



SEPTEMBER 2019, SEVILLA, SPAIN

ABB Control Systems Annual Partner Conference 2019

Freelance 2019 – New functions and highlights



Presenter

Global Product Manager Freelance

Presenter

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Agenda

Freelance Version 2019 – What's new
Other news around Freelance
Success Story – Byworth Boiler
Q&A



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Freelance 2019 – What's new

Improvements over the whole system

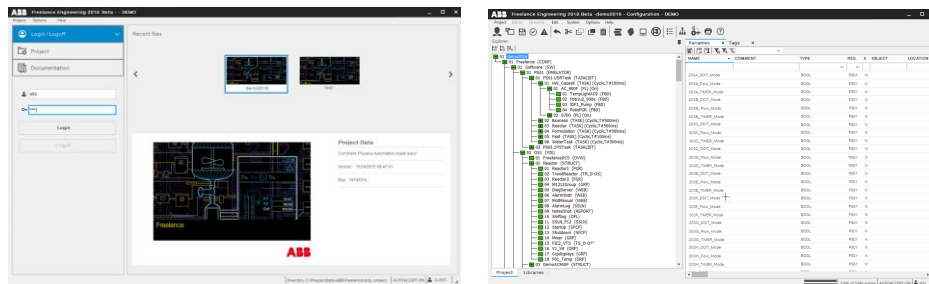
Control



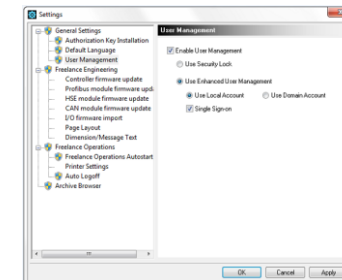
Operations



Engineering



Security



Freelance 2019

Extended AC 900F Controller Portfolio: PM 904F

PM 901F



- Controller Redundancy
- Serial interfaces
- Optional display
- 3x Ethernet Ports
- 2x Communication interfaces

PM 902F



- Controller Redundancy
- Serial Interfaces
- Optional display
- 4x Ethernet Ports
- 2x Communication interfaces

PM 904F



- Controller Redundancy
- Serial interfaces
- Optional display
- 4x Ethernet Ports
- **4x Communication interfaces**
- **Extended application memory**

PM 904F: More Connectivity, More Application Memory

Freelance 2019

PM 904F: The newest controller in the family

4 slots for communication modules

Optional Display Module

Battery (underneath display)



LED's: Power, Error, Run/Stop, Prim/Sec, Batt.

