PORTAINER.iO

CASE STUDY

UTILIZING SOFTING SMARTLINK SW-HT WITH PORTAINER EDGE FOR SECURE HART DEVICE ACCESS

Keep OT stable. Add capability at the edge.
Manage centrally without exposing the plant.

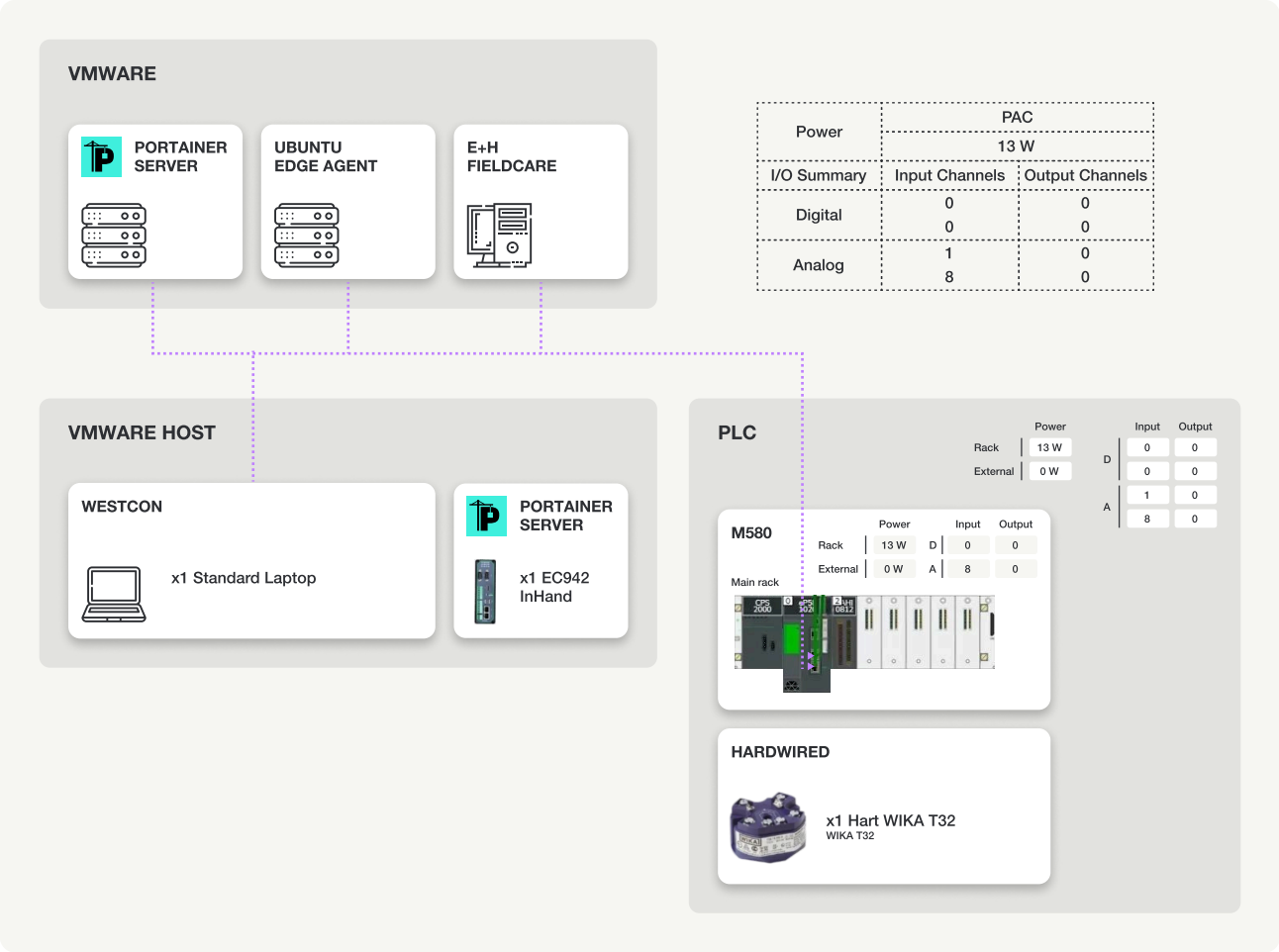
Feb 26

This technical demonstration outlines an architecture utilized by Portainer and partner, Westcon, to showcase a use case for a shared customer. It leverages Portainer Edge features and Softing smartLink SW-HT in a lab environment to securely access data from HART devices without modifying existing OT infrastructure.

