

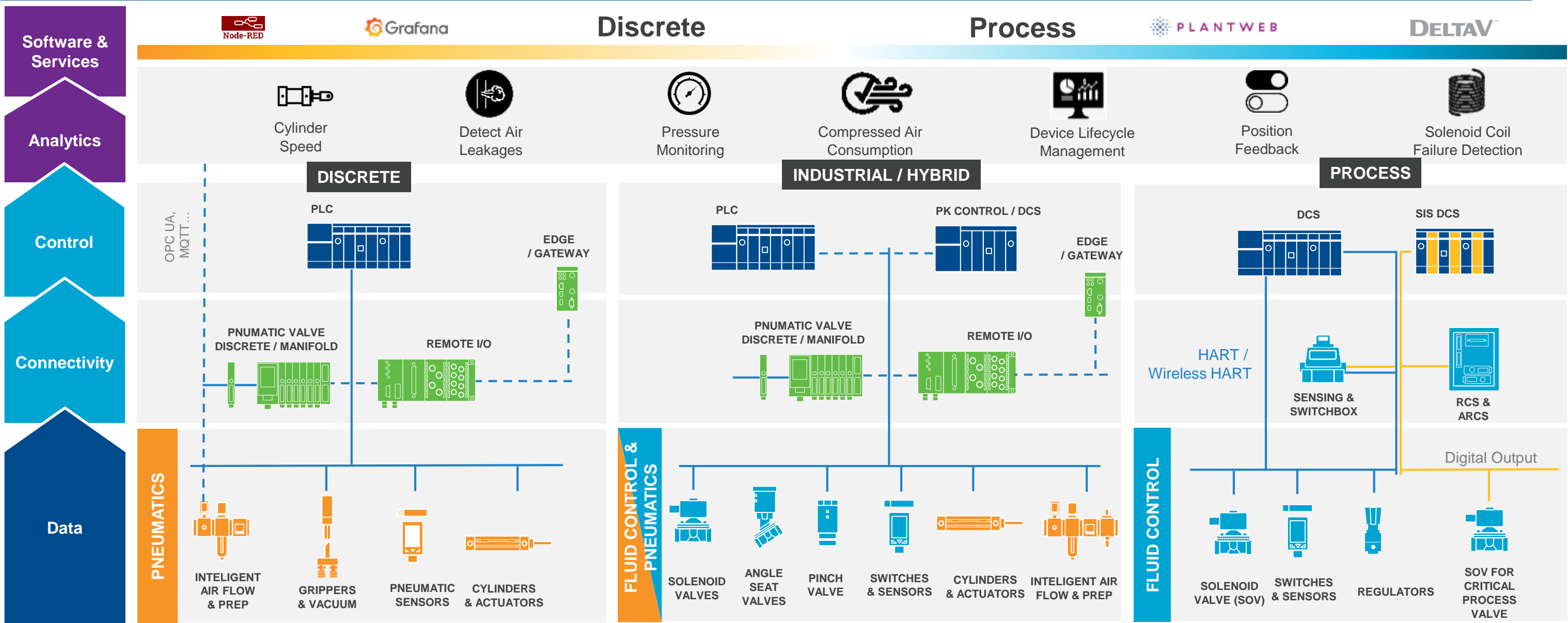
Digital Transformation

Portfolio Overview – Fluid Control & Pneumatics



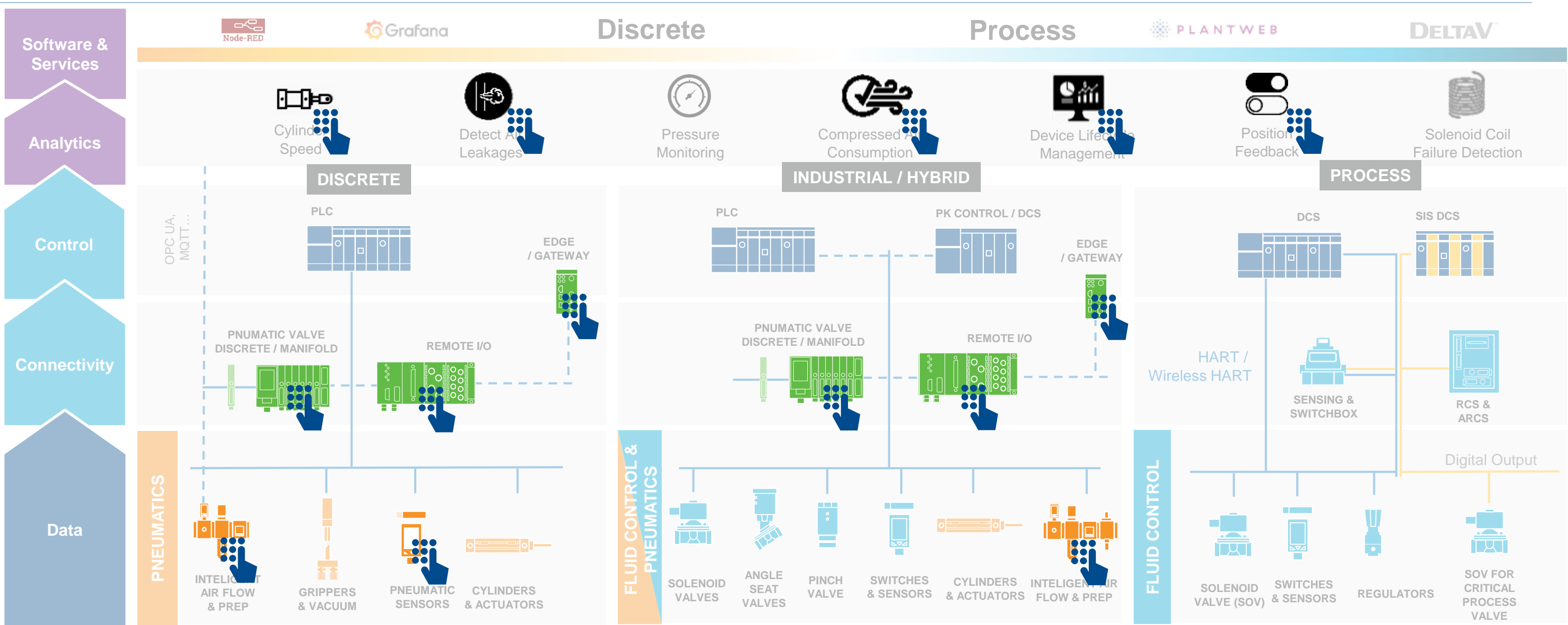
Architecture

Emerson Has the Expertise and Technology to Deliver Insightful, Value-Driven Solutions for Fluid Control and Pneumatics Applications



Delivering Actionable Insights Across Process, Hybrid and Discrete Markets

Emerson Has the Expertise and Technology to Deliver Insightful, Value-Driven Solutions for Fluid Control and Pneumatics Applications



