



BoX2

Clever connectivity. Added smart functions.

BoX2 series

Clever connectivity. Added smart functions.



- ▶ IoT and cloud connectivity is a still growing requirement from machine builders and facility managers to store and access business-critical data in the cloud for analytics, business intelligence and optimization of processes. The new BoX2 series is Beijer Electronics answer to this.

BoX2 series

Clever connectivity. Added smart functions.



- ▶ BoX2 is a series of IoT gateways offering clever connectivity and the possibility to add optional smart functions. BoX2 series gateways enable customers to create high-technological modern solutions for essential application requirements in the industry.

Functionality supported by BoX2



*Data sharing
between PLCs*

*IIoT and cloud
connectivity*

*Mobile and
web server*

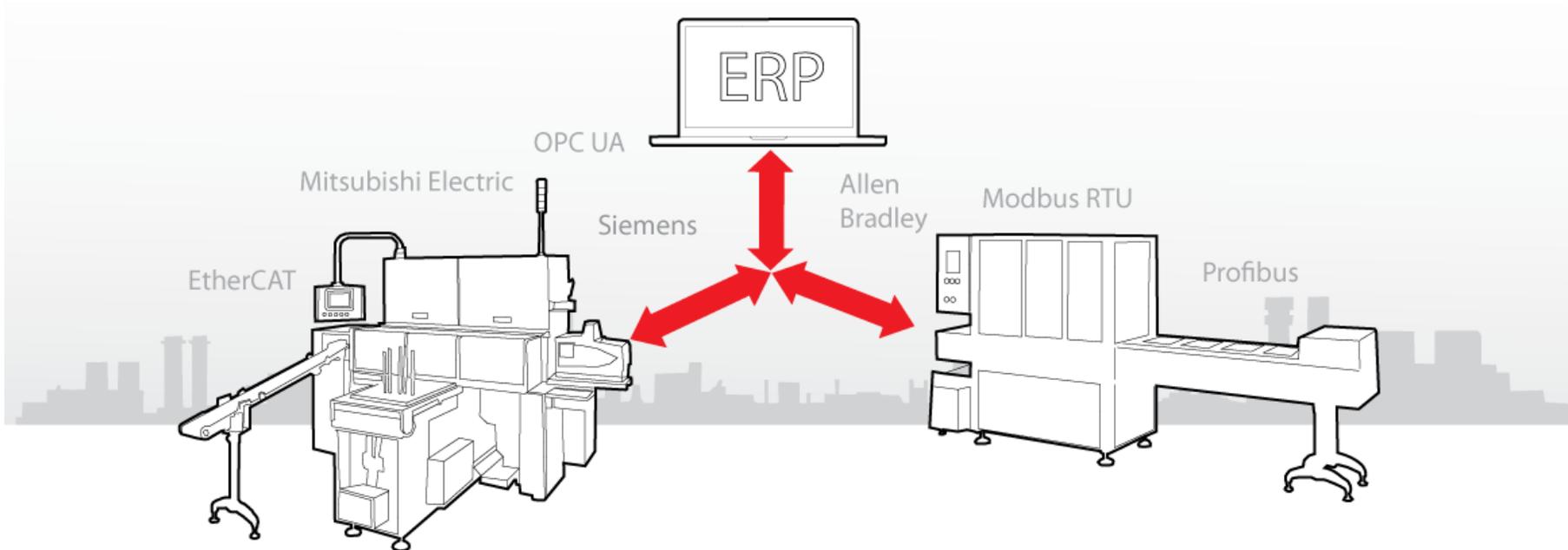
*Integrated
CODESYS
control*

*Smart
functions*

USE CASE EXAMPLE

Bringing your production up to speed

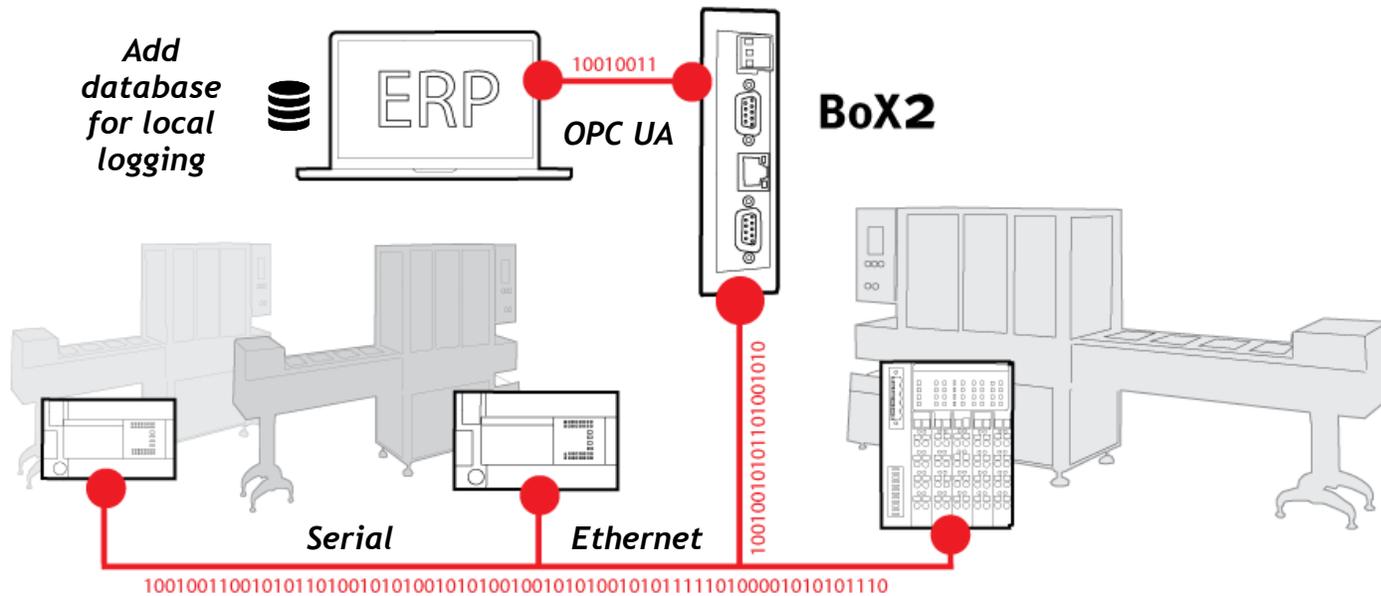
Think, if old and new machines in your facility could communicate effectively together. In smart ways. Exchange, share and bring crucial information to light. So you can maximize efficiency and optimize operations.