SD card slot for loading programs, backup, loading firmware

Switches/Buttons: Reset, Toggle, Run/ Stop

Up to 10 direct I/O modules can be connected

Power 24 V

4 x Ethernet 10/100 MB

1 x Diagnosis/ Radio-Clock

2 x serial lines, Modbus or Telecontrol

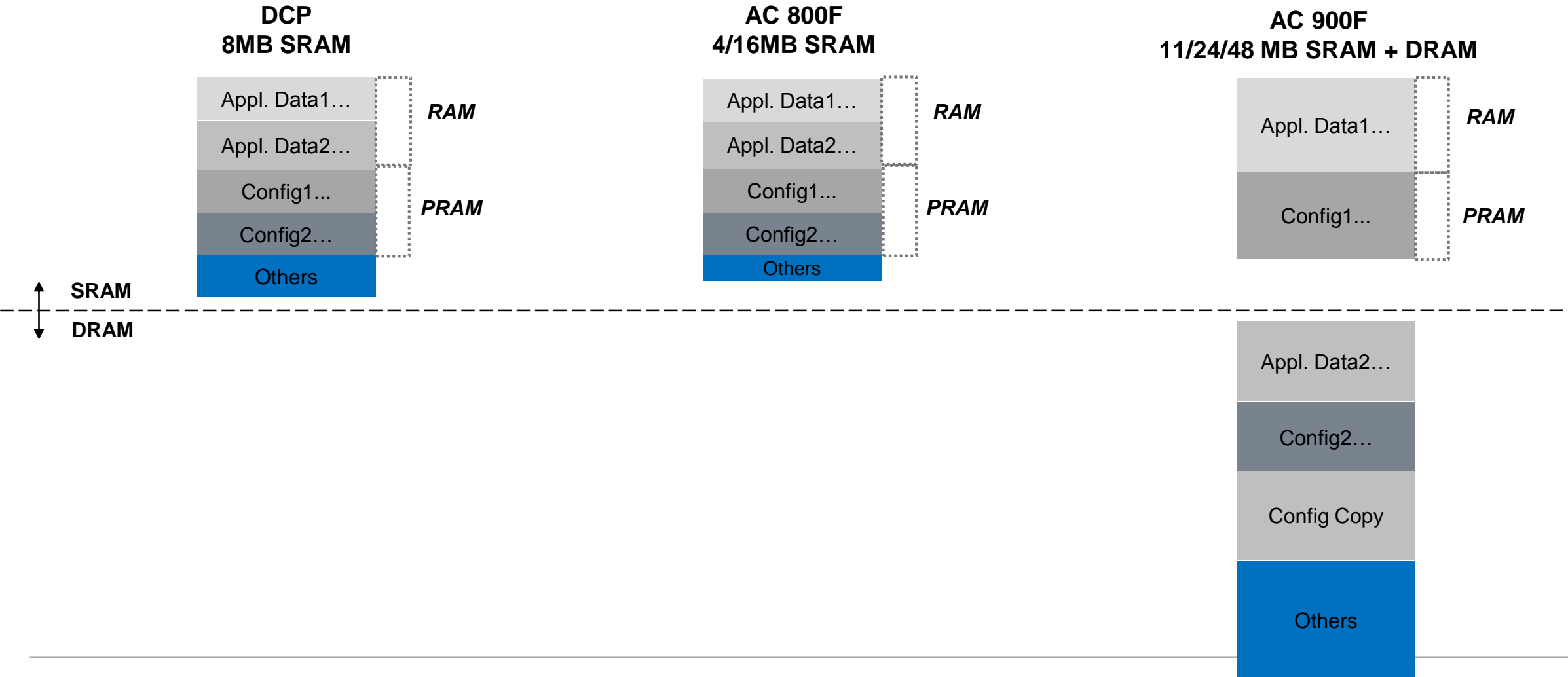
Freelance 2019

PM 904F: Newest technology for upgrades and new projects

Parameters	PM 802F	PM 803F	PM 901F	PM 902F	PM 904F	Alternative to PM 803F by	
						PM 902F	PM 904F
CPU redundancy	☑	☑	☑	☑	☑	●	●
SD card support	-	-	☑	☑	☑	●	●
PROFIBUS Master modules	4	4	2	2	4	●	●
CAN Bus modules	1	1	1	1	1	●	●
FF HSE modules	4	4	-	-	-	●	●
Modbus RTU ports	8	8	2	2	2	●	●
Modbus TCP ports	2	2	3	4	4	●	●
IEC 60870-5-101 ports	8	8	2	2	2	●	●
IEC 60870-5-104 ports	2	2	3	4	4	●	●
Direct IOs	-	-	☑	☑	☑	●	●
Typically IOs	400	1000	400	1500	1500	●	●
Application memory	4MB	16MB	11MB*	24MB*	48MB*	●	●
Ambience temperature [°C]	0 – 60	0 – 60	-20 – 70	-20 – 70	-20 – 70	●	●
G3 compatible	optional	optional	standard	standard	standard	●	●

*The AC 900F Controller Family has a different Memory architecture than the AC 800F/DCP. Memory figures between the controller families are not comparable.

Memory architecture – principles*

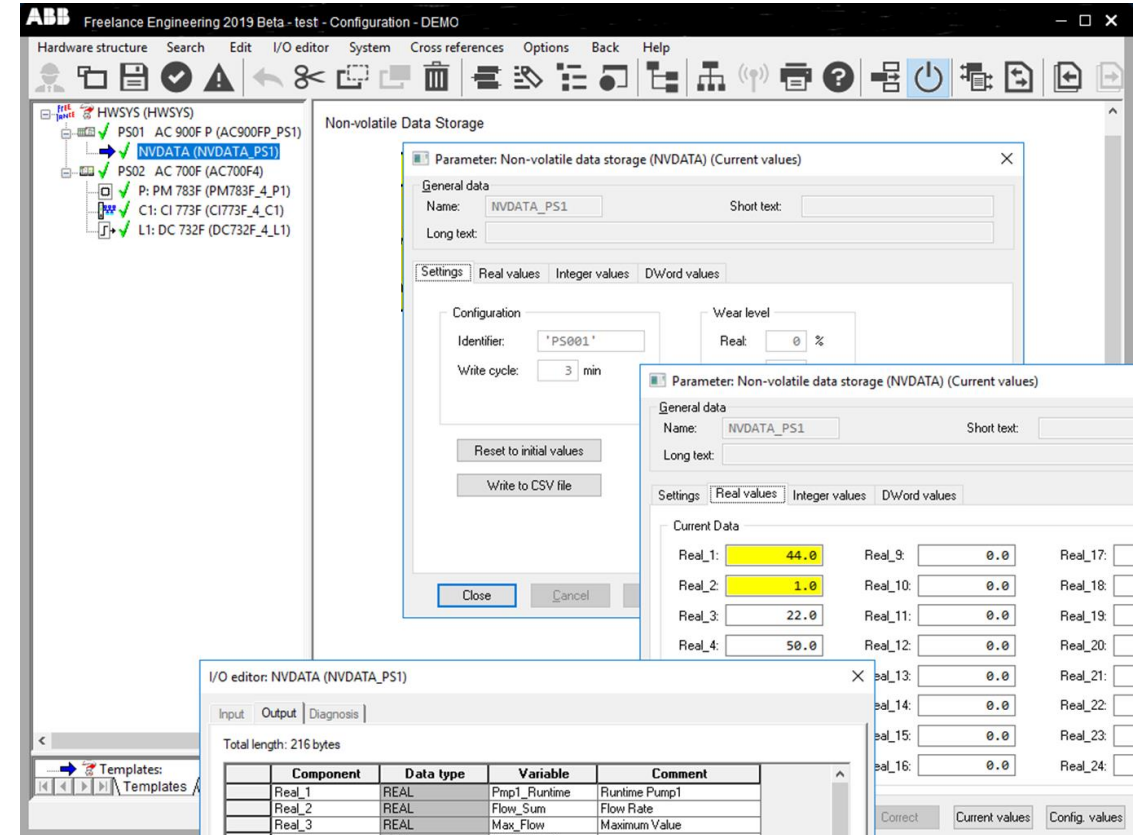


Freelance 2019

AC 900F: Permanent Storage of User Variables

Available for all AC 900F controller

- Permanent storage of variables, e.g. lifetime counter and metering data
- The values will be kept during
 - Cold Start
 - Load Whole Station
 - Power Down Without Battery
 - Firmware Update
 - Version Upgrade
- Export capabilities and Identifier to avoid using wrong data (e.g. controller replacement)
- Configurable initial values and write cycle time