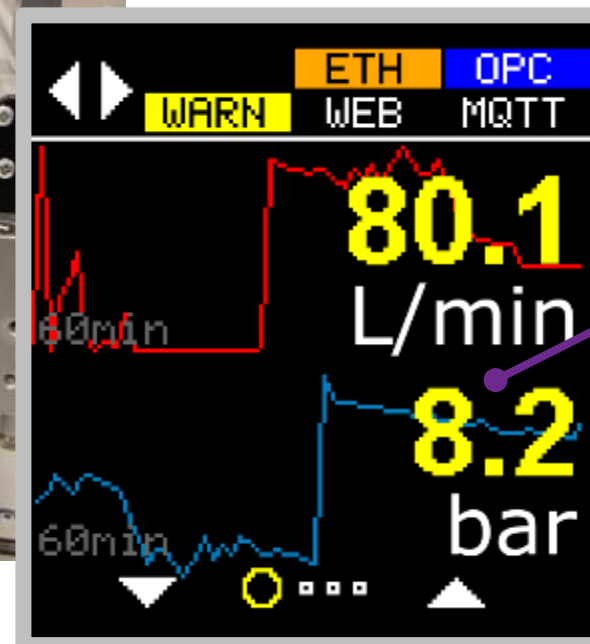
Delivering Actionable Insights Across Process, Hybrid and Discrete Markets

Hardware



AVENTICS Series AF2 Air Flow Sensor

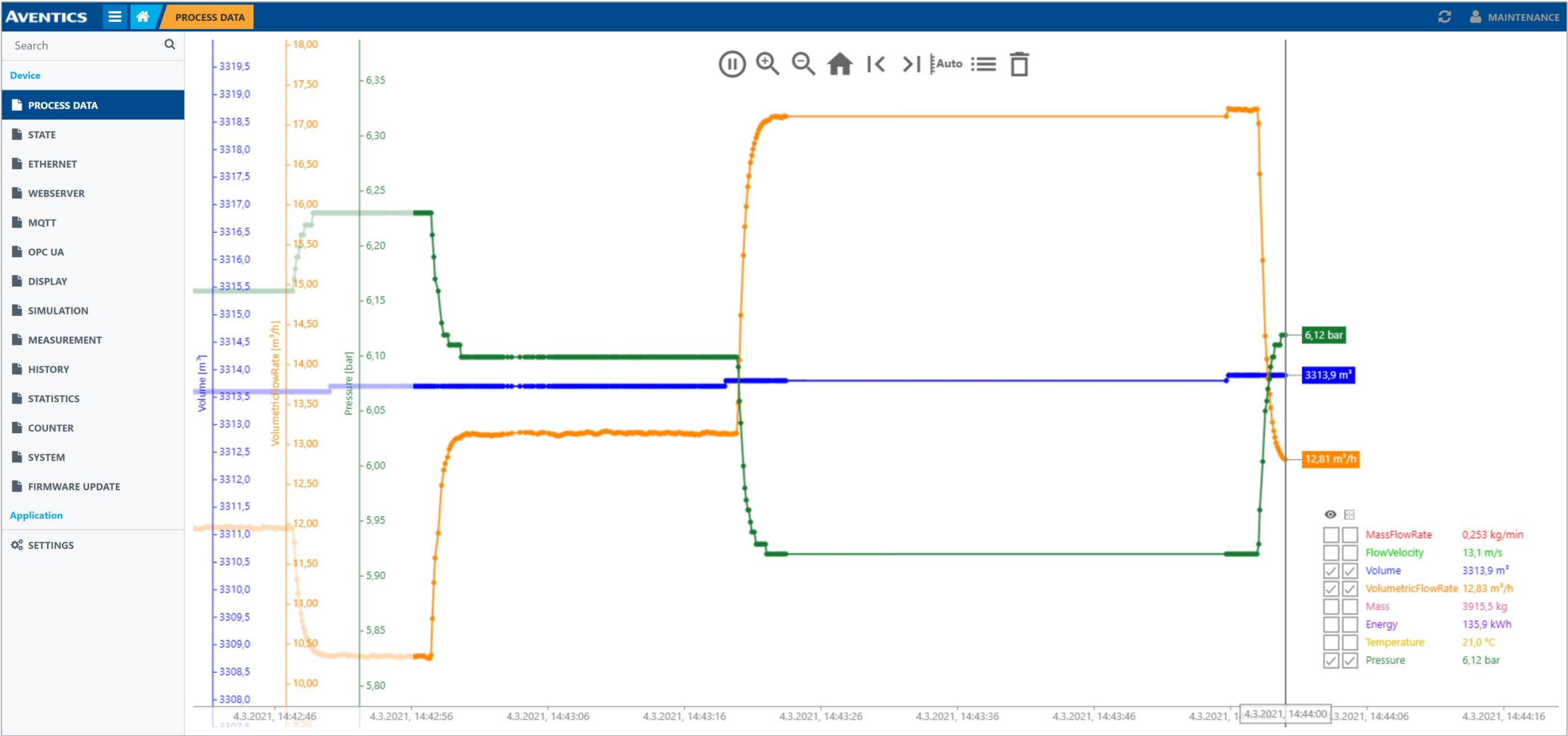
- Variants AS2 / AS3 / AS5
 - Industrial: IO-Link / Analog / Frequency / Impulse / Switch
 - Ethernet: Webserver (Dashboard) / OPC UA / MQTT
- Integrated statistics (min, max and mean)
- Integrated counter (Volume, Mass, Energy)
- Integrated logging (7d, 24h, 60min) readable via OPC UA
- OLED Display with configurable values and graphs



