



IoT



Autonomous RTUs

IoT for Precision Agriculture





Internet of Things Networks & Technologies

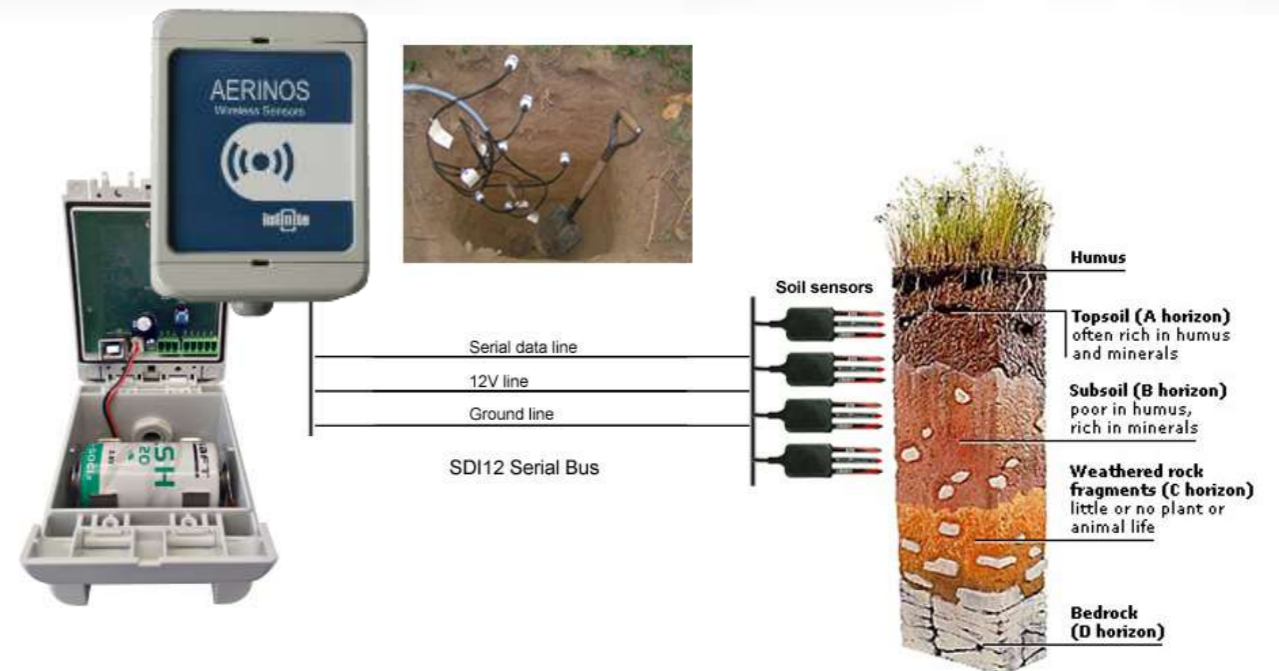




Precision Agriculture

Agriculture related weather measurements:

- Solar radiation
- Air temperature and relative humidity
- Wind speed and direction
- Rainfall
- Soil temperature and moisture
- All in one weather stations



