IoT for Substation Automation

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IoT @ Substation Automation enables customers to create new data-driven services in only two easy steps

1. Enable Connectivity
   - Update SIPROTEC/SICAM devices with IoT connectivity
   - OPC UA P/S

2. Connect to MindSphere
   - Cloud for utilities
     - Open application interface for applications and 3rd party apps
   - Self discovery of Siemens products

3. Run the Service
   - Monitor e.g. health status of your Substation assets with Grid Diagnostic Suite or develop your own Apps
Evolution in Substation Automation
Digitalization – IoT the enabler for data analytics

Today – Focus on operation

- Field Level: 100%
- Station Level: 30%
- Control Center: 5%

Tomorrow – Use existing data @ field level for analytics & new options

- Field Level: 95%
- Station Level: 30%
- Control Center: 5%

IoT-Platform
IoT Connectivity – The first step
Make more data available – Trouble-free IoT upgrade

Use existing infrastructure/hardware

Easy upgrade IoT protocol in existing hardware → no impact on running applications

No system changes in configuration (device, substation, network, etc.)

Highest degree of security

IoT standards → OPC UA Pub/Sub
Make use of the new digitalized world
Apps and Data Analytics

- Zero Config
- Grid Diagnostic
- Prediction
- Risk detection
- Monitoring assets/
  Condition Monitoring
- Expert system

Predictive functionality
Correlation analysis
Detecting failures through e.g.
Gradient Check
IoT Solution with SICAM A8000 ready for pilot projects - overall

Energy IP
powered by
Mindsphere

Mindsphere
3.0

MQTT
OPCUA Pub/Sub

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SICAM A8000
CP-8000/21/22
CP-8050

OPUPT0
OPUPI0

OPUPT1
OPUPI1

Mindconnect 3.0
IoT@SICAM A8000 CP-8022
Pilot project, municipal utility, Cottbus

Yesterday was the day, the first substation station in Germany was connected to the MindSphere on the low-voltage side! SIEMs measuring modules and A8000 as gateway to MindSphere are used. In the next step four more stations will follow!

You can watch the results live at "Nacht der kreativen Köpfe" in Cottbus on 6th October 2018. Come along, alone or with your customers.

A great team performance of the whole region! :)

@WirtimOsten @DigitalizationEnergyManagement @MindSphere @EMACMindSphereApplicationCenter
IoT@SICAM A8000 CP-8022
Pilot project municipal utility Cottbus
SICAM Navigator overview
SICAM Navigator for Ring Main Units (RMU)
Industrial IoT R&D application example: Framework for industrial Apps

Use A8000
- As IoT gateway
- As an IoT edge device to run independent software on RTU

Ring Main Unit or substation
Local interfaces and I/O’s for conventional sensors & actors (via extension modules)
Interface for local IoT sensors & actors

Communication
Substation and control center

DSO Headquarter
- Backend 1 for app 1
  - App. configuration
  - Department 1
  - Company data base
- Backend n for app n
  - App. configuration
  - Department n
- Device & app. mgmt.
  - System provisioning
- DMS/SCADA
  - Grid operation

IIoT environment
- IEC 60870
- IEC 61850

Sicam A8000 Platform
- RTU Core
  - SW APP 1
  - SW APP 2
  - SW APP 3
  - SW APP...
- Life Cycle
- Monitoring
- Execution Environment
- RT Linux

Industrial IoT R&D application example:
Framework for industrial Apps

Legacy devices and Sensors with Standard protocols

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Contact

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