- Volumetric Flow Rate (L/min)
- Pressure (bar)
- Temperature (°C)
- Mass Flow Rate (kg/h)
- Flow Velocity (m/s)
- Volume (L)
- Mass (kg)
- Energy (kWh)



AVENTICS Series AF2 Air Flow Sensor Integrated Webserver Dashboard



AVENTICS Series AF2 Air Flow Sensor Stand-Alone Product Portfolio



Material No. “Stand-alone,,	Qmin (l/min)	Q extendet (l/min)	Qmax Indicator	Connection	List price (€)	Material short text
R412026834	5	1.590	3.180	Analog 4-20mA and IO-Link	796	AS2-AF2-FLX-G038
R412026835	8	2.445	4.890		832	AS3-AF2-FLX-G012
R412026836	22	6.490	12.980		946	AS5-AF2-FLX-G100
R412026837	5	1.590	3.180	Ethernet	796	AS2-AF2-ETH-G038
R412026838	8	2.445	4.890		832	AS3-AF2-ETH-G012
R412026839	22	6.490	12.980		946	AS5-AF2-ETH-G100

Composition of the material short text

AS3-AF2-ETH-G012

Design for air preparation unit
Series AS3

Series name AF2

Ethernet

Connection size 1/2 inch



AVENTICS Series AF2 Air Flow Sensor

FRL Configurator Product Portfolio



Material No. configurator	Qmin (l/min)	Q extendet (l/min)	Qmax Indicator	Connection	List price (€)	Material short text
R412027176	5	1.590	3.180	Analog 4-20mA and IO-Link	778	AS2-AF2-FLX-G038-CON
R412027177	8	2.445	4.890		811	AS3-AF2-FLX-G012-CON
R412027178	22	6.490	12.980		897	AS5-AF2-FLX-G100-CON
R412027179	5	1.590	3.180	Ethernet	778	AS2-AF2-ETH-G038-CON
R412027180	8	2.445	4.890		811	AS3-AF2-ETH-G012-CON
R412027181	22	6.490	12.980		897	AS5-AF2-ETH-G100-CON
R412027503	8	2.445	4.890	4-20mA, IO-Link	811	AS3-AF2-FLX-G012-CON-R-L



Composition of the material short text

AS3-AF2-ETH-G012

Design for air preparation unit
Series AS3

Series name AF2

Ethernet

Connection size 1/2 inch



Smart Pneumatics Monitoring

Scalable Hardware Including IIoT Software Stack







Gateway	RXi2-LP Edge
Computing Power	AMD x86, 2 Cores, 1.0GHz
RAM	4GB RAM
Storage	32GB SSD + microSD Slot
Based on Scalable Hardware Platform	✓
Dimensions (H x D x W)	193 x 130 x 42 mm 7.6 x 5.12 x 1.65 inch
DIN-Rail mount	✓
RJ45 Ethernet	2x 10/100/1000 Mbps
USB	2x USB 3.0
WIFI	✓ via separate USB Dongle
Operating temperature	-25 .. +55°C
Protection Class	IP20
Open Linux Architecture	✓
Management UI	✓
Docker support	✓
OPC UA	✓
MQTT	✓
Modbus (TCP / RTU)	✓ direct / ✓ via separate USB Dongle





Smart Pneumatics Monitoring

PACEdge 2.0 IIoT Software Stack

Connectivity	 IIoT Data Exchange	 IIoT Data Exchange	 MQTT Broker (Server)
Visualization	 Dashboard Solution		
Database	 Time Series Database	 MySQL Database	
Data Aggregation	 Aggregation Solution	 Machine Learning	
Operating System	 Operating System	 App Management	 Web Configuration

The IIoT Stack is based on Open Source Software Tools



SPA Panel

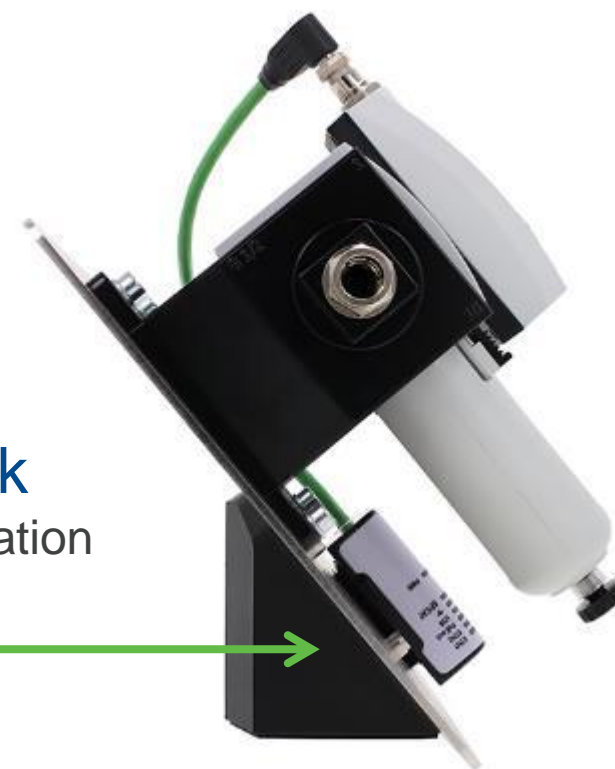


**AF2 AS3
Ethernet
Variant**

**WIFI Router
with Power
over Ethernet**

This is not a filter, it's the
calming route of the AF2

Foundation Block
(for customer presentation
purposes)