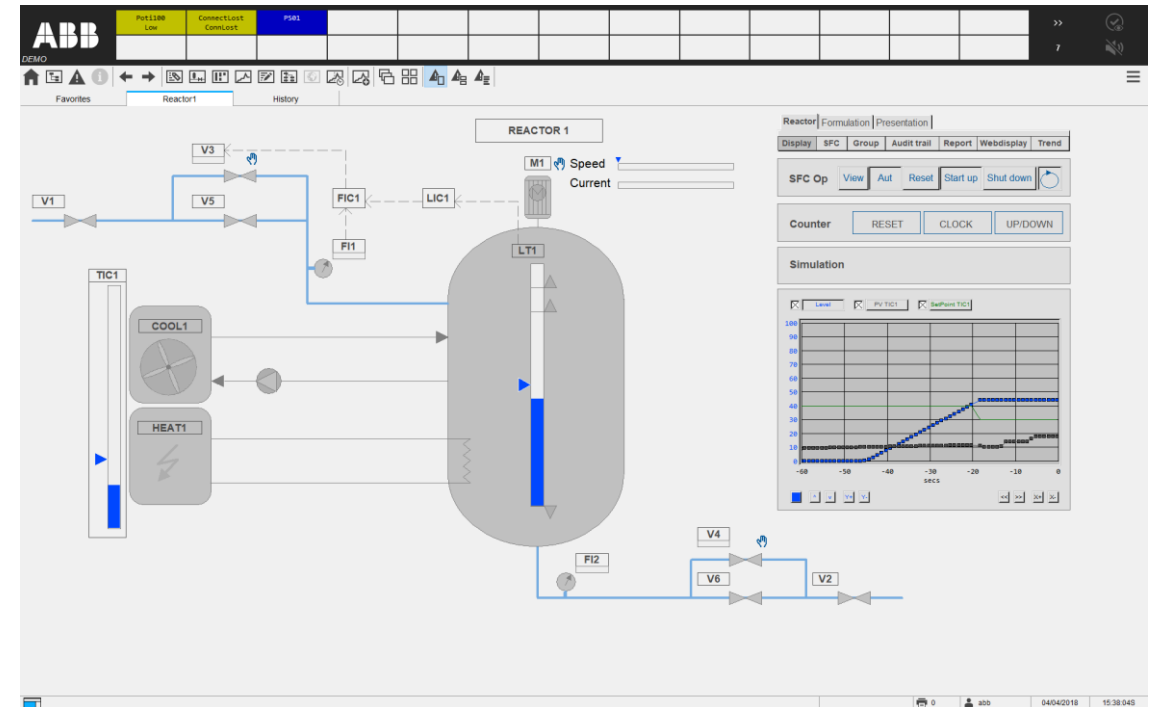


Freelance 2019

Freelance Operations

Various improvements like...

- High Performance HMI style
- Three tabs for faster navigation and handling
- Menu behind button to get more space for alarms
- Advanced search function in Display Explorer and Trends
- Configurable User Auto Log Off
- Larger Font Sizes and Buttons
- Quad Monitor support
- ...



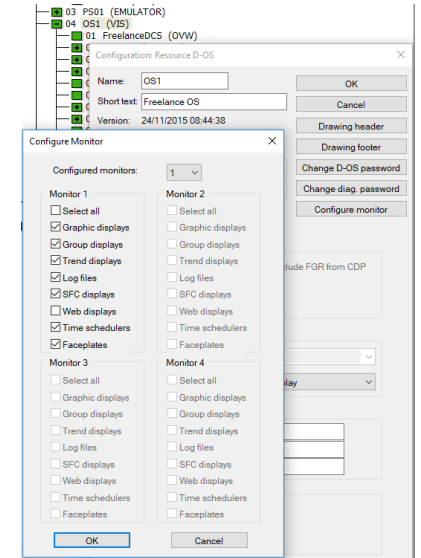
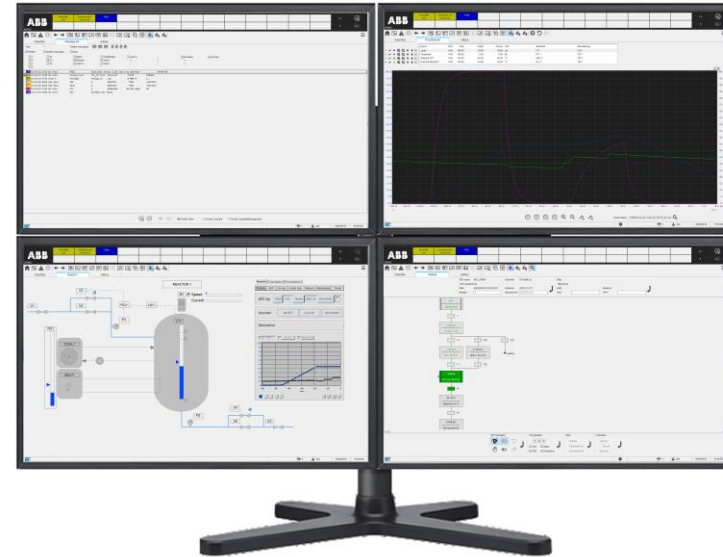
Increased Operator effectiveness with full compatibility to existing user application

Freelance 2019

Freelance Operations – Quad Monitor support

Advanced configuration options

- Amount of monitor to be used by Freelance is selectable (1-4).
- Amount and numbering of available monitors is detected by Windows (display settings).
- Display types which shall be shown on each monitor is selectable.



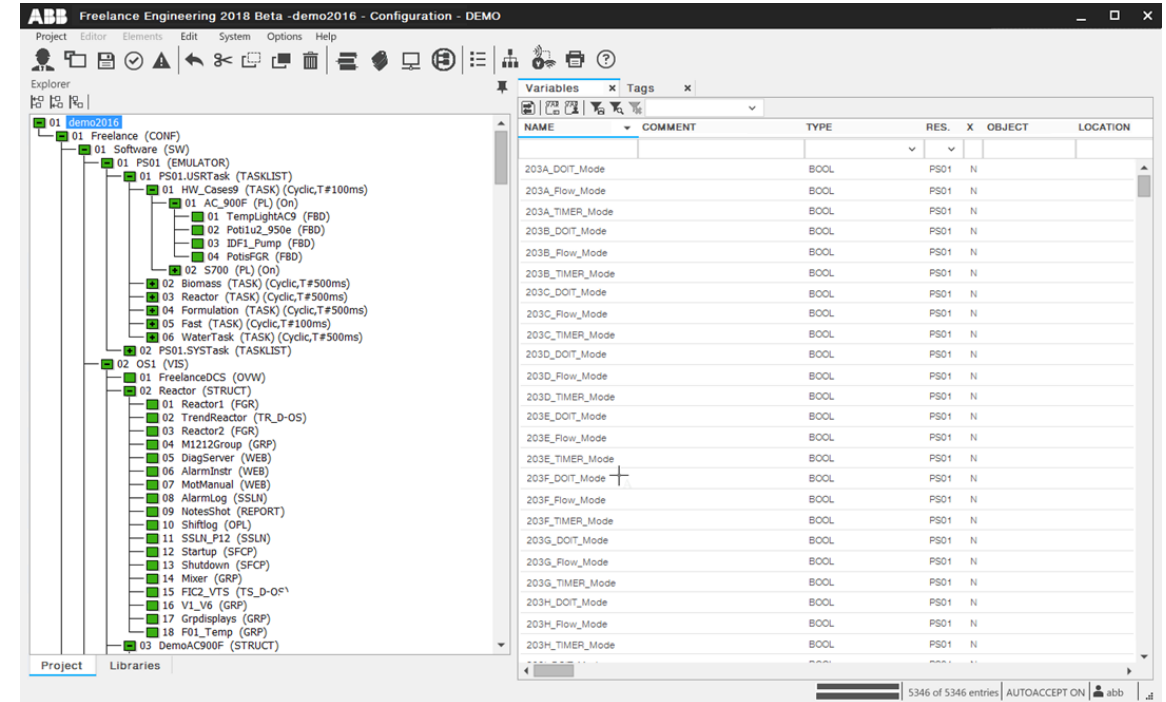
Increased Operator effectiveness with full compatibility to existing user application

Freelance 2019

Freelance Engineering

Various improvements like...