The solution enables engineering software such as Control Expert and PACTware to connect to HART devices through a software-defined access layer. This supports installation & commissioning of new or replacement equipment, and enables access to existing HART devices for integration with one of the many supported field device management and equipment lifecycle solutions.

While demonstrated in a controlled environment, the architecture reflects real industrial constraints and is designed to be repeatable across production sites.

Architecture Overview



Power	PAC	
	13 W	
I/O Summary	Input Channels	Output Channels
Digital	0 0	0 0
Analog	1 8	0 0

The system consists of two virtual machines running on a single laptop to simulate a typical production scenario in which edge workloads are managed centrally but operate within site boundaries.

- VM1: Hosts the Portainer server, providing centralized management and visibility.
- VM2: Acts as a Portainer Edge Agent node simulating an edge device, running the Softing smartLink SW-HT container

Physical OT Components:

- Schneider Electric PLC M580
- Schneider HART module AHI0812
- WIKA Temperature transmitter with potentiometer wired in for signal simulation

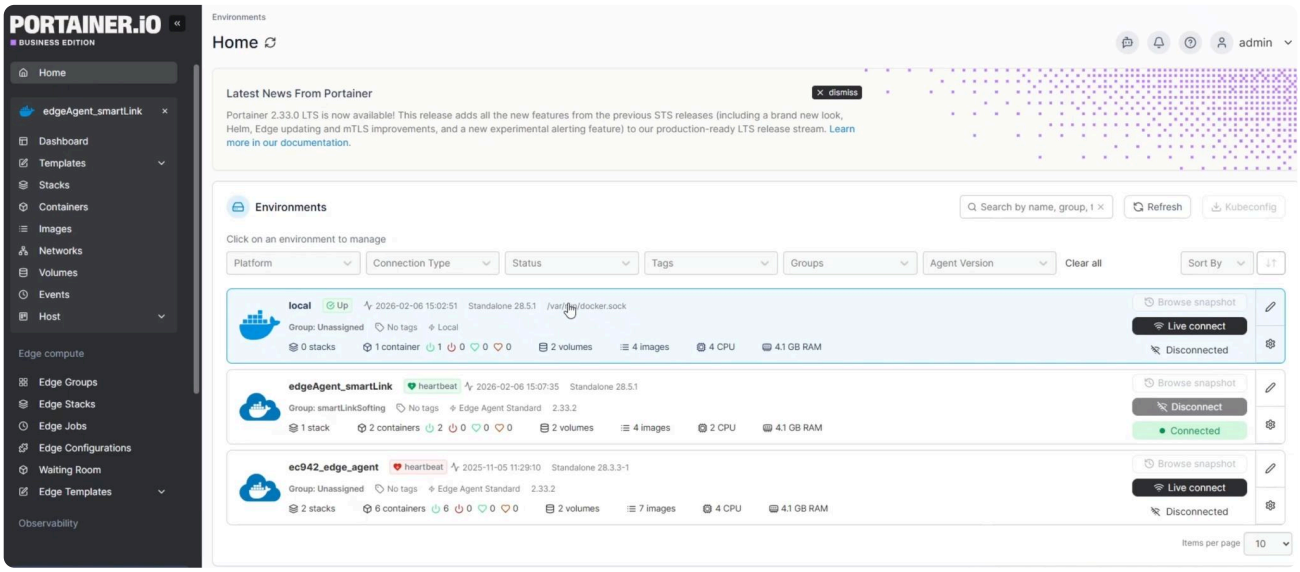
The HART devices remain connected via the existing PLC and module infrastructure. No additional gateway hardware or protocol converters are introduced.