SPA Panel AS3



- **AF2 Showcase and measurement tool**
- Including AF2 PC Dashboard Software – click [here](#)

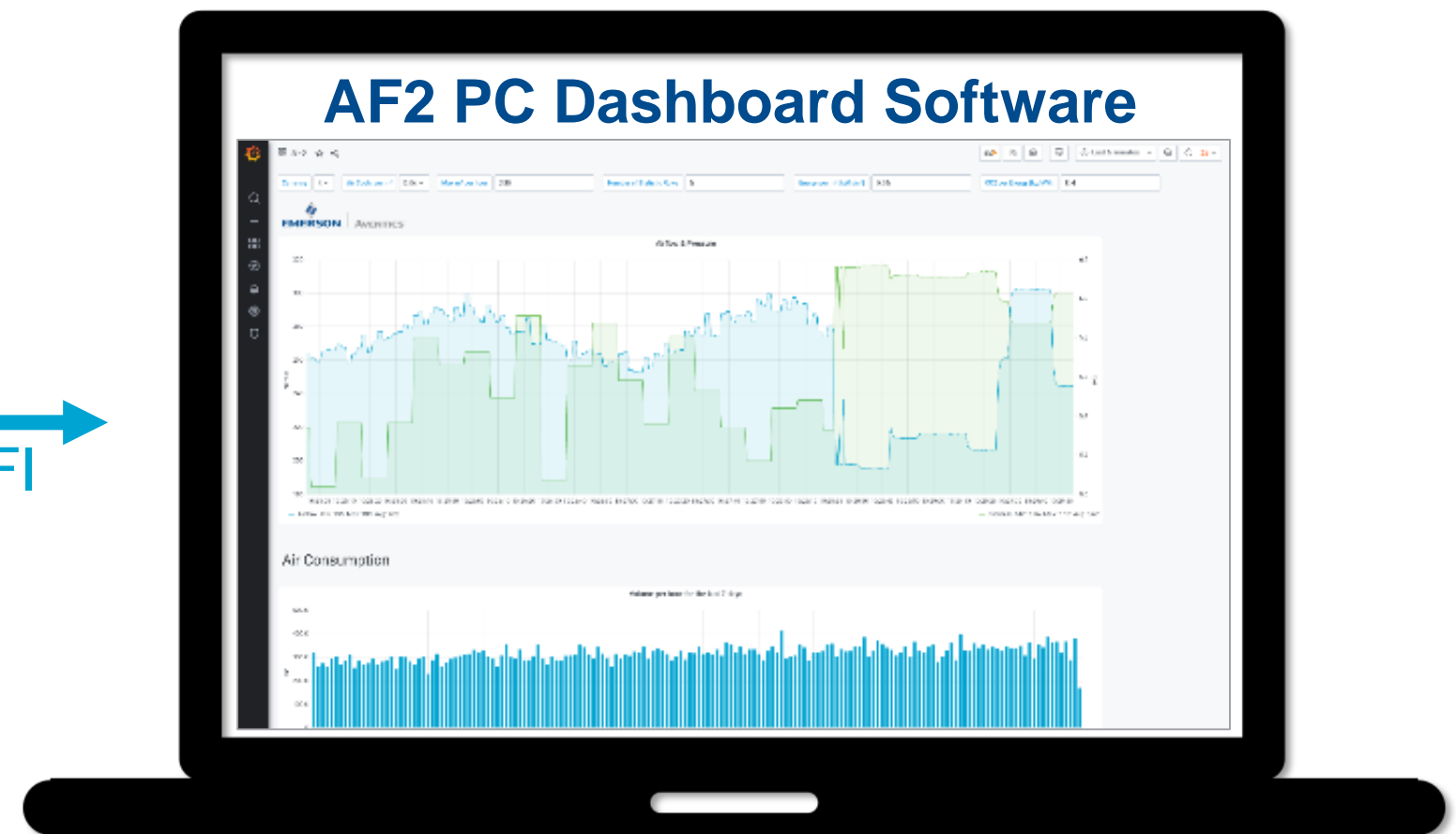
SPA Panel

Including AF2 PC Dashboard Software

- The SPA Panel comes with AF2 PC Dashboard Standalone Software
- Copy the Software from the USB flash drive on a Windows computer
- Connect your computer to the SPA Panel via Ethernet or WIFI and run the software
- Historical data will be stored on the device that executes the software



Ethernet / WIFI



SPA 2.0 AS3



- **IIoT Showcase and measurement tool**
- Including FRL with integrated AF2 and RXi2-LP Edge Gateway

SPA 2.0

Including RXi2 Edge Gateway Dashboard (PACEdge)

- The SPA 2.0 comes with a preinstalled Dashboard at the RXi2 Edge Gateway leveraging PACEdge
- Connect your computer to the SPA 2.0 via Ethernet or WIFI, open your Internet Browser and enter the IP of the SPA
- Historical data will be stored at the RXi2



