



Plug & Play IoT Connectivity for Legacy PLCs

PLC Networking Challenges in Industry 4.0

Introduced during the era of Industry 3.0, Programmable Logic Controllers (PLCs) have long been regarded as the brains of cross-industry automation and controls systems. A PLC gathers and processes analog and digital data from thousands of input devices, then triggers real-time responses on corresponding output devices based on pre-configured logic.

As the Industrial Internet of Things (IIoT) and cloud computing usher in the fourth Industrial Revolution, legacy PLCs now present major

challenges of data silos caused by insufficient networking capability.

Designed in the early 2000s when Internet connectivity was nowhere near pervasive, the first PLCs were intended for communications within local, closed-loop processes only. Most of the time, they employed proprietary, vendor-specific protocols to build I/O values and interact with other components in the control systems.

Due to the lack of networking connectivity, legacy PLCs do not support communications with the cloud and have very limited ability to

exchange data with high-level management systems like Manufacturing Execution Systems (MES) and Enterprise Resource Planning (ERP). Reprogramming brownfield PLCs for IoT connectivity to extract production data can result in costly downtime and even threaten to damage functioning equipment.

Next-generation PLCs with industrial ethernet capabilities also come with networking challenges. In many industrial settings like open-pit mines, PLCs are located kilometers away, making wired connectivity an unfeasible option. Additionally, running cables around factories and complex industrial facilities is dangerous, cost-prohibitive and may even cause production shutdowns.

Bringing IoT Connectivity to Brownfield PLCs

BehrTech in partnership with MAJiK Systems has created a market-ready solution that introduces a unique approach to IoT-enable

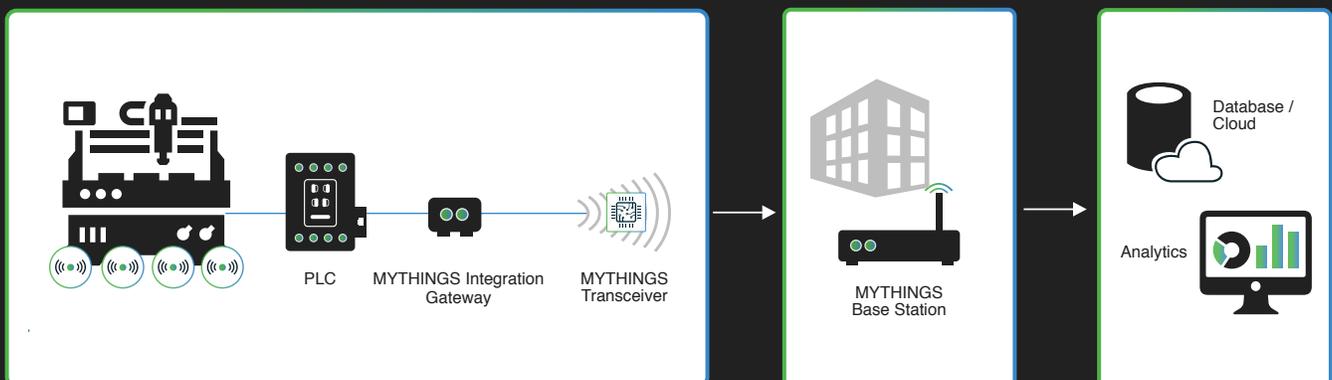
legacy PLCs simply and efficiently. The joint solution features two key components:

MYTHINGS™ by BehrTech: Featuring MIOTY Low-Power Wide Area Network (LPWAN) technology that delivers robust, scalable and cost-effective PLC data communications

MAJiK Platform: A versatile software suite for monitoring, analyzing and optimizing critical production data from field PLCs

How it Works

A MYTHINGS integration gateway running MAJiK's software, interfaces with brownfield PLCs to gather critical data points (i.e. PLC tags). A MYTHINGS transceiver, connected to the integration gateway, reliably and securely transfers data to a MYTHINGS base station. Data can then be relayed to a cloud platform and/ or on-premise application systems (MES, ERP) for storage, analytics and visualization.



Solution Features

- Fast and easy implementation that involves no PLC reprogramming or production downtime
- Robust, long-range and cost-effective connectivity for data communications from PLCs in remote, difficult industrial settings
- Support for cross-vendor PLCs and multiple physical interfaces (USB, serial, Ethernet)
- Configurable data transmission frequency and extracted PLC values
- Ability to scale with your operations

Solution Benefits

- Improve asset utilization and overall equipment effectiveness (OEE)
- Reduce Mean-Time-to-Repair and production downtime
- Boost visibility, productivity, and on-time delivery
- Enhance equipment and worker safety and improve compliance
- Reduce production waste and cost

Example Use Cases

The BehrTech – Majik PLC Integration solution bridges the information technology/ operations technology (IT/OT) gap in brownfield facilities allowing you to tap into valuable production data that was previously inaccessible in isolated, closed-loop systems.



Monitor assets and equipment to detect anomalies and breakdowns (e.g. motor overheating, bearing failure, conveyor jams, valve/ pipeline leakage, etc.)



Oversee production rate and count, cycle time, changeover, scrap rate, utilization, etc.



Receive notifications for tank or silo refills



Utilize data modelling to enable predictive maintenance



Track the energy usage of machinery and equipment



Collect operational data for auditing purposes (e.g. FDA & OSHA audits)



Supported PLCs

Vendors	Models
Allen-Bradley / Rockwell	ControlLogix, CompactLogix, MicroLogix, PLC5, SLC500
Siemens	S7 Family (200, 300, 400, 1200, 1500)
Beckhoff	TwinCAT PLCs
Mitsubishi Electric	MELSEC iQ-R, MELSEC iQ-F, MELSEC Q
Phoenix Contact	Class 100, Class 1000, Class 300, Class 3000
Schneider Electric	Modicon, PacDrive
ABB	All AC500 Series PLCs
Omron	CJ2M-CPU31, CJ2M-CPU32, CJ2M-CPU33, CJ2M-CPU34, CJ2M-CPU35
GE	PACSystems RX3i 330, PACSystems RX3i CPL410, RX3i CPE 400, PACSystems RSTi-EP, VersaMax

About BehrTech

BehrTech offers a disruptive wireless connectivity software platform that is purpose built for massive scale Industrial Internet of Things (IIoT) networks. At the core of the platform is MIOTY, a new communication technology standardized by ETSI that provides reliable, robust, and scalable connectivity unlike any other technology on the market. With its approach to interoperability, BehrTech makes it easy for end users to retrofit its MYTHINGS platform in any environment and enables partners, system integrators, and VARs to deliver fully-integrated IIoT solutions that enable data-driven decisions to be made.

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