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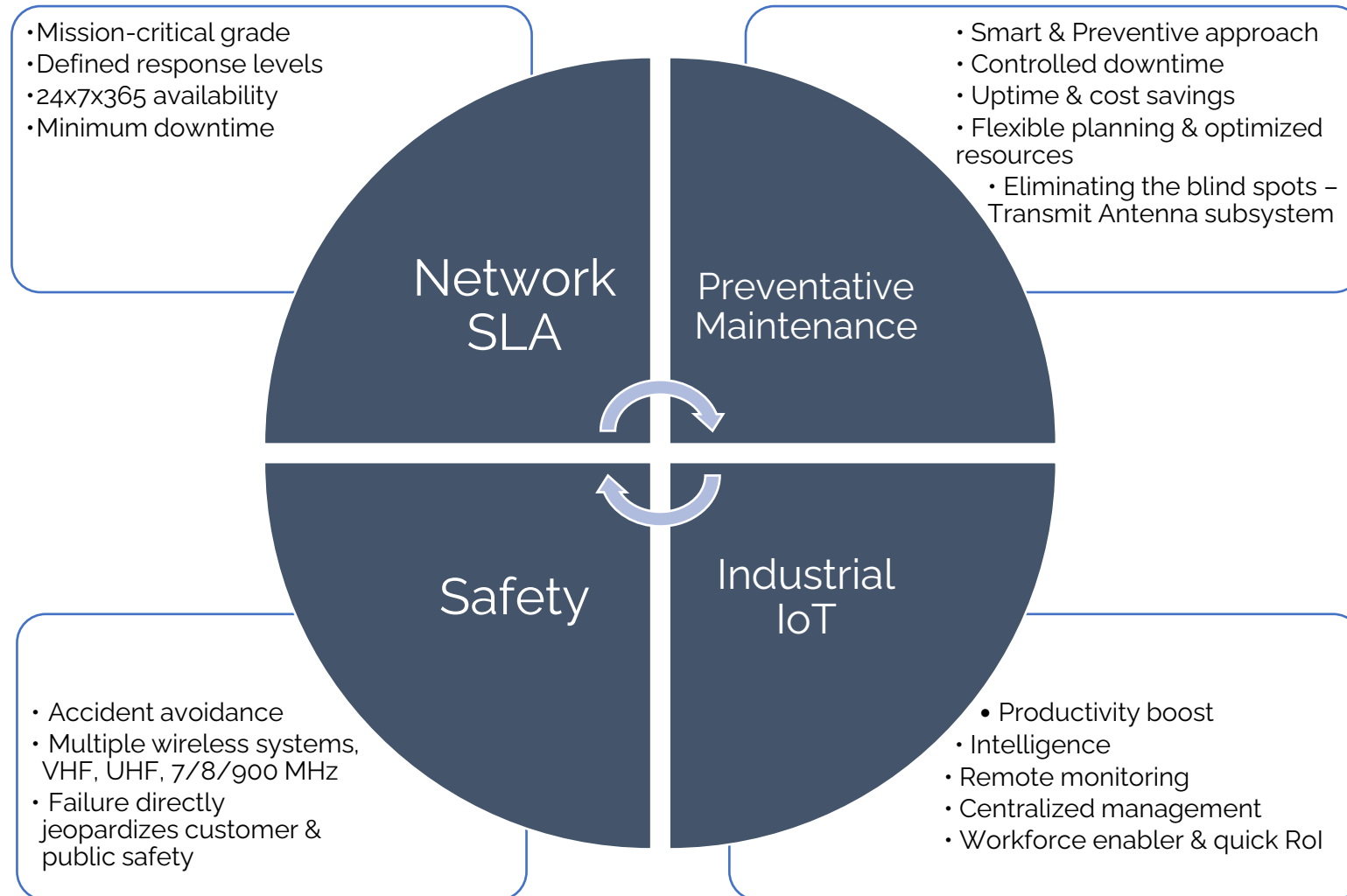
IntelliSENSE™ **2.0** Your New IoT HUB

IntelliSENSE Control Unit Front View

Why RF Power Monitoring in the Radio Network

Network SLA
- Mission-critical grade
- Defined response levels
- 24x7x365 availability
- Minimum downtime