Ethernet / WIFI

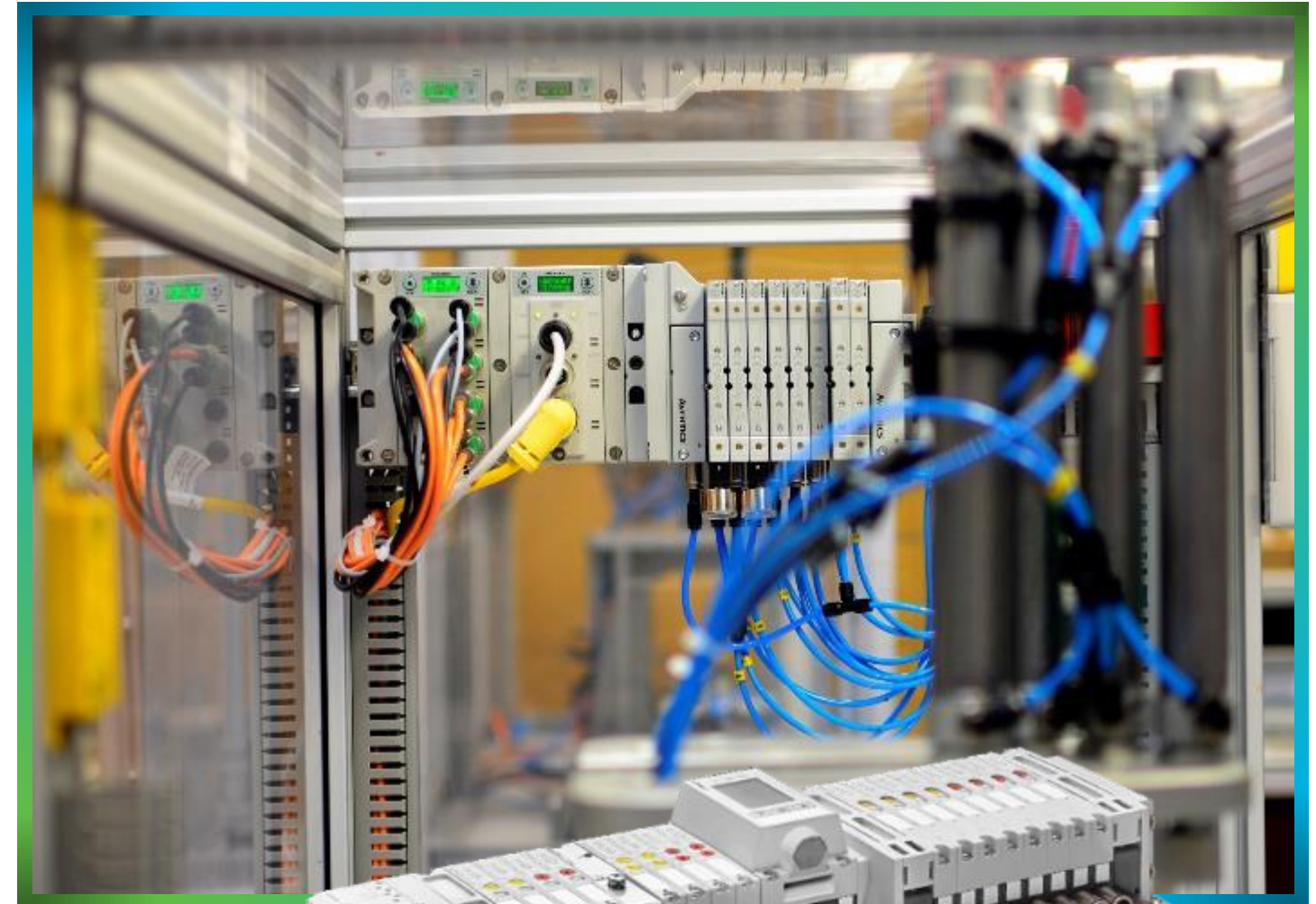


Valve Systems

- Large variety of signals processed:
 - Analog and digital input/output modules
 - Analog combination modules
 - Control modules
 - Pressure measurement modules
- All relevant fieldbus protocols
- Consistent communication up to the valve
- Integrated web server
- Modular design
- Integrated graphic display providing plain-language diagnostics
- System can pre analyze data and can be used as data source. Connect with RXi2 Edge Gateway for further insights and analytics
- To get part number and list price, use the configurator:



- [500 valve system with G3 Fieldbus](#)
- [AV Valve System with AES Fieldbus](#)





Sensors



AVENTICS PE5 Pressure Sensor

- Measurement ranges for relative pressure (vacuum and overpressure)
- Large display for system pressure, switching states, and set switching points
- IIoT data source for pressure analytics



[Select your PE5 Pressure Sensor](#)



AVENTICS SM6 Distance Sensor

- Measurement range setting from 107 to 1007 mm via teach-in button
- LED function indicator
- High precision: resolution 0.06 mm, scanning rate 1.15 ms
- IIoT data source for cylinder movement analysis



[Select your SM6 Distance Sensor](#)



AVENTICS ST4-2P End-Position Sensor

- Mounting from above in the slot ("drop-in")
- LED function indicator
- Shock and vibration-resistant
- IIoT data source for shock absorber damping time and cylinder mileage



[Select your ST4-2P End-Position Sensor](#)

Software



Cylinder Cycle Time

- Content: Node-RED + Grafana Import without Customer specific configuration
 - Cylinder Cycle Timetable
 - Min- and Max-Thresholds could be defined for each cylinder
 - Mean and Status are calculated with respect to the current measured time and the Thresholds
 - Color indicator

Cylinder Monitoring - Cycle Time Table					
Name ▲	Min	Max	Mean	Current	Status
Cylinder 1	50 ms	950 ms	499 ms	718 ms	
Cylinder 2	60 ms	940 ms	508 ms	933 ms	
Cylinder 3	70 ms	930 ms	497 ms	18 ms	
Cylinder 4	80 ms	920 ms	497 ms	275 ms	
Cylinder 5	90 ms	910 ms	494 ms	754 ms	



