

**IoT/IIoT Enablement Overview**

**Machine / Device / Equipment**

- Make/Model Description
- Use cases Users

**Objectives**

- Operational data**
  - production
    - Number of units produced
    - On-off duty cycle
    - production rate
  - consumption
    - energy
    - efficiency
    - ...
- Maintenance and support**
  - Uptime / Downtime measurement
  - Reduction of downtime
  - Prediction of failure
  - ...
- your specific objectives ...

**Cloud GUI**

- Dashboard
  - User specific
    - KPIs
    - Alerts
    - Actions
  - Charts
  - Reports
- Drill down

**Cloud Analytics**

- Synthesized parameters
- Feature extraction
- Machine learning
- Deep Learning
- Formula/Algorithm

**Data Modelling**

- Digital Twins
- ...

**Configuration**

- Assets hierarchy
- Device Provisioning/Management
- ...

**Cloud Protocol**

- MQTT
- AMQP
- Web services
- Security

**Cloud/Server**

**TheEdge/ Field Gateway**

**Interface to Field/Sensors**

- Via Existing Controller
- Direct Interface
  - Interface
    - Wired
    - Wireless
  - Added/Retrofitted Sensors (monitor)
  - Actuators (control)

**Edge Analytics**

- Statistical summary of sensor values
- Synthesized parameters
- Notifications

**Cloud connection**

- LAN
- WiFi
- GPRS/3G/4G
- LoRa
- ...

**Management**

- Provisioning
- OTA
- Security

**Gateway (Edge) Hardware**

- Footprint**
  - processor/microcontrollers
  - RAM/Flash/EEPROM
  - integrated peripherals and modules
- OS**
  - Without OS
  - With OS
    - FreeRTOS
    - Linux
    - Windows 10 IoT Core
    - variety others
- Framework**
  - Predix Machine
  - IBM Foundation
  - Proprietary
  - ...