Preventative Maintenance
- Smart & Preventive approach
- Controlled downtime
- Uptime & cost savings
- Flexible planning & optimized resources
- Eliminating the blind spots – Transmit Antenna subsystem

Safety
- Accident avoidance
- Multiple wireless systems, VHF, UHF, 7/8/900 MHz
- Failure directly jeopardizes customer & public safety

Industrial IoT
- Productivity boost
- Intelligence
- Remote monitoring
- Centralized management
- Workforce enabler & quick RoI

Changing Maintenance Paradigm

IBM

- **Reduction in downtime by up to 50%**
- **Reduction of maintenance costs by up to 25%**
- **Reduction in capital investment by 3-5%**

- Time to Listen to Your Machines

- Sensor technology and data analytics **will change the maintenance paradigm.**
- In the rail sector, the combined **efficiency gain** through condition-based and predictive maintenance is expected to be around **15 - 25%.**

- The Rail Sector's Changing Maintenance Game

McKinsey & Company

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Sinclair ITS-200 Benefit

Complete monitoring of the entire transmit antenna network
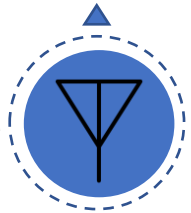
Non-intrusive measurement

Comprehensive alarms & ease of monitoring

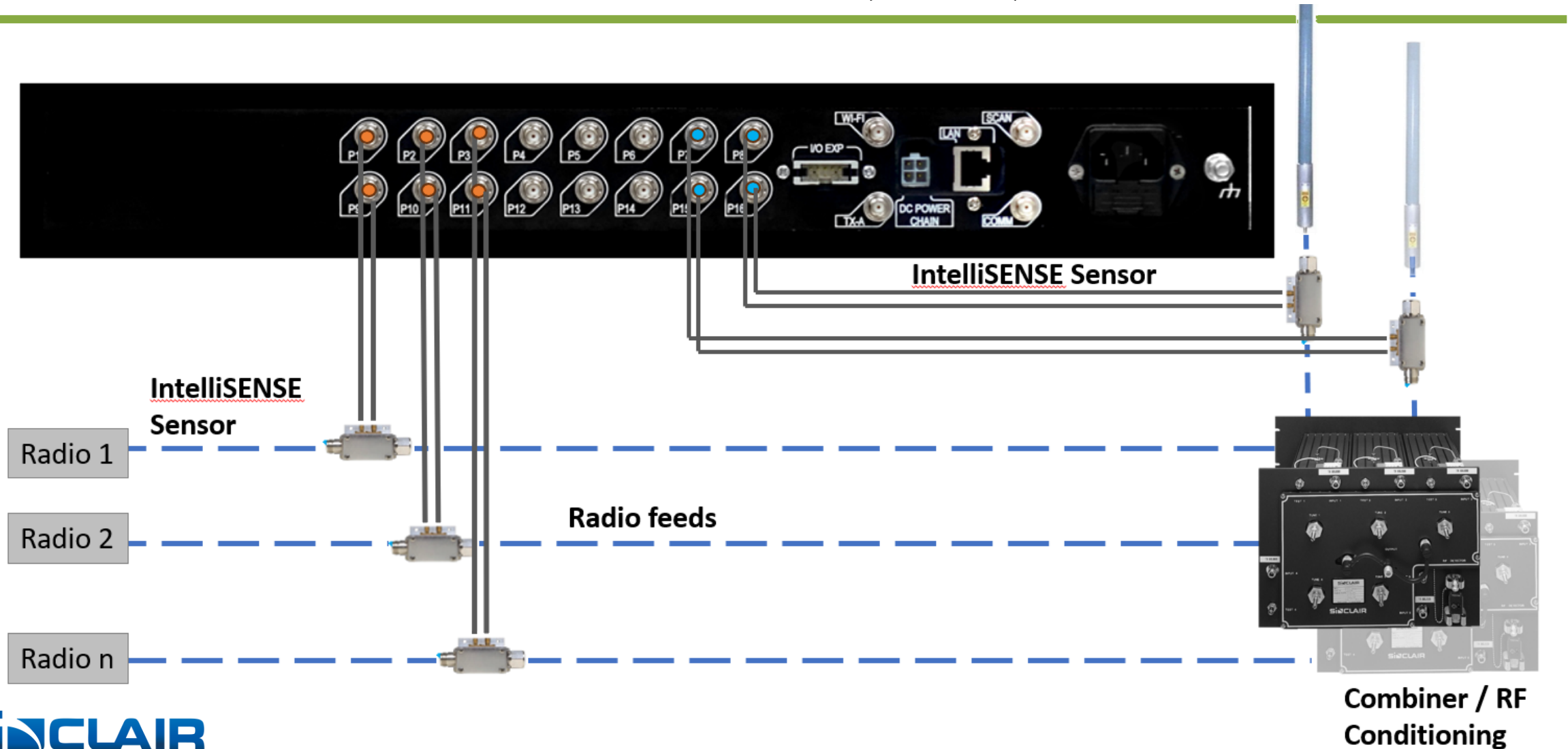**Truly channelized design for 360º monitoring**