IoT Autonomous devices



ADS-410, Itron IoT wireless end nodes

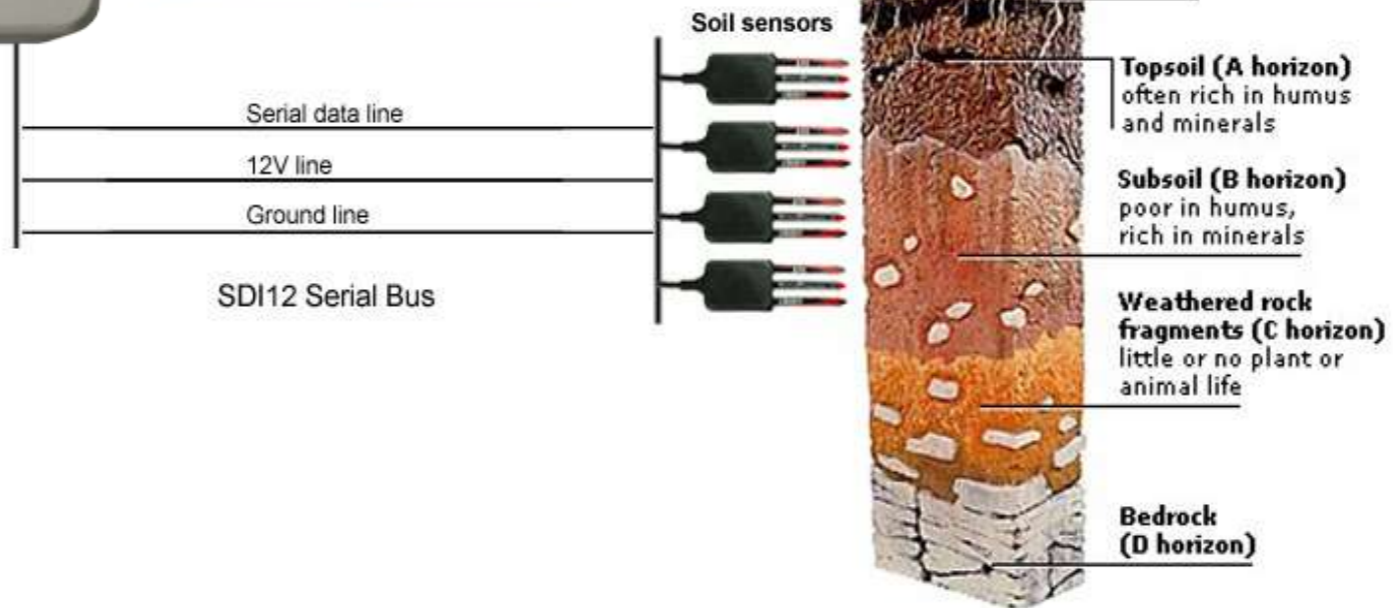
Power supply:	3.6V, 13-18 Ah Lithium Thionyl battery, D-size 5VDC mains or photovoltaic power
Consumption :	Continuous 18 μ A
Discrete inputs:	IN1, configurable as: Digital input, 0-30VDC Analog input, 0-1VDC, 12 bit resolution Digital counter, 1 KHz
SDI-12 Bus:	8 Channels, up to 3 sensor support.
RS-485, 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

Battery lifetime

ADS-410 RTU/Itron powered by one 3.6V, 13Ah lithium-thionyl battery

Excitation @12V [mA]	Sample/Send rate [S/hour]	Sampling delay [sec]	Battery life [Years]
1	4	1	6.9
1	12	1	4.7
1	30	1	2.7
25	6	1	2.6
25	30	1	1
5	4	1	6.2
5	6	1	5.4
5	30	1	2.1
25	4	5	1.8
50	4	5	1
100	4	5	0.5

ADS-410 Gen5 Itron



IoT Autonomous devices

ADS-300, NB-IoT/LTE-M RTU



Power supply:	3.6V, 13-18 Ah Lithium Thionyl battery, D-size 5VDC mains or photovoltaic power
Consumption :	Continuous 18 μ A
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:	Sierra Wireless NBloT, LTE-Cat M1
Antenna	internal or external
Messages:	MQTT Data/Alarm, remote configuration
Temperature:	-20°...+65°C, operating
Dimensions:	79.5 x 125 x 61 mm (with cable gland)
Housing:	IP66, IP68 Nema 4x



Weather

Silos & Level



Soil



Herds



Sensors

Soil Moisture, Conductivity, Temperature



All in one weather



Valves



Sensors

Leaf Wetnets



Soil Moisture



Ambient
Humidity & Temperature



Soil Temperature



Sensors



Wind Speed



Sun Radiation



Wind Direction

Sensors

Water Level Ultrasonic



PH



Water Quality

WA Manager configuration tool

The screenshot displays the WA Manager configuration tool interface. On the left, a table lists several devices:

S/N	Type	Version	Device Name	Unit ID	Phone Number	Comments
1	ADS-280	3.0	ADS-280			
2	ADU-300	11.8	ADU-300			
3	ADS-280	3.0	ADS-280			
4	ADS-102	3.0	ADS-102			
5	SCOM-190	3.0	SCOM-190			
6	SCOM-190	3.0	SCOM-190			

