WATERFALL®
Stronger Than Firewalls

SECURE & RELIABLE SMART MANUFACTURING OPERATIONS

THE SMART WAY TO IIOT STARTS WITH SECURE CLOUD CONNECTIVITY

Customer	Smart Manufacturing Enterprise
Customer Requirement	Enable secure Industrie 4.0 and industrial Internet cloud connectivity for manufacturing floor systems, while eliminating the risk of remote attacks impairing manufacturing operations
Waterfall's Unidirectional Solution	Unidirectional CloudConnect secures the smart manufacturing network perimeter from external threats with hardware-enforced protections, and converts data into unified cloud-friendly formats, enabling vendor monitoring, industrial could services and real-time visibility into operations

INDUSTRIAL CONNECTIVITY CHALLENGES

The IIoT promises enormous value to manufacturing operations, but faces significant challenges. Industrial communications protocols and data formats are not good fits for big-data and cloud analysis needs, and increased Internet connectivity to edge devices on industrial networks dramatically increase attack opportunities and security risks.

Waterfall's Unidirectional CloudConnect provides strong, physical protection from Internet-based and other remote attacks for industrial control systems and edge devices. In addition to strong cyber protections, CloudConnect routinely carries out all necessary industrial to cloud communications as well as data format and object format conversions. Unidirectional CloudConnect makes industrial cloud connectivity easy and robust.

THE CHALLENGE

To secure the production network from IP theft and cyber-sabotage from threats emanating from cloud networks, yet still provide the enterprise network with real-time access to live operations data and visibility into manufacturing operations.

Modern industrial attacks routinely defeat firewalls, encryption, intrusion detection and other software protections. The smart manufacturing site needs to enable cloud connectivity for edge devices in control system networks, while reliably defeating modern attacks.

WATERFALL SOLUTION

Waterfall Unidirectional CloudConnect was installed between the manufacturing production network and the enterprise network.

Unidirectional CloudConnect collects data from IIoT edge devices as well as from conventional industrial data sources such as PLCs, OPC servers and production historians. Unidirectional CloudConnect converts this data into websockets and other cloud-friendly formats and publishes the data to cloud platforms while physically preventing any Internet-based attacks from reaching manufacturing networks.
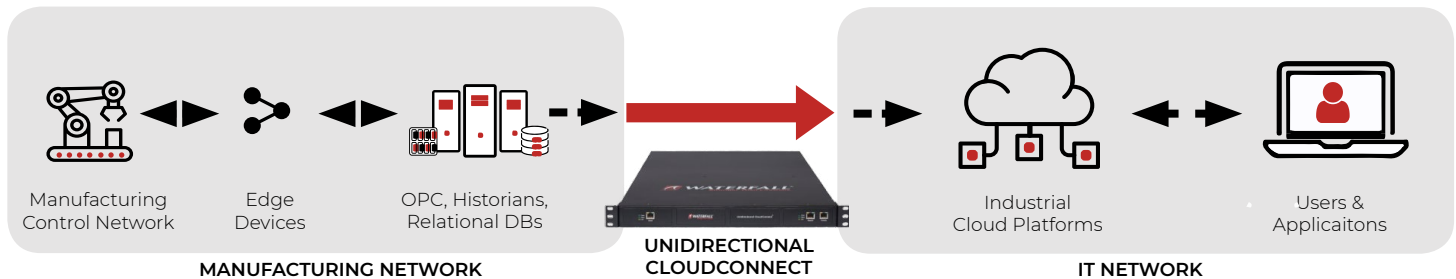
RESULTS & BENEFITS

100% Security: The production network is now physically protected from any cloud-based threats.

100% Visibility: Waterfall Unidirectional CloudConnect provides safe visibility into industrial operations for enterprise users, vendors and cloud-based service providers.

100% Compatible: ICS, enterprise and cloud systems continue to operate normally. Unidirectional CloudConnect provides to each participant the protocols and servic es they expect of connected devices and networks.

THEORY OF OPERATION

Manufacturing Control Network — Edge Devices — OPC, Historians, Relational DBs — **UNIDIRECTIONAL CLOUDCONNECT** — Industrial Cloud Platforms — Users & Applicaitons

MANUFACTURING NETWORK — **IT NETWORK**

Waterfall Unidirectional CloudConnect is a secure cloud gateway based on Waterfall's industry-leading Unidirectional Security Gateway technology. CloudConnect uses both hardware and software components. **Unidirectional Gateway hardware can transmit information from a control system network to an external network but is physically incapable of propagating any cyber attack back into the protected network.** Unidirectional Gateway hardware includes a Transmit (TX) Module with a fiber-optic transmitter, but no receiver, and a Receive (RX) Module, with an optical receiver, but no transmitter. The gateway hardware can transmit information from a manufacturing network to an external network, but is physically incapable of propagating any virus, DOS attack, human error or any other cyber attack back into the protected network.

Unidirectional CloudConnect builds on this **one way protection hardware** by gathering data from Industrial Internet (IIoT) and Industrie 4.0 edge devices, translating that data into Internet-friendly and cloud-friendly formats and protocols, and transmitting the information securely to cloud systems. Unidirectional CloudConnect both translates industrial data into big-data and cloud-friendly formats and provides Internet connectivity for manufacturing operations without risk to those operations.

UNIDIRECTIONAL CLOUDCONNECT BENEFITS:

» Safe Cloud integration physically preventing remote attacks from infecting the production network

» Enables big-data, cross-site and cross-application analysis and correlations

» Safely enables outsourced and cloud services such as predictive maintenance, big-data optimization and outsourced cloud security monitoring

» Compliance with even the most demanding cyber-security regulations, standards and best-practice guidance

SECURITY AND COMPLIANCE

- **Certification**: Common Criteria EAL 4+, ANSSI CSPN, NITES Singapore, CCC China

- **Assessments**: US DHS SCADA Security Test Bed & Japanese Control Systems Security Center Bed, Idaho National Labs, Digital Bond Labs, GE Bently Nevada Systems Labs, and NISA Israel

- **Complies with**: Global ICS Standards & Regulations, NERC CIP, IEC 62443, NRC 5.71, NIST 800-82r2, CFATS, ISO, IIC SF, ANSSI, and many more

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ABOUT WATERFALL SECURITY

Waterfall Security Solutions is the global leader in industrial cybersecurity technology. Waterfall products, based on its innovative Unidirectional Security Gateway technology, represent an evolutionary alternative to firewalls. The company›s expanding portfolio of customers includes national infrastructures, power plants, nuclear plants, offshore oil and gas facilities, rail transport, refineries, manufacturing plants, utility companies, and many more. Deployed throughout North America, Europe, the Middle East and Asia, Waterfall products support the widest range of leading industrial remote monitoring platforms, applications, databases and protocols in the market. Please contact: **info@waterfall-security.com**.