BoX2 can make your machines communicate effectively together. Old and new ones. One machine with another. In complex setups with more machines communicating together. Routing key data and utilizing BoX2's extensive list of communication drivers to all major brands of controllers on the market. Exchanging data with the overlying systems in your facility. So you can bring your production up to speed and optimize operations.

Protocol conversion

BoX2 can operate as a protocol converter enabling two or more different controller devices, to exchange data and achieve interoperability. Drivers for the different controllers are installed on BoX2, which converts the data of one network into the protocols of the network in which data is navigating.

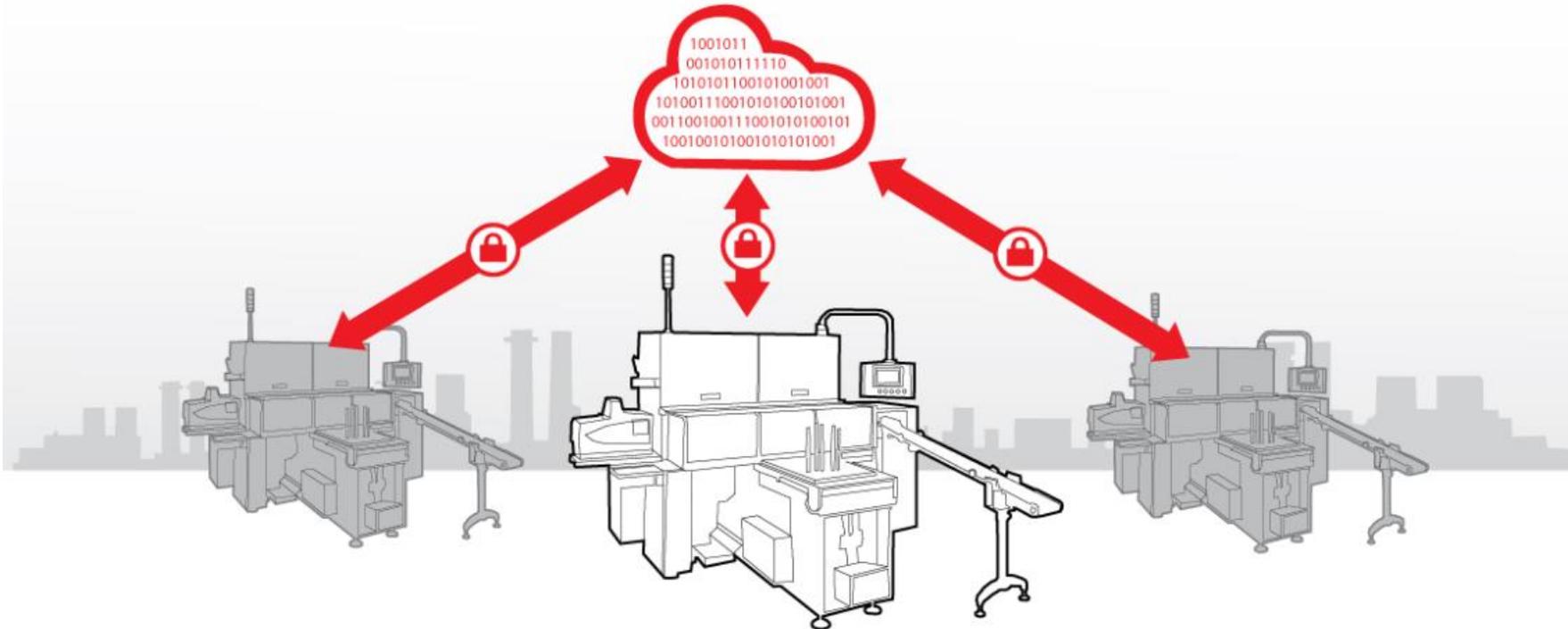


BoX2 also supports OPC UA, a secure communication protocol designed to connect ERP systems, analytic tools, databases and other enterprise systems with the real-world data from controllers and other devices. Furthermore, applications can be added additional smart functions such as local data base storage, etc. All to be combined, so you can optimize the overall performance of your operations.