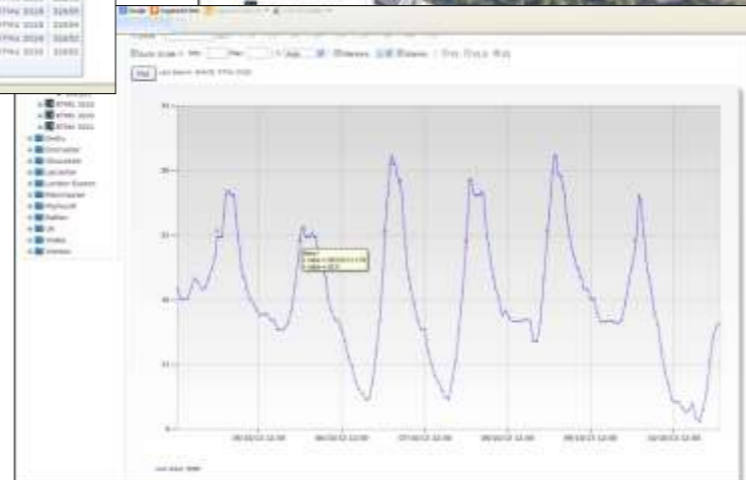
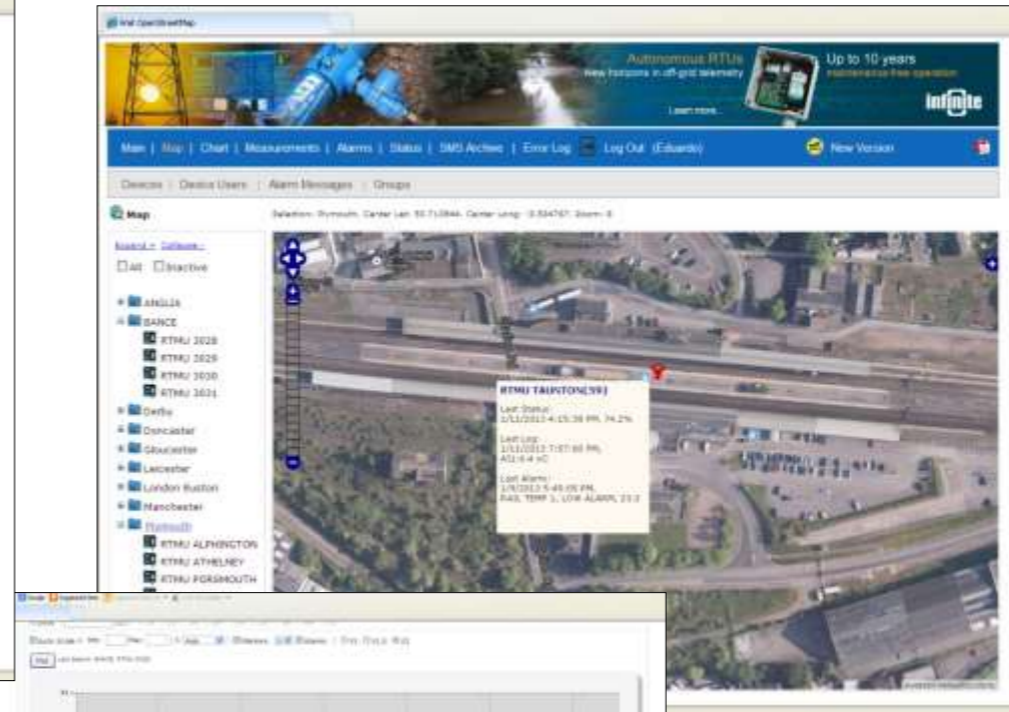
The main configuration window is titled "Edit Device No. 1 ADU-700". It contains the following sections:

- General:** Device name: ADU-700, Unit ID: [empty], Phone number: [empty].
- RF Nodes Network:** RF System ID: 80593.
- Mobile Network:** SMS Transmission attempts: [empty], Retry delay (sec): 10, FBI number: [empty].
- Status Messaging:** Period (Min): 10,000, Battery Supply: 7.0 Days, External Supply: 10,000, 7.0 Days. Includes checkboxes for "Include Signal Quality" and "Wait period after transmission (sec): 40".
- Alarm Messaging:** Merge alarms: [empty].
- FTP Data Transmission:** Purge Logs after: [empty], Transmission Retries: [empty].
- GPS Location:** Includes checkboxes for "Include in Status" and "Include in Data File File". Time out (sec): 120, HDOP Max: [empty]. Home Position (Manual Entry) with Latitude and Longitude fields.
- Comments:** A text area with a "EXPORT" button.