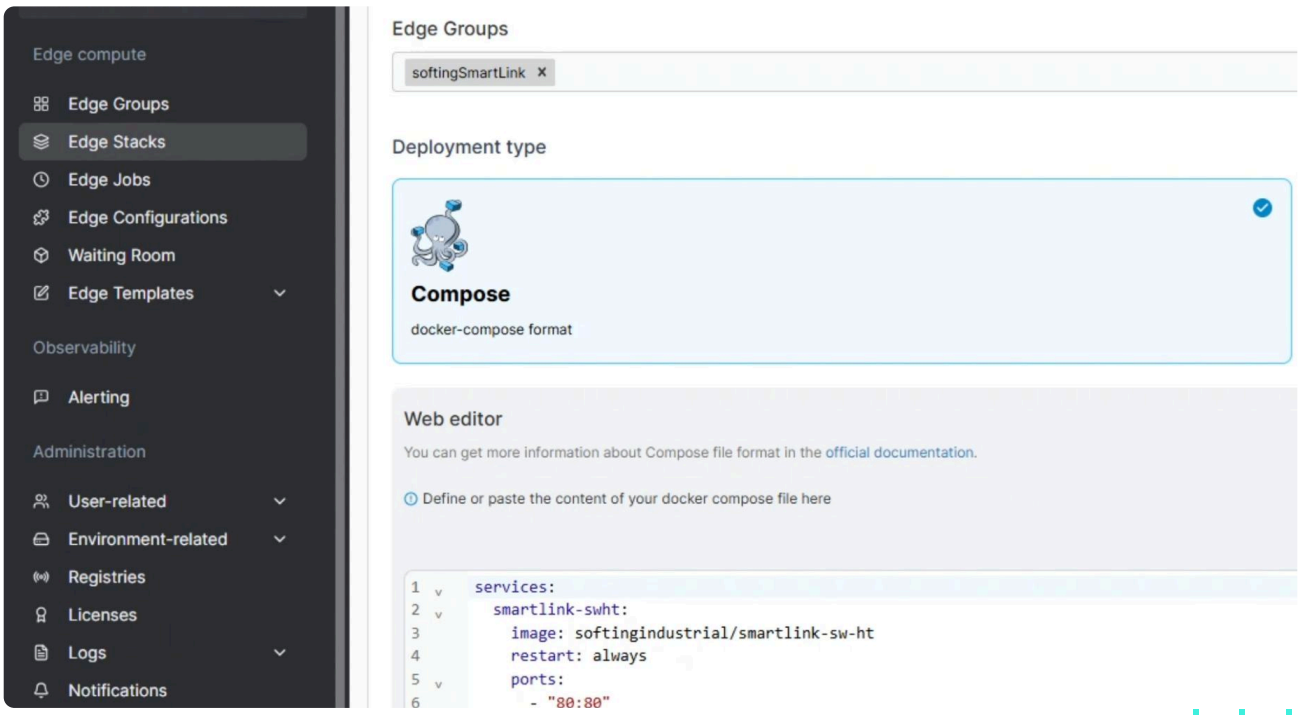
Deployment Process

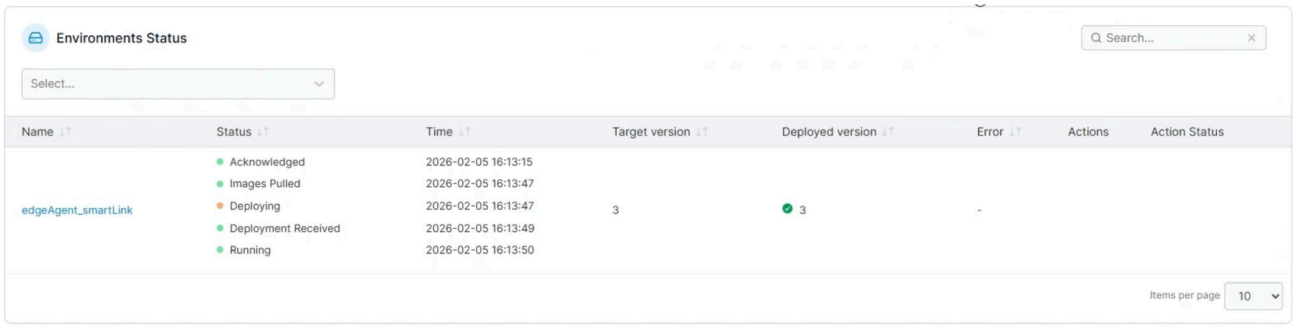
The Softing smartLink SW-HT container is deployed as a Portainer Edge stack onto the edge agent (VM2).

Portainer Edge initiates an outbound tunnel from the edge node to the Portainer Server. This eliminates the need for inbound firewall changes or exposing the edge device to external networks.

The container operates within a lightweight, web-configurable runtime environment and can be deployed on a variety of edge compute platforms, including industrial PCs or virtual machines within plant environments.








```yaml
services:
  smartlink-swht:
    image: softingindustrial/smartlink-sw-ht
    restart: always
    ports:
      - "80:80"
      - "443:443"
      - "5094:5094"
      - "49152:49152/udp"
      - "49154:49154/udp"
    environment:
      - TZ="UTC"
    volumes:
      - smartLinkSWHT:/var/lib/smartLinkSW-HT

volumes:
  smartLinkSWHT:
```

HART communication workflow

smartLink SW-HT communicates directly with the HART module connected to the PLC using the existing industrial network infrastructure.