Modern GUI interface & SNMP support

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Application

IntellSENSE CONTROL UNIT *(Back view)*

Features

Performance Monitoring

- Antenna VSWR
  - ✓ Antenna Forward Power
  - ✓ Individual Tx forward power at antenna port
  - ✓ Individual Tx VSWR at antenna port
  - ✓ Individual Tx CH power
  - ✓ Individual Tx CH frequency
  - ✓ Individual Tx CH return loss
  - ✓ Individual Tx CH insertion loss

Ease of Use & Access

- User friendly web-based GUI
- SNMP support
- Comprehensive alarm management
- Secure user administration with RBAC (role-based access control) to manager users and their access rights
- Event log

- Built-in Satcom link *(Roadmap)*
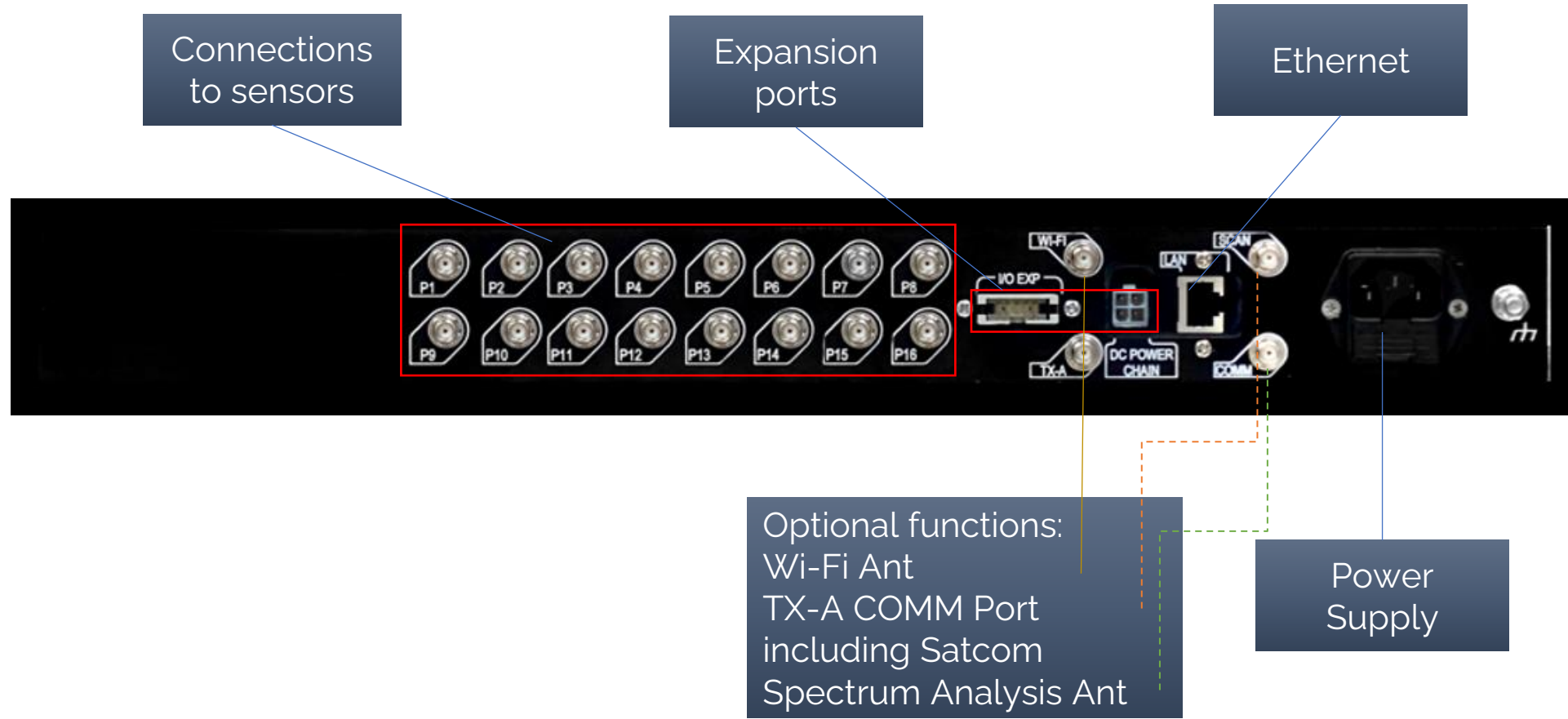- Wi-Fi connection for easy commissioning and onsite access *(roadmap)*