On the right side of the main window, there is a smaller application window titled "WA Manager Release 10" featuring a cover image of a worker in an orange safety suit and a white hard hat, with the text "AERINOS Wireless Sensor".

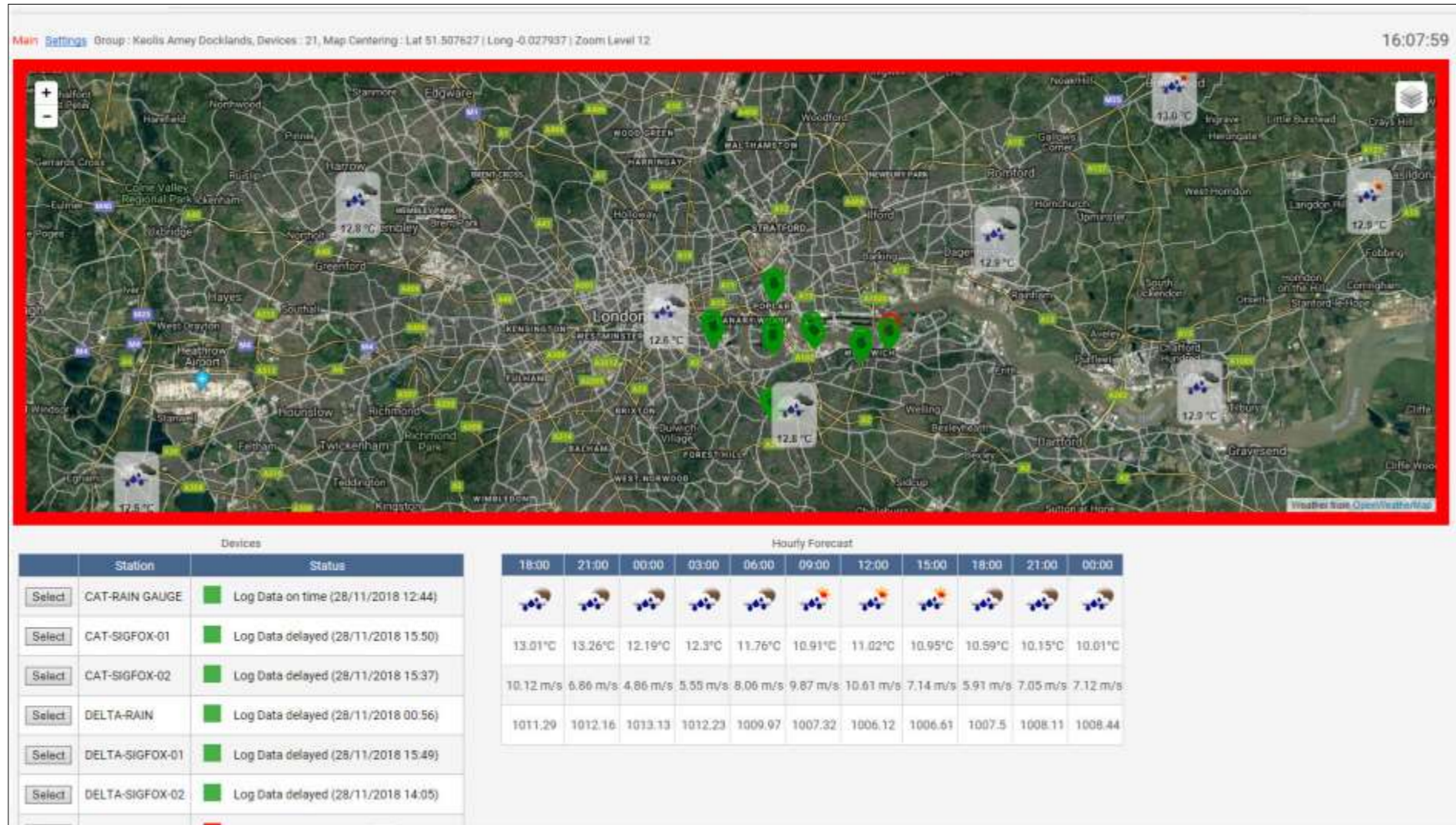