- High Performance HMI style
- Auto routing capabilities in the FB Diagram editor
- Larger Buttons in the Tool Bar
- Search and sorting functionality
- Visualizations between Modes
- Advanced configuration options like for Display assignment
- Project Backup's on SD Card
- Reduction of side effects
- ...



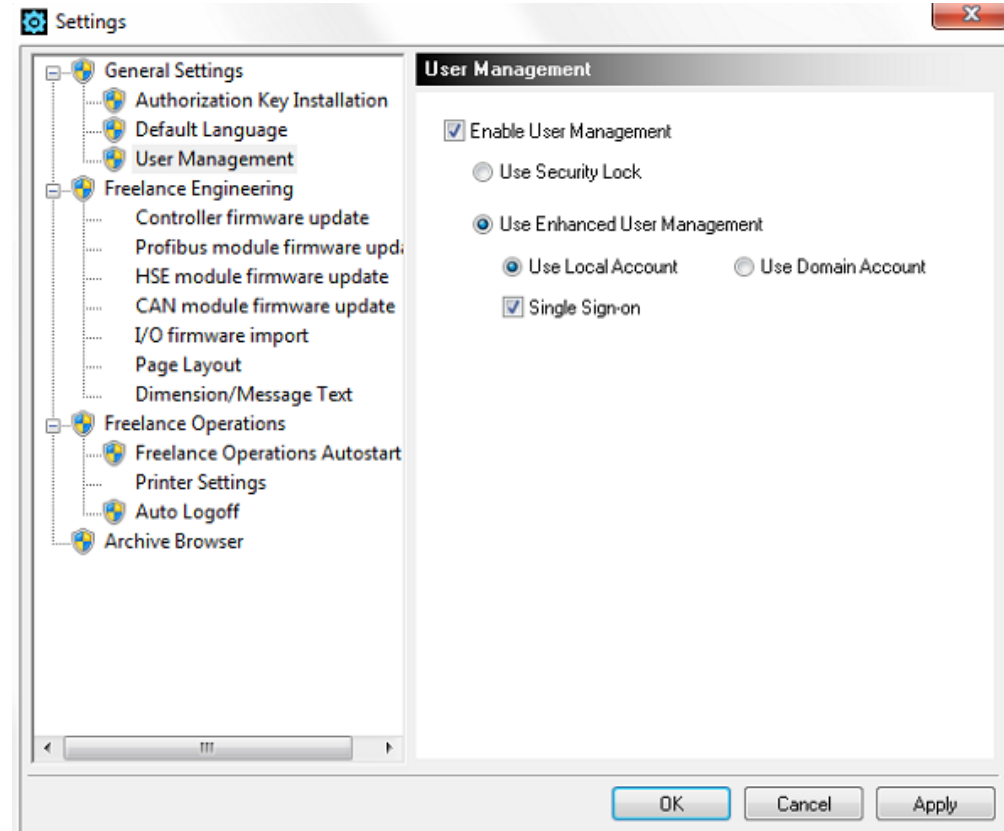
Increased Engineering effectiveness with full compatibility to existing user application

Freelance 2019

Security

Extended User Management

- Security improvements
 - Alternative user management and authentication based on Windows User Accounts
 - Auto-logoff, Password aging, Password complexity, min. Password length, Central Password Management
 - Password management via Local User Accounts or Domain Server
- Options for User Management
 - Security Lock (known from former Versions)
 - Extended User Management (based on Windows Accounts)



Freelance 2019

User Management - Overview and comparison

No Security	No security features
Security Lock	Group based permissions Auto log-off
Local Accounts	Group based permissions Auto log-off Password policies with Single Sign-On Option
Domain Accounts	Group based permissions Auto log-off Password policies with Single Sign-On Option Centralized Password Management




To be configured in Freelance Settings tool

Independent user management options to fit all needs

Freelance 2019

Supported Operating System

Supported Operating System

	Freelance 9.2	Freelance 9.2 SP1/2	Freelance 2013 / 2016	Freelance 2016 SP1	Freelance 2019
	x	x	-	-	
	-	x	x	x	x
	-	-	-	x	x

Supported Operating Systems in Freelance 2019

- Operating Systems
 - Windows 7
 - Windows 10
- Mixed architecture, that means combinations of Windows 7 and Windows 10 PC's within the same system are possible

Benefits

- Easy upgrade from older Freelance Version without the need to update the Operating Systems
- Smooth and stepwise upgrade of Operating Systems in the plant, no need to update all PCs at once
- Easy expansion in the installed base, e.g. additional Operator Stations by using newest PC's

Freelance 2019

Live Demo



Freelance 2019

Summary

Enhanced scalability: New PM 904F controller

Improved usability: Increase Operator and Engineering efficiency

More connectivity: Up to 4 communication Interfaces for AC 900F

Compatibility: Support of Windows 7 and Windows 10

Enhanced Security: New Extended User Management



Freelance 2019 - significant improvements in all areas: scalability, usability, connectivity, compatibility and security

Agenda

Freelance Version 2019 – What's new

Other news around Freelance

Success Story – Byworth Boiler <- Not confirmed yet!