Valve Cycle Counter

- Content: Node-RED + Grafana Import without Customer specific configuration
 - Cycle Counter Table
 - Max-Thresholds could be defined
 - Percentage and Status are calculated with respect to the current measured time and the Thresholds
 - Color indicator

Valve Monitoring - Cycle Counter Table				
Name ▲	Lifetime	Percentage	Current	Status
Valve 1	75.000.000	67 %	50.001.682	
Valve 2	75.000.000	86 %	64.321.405	
Valve 3	75.000.000	95 %	71.432.407	
Valve 4	75.000.000	99 %	74.001.611	
Valve 5	75.000.000	101 %	76.000.537	



Air Consumption Long Term (Airflow as Source)

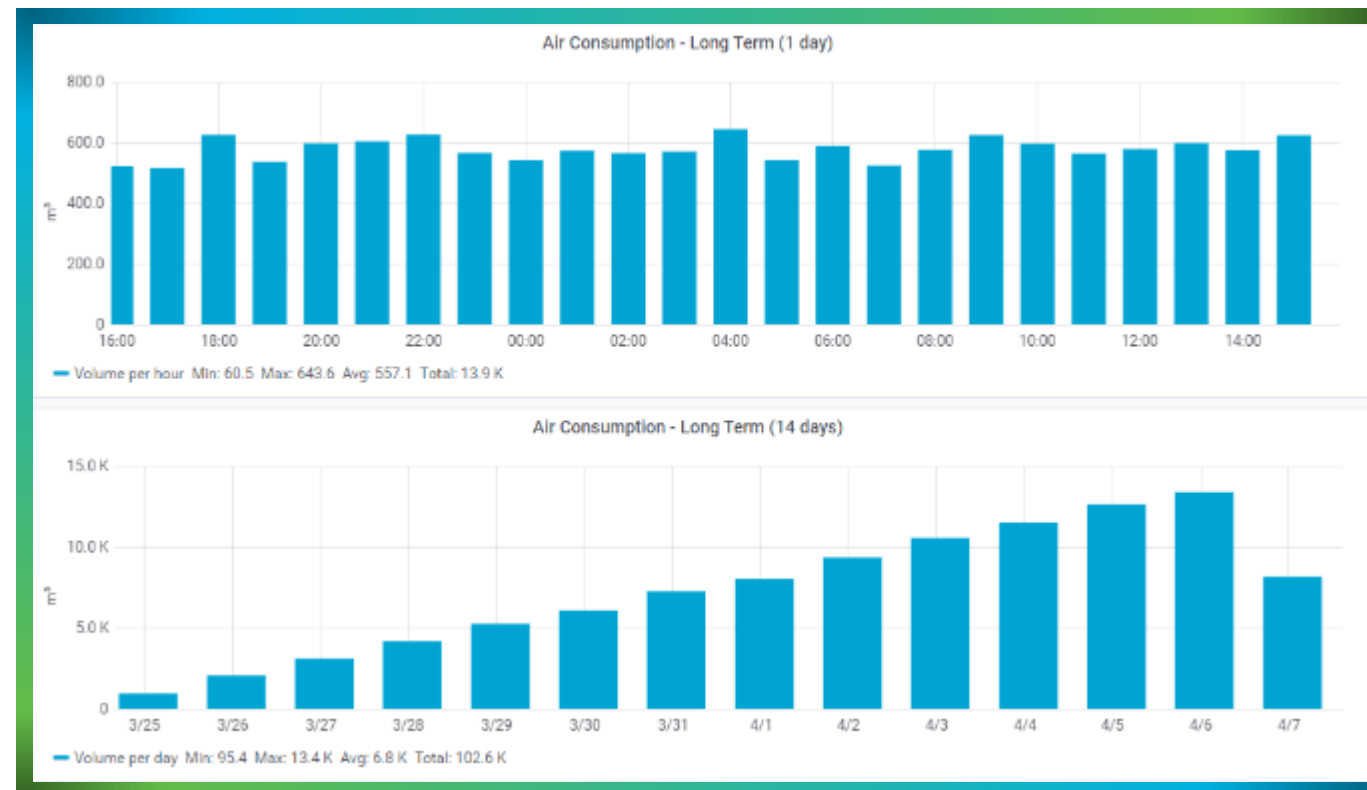
- Content: Node-RED + Grafana Import without Customer specific configuration
 - Long Term monitoring for 1 day or 14 days as a bar charts
 - Usage of Airflow as a Data Source
 - Statistical overview shows the min, max, average and Total Volume





Air Consumption Long Term (Volume as Source)

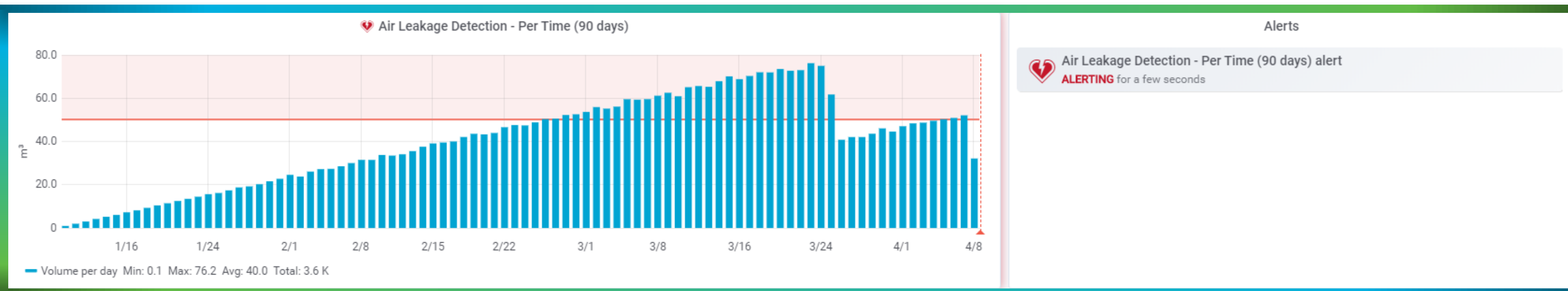
- Content: Node-RED + Grafana Import without Customer specific configuration
 - Long Term monitoring for 1 day or 14 days as a bar charts
 - Usage of Volume of Air as a Data Source
 - Statistical overview shows the min, max, average and Total Volume