USE CASE EXAMPLE

When your data is playing hide and seek

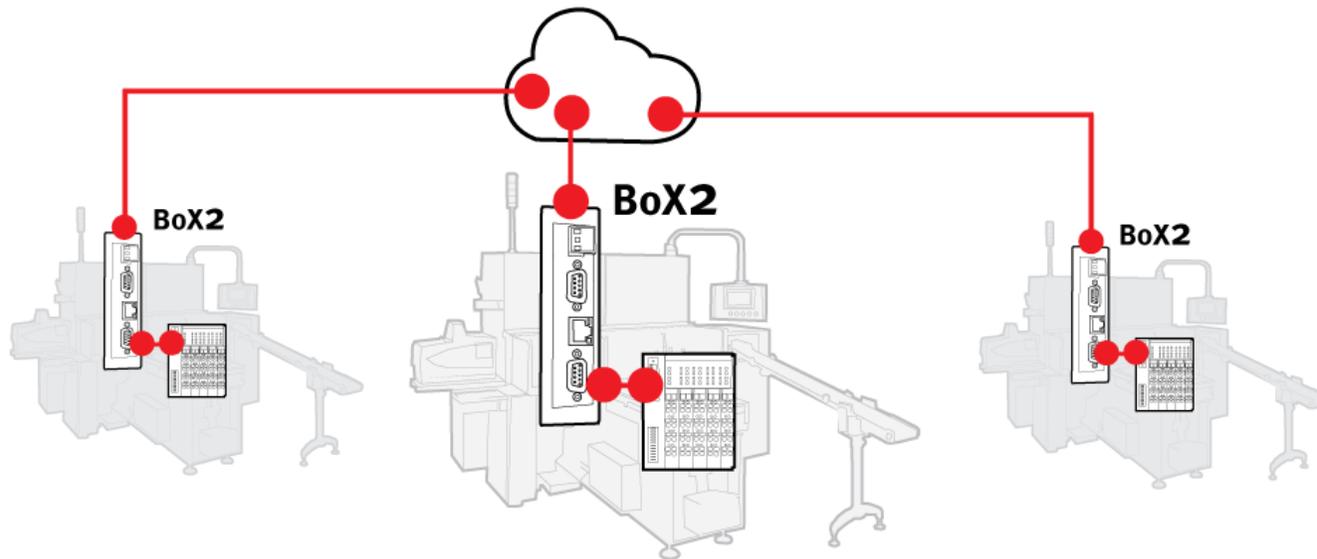
Think, if you could access the crucial data hidden deep in your facility and place them in the cloud. In a smart way. Structured, timely and available. Ready to be turned into insights.



BoX2 can provide the data you need for your analysis, when you have an installed base of machines in your facility and want to optimize up-time and overall efficiency. Via communication drivers to all major brands of controllers on the market, BoX2 can access the data hidden in your machines and transfer them through secure IoT connections to the cloud. Add our smart software functions to further refine and structure the data. Ready to be turned into insights.

Cloud connectivity

BoX2 can act as a cloud gateway transforming the local machine data to data that is accessible in the cloud. Data is securely transmitted to the Beijer cloud using strong encryption over MQTT which allows stable and light weight communication.

