

O in Action

#IoTinActionMS



Partner Customer Case Study: ICONICS

Jennifer Anderson

Principal Solution Specialist, Americas IoT Microsoft







Accelerate IoT for Connected Operations

Mark Hepburn VP of Worldwide Sales





About ICONICS

A Mitsubishi Electric Group Company





Energy Smart Buildings Smart Cities



Manufacturing Intelligence and Industrial Automation

Power & Water Utilities Oil & Gas

Public Infrastructure

MITSUBISHI ELECTRIC A Mitsubishi Electric Group Company

Enabling Digital Transformation © 2020 ICONICS, Inc.

Automation Software for Any Industry



Over 375,000 Applications Worldwide



US Govt (Pentagon, DISA, etc.)



Target 1830 Bldgs





Raytheon 56 Bldgs



Argonne National Labs

Hess Midstream Processing



FCA Casting Plant



FLSmidth





Microsoft 138 Bldgs





AT&T 900+ Bldgs

BMW Spartanburg



Scholle IPN

Purdue University



ZF Axle



Connected Factories

Solution Capabilities for Industry 4.0 and Advanced Digitization





Customer Showcase

Exception Based Surveillance

Centralized Monitoring and Control with Azure IoT Hub and Azure-based SCADA

Full SCADA with command and control.

alarm and historian across 900 sites, 1200

ICONICS Solution

39

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Dickinson Williston Basin

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Formation

Sidney

Glasgow

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Miles City

Customer Business Goal

Leverage Cloud Platform and IoT Technologies to reduce operating costs, **improve resiliency** and **performance**



"We deployed an enormous system with ICONICS GENESIS64, and are moving it to the Azure Cloud with Azure IoT Hub and ICONICS IoTWorX with disaster recovery and greatly improved mobile operator interface"

- Clifton Summers, Senior Technical Manager, Hess Corporation

SOUTH DAKOTA



Asset-based Mobile HMI cloud system improved operator response and reduced operating costs by \$5MM over 8 years. Disaster recovery system leverages Azure platform scalability. Preparing to leverage advanced Azure PaaS services including Azure Data Lakes, and Machine Learning.

HESS

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IoTWorXTM

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Oil and Gas Case Study: Hess Process Control system that is accessible to mobile users





Customer Showcase

Manufacturing Intelligence

Real-Time Dashboards on MS Azure with Power BI

Customer Business Goal

Provide Real-Time dashboard to improve OEE, SPC & Machine performance

ICONICS Solution

Provided common metrics for driving improvements, resulting in a system that could be deployed across Scholle globally.



ICONICS **OEE solution deployed to all 12 Scholle sites** around the world.







Customer Showcase

Production Monitoring and Control across **12 plants** and 502 machines **worldwide** with **MS Azure**

- MS Azure access from anywhere
- OEE and KPI's
- ERP Order Integration for Operators
- **Power BI integration** with business systems
- Unified data model for decisions
- Real-time Machine Status
- Alarm Management
- Worldwide Data Access
- Enterprise Historian
- Statistical Process Control with 3.5 Million
 Samples Per Machine
- High-Speed Operation: 85 charts for every product at 2 seconds per product





Department AndOn Displays







Mobile Analytics and control



ICONICS Suite of Solutions V10

HMI / SCADA	Historian	Analytics	ΙοΤ
GENESIS64 [™] MobileHMI [™] KPIWorX [™]	Hyper Historian [™]	AnalytiX [®]	IoTWorX ™
HMI, SCADA, Dashboarding	Enterprise Historian	Analytics	IoT and Cloud
 HTML5, WPF Self-service dashboard Advanced Graphics in 2D and 3D Smart pins GEO Mapping (GIS) Asset Management Trend Charting Standard interfaces 	 High-Capacity 100 000 Samples/Sec Mission Critical Redundancy Virtualization Advanced Archival Distributable Architecture Real-Time Statistical Calculation Standard interfaces 	 Energy Management Asset Fault Detection and Diagnostics Predictive Maintenance Manufacturing Productivity (OEE) Alarm Analysis Reporting and AnalytiX-BI 	 IaaS, PaaS, SaaS Pub/Sub Architecture Message Oriented Middleware Built-in Security Edge Analytics Over-air-configuration Standard interfaces
<image/>	Total Plant Total	<section-header></section-header>	 CONSTAIR Example Sward August Sward August<!--</td-->

Modular • Interoperable • Secure • Reliable • Scalable • Unified



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Universal Connectivity

Equipment ++ Ŵ ÷÷





Centralized, Uniform Platform delivered on a Single Pane of Glass





Convergence of Disparate Devices to One IoT Platform





IoT Challenges







Establish bidirectional communication with thousands of IoT devices

- Secure transport of telemetry data from device to cloud
- Communication via a publisher/subscribe methodology (Pub/Sub)
- Secure transport protocols: AMQP, MQTT, REST, Web Services

