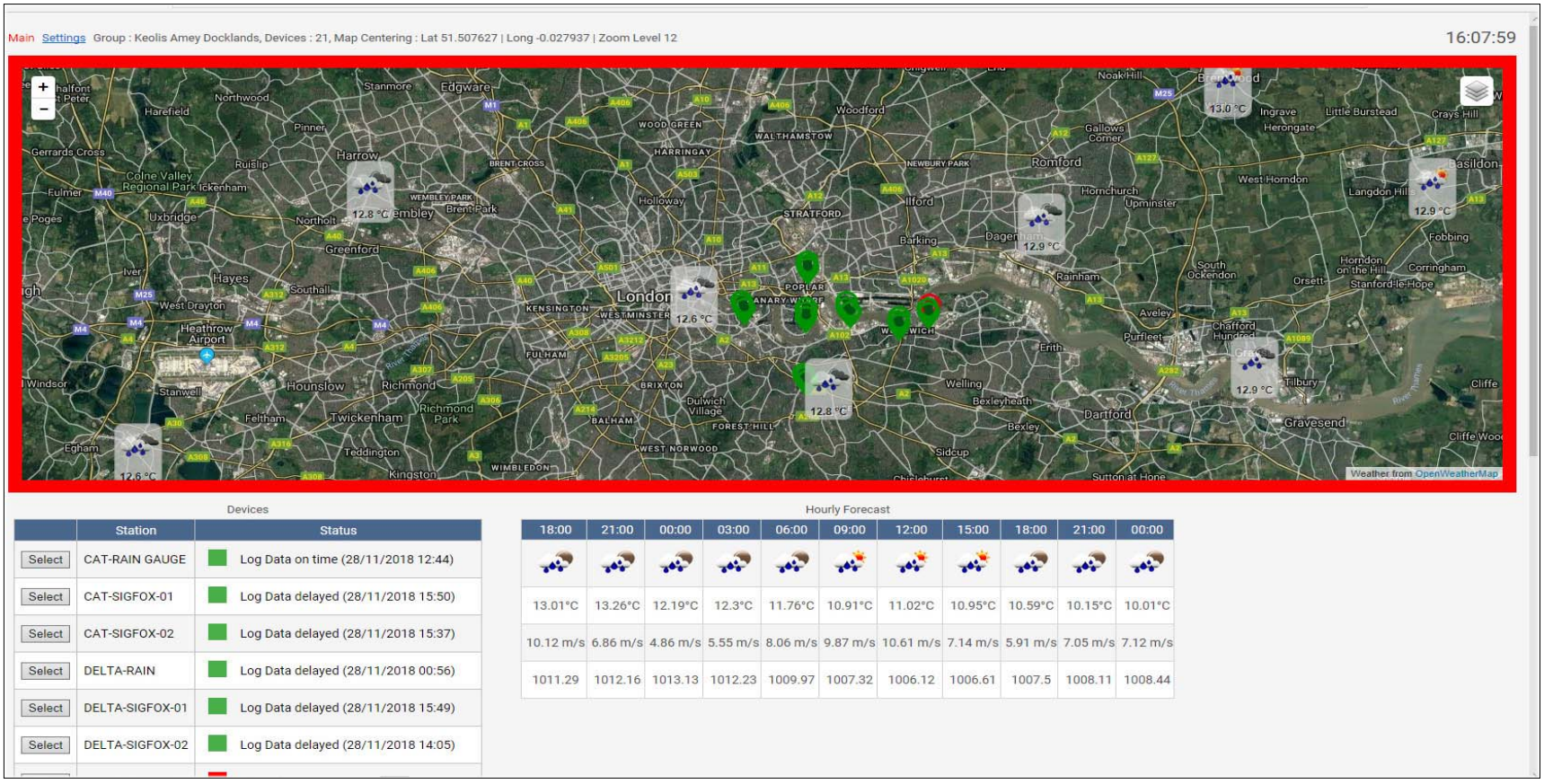
WaT - Web aided Telemetry

Cloud telemetry platform with GIS information



WaTEye - Web aided Telemetry Eye dashboard

Online dashboard with live weather and telemetry data

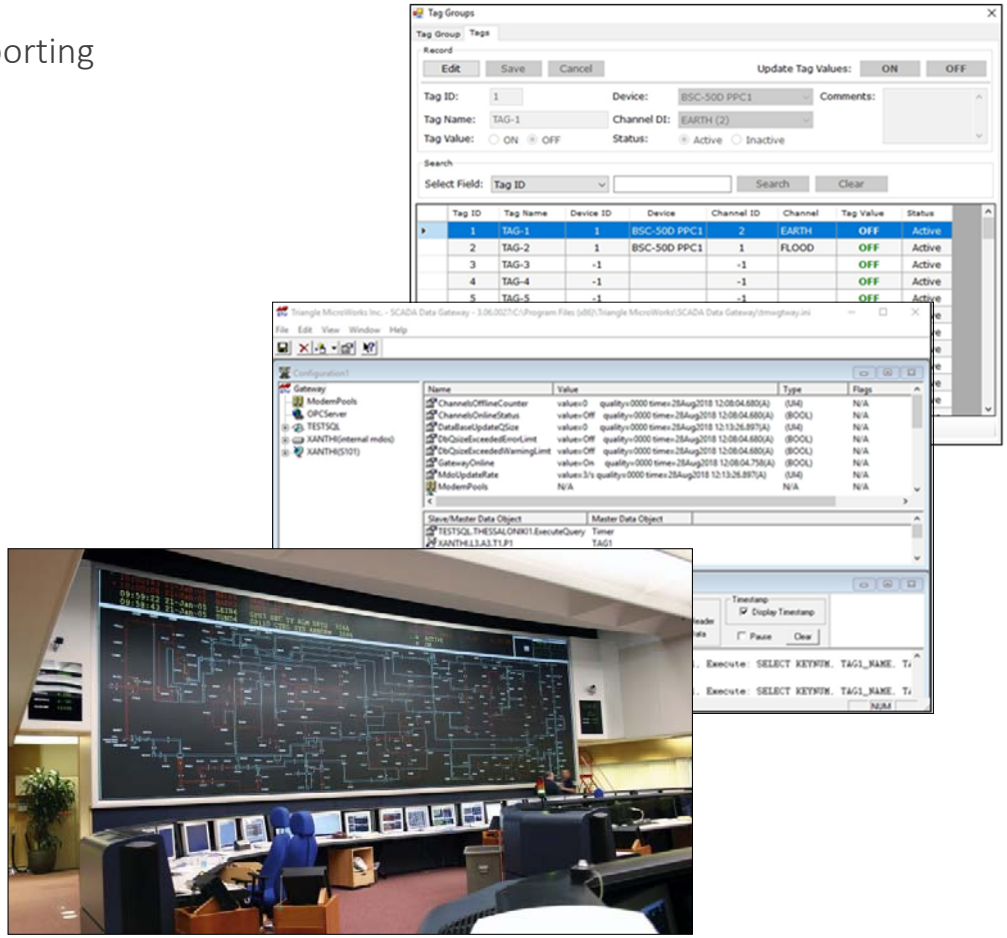


MsG – Multiprotocol Scada Gateway

The MSG is a modern SCADA communication gateway, supporting multiple protocols,

- DNP3 Secure Authentication v5 (SAv5)
- IEC 60870-5-101, 102,103
- IEC 60870-5-104
- IEC 60870-5 Secure Authentication for -101 and -104
- OPC Data Access
- OPC XML Data Access
- OPC Alarms & Events
- IEC 61850
- IEC 60870-6
- Modbus

MS SQL server database backend for
Historical data storage and management.



Clients & OEM


amey


sixense
Systems


VINCI


TESLA
MEASUREMENT CONTROL SYSTEMS
ENVIRONMENTAL TECHNOLOGIES


Balfour Beatty


General
Electric


US3
UTILITY SYSTEMS SCIENCE & SOFTWARE


Itron


Network Rail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