Versatility

- Native multi-technology and multi-system support
- Smooth expansion
- License-based
  - Pay-as-you-grow
  - Pay-as-you-use

- Spectrum Analysis *(optional)*

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Front View

Alarm

LCD Display

Power Switch

Power/ VSWR

LED Status

Browse Buttons

Back Panel

Connections to sensors

Expansion ports

Ethernet

Optional functions:
Wi-Fi Ant
TX-A COMM Port
including Satcom
Spectrum Analysis Ant

Power Supply

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Specifications – Main Unit

Electrical Specifications - Control Unit	
Frequency Range	70 - 3000 MHz
Sampling Bandwidth	0.004 - 100 MHz
Connectors (P1 - P16)	SMA-Female
Input Power (P1 - P16)	≤ 20 dBm
Impedance	50 Ohm
Dynamic Range	55 dB
Power Accuracy	0.1dBm
Frequency Resolution	0.2 kHz
Monitoring Capacity	8 channels VSWR, or 16 channels Power
Networking	1 x Ethernet 10/100 Base-T
Power Consumption	2 Watts max.
Power	110/240 VAC, or 48 VDC

One device for all frequency

Mechanical and Environmental - Control Unit	
Depth	254 mm (10 in)

Wide bandwidth for 1/2/3/4/5 G

Outstanding dynamic range

Weight	2.7 kg (6 lbs)

Precision monitoring

Temperature Range	(-4 to +140°F)

Flexible deployment

Ultra speed for real time monitoring

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Specifications – Sensor

Sensor Specifications	ITS-PS-233G-NMNF	ITS-PS-436-NMNF
Frequency Range	100-512 MHz	740-960 MHz
Insertion Loss	≤ 0.2 dB	
Coupling Value	40 ± 1.5 dB	
Directivity	25 dB	
Average Power	500 W	
FWD/REF VSWR	1.4: 1	1.25: 1
In/Out VSWR	1.25: 1	1.25: 1
Impedance	50 Ohm PIM	
	< -150 dBc	
Input Connector	N-Male	
Output Connector	N-Female	
Coupler Port Connectors	2 x SMA-Female	

FWD   REF

RF IN

RF OUT

Mechanical and Environmental – Power sensor

NF

ITS-PS-436-NMNF

Width   50.0 mm (2.00 in)

Depth   36.1 mm (1.42 in)

Length/Height   65 (2.56 in)

Temperature Range   -20 to +60 °C (-4 to +140°F)

Wide bandwidth

Non-intrusive, minimum I.L.