Authenticate per device for security-enhanced IoT solutions

- Independent credentials and identities for each connected device
- MS Azure IoT Hub TLS Security Supports TPM + X.509

Automate IoT device provisioning and registration to accelerate deployment

- Zero touch provisioning secure and scalable
- Load balance across multiple IoT Hubs
- Device Provisioning Services (DPS) with MS Azure IoT Hub

Cost effective platform and networking with cloud technology at the edge device

- Store and Forward for resiliency and network efficiency; Low cost hardware and operating system
- Easy Orchestration of micro-services (containers) for device twins and edge analytics
- Azure IoT Edge Operating System (residing on the IoT gateway)





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IoTWorX:

Connectivity

deployment

Visualization

IoTWorX[™] **Integrated IoT Solution Microsoft Azure Cloud Connectivity** Built in secure Cloud HTTPS GENESIS 64 ICONICS Facility Hyper App Servers / Graphics AnalytiX Historian Workbench / MobileHMI Azure Services Quick time to cloud Kathar Rowers Salatake **IoT Point Manger** FrameWorX Server Enterprise wide **Cloud Platform Services** Azure loT Hub Azure Device Provisioning Service: **Remote Monitoring** Visualization **HTTPS** AMQP No touch provisioning from the cloud at the Edge Workbench Real time data logging and Premise IoTWorX[™] visualization at the edge FDD analysis at the edge On Data Storage at the edge

KPlWorX[™]

- Store and forward Data to cloud •
- Local Playback on IoT Visualizer
- Supports up to 5000 tags



Azure IoT Edge Runtime

Azure IoT Edge is a fully managed service that allows you to deploy Azure and third-party services, and edge modules to run directly on IoT edge devices, whether they are cloud-connected or offline

The **IoT Edge security daemon** starts each time an Edge device boots and bootstraps the device by starting the IoT Edge agent.

The **IoT Edge agent (is the manager)** facilitates deployment and monitoring of modules on the IoT Edge device, including the IoT Edge hub. Ensures that IoT Edge modules are always running.

The **IoT Edge hub (is the communicator)** manages communications between modules on the IoT Edge device, and between the device and IoT Hub.

IoT Edge Runtime	Edge Hub Contain	er	1		
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			Agent		
			Contain		
			e B		
			Edge Se		
			curity Da		
			aemon		
Doc	ker Engine MOBY	Docker Daemon	ل ے		
Host OS – (Linux, Ubuntu 16.4, 18.4, Debian Raspbian)					



Pub / Sub



IoTWorX[™] Software Stack

- Azure IoT Edge Runtime Platform
- Linux Ubuntu
- Docker Containers
- IoT Cloud Connector
- IoT Communicator
- IoT Hyper Collector
- IoT Analyzer
- IoT Visualizer
- Integrated MQTT Broker
- System Health

Provisioning **IoTWorX**[™]

- Secure, Automatic (no touch) Provisioning
 - Azure DPS (Device Provisioning Service)
 - TPM (Trusted Platform Module)
 - Zero touch provisioning over cloud
 - Device Vendor installs Device Software
 - User provides (to device vendor)
 - ID Scope
 - Registration ID (not needed if TPM based)
- Optional Manual Provisioning
 - User installs device software and manually enters connection string



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	IoT Software	IoT Hardware Azure Clou		ire Cloud	ICONICS Apps	
	Model	loT Cloud Connector	IoT Communicator	IoT Collector	loT Analyzer	IoT Visualizer
	IoTWorX Communicator 5000 Tags*	√	\checkmark			\checkmark
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* Requires subscription for one or more ICONICS products in the cloud. All ICONICS IoTWorX models are available through affordable subscription pricing.



Minimum Hardware requirement (Windows10)

- Processor: Intel Atom 38xx 03 39xx Dual Core
- Memory: 4GB RAM
- Storage: 32GB SSD

Minimum Hardware requirement (Linux Debian)

- Processor: ARM CorteX A53
- Memory: 1GB RAM
- Storage: 32GB Micro SD



Minimum Azure Services

- Virtual Machine Minimum DS2_V2: 2 cores, 7GB RAM, 14 GB Disk Space
- Azure IoT Hub S1 recommended
- Azure SQL Database Basic



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Email iot@iconics.com

www.iconics.com

TRANSF 360 RM

ACTIVITIES

TRAVEL

CONTACT US

2020 WORLDWIDE CUSTOMER SUMMIT

74d 1h 58m 22s

March 31 - April 3, 2020 • Foxwoods Resort Casino • Mashantucket, CT, USA

REGISTER NOW

WHAT TO EXPECT

https://iconics.com/WWCS

NSFRM

PROGRAM

SPEAKERS





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Thank you!