Q&A

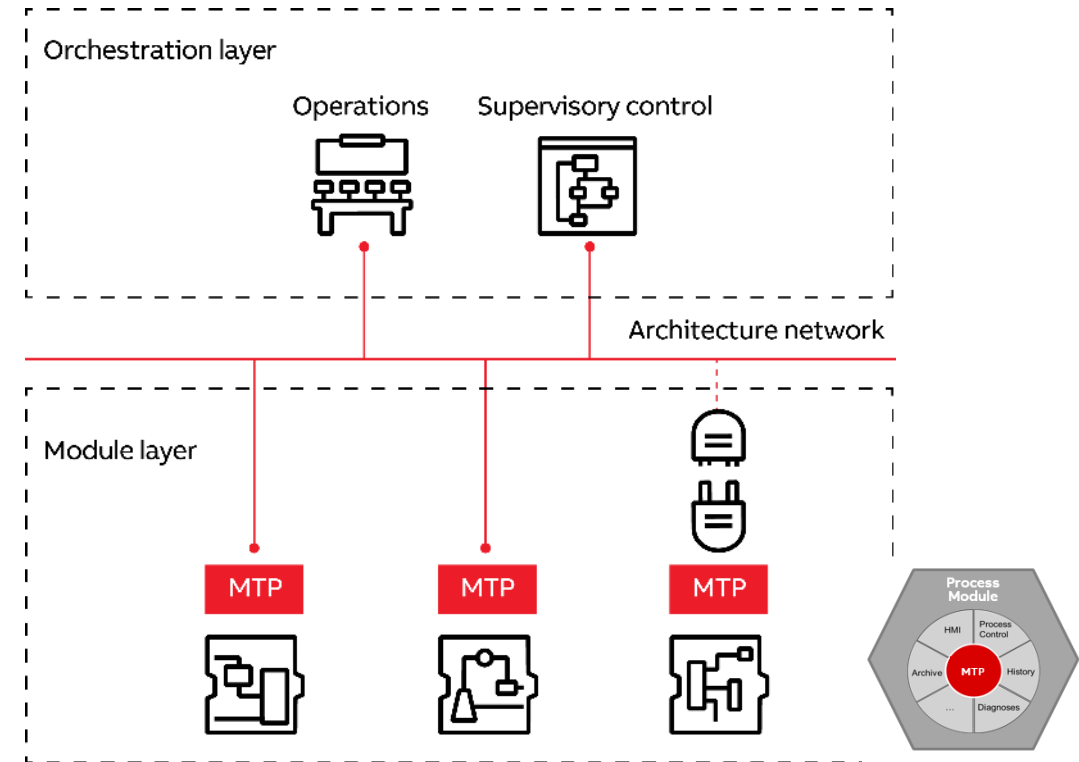


Other news around Freelance

Modular Automation

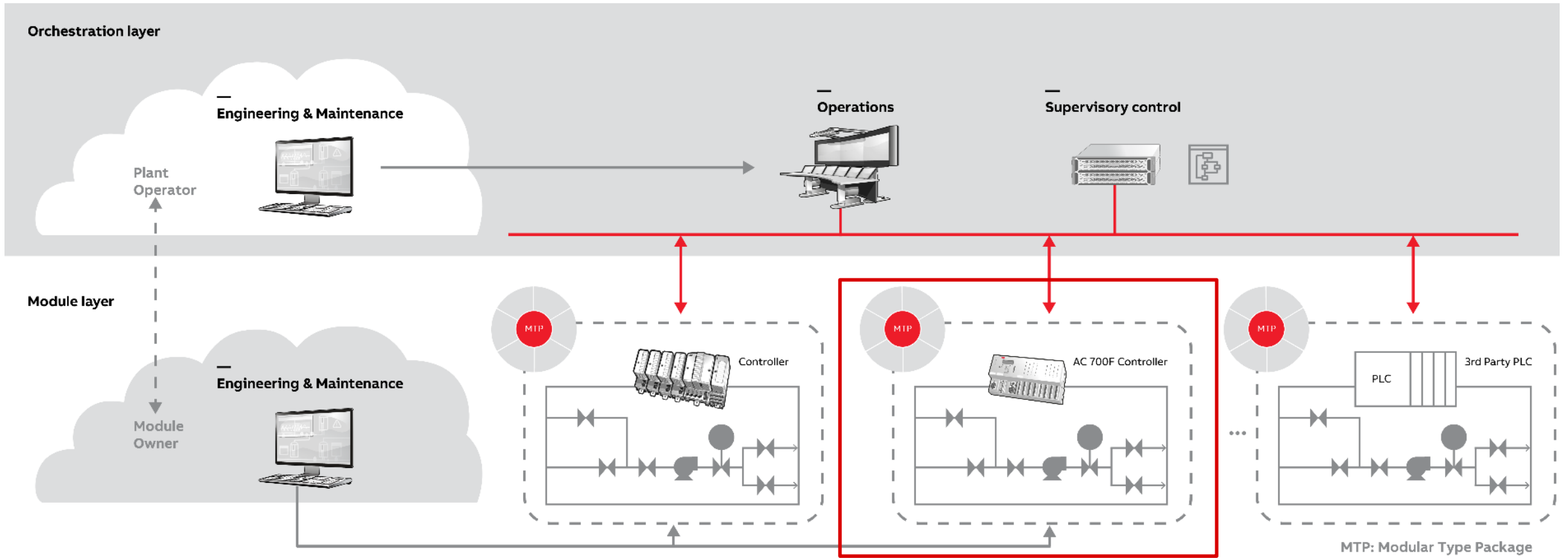
Reduce cost, risk and schedule by

- Focus on core business of production of goods – partners for modules
 - Higher flexibility in production in terms of scaling and change of product variants
 - Faster Time to market (from idea to market introduction)
 - Over the plant life cycle reduced cost as upgrades can be done on smaller granularity
 - Standardization in process modules enables flexibility of suppliers
- ⇒ ABB solution already released
- ⇒ Freelance is ready made for MTP's



Other news around Freelance

Automation for Modular Plants - System architecture



Agenda

Freelance Version 2019 – What's new
Other news around Freelance
Success Story – Byworth Boilers
Q&A





Byworth

BOILERS





What We Do



- Manufacture industrial steam and hot water boilers
- Boiler house installations
- Boiler service and commissioning
- Steam plant training



Traditional Boiler Control

- Several independent controllers
- Older technology
- Heavily restricted functionality
- Reliant on 3rd party development





Why ABB Freelance

- Single programming environment
- Distributed control (multi-boiler)
- Configurability
- Connectivity