Key characteristics of the communication path:

- Standard HART-IP protocol
- Transparent forwarding of all HART commands
- Full bidirectional communication
- No modification of command sets

Engineering tools such as Control Expert or PACTware connect to the smartLink instance as if it were a traditional HART gateway. This preserves compatibility with established commissioning and diagnostic workflows while enabling remote access through a software-defined model

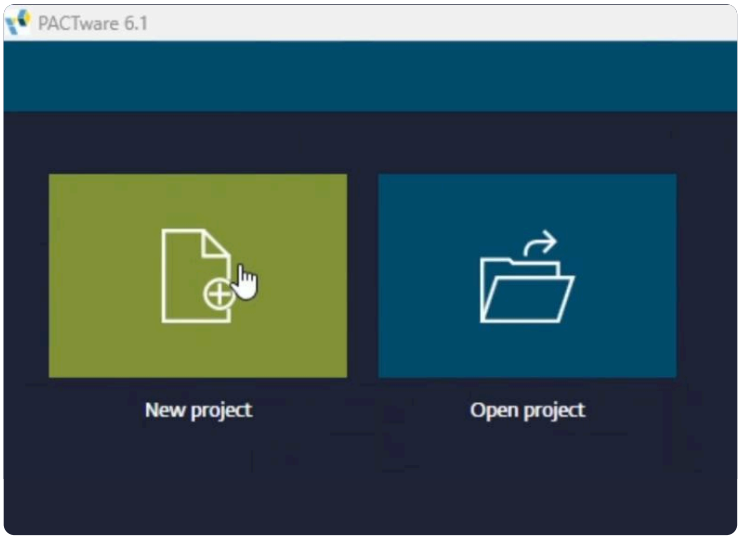


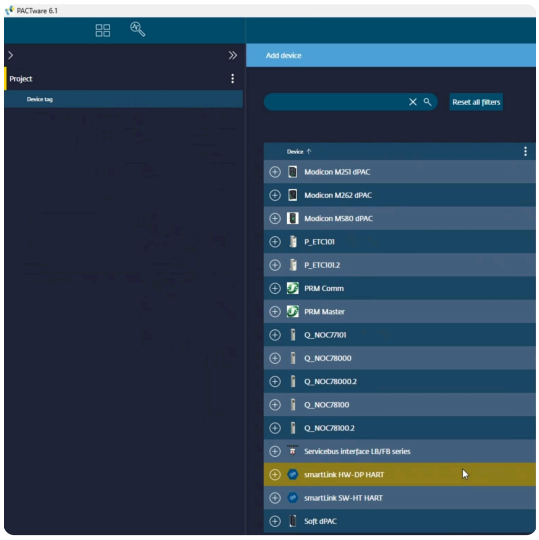


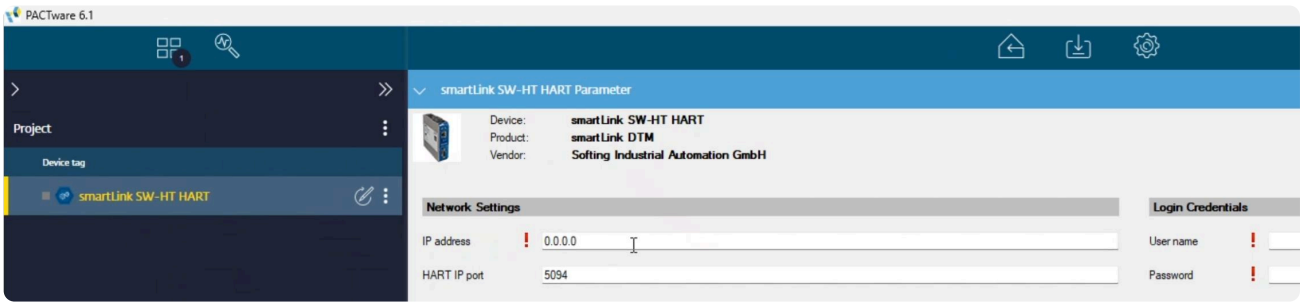
Device Integration Process

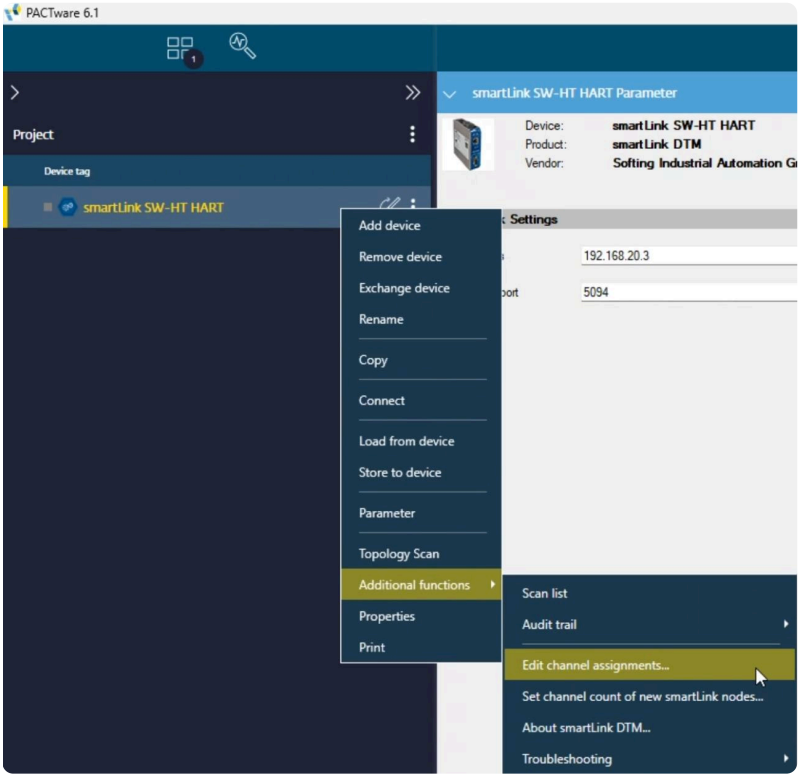
Device integration follows standard engineering practice:

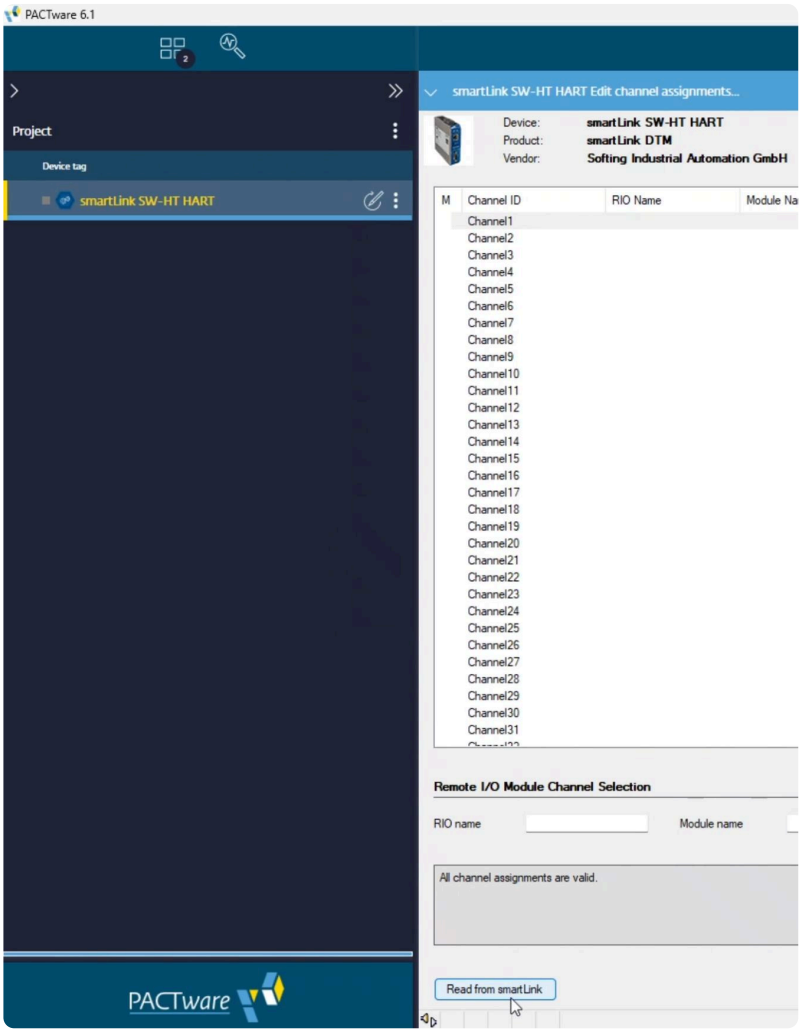
- Configure the smartLink SW-HT container with the IP address of the HART module (e.g., AHI0812) on the PLC network.
- Initiate a HART scan via the device management interface. The system automatically detects and enumerates all accessible HART devices downstream of the configured module.
- Use FDT-compliant tools such as PACTware to establish communication with the smartLink SW-HT instance.
- In PACTware, create a new project and configure device discovery by specifying the smartLink's IP address.
- Perform a topology scan to locate devices; the WIKA transmitter is identified through automatic HART device enumeration.
- Establish real-time data connections for monitoring sensor readings and diagnostic information.