Air Leakage Detection per Time (Airflow as Source)

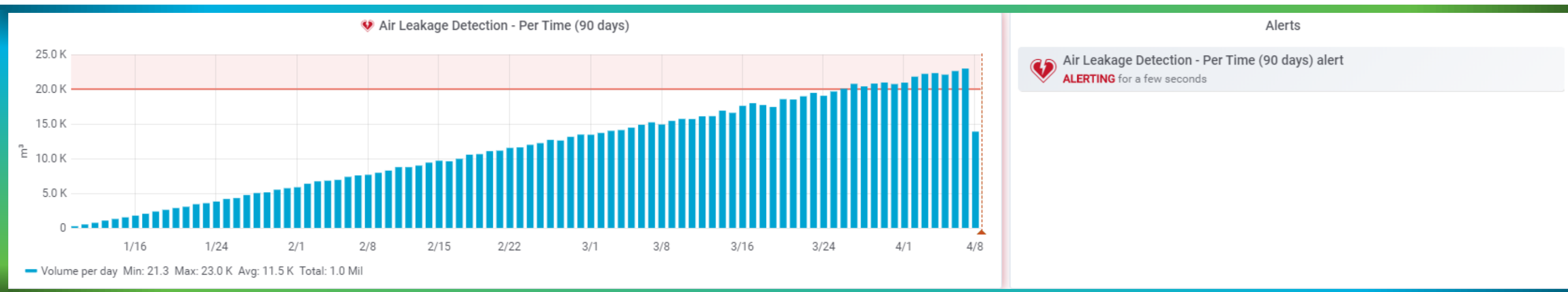
- Content: Node-RED + Grafana Import without Customer specific configuration
 - Leakage Detection Per Time for 90 days as a bar chart
 - Usage of Airflow as a Data Source
 - Max Volume per day could be set
 - Alert will be visible in the Alert list





Air Leakage Detection per Time (Volume as Source)

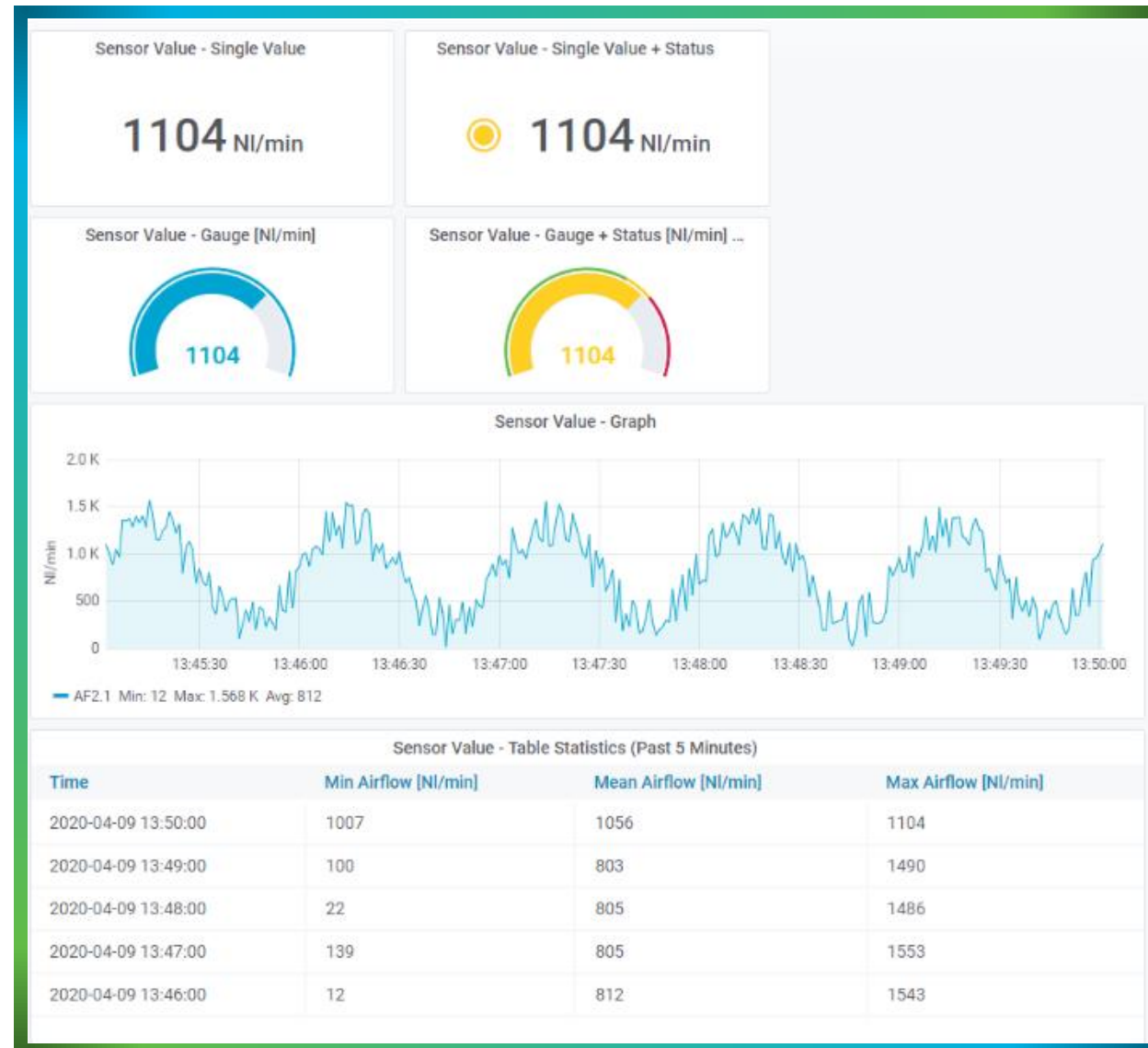
- Content: Node-RED + Grafana Import without Customer specific configuration
 - Leakage Detection Per Time for 90 days as a bar chart
 - Usage of Volume of Air as a Data Source
 - Max Volume per day could be set
 - Alert will be visible in the Alert list