High power handling

PIM optimized for trunking system

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User Interface
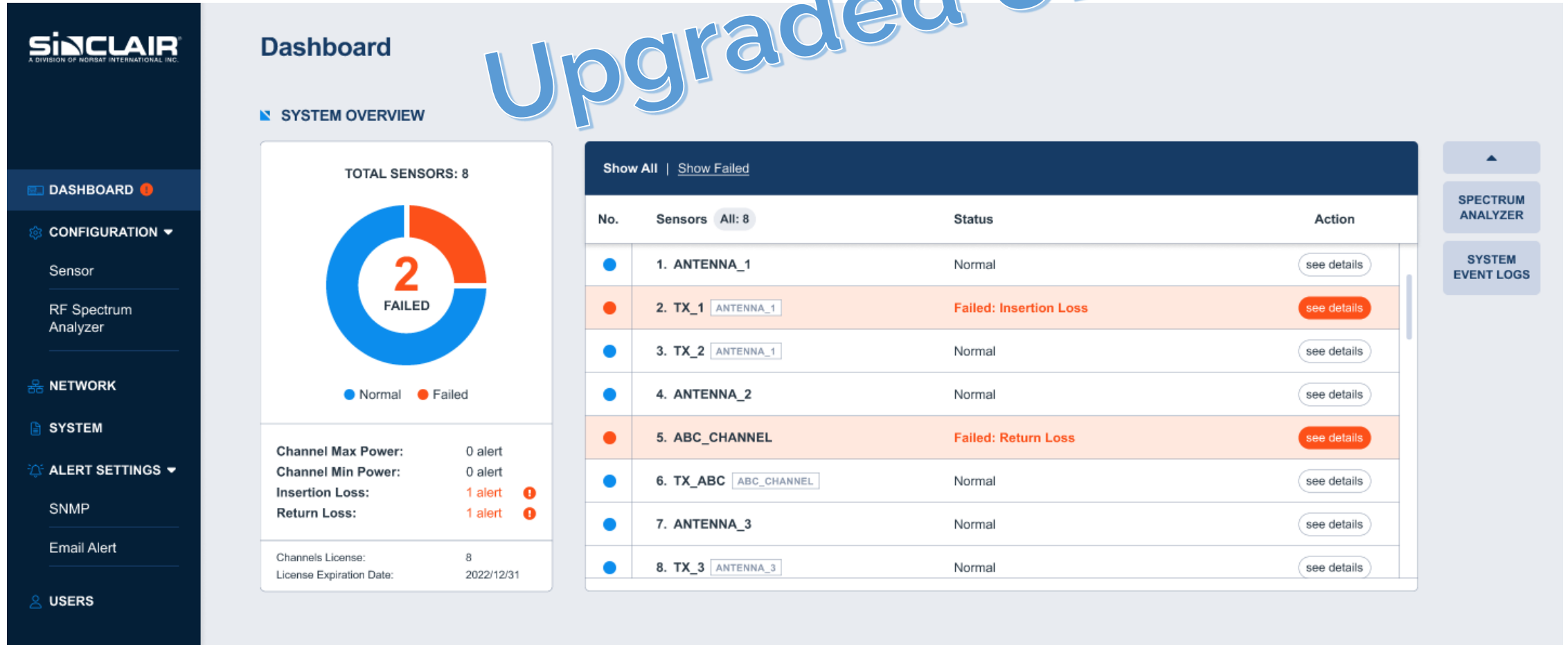
Tx and Ant Sensors Deployed

DETAILED VIEW

VIEW ALL ▾

ANTENNA_1
port 3

Forward Power dBm	Return Loss dB
39.59	15.56

Sensor	Frenquency MHz	Input Power dBm	Return Loss dB	Drift kHz	Insertion Loss dB	Antenna Power dBm	Antenna Return Loss dB
TX_1 port 1 | port 2	256	40.5	27.76	3.0	15.34	27.16	13.6
TX_2 port 4 | port 5	250	40.0	27.76	3.0	5.26	34.74	13.4
vir_1 virtual	151	--	--	3.0	--	37.5	12.34

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Leveraging the Virtual Sensors

Spectrum Analysis

- Spectrum monitoring

- Interference detection
    - A more complex RF environment
    - Spectrum sharing movement
    - CBRS / 5G & Private 5G / Local spectrum / WiFi6