WaT - Web aided Telemetry

Cloud telemetry platform with GIS information



WaTEye - Web aided Telemetry Eye dashboard

Online dashboard with live weather and telemetry data

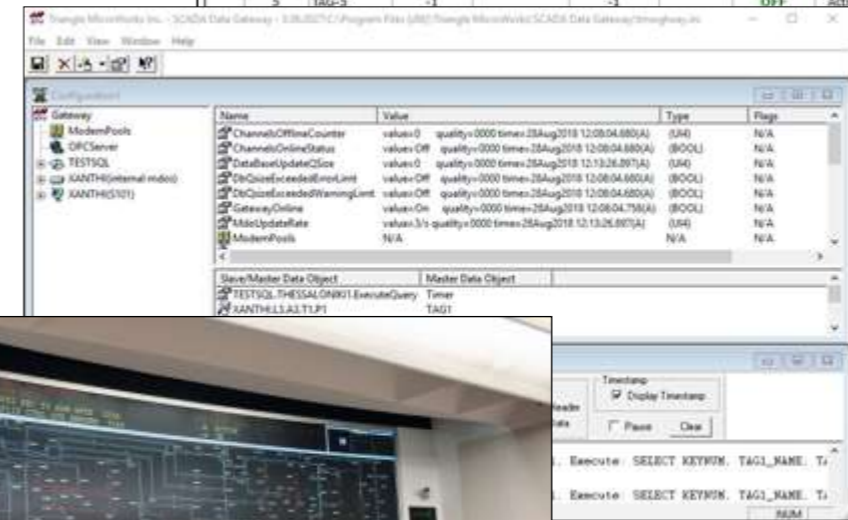
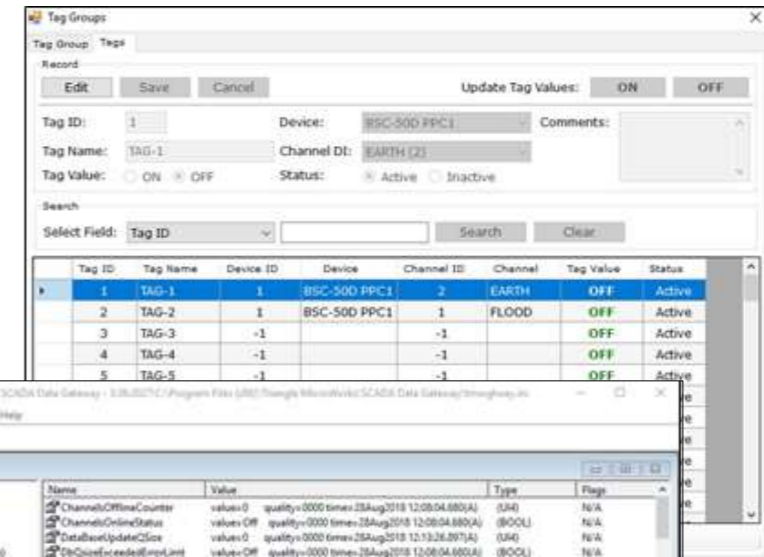