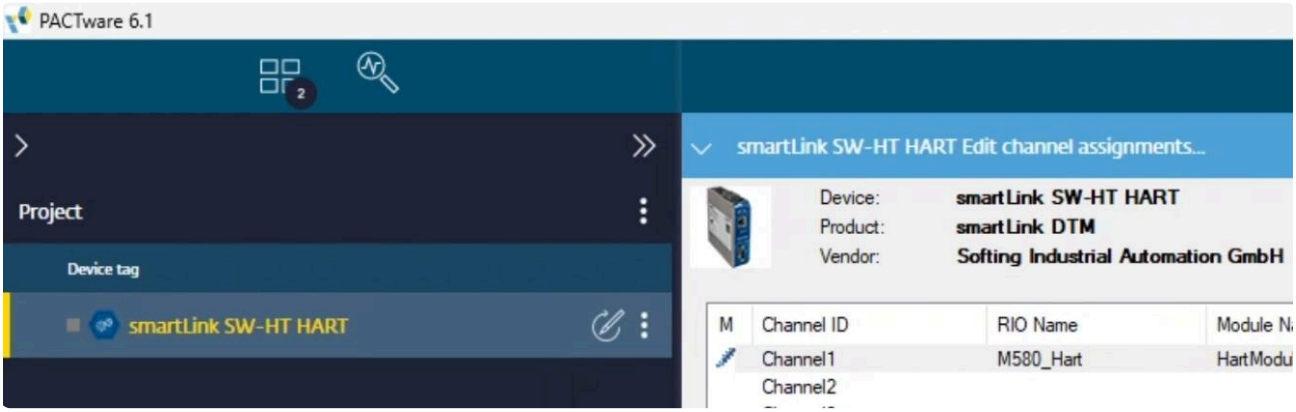


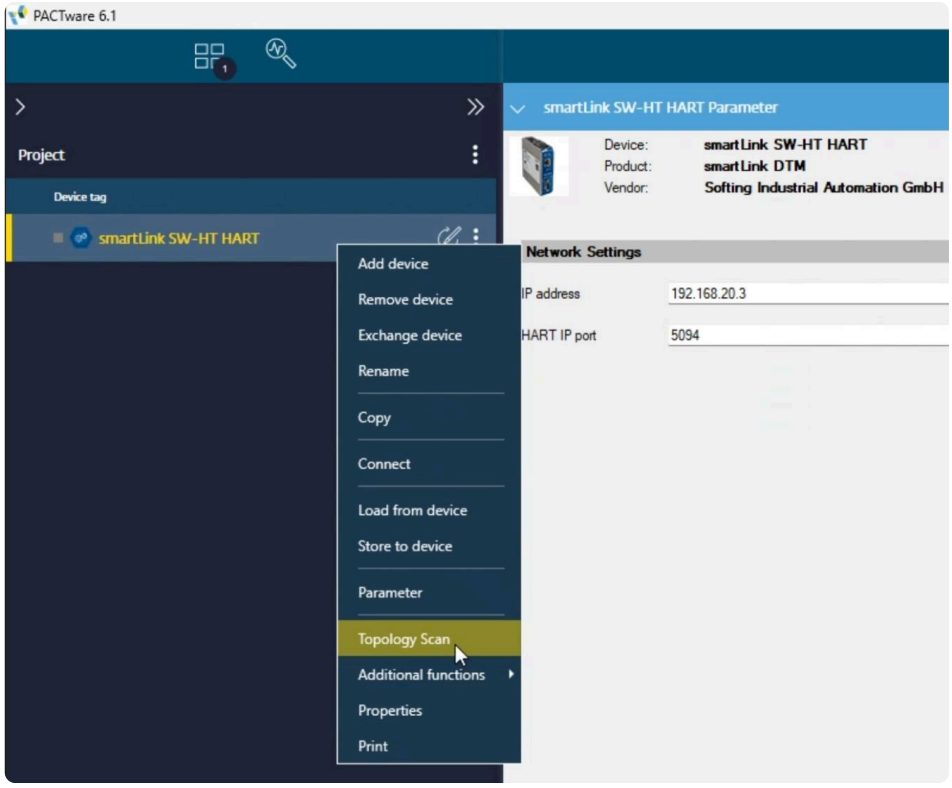


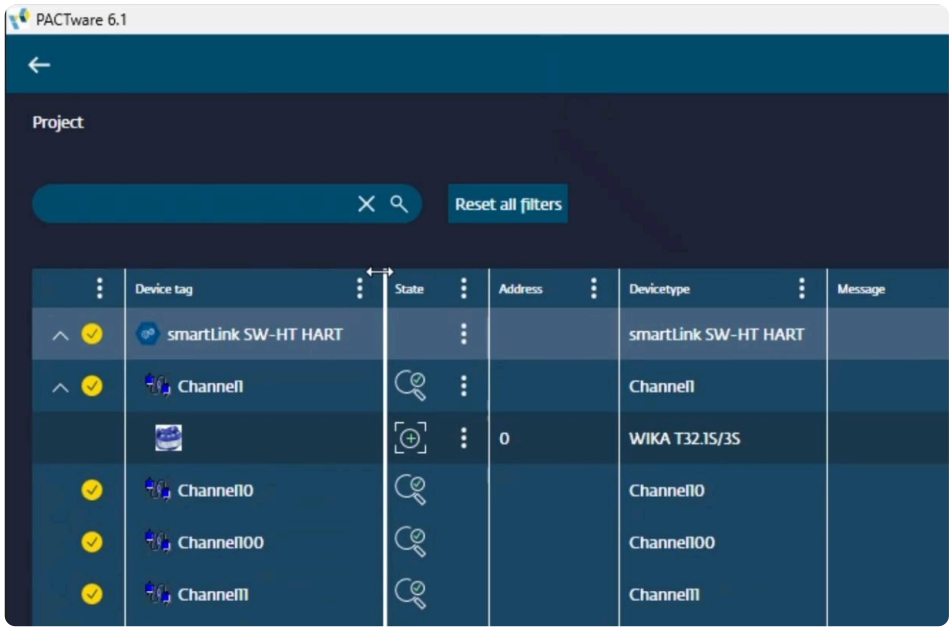


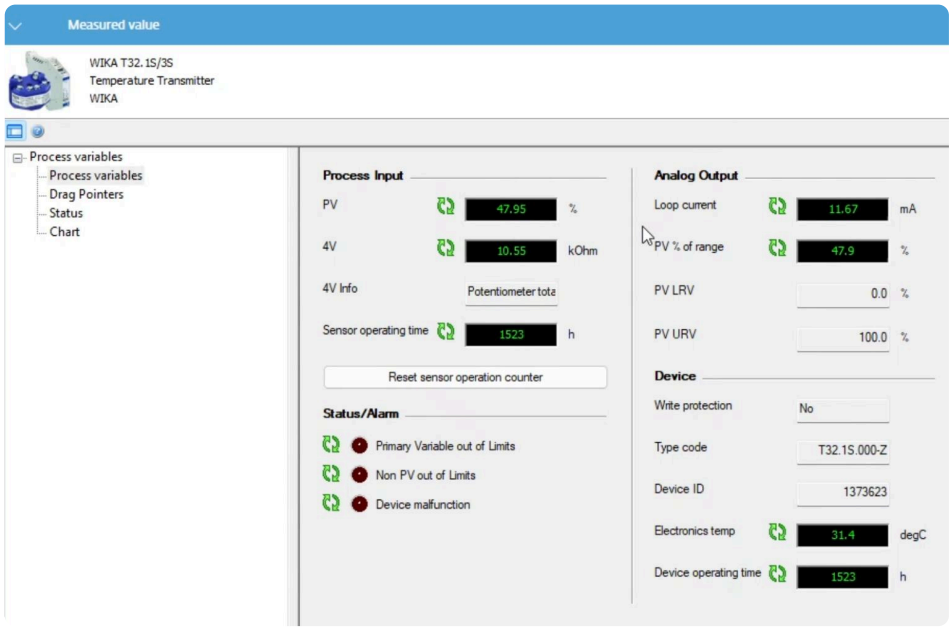

PACTware 6.1
Project
Device tag
smartLink SW-HT HART
smartLink SW-HT HART Parameter
Device: smartLink SW-HT HART
Product: smartLink DTM
Vendor: Softing Industrial Automation G
Settings
192.168.20.3
5094
Add device
Remove device
Exchange device
Rename
Copy
Connect
Load from device
Store to device
Parameter
Topology Scan
Additional functions
Properties
Print
Scan list
Audit trail
Edit channel assignments...
Set channel count of new smartLink nodes...
About smartLink DTM...
Troubleshooting