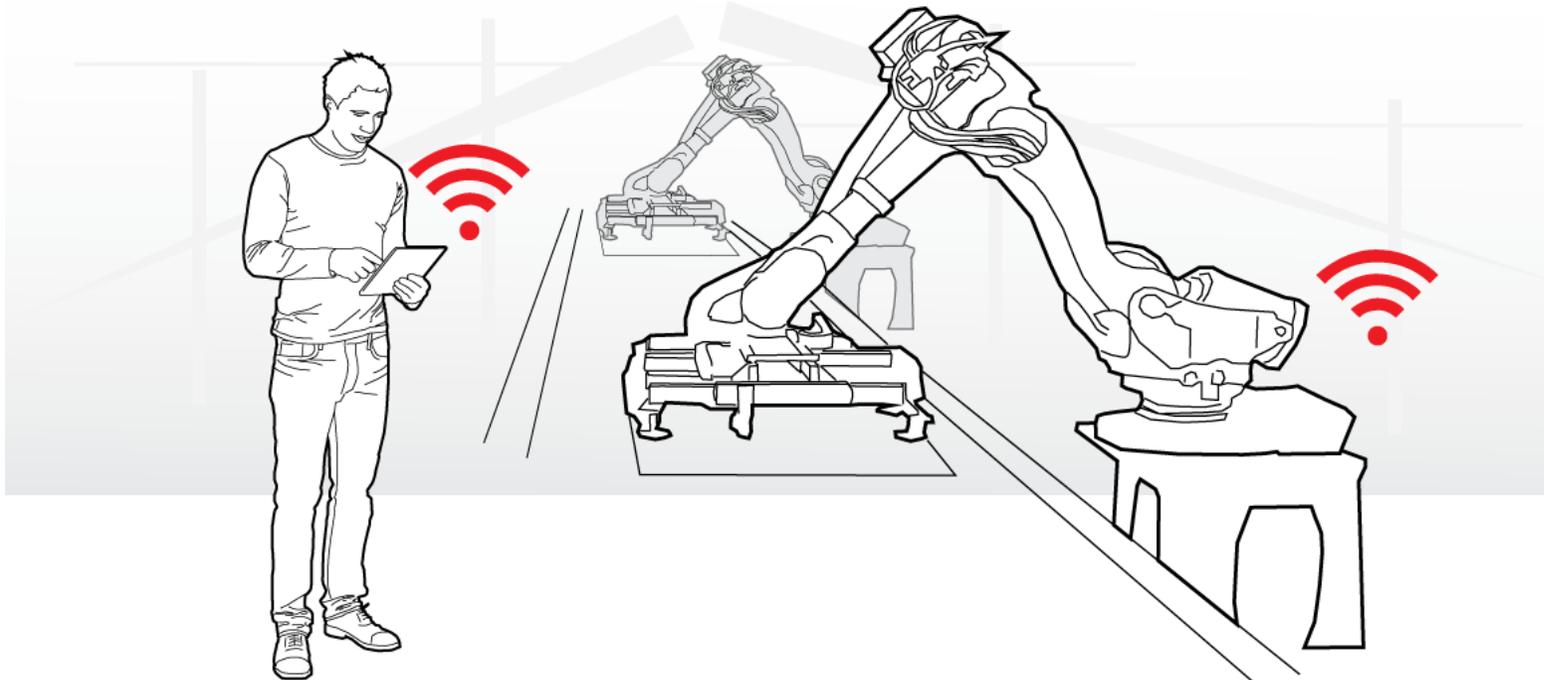


MQTT provides network clients with a simple way to distribute telemetry information. MQTT offers low bandwidth consumption, bidirectional communication and ease of use. MQTT uses a publish/subscribe communication used for machine-to-machine communication and plays an important role in IoT. BoX2 combines raw data transmission with local data processing and storage; utilizing database, alarming and C# scripting to create basic edge computing.

USE CASE EXAMPLE

Mobility for peace of mind

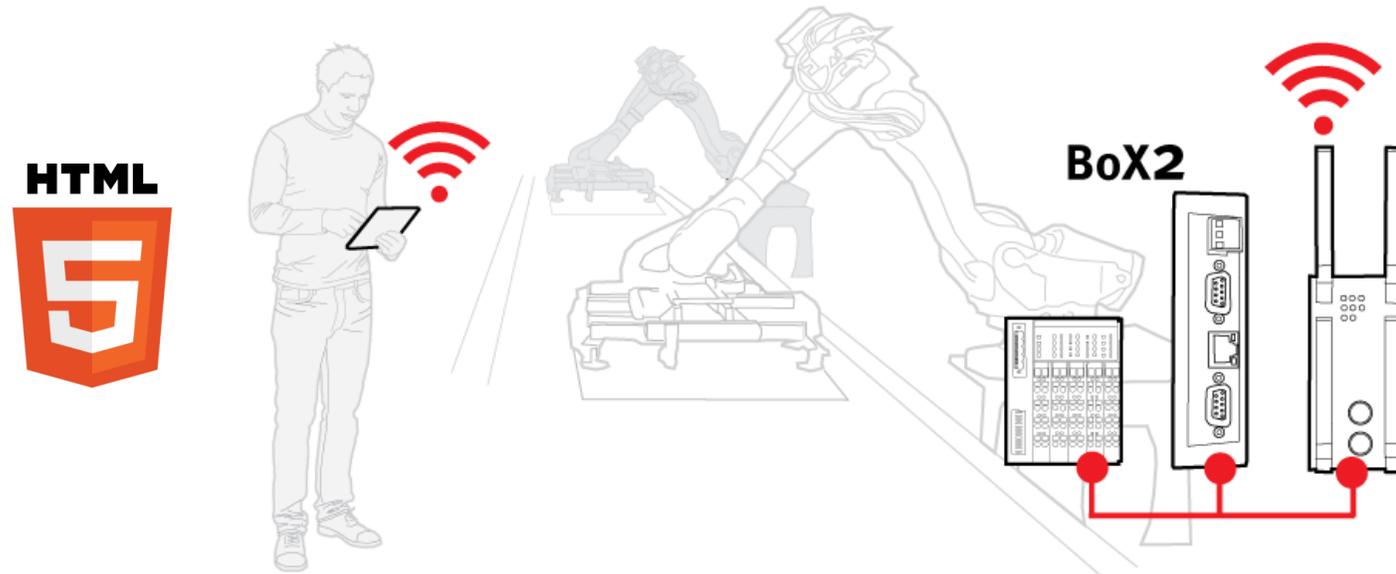
Think, if you could keep up with the status of your plant without being tied up at a work station or a production line. Move freely around and still keep track of things. And interact safely. Mobile, agile. With peace of mind.



BoX2 is your perfect platform for HMI and dashboard applications on the go. Keeping you updated with status information and vital data from your facility. Presented in clear interactive graphics. On production trends, alarms and upcoming maintenance. So you can take decisions and corrective measures from anywhere within your facility. Mobile, agile. With peace of mind.