- Intelligence gathering

- Be prepared, be in-the-know
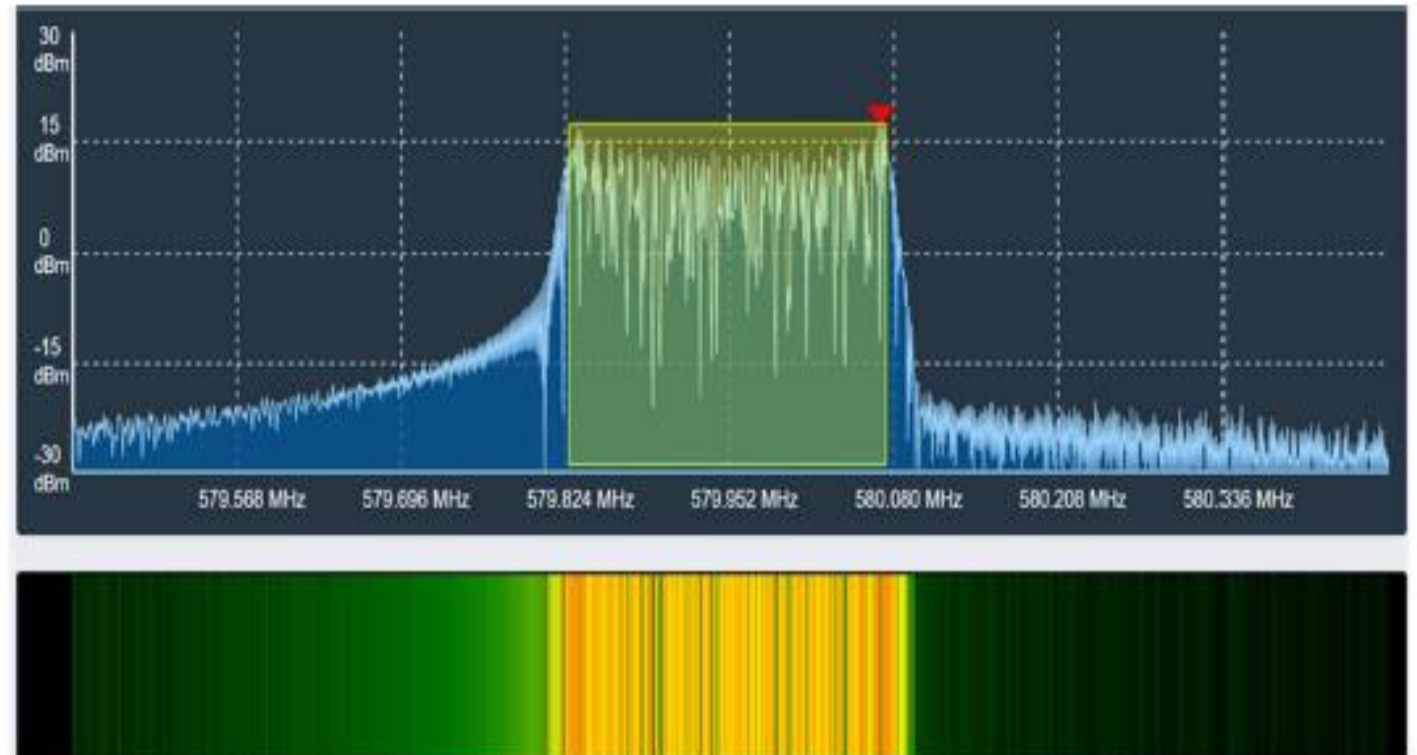
Spectrum Analysis – User Case