PACTware 6.1
Project
Device tag
smartLink SW-HT HART
smartLink SW-HT HART Edit channel assignments...
Device: smartLink SW-HT HART
Product: smartLink DTM
Vendor: Softing Industrial Automation GmbH
M
Channel ID
RIO Name
Module Na
Channel1
Channel2
Channel3
Channel4
Channel5
Channel6
Channel7
Channel8
Channel9
Channel10
Channel11
Channel12
Channel13
Channel14
Channel15
Channel16
Channel17
Channel18
Channel19
Channel20
Channel21
Channel22
Channel23
Channel24
Channel25
Channel26
Channel27
Channel28
Channel29
Channel30
Channel31
Remote I/O Module Channel Selection
RIO name
Module name
All channel assignments are valid.
Read from smartLink
PACTware


PACTware 6.1
Project
Device tag
smartLink SW-HT HART
smartLink SW-HT HART Edit channel assignments...
Device: smartLink SW-HT HART
Product: smartLink DTM
Vendor: Softing Industrial Automation GmbH
M
Channel ID
RIO Name
Channel1
M580_Hart
Channel2


PACTware 6.1
Project
Device tag
smartLink SW-HT HART
smartLink SW-HT HART Parameter
Device: smartLink SW-HT HART
Product: smartLink DTM
Vendor: Softing Industrial Automation GmbH
Network Settings
IP address
192.168.20.3
HART IP port
5094
Add device
Remove device
Exchange device
Rename
Copy
Connect
Load from device
Store to device
Parameter
Topology Scan
Additional functions
Properties
Print


PACTware 6.1
Project
Reset all filters
Device tag
State
Address
Devicetype
Message
smartLink SW-HT HART
smartLink SW-HT HART
Channel1
Channel1
0
WIKA T32.1S/3S
Channel10
Channel10
Channel100
Channel100
Channel11
Channel11


Measured value
WIKA T32.1S/3S
Temperature Transmitter
WIKA
Process variables
Process variables
Drag Pointers
Status
Chart
Process Input
PV
47.95
%
4V
10.55
kOhm
4V Info
Potentiometer tota
Sensor operating time
1523
h
Reset sensor operation counter
Status/Alarm
Primary Variable out of Limits
Non PV out of Limits
Device malfunction
Analog Output
Loop current
11.67
mA
PV % of range
47.9
%
PV LRV
0.0
%
PV URV
100.0
%
Device
Write protection
No
Type code
T32.1S.000-Z
Device ID
1373623
Electronics temp
31.4
degC
Device operating time
1523
h

Technical Advantages

- Hardware-agnostic access: Utilizes existing industrial network infrastructure without requiring dedicated HART multiplexers or gateways.
- Protocol transparency: Full bidirectional communication using the standard HART-IP protocol ensures compatibility with any compliant engineering or field device management tool.
- Seamless integration: Support for FDT Communication DTM enables integration with lifecycle management and field device management solutions already deployed in industrial environments.
- Secure edge deployment: Agent-initiated outbound connectivity aligns with zero-trust principles while respecting OT isolation requirements.
- Scalable licensing model: smartLink SW-HT licensing scales based on device count with no hardware cost implications; licenses are determined by the number of connected HART devices, enabling cost alignment with operational growth.

Because the solution is containerized and centrally managed, once implemented in one plant it can be replicated across multiple sites without modifying PLCs, HART modules, or field devices.

Portainer enables standardized stack deployment, version control, and governance across distributed edge nodes. This supports consistent rollout across facilities while maintaining site-level isolation.

CONCLUSION

This demonstration shows how secure access to HART devices can be achieved using a software-defined architecture layered onto existing OT infrastructure. By combining Portainer Edge for application deployment and lifecycle management with Softing smartLink SW-HT for standards-based HART connectivity, the model enables remote commissioning and device access without redesigning networks or introducing inbound exposure. The approach preserves OT stability while adding controlled, scalable capability at the edge.

Westcon

Founded in 1994, Westcon is a recognized reference in Brazil and a specialist in industrial network connectivity, process automation, and OT cybersecurity.

As the official distributor of Portainer.io and Softing, the company brings together more than 30 years of experience, technical excellence, and pioneering work in the analysis, diagnostics, and certification of industrial networks.

www.wii.com.br

Softing

Softing and Portainer work together to automate site-specific software setup using containers. Instead of manual configuration at each remote location, edgeConnector is deployed over-the-air, saving time, reducing errors, and streamlining operations for Softing's industrial customers.

industrial.softing.com/us/products/docker/smartlink-sw-ht.html

Portainer

Portainer is the world's leading container management platform, helping organizations deploy, manage, and secure containerized applications across Docker, Kubernetes, and edge environments. Portainer simplifies container operations through a consistent, intuitive interface designed for both developers and operations teams.

www.portainer.io/solutions/portainer-for-industrial-and-iot

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