Communication server for mobile HMI

BoX2 can act as a next generation HMI server combining server functionality via the built-in web server capable of serving HTML5 base visualization to any compatible device.

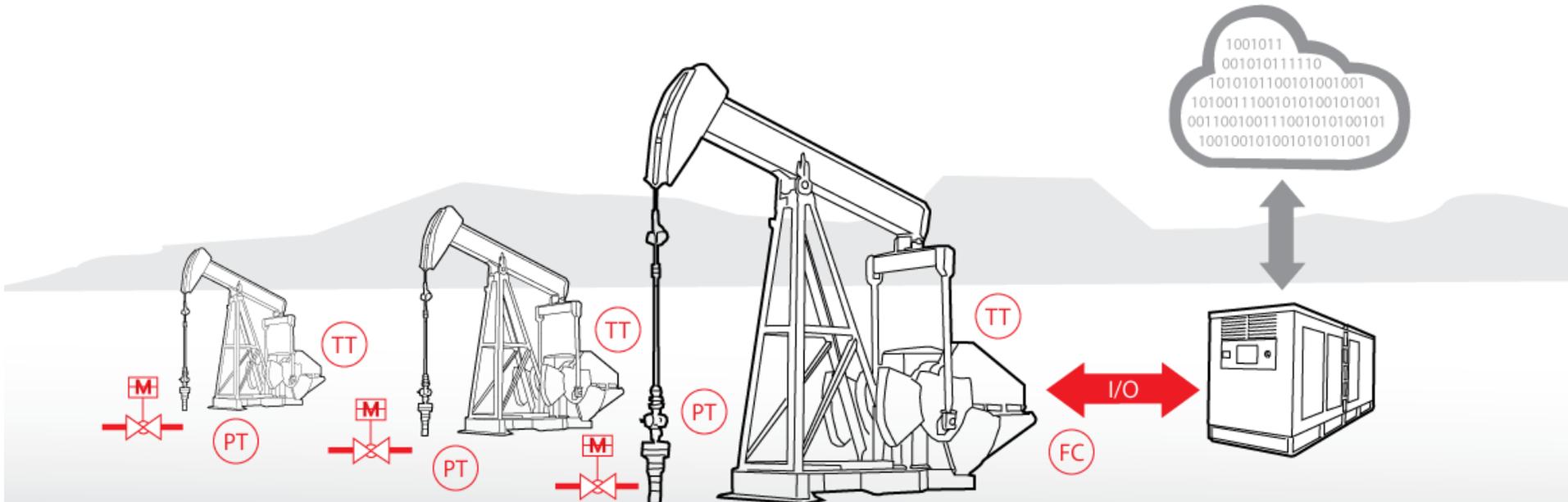


HTML5 is the future of web coding. HTML5 appears the same across all platforms and browsers, coding is simplified and it is faster and more adaptive to the user. BoX2 enables powerful modern web HMI functionality to be used in situations where an operator or plant manager needs to be mobile instead of being tied up at a fixed place at a work station or production line.

USE CASE EXAMPLE

Including all aspects of control

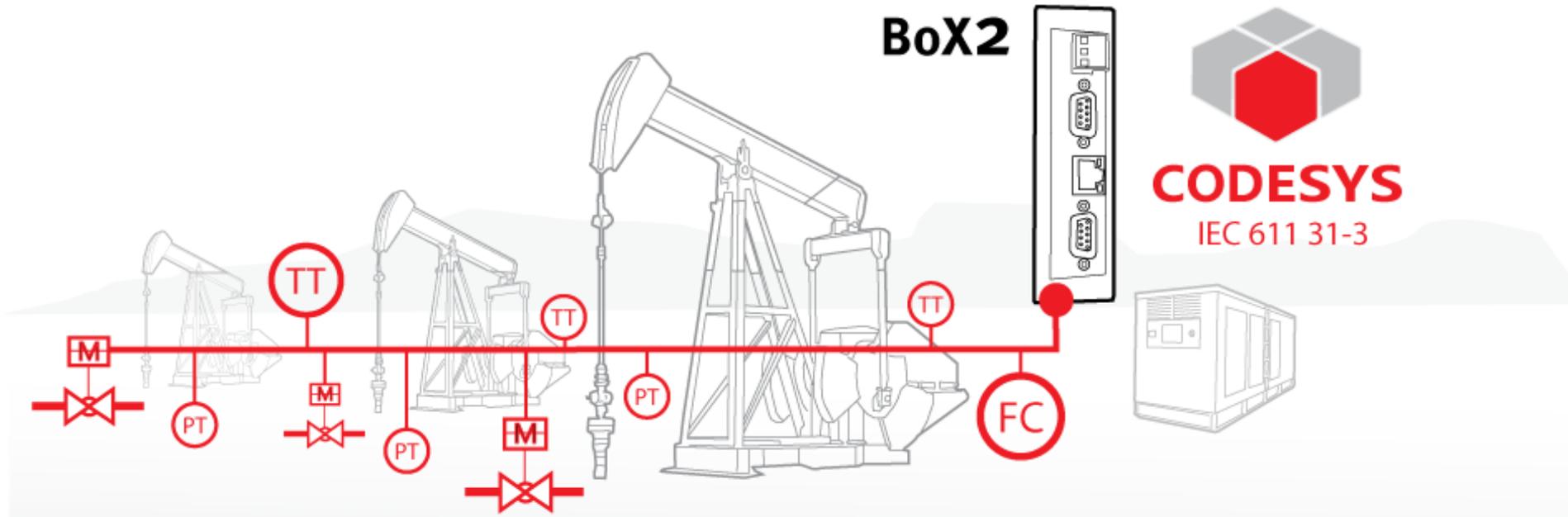
Think, if you could control every aspect of your machines operation by a single device. The basic logic operation. And the advanced. But also create IIoT connectivity. Store vital information in the cloud. Add smart functions for alarms, recipes, reporting, etc. All by one single device.