Sensor Value

- Content: Node-RED + Grafana Import without Customer specific configuration
 - Text & Text with Color Indicator
 - Gauge & Gauge with Color Indicator
 - Line chart
 - Sensor Statistic



AF2 PC Dashboard

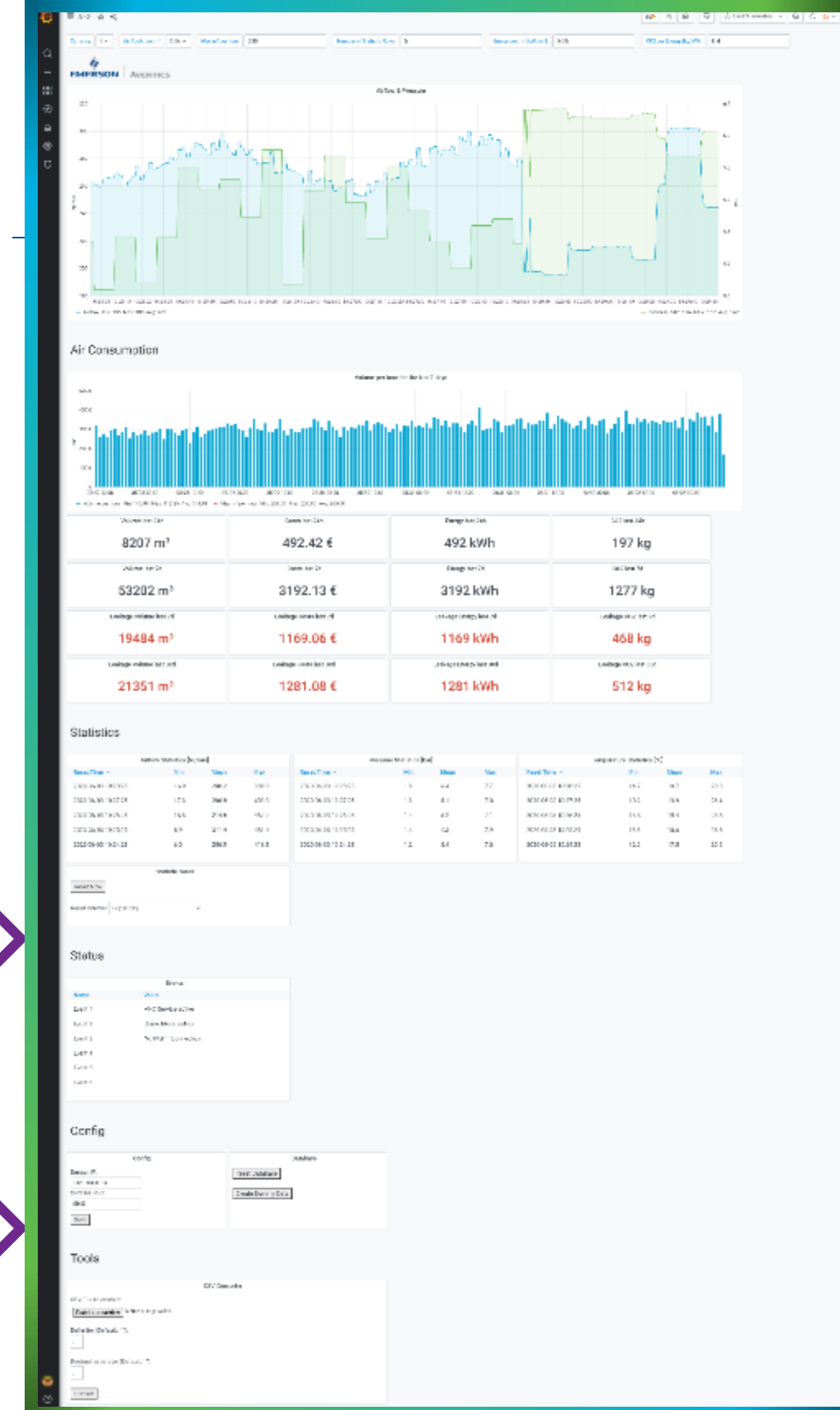
- Content: Windows x64 Standalone Software
 - This Software could be used in combination with the SPA Panel and also with an AF2 Ethernet Airflow Sensor
 - Airflow and Pressure Charts
 - Air Consumption incl. Price
 - Leakage incl. Monitorization
 - CO2 Measurement
 - Sensor Statistics
 - AF2 Status of Warnings and Errors
 - CSV Export
 - Dummy Data creation
- Execute the software on a Windows computer and connect one AF2 Airflow Sensor or SPA Panel via Ethernet to the Software



AF2



SPA Panel



Services

WHY EMERSON

Our Expertise

Emerson offers access to experts, knowledge and tools **to help you realize your IIoT and Industry 4.0 needs**

Schedule a **Digital Transformation Introductory Session** to learn how to reduce machinery downtime, increase equipment reliability, enhance safety, make energy efficiency savings and improve production efficiency.

[Sign Up](#)



**Control,
Pneumatics and
IIoT platforms**



**Education
and Training**



**Services and
Integration**



EMERSON™

Digital Transformation

Let Us Guide You in Your
Journey