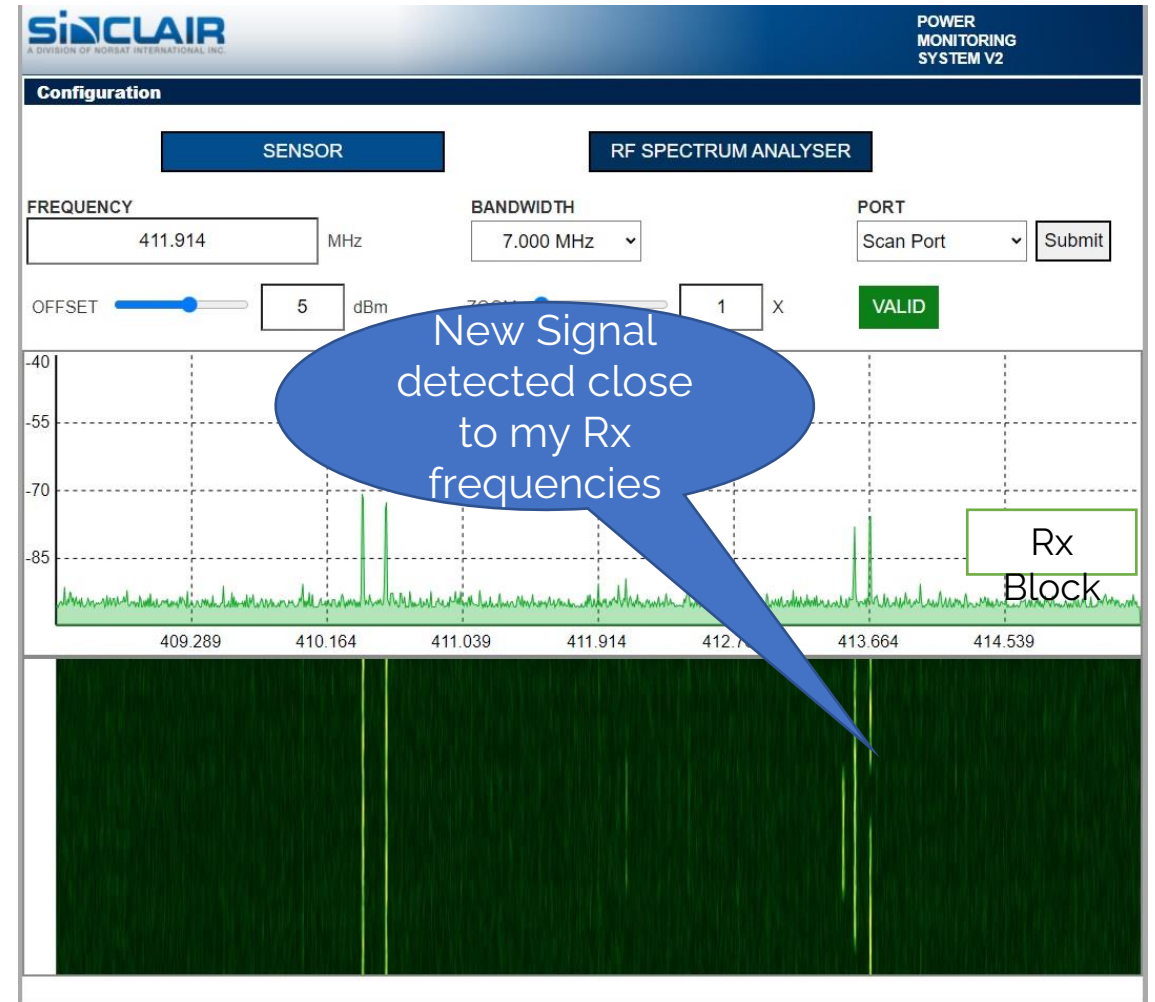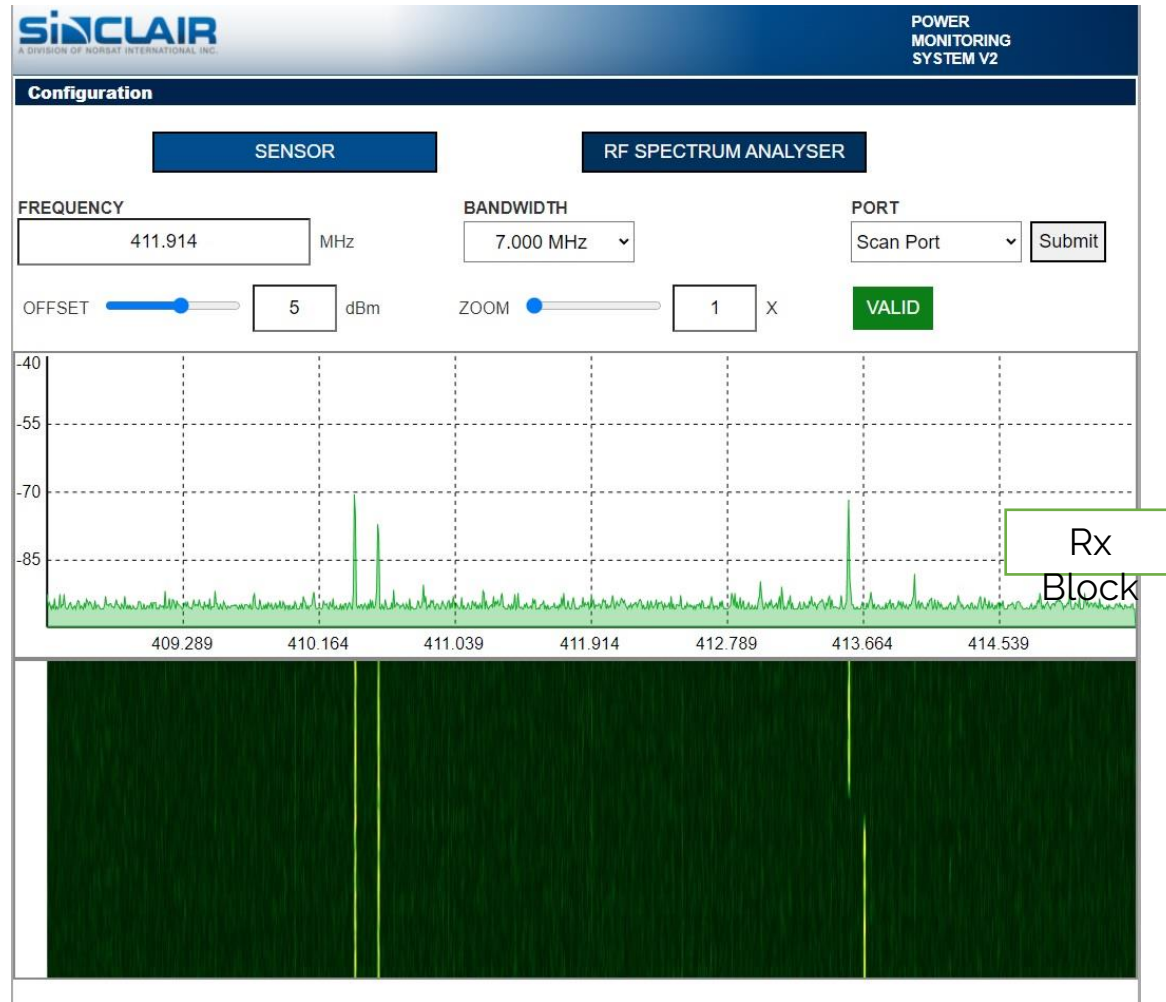
Features – Cont'd

