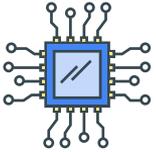# Challenge

Communication between assets and internet is one of the main challenges for Industrial IoT projects

Solution

qiio's unique integration of standard cloud, connectivity and hardware components is the solution

qiio

End-to-end solution

Hardware & embedded software

Connectivity

Software as a Service (SaaS)

Full operation

interface dashboard
user reporting sensor support
application azure sphere data embedded
operation industry SCALABLE cloud
connectivity SIMPLE SaaS configuration
management edge trust SECURED
modular SUPERVISED control hardware
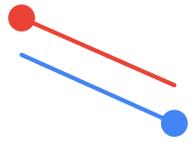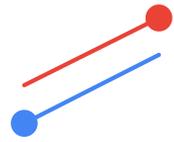security software collect monitor asset

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A modular IoT solution: 95/5 blueprint

95% of the solution is ready to go
5% needs to be customized to match
customer's specific needs

95   qiio   05
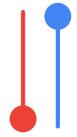
Hardware Root of Trust

Is your device's identity and software integrity secured by hardware?

Defense in Depth

Does your device remain protected if a security mechanism is defeated?

Small Trusted Computing Base

Is your device's TCB protected from bugs in other code?

Dynamic Compartments

Can your device's security protections improve after deployment?

Certificate-Based Authentication

Does your device use certificates instead of passwords for authentication?

Failure Reporting

Does your device report back about failures and anomalies?

Renewable Security

Does your device's software update automatically?

☐ = Silicon support required   ◎ = OS support required   ⬡ = Cloud Service support required

Highest security standards:

Microsoft's *"Seven Properties of Highly Secured IoT Devices"* applied

End-to-end solution audited by Swisscom

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First use case:

Industrial equipment

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Need:
Remote controlling of industrial equipment

- upload equipment data to the cloud
- enable remote configuration & control

IoT–enabled Beer Station: real use case
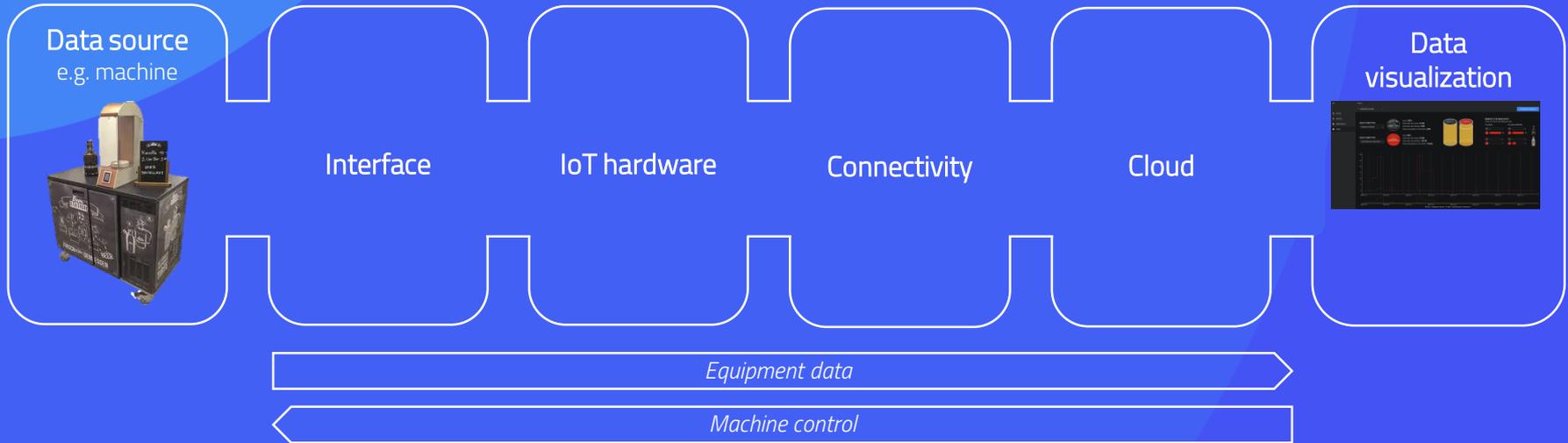
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Second use case:

Sensor network

Need:

Data collection from sensor network

- wireless
- wired

IoT-enabled building management: real use case

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Connect any data source to the cloud

Step-by-step integration

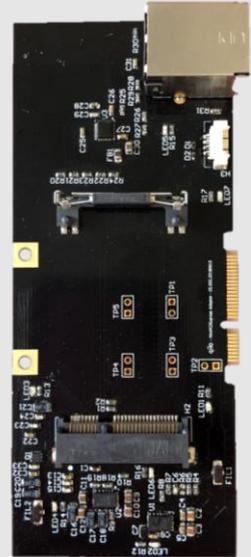**1** Customize the physical interface with the Concentrator

- Specific electronic board for industrial equipment

- Communication technologies

Wireless communication	Wired communication
LoRaSC	CAN bus, Modbus, etc.

Step-by-step integration

2 Integrate into the Concentrator

- Specific protocol of industrial equipment or sensors
- Cloud mechanisms
- Edge logic (Data pre-processing)

3 Implement communication with the cloud

- 2G/3G/4G/LTE-M
- Wi-Fi
- Ethernet

Step-by-step integration

4 Implement the cloud architecture

- qiio managed services
  (asset, concentrator, user & connectivity)

- IoT Hub

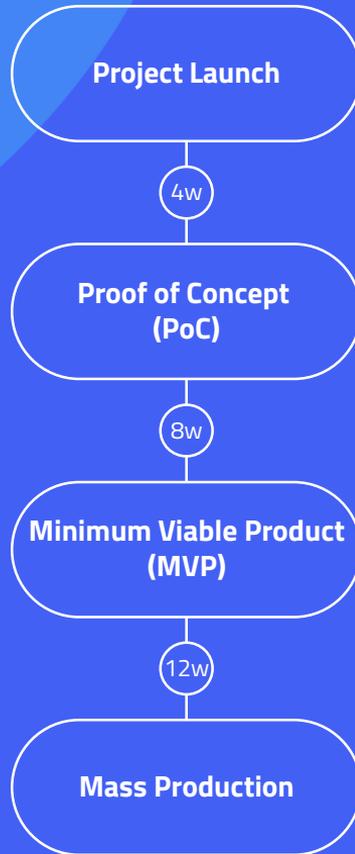- Cosmos DB, Data Lake Storage, Blob, etc.

5 Operate

- Operate IoT services

- Host client tenants

- Client support

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Project schedule

Project Launch

- Purchase order (PO)
- Statement of Work (SoW)
- Preliminary protocol specification

4w

Proof of Concept (PoC)

- Standard hardware (development board)
- Limited protocol implementation
- Partial cloud implementation

8w

Minimum Viable Product (MVP)

- Final hardware
- Full protocol implementation
- Full cloud implementation
- Manual production testing
- Partial manual manufacturing

12w

Mass Production

- Ready for high volumes
- Full industrialization of manufacturing process
- Full industrialization of testing process

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IoT Concentrator

Features	
General	Standard qiio product
Interfaces	SPI, I2C, UART, USB, Serial (CAN bus, Modbus, etc.)
Communication	• Cellular (2G, 3G, 4G, LTE-M) with integrated eSIM • Wi-Fi, Bluetooth Low Energy (BLE) • Ethernet • LoRaSC, CAN
Localization	• qMAPS (Cellular Triangulation) • GPS/GNSS
Industrial strength	Swisscom security audited
Security	Hardware security module
Special	Factory provisioning & staging integrated with the Azure platform

