TURCK

Your Global Automation Partner

Data Center Industry Guide

Digital Automation Solutions

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Introduction

Flexible Automation Built for the New Era of Data Centers

As data centers continue on their rapid build-out across the globe, increasingly dense server racks are pushing data center infrastructure into a new mechanical reality. Liquid cooling, free-cooling chillers, modular CDUs, smart pump skids and intelligent power equipment now define uptime - not the servers themselves. Yet most of this infrastructure is still automated with cabinet-bound, single-protocol architectures that no longer match the speed and modularity at which today's data centers are being built.

TURCK is a global automation partner with a portfolio purpose-built for these environments: rugged IP67 sensors, IO-Link condition monitoring, decentralized multiprotocol I/O and cabinet-free system architectures. We partner with data center owners, engineering firms, OEM suppliers and integrators who deliver the mechanical and electrical solutions data centers demand.

Our customers are the companies designing and building the critical infrastructure behind today's data centers.

Why work with TURCK?

- Decentralized IP67 architectures that eliminate large control cabinets and accelerate startup
- Multiprotocol Ethernet (PROFINET, EtherNet/IP, Modbus TCP) in a single SKU - one product line for multiple PLC platforms
- IO-Link end-to-end for sensor-to-cloud condition monitoring
- Wide range of sensors, including temperature, flow, pressure, leak, vibration and humidity, ideal for cooling loops and immersion cooling applications
- Global reach, local support that includes engineering resources, technical experts and local sales ready to support today's fast-moving data center industry

NEED MORE HELP?

For questions, please reach out to your local TURCK sales representative or email us at DataCenterUS@turck.com