- Spectrum Analysis *(Optional)*
  - Spectrum monitoring
  - Interference detection
  - Intelligence gathering
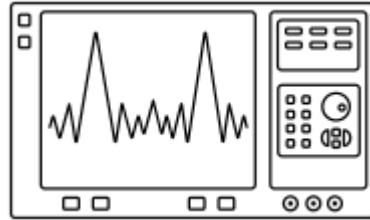
- Remote Diagnostic
  - Convenient troubleshooting
  - Digital and RF
  - In-time and remote diagnostic 24x7
  - Lower operational cost & flexibility

- Wi-Fi Access *(Roadmap)*
  - Easy access
  - Mobile friendly

- Rx Antenna Monitoring *(Roadmap)*
  - Active monitoring of "dormant" RF devices, eg Rx antennas
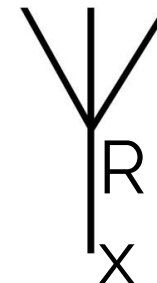
IoT Hub
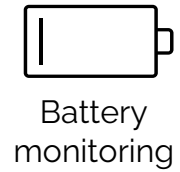
Battery monitoring
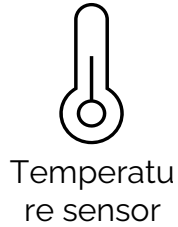
Temperature sensor

Health report
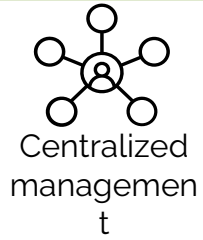
Centralized management
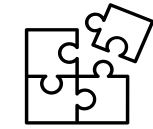
Diagnostic assistance

Humidity sensor

AI & health prediction
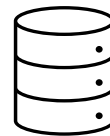
Ant motion monitoring

Intrusion detection

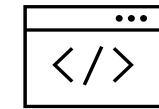Diesel level sensor

Backup link & health

ITS - the IoT Hub
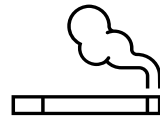
Smoke sensor

Standard-based

Power monitoring
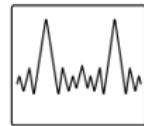
Door sensor

Spectrum Monitoring

Event log

RF power monitoring

IIoT
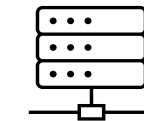
3rd party device monitoring

Flooding sensor

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Thank you for your time!

Any questions?

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