BoX2 enables you to perform powerful local logic control. By integrated IEC 61131-3 CODESYS control - the industry leader in PLC and controller programming for basic and advanced applications. Control applications which can be combined with HMI server functions, IIoT and cloud connectivity, and an abundance of additional smart functions. So you can make killer applications with all aspects of control included. All by one single device.

Integrated CODESYS control

CODESYS is the leading hardware-independent IEC 61131-3 development tool on the market - the industry standard in PLC and controller programming. CODESYS fits hand-in-glove with BoX2 and Beijer Electronics' software in terms of openness, communication and ability to exchange data.



BoX2 enables you to perform powerful local logic control. CODESYS is a fully integrated development system. Complete with integrated compilers, object-oriented programming, alarm management and add-ons such as UML/SYN integration. CODESYS can be embedded in virtually any system offering code transparency between systems.

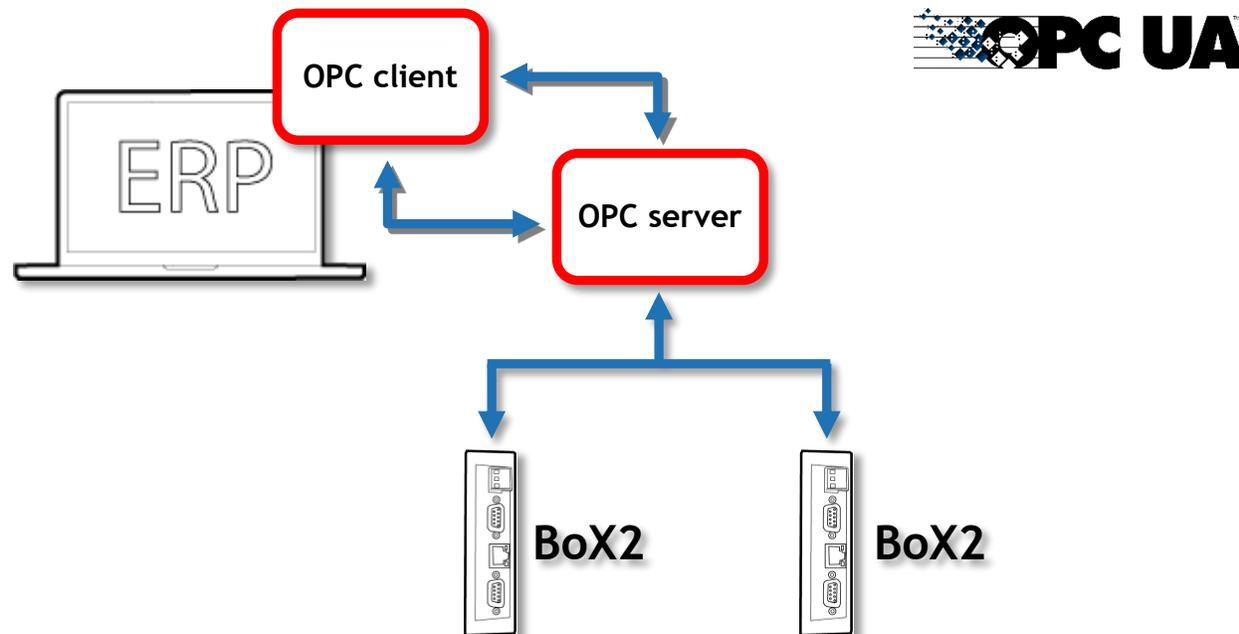
Access to all the data hidden in your machines

- ▶ With more than 75 PLC driver families of all major brands of controllers on the market, BoX2 can access all the data hidden in your machines or facility.