ABB Unity

Operate Message list View Display Tools Print Help

Left Panel: Boiler, Boiler Checks, Bottom Blowdown, Burner, Cold Start, Dosing Pumps, Feed Water, Flue Gas, Hotwell Tank, Instrumentation

Right Panel: Logs, Metering, Remote Alarm, Schedule, Sequencing, Servicing, Steam Valve, TDS Control, Trending, Water Level

Bottom Gauges:

- Boiler Level
- Boiler Pressure: 9.3 bar
- Hotwell Tank Level: 58%
- Hotwell Temperature: 77 °C
- Feed Temperature: 81 °C
- Flue Temperature: 205 °C

2016



ABB

Operate Message list! View Display Tools Print Help

Low Water 1 ● Low Water 2 ● High Water ● Excess Pressure ● Burner Lockout ● Hotwell Tank ●

Boiler Information

Setpoint	Valve Position
50 %	97 %
Reliability	Lockout Count
99.1 %	93

Burner ●

Modulating

Modulation	Setpoint
72 %	9.5 bar

Flue Gas

Pre-Economiser	Post-Economiser
205 °C	134 °C

Feed Pumps

Pump Pressure	
12.1 bar	
Pump One	Pump Two
50 Hz	0 Hz

[Feed Pump Display](#)

Boiler Level ● Boiler Pressure **9.3 bar** Hotwell Tank Level **63 %** Hotwell Temperature **76 °C** Feed Temperature **80 °C** Flue Temperature **205 °C**

2016



ABB system

Operate Message list View Display Tools Print Help

Low Water 1 ● Low Water 2 ● High Water ● Excess Pressure ● Burner Lockout ● Hotwell Tank ●

Feed Pump One Inverter

Frequency
45 Hz

Speed
2711 rpm

Current
2 amps

Temperature
35 °C

Run Hours
8444 hrs

Feed Pump Control

Feed Pump One On / Off Automatic Rotation On / Off Feed Pump Two On / Off

Hotwell Water Level ● Feed Temperature

Setpoints

Water Level **50.0** % Pump Pressure **11.0** bar

Water Level

Temporary Pump On / Off Control On / Off

Automatic Rotation

Next Pump Change-over
24:00

Current Lead Feed Pump

Pump One Pump Two

Feed Pump Two Inverter

Frequency
0 Hz

Speed
0 rpm

Current
0 amps

Temperature
0 °C

Run Hours
0 hrs

Boiler Water Level %

9.0 bar

58 %

73 °C

79 °C

207 °C

2016



ABB system Boiler On

Operate Message list! View Display Tools Print Help

Low Water 1 ● Low Water 2 ● High Water ● Excess Pressure ● Burner Lockout ● Hotwell Tank ●

Burner Information

Modulating

Setpoint	Modulation	Flame Signal	Flow Rate
9.5 bar	99 %	90 %	0 L/hr

Cold Start Stage Two - On Off

```

graph TD
    Start[Stage 2 Active] --> OnPeriod[On Period 0 mins set]
    OnPeriod --> OffPeriod[Off Period 0 mins set]
    OffPeriod --> OnPeriod
    Start --> Setpoint[Boiler Stage 2 Setpoint 0.6 bar]
    Setpoint --> Complete[Stage 2 Complete]
  
```

Cold Start Countdown

Stage One Activated In
12:00

Stage Two Activated In
36:00

Cold Start Stage One - Low Fire

```

graph TD
    Start[Stage 1 Active] --> Setpoint[Boiler Stage 1 Setpoint 3.0 bar]
    Setpoint --> Complete[Stage 1 Complete]
  
```

Boiler Level

9.0 bar

59 %

Unity

74 °C

79 °C

207 °C



ABB system

Operate Message list View Display Tools Print Help

Low Water 1 ● Low Water 2 ● High Water ● Excess Pressure ● Burner Lockout ● Hotwell Tank ●

Water Level

Current Level **56 %** Setpoint **50 %**

Level Setpoint

High Level Alarm Setpoint **90 %**


High Setpoint

Low Level Alarm Setpoint **15 %**

Low Setpoint

Hotwell Control

Water Fill Steam Injection Alarms



Steam Injection

Temperature **74 °C** Setpoint **79 °C**

Temperature SP

High Temperature Alarm Setpoint **95 °C**

High Setpoint

Low Temperature Alarm Setpoint **30 °C**

Low Setpoint

Boiler Level

9.0

Boiler Pressure

9.0 bar

Hotwell Tank Level

56 %

Hotwell Temperature

74 °C

Feed Temperature

79 °C

Flue Temperature

207 °C

2016

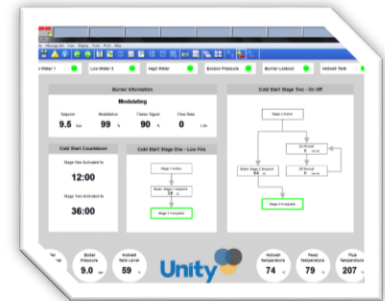




ABB system

Sequence00 DEMO

Operate Message list View Display Tools Print Help

Low Water 1 ● Low Water 2 ● High Water ● Excess Pressure ● Burner Lockout ● Hotwell Tank ●