MSG – Multiprotocol Scada Gateway

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

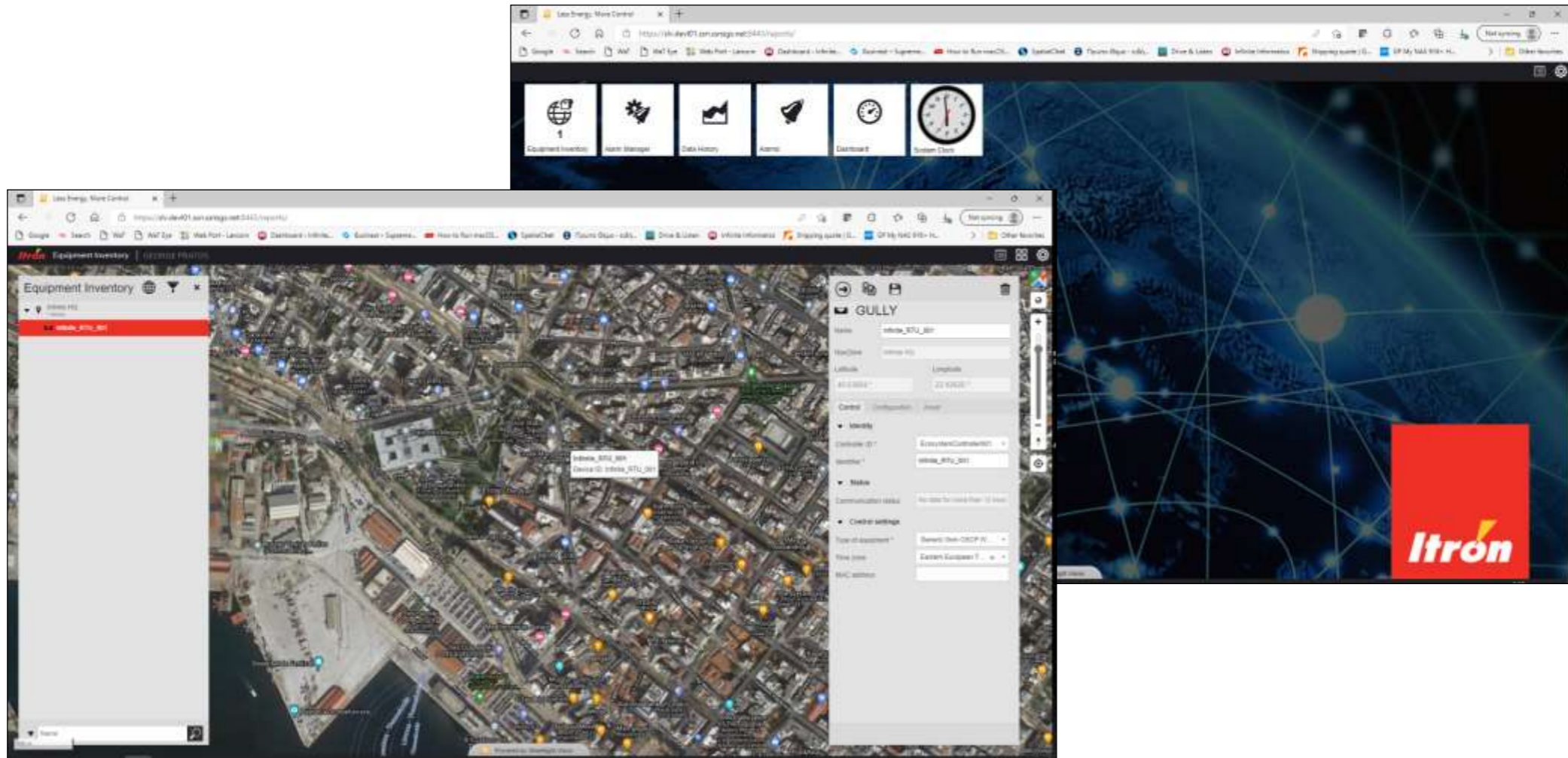
- DNP3 Secure Authentication v5 (SAv5)
- IEC 60870-5-101, 102,103
- IEC 60870-5-104
- IEC 60870-5 Secure Authentication for -101 and -104
- OPC Data Access
- OPC XML Data Access
- OPC Alarms & Events
- IEC 61850
- IEC 60870-6
- Modbus

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



Itron SLV- Streetlight Vision

SLV cloud platform integration



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The image displays the Terra Pro IoT interface for precision agriculture, featuring several key components:

- User Interface (UI):** The top left shows the user profile (User: TerraPro Demo) and a search bar (Pesquisar...). Below it is a table of sensors for five parcels (Parcela 1 to Parcela 5).
- Sensor Table:**

Parcela	Sensor
Parcela 1	Teor de Humidade
Parcela 2	Contador de Rega
Parcela 3	Contador de água por...
Parcela 4	
Parcela 5	
- Map:** A satellite map showing the location of the parcels, marked with blue circular icons labeled 'PRO'. A sidebar on the right contains navigation icons: Mapa, Gráficos, Alarme, Relatórios de Rega, and Definições.
- Data Graph:** A line graph showing sensor data over time, with a legend for 'Teor de Humidade', 'Humidade', and 'Humidade'. The x-axis represents time from 15:00 to 03:00.
- Weather Forecast:** A weather forecast for Montemor-o-Novo, PT, showing temperature (14°C) and time (14:11). The forecast includes icons for sun, clouds, and moon, along with maximum and minimum temperatures and humidity levels for five time slots: 15:00, 18:00, 21:00, 00:00, and 03:00.
- Heatmaps:** Three circular and rectangular heatmaps showing spatial data distribution, likely related to soil moisture or temperature.
- User Interaction:** A person is shown using a laptop to interact with the Terra Pro interface.

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АГРОПЛАТФОРМА



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