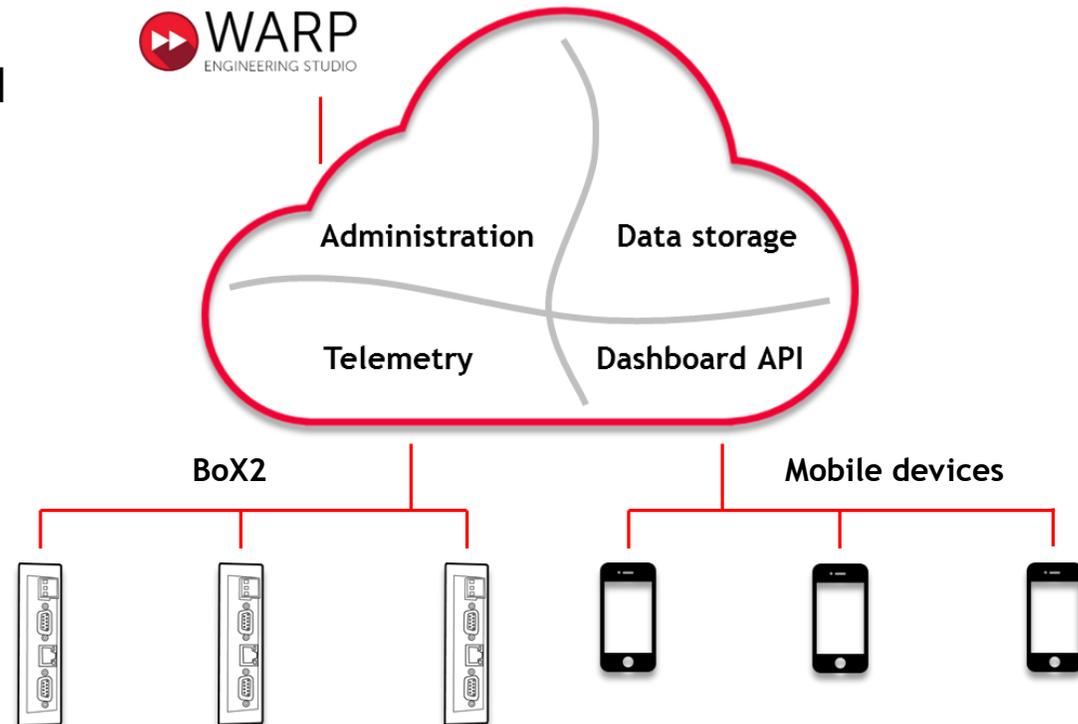
Connect to ERP systems, analytic tools, etc. via OPC UA

- ▶ OPC UA is a communication protocol designed to connect ERP systems, analytic tools, databases and other enterprise systems with real-world data from controllers and other devices that interact with real processes that control and generate real-world data.



Safe storage, access and administration of data in the cloud

- ▶ Beijer cloud is hosted on Microsoft Azure
- ▶ Administration of organization, user, devices, device groups, cloud tags and roles via WARP
- ▶ Telemetry of data from the device to the cloud
- ▶ The cloud hosts data from devices
- ▶ Data are accessible for Beijer dashboard



Secure all the way

- ▶ Each BoX2 has a X.509 international standard certificate tied to it's serial number
- ▶ Each BoX2 has a traceable unique identity used to identify the device in the cloud
- ▶ BoX2 is identified and recognized, before it even has started sending data, during initial handshake
- ▶ All communication from devices to the cloud is outbound, and devices are never visible on the public internet
- ▶ Data communication to the cloud include secure bank level, high security SSL/TLS encryption



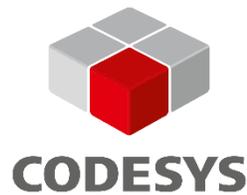
HTML5 for cross-platform mobile applications

- ▶ HTML5 is a markup language used for structuring and presenting content on the World Wide Web. It is the fifth and current major version of the HTML standard.
- ▶ HTML5 includes detailed processing models to encourage more interoperable implementations; it extends, improves and rationalizes the markup available for documents, and introduces markup and application programming interfaces for complex web applications. HTML5 is also a candidate for cross-platform mobile applications, because it includes features designed with low-powered devices in mind.
- ▶ HTML5 is the future of web coding. HTML5 appears the same across all platforms and browsers, coding is simplified and it is faster and more adaptive to the user.



Integrated CODESYS control

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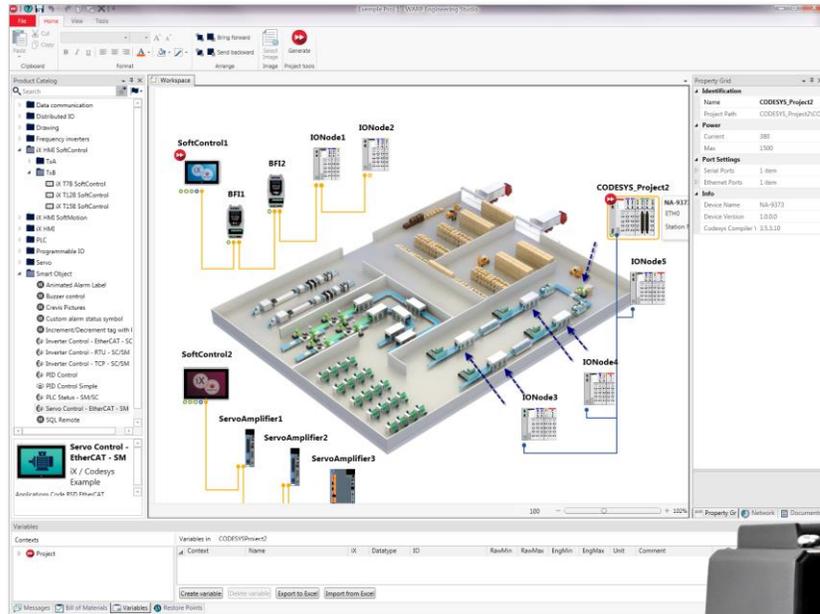


- ▶ LADDER DIAGRAM
- ▶ FUNCTION BLOCK DIAGRAM
- ▶ STRUCTURED TEXT
- ▶ INSTRUCTION LIST
- ▶ SEQUENTIAL FUNCTION CHART

- Fully adaptable to your systems requirements
- Powerful with integrated compilers, object-oriented programming, alarm management and add-ons such as UML/SYN integration
- Fully integrated development system
- Can be embedded in virtually any system
- Code transparency between systems

Easy configuration with WARP Engineering Studio

- ▶ Create integrated solutions with WARP Engineering Studio. WARP automatically configures all hardware, software and communication, and accesses all individual application software in your application. What used to take days to set up, can be up and running in a few minutes.