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Connectivity

Features	
Cellular, Wi-Fi & Ethernet	• eSIM integrated in Concentrator providing worldwide roaming • Wi-Fi integrated
Connectivity management Microsoft Azure	• Switch between SIM & Wi-Fi through Azure command • Configurable on Azure platform • Wi-Fi SSID & password • Local cellular APN

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Software as a Service (SaaS)

Data collection
- Log of events
- Status of sensors

Application enablement
- Preventive maintenance
- Digital twin

Concentrator management
- Configuration & update campaigns
- Hardware monitoring

Asset management
- Configuration & update campaigns
- Control & monitoring

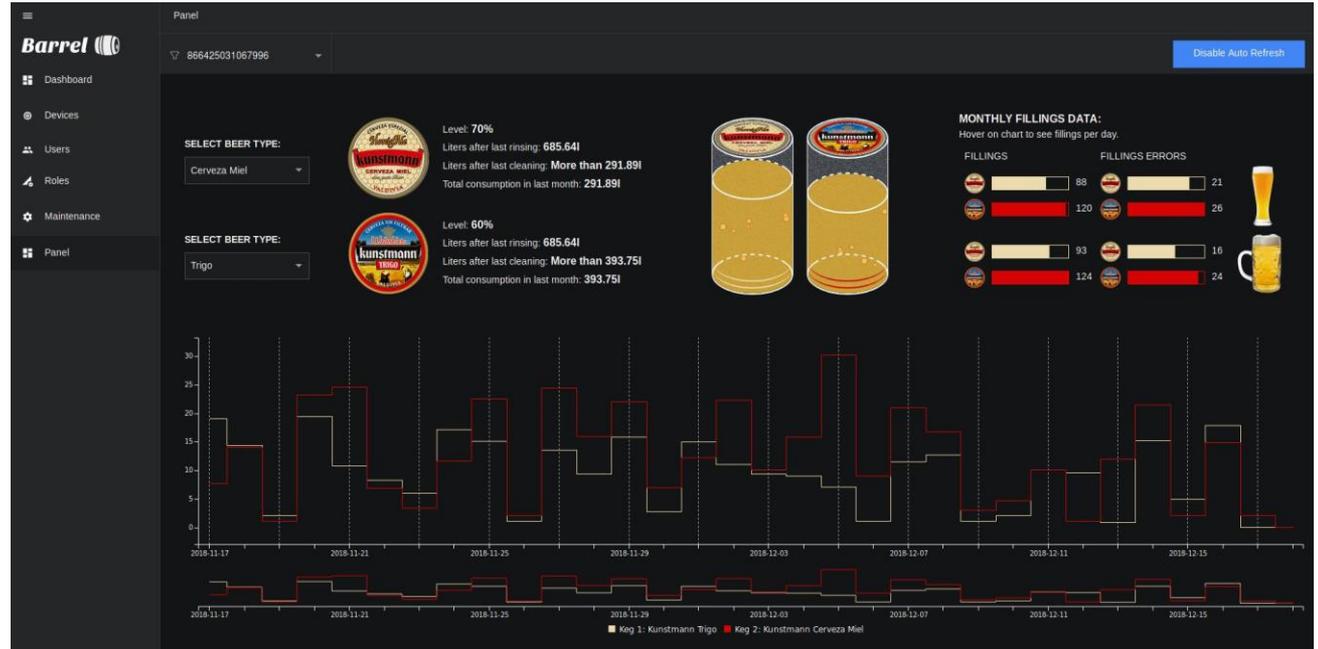### Connectivity management
- Cellular integration
- Wi-Fi management

User management
- User mapping
- Identity management

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Cloud portal

- Dashboards
- Access to cloud services
- Preventive maintenance
- Digital twin

Thank you!

95/5 blueprint:
Plug & play solution

Expert in
hardware & cloud computing

Strong partnership:
Swisscom & Microsoft

Manufactured in Switzerland

Local support

Multilingual operation:
DE, FR & EN