Sequence Control

Sequencing Available ●

On / Off

Auto Rotation

Reset Sequence

Sequencing

Exported Steam

0

kg/hr

Next Boiler Rotation

Sunday @ 06:00:00

Sequence Setpoints

Setpoint Match

Rotation

Pressures

Flows

Boiler One

Running as Lead

Boiler Status ●

Boiler Pressure 0.1 barg

Burner Modulation 0 %

Boiler Two

Idle as Assist

Boiler Status ●

Boiler Pressure 5.0 barg

Burner Modulation 0 %

Boiler Three

Idle as Standby

Boiler Status ●

Boiler Pressure 2.5 barg

Burner Modulation 0 %

Boiler
Level

Boiler
Pressure
0.1 bar

Hotwell
Tank Level
47 %

Unity

Hotwell
Temperature
38 °C

Feed
Temperature
0 %

Flue
Temperature
66 °C

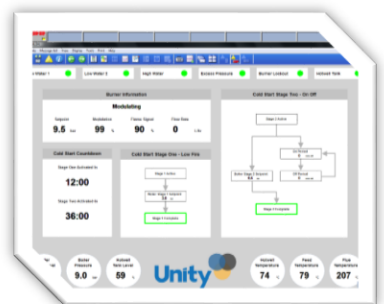
Unity

Boiler One

Feed Pumps

Sequence Setpoints

Sequencing





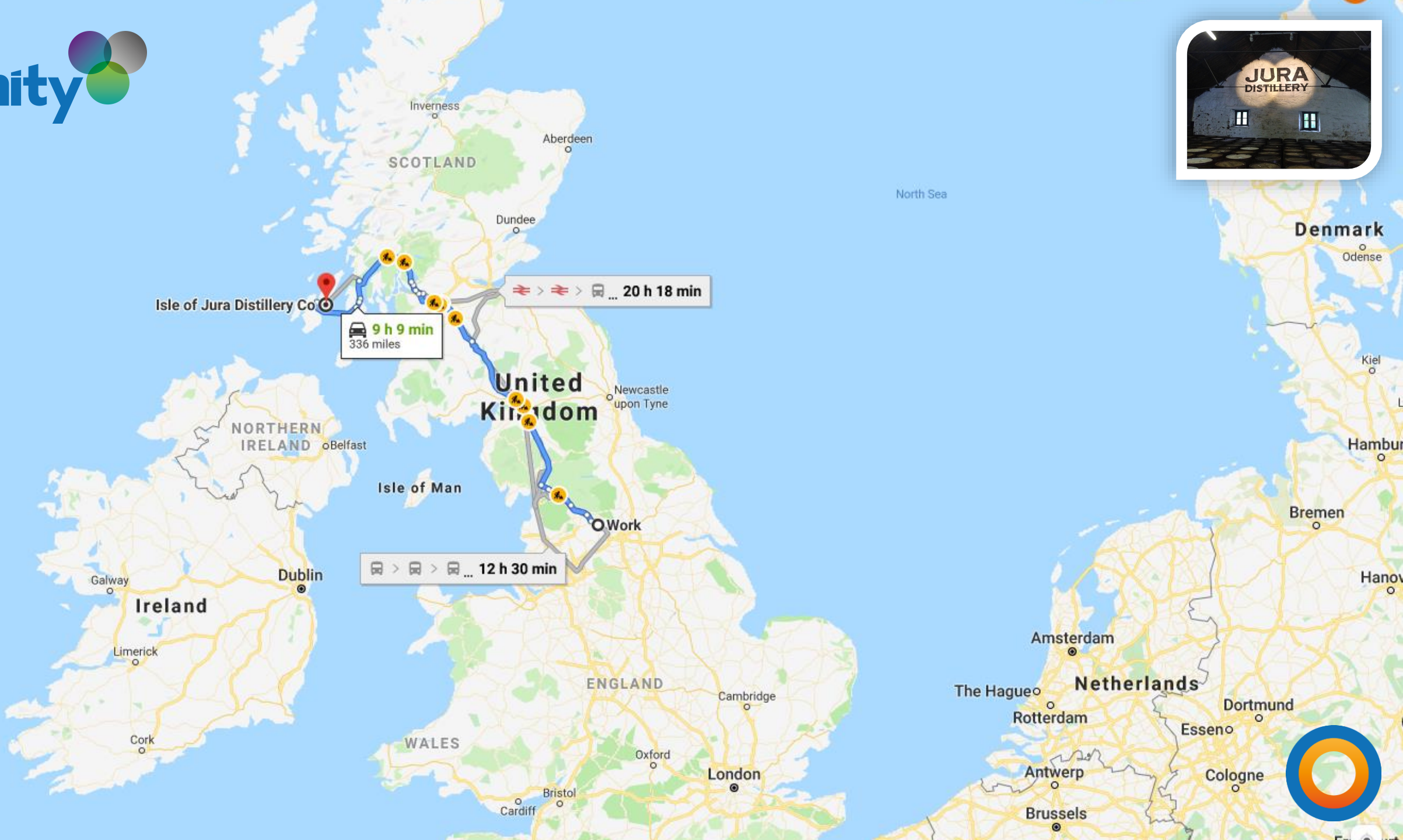
Unity

Three overlapping circles are positioned to the right of the word 'Unity'. The top-left circle has a purple-to-blue gradient. The top-right circle is a solid grey. The bottom circle has a green-to-teal gradient. They overlap each other and the word 'Unity'.



JURA DISTILLERY







Remote Monitoring



- Cellular network
- Modbus TCP communication
- Remote alarms / management



Exported Steam



JURA
SINGLE MALT SCOTCH WHISKY



TAMNAVULIN
SPEYSIDE
SINGLE MALT
SCOTCH WHISKY

-
kg/hr
-
bar(g)

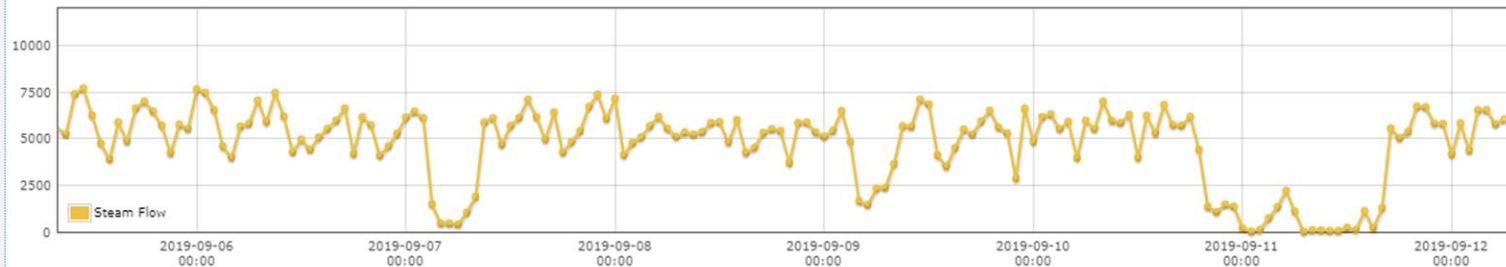
-
kg/hr
-
bar(g)

3880
kg/hr
6.0
bar(g)