Smart objects for specific use cases



Added smart functions

- ▶ Applications can be added additional smart functions such as local data base storage, alarm servers, recipes, reporting, c# scripting, etc. giving you widened opportunities to realize what you want to accomplish in your solutions. Smart functions are configured via iX software.

State	Active Time	Text
Active	2012-04-17 11:04:27	Simulation Alarm 3
Active	2012-04-17 11:04:26	Simulation Alarm 2
Active	2012-04-17 11:04:25	Simulation Alarm 4, value is: 52
Inactive	2012-04-17 11:04:24	Simulation Alarm 4, value is: 51

Ack Selected
Ack All
Clear
Filter
Info
||

Data Logger

Add Delete Settings... Show Selection...

Name	Tag	Expression
Temperature	Temperature	



Recipe

Tag Configuration Runtime Data

Add Delete Show Selection...

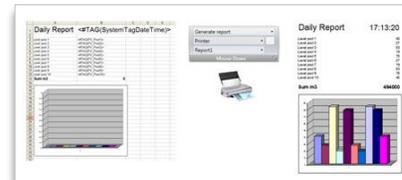
Runtime Recipe Title	Bottles	Size	Line	Carbon Dioxide	Water	Apple	Lemon
Soda Mix 1	3000	10	1	30	30	3	2
Soda Mix 2	2500	20	2	20	40	2	3
Soda Mix 3	3000	3	3	30	30	1	1

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using iX.Plugins;
using iX.Plugins.DataLogger;
using iX.Plugins.DataLogger.Models;

namespace iX.Plugins.DataLogger
{
    public class DataLogger : IPlugin
    {
        public DataLogger()
        {
            // ...
        }

        public void Start()
        {
            // ...
        }

        public void Stop()
        {
            // ...
        }
    }
}
```



Fits into any industrial environment

- ▶ BoX2 is available in versions designed for industrial environments with high temperature, moisture and vibration. BoX2 offers standard industrial certifications, extended classes of marine and hazardous area certifications.



BoX2 base

Cost-effective IoT gateway

- ▶ UL, CE, FCC, KCC certificates
- ▶ Flexible mounting on DIN-rail
- ▶ IP22
- ▶ Plastic housing
- ▶ Operating temperature -10° to +50° C



BoX2 pro

High-performance IoT gateway

- ▶ UL, CE, FCC, KCC certificates
- ▶ Marine certifications
- ▶ Flexible mounting on DIN-rail
- ▶ IP22, NEMA 4X/12 and UL Type 4X/12
- ▶ Robust aluminum housing
- ▶ Operating temperature -10° to +60° C



BoX2 extreme

Rugged IoT gateway

- ▶ UL, CE, FCC, KCC certificates
- ▶ Marine certifications
- ▶ Certified for hazardous environments
- ▶ Flexible mounting on DIN-rail or base plate
- ▶ IP66, NEMA 4X/12 and UL Type 4X/12
- ▶ Robust aluminum housing
- ▶ Operating temperature -30° to +70° C
- ▶ High vibration resistance

Technical overview



	BoX2 base Cost-effective IoT gateway	BoX2 pro High-performance IoT gateway	BoX2 extreme Rugged IoT gateway
Functionality	Protocol conversion Cloud connectivity - - - - -	Protocol conversion Cloud connectivity Local data logging Local web server Alarm server FTP Integrated CODESYS PLC - option	Protocol conversion Cloud connectivity Local data logging Local web server Alarm server FTP Integrated CODESYS PLC - option
Serial port	2 × 9 pin D-sub Com1 RS232, Com2 RS485 or RS422 Com3 RS232 Com4 RS485	1 × 9 pin D-sub Com1 RS232, Com2 RS485/or RS422 Com3 RS485 (if Com2 is RS485)	2 × 8 pin M12 connectors - IP66 Com1 RS232, Com2 RS485 or RS422 or CAN Com3 RS485 or CAN
Ethernet port	1 × 100mbit RJ45	2 × 100mbit RJ45	1 × 100Mbit M12 connector - IP66
Mounting	DIN rail	DIN rail	DIN rail, stand alone
IP rating	IP22	IP22	IP66
Performance	1	4 × BoX2 base	4 × BoX2 base
Flash storage	200 MB	1,5GB	1,5GB
Certification	CE, UL	CE, UL	CE, UL
Marine certifications	-	DNV after release, others on request	DNV after release, others on request
Hazardous location certifications	-	-	Not at release, C1D2, ATEX, IECex later
Temperature	-10°C to + 50°C	-10°C to + 60°C	-30°C to +70°C

Beijer
ELECTRONICS