5882
kg/hr
8.3
bar(g)

Tamnavullin Distillery

31 days 7 days 24 hours



Fettercairn Distillery

31 days 7 days 24 hours



Remote Support



- Full dial in access
- Remote fault analysis
- Peace of mind for customer





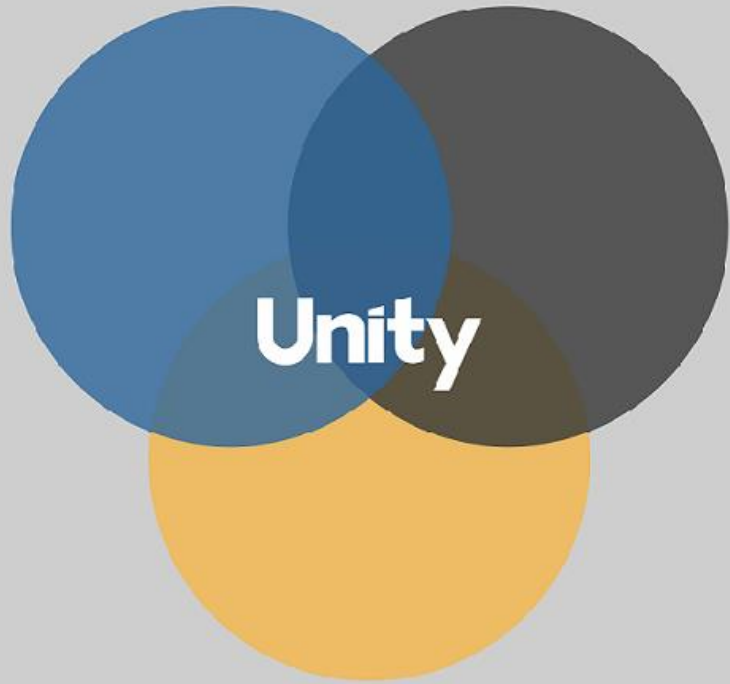
ABB
DEMO

System	8	Critical	7	Warning	5	Boiler	0	Burner	0		1	Blowdown	0	No Area	9
Feed Pumps	0			Cold Start	0										

Navigation bar with icons for Home, History, Favorites, and various system functions.



- Boiler
- Boiler Checks**
- Bottom Blowdown
- Burner
- Cold Start
- Dosing Pumps
- Feed Water
- Flue Gas
- Hotwell Tank
- Instrumentation



- Logs
- Metering
- Remote Alarm
- Schedule
- Sequencing
- Servicing
- Steam Valve
- TDS Control
- Trending
- Water Level

Byworth BOILERS logo and key performance indicators:

- Boiler Water Level: 67 %
- Boiler Pressure: 3.2 bar
- Hotwell Tank Level: 71 %
- Hotwell Temperature: 87 °C
- Outdoor Temperature: 17 °C
- Boiler Reliability: 95 %



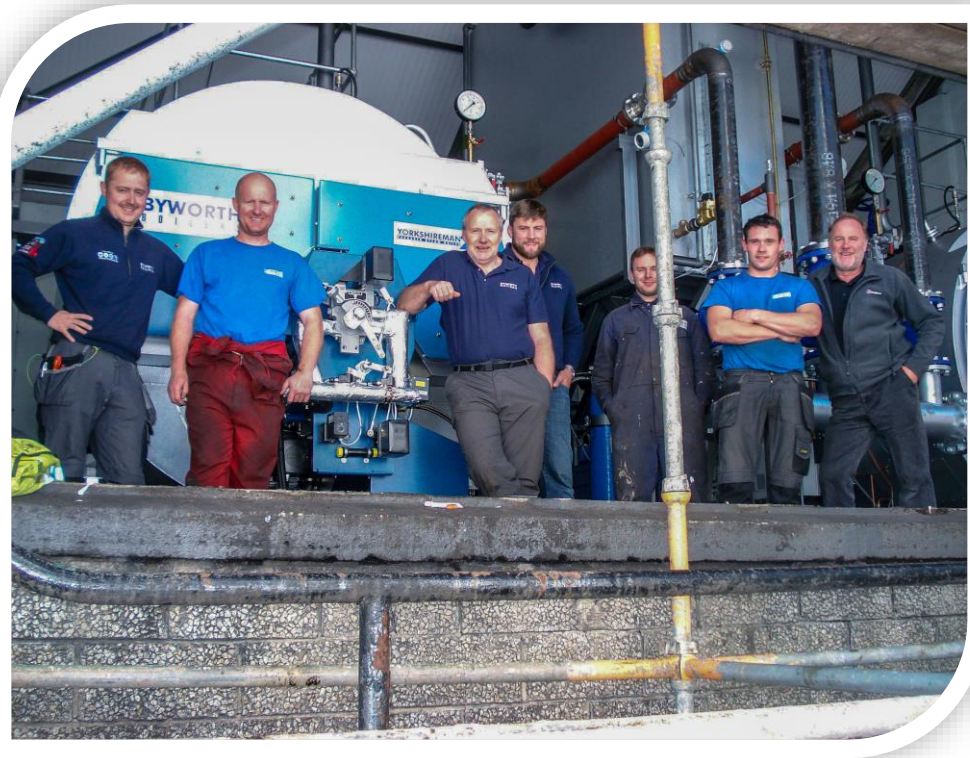


Jura Outcome

12% fuel volume reduction

“Using less fuel reduces your carbon footprint and that’s multifaceted because using less fuel reduces carbon all through the fuel supply chain. The reduction means maybe 2 less lorries a month having to come to Jura.”

Andy Jardine – Whyte and McKay





Byworth
BOILERS

Unity



Agenda

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Q&A





Questions?

Next session

BREAKOUT TRACKS				
2.45 pm	Growth opportunities in Control Systems' Lifecycle	Select I/O	Freelance 2019 – New functions and highlights	System 800xA enhanced Safety offering
	Segment Offering	Product Overview	Product Overview	Product Overview
3.30 pm	Break			
4.00 pm	Partner success story			
4.30 pm	Guest speaker from a leading Digital company			
5.15 pm	Summary of Day 1			
5.30 pm	End Day 1			
5.40 pm	Group Picture			
6.15 pm	Networking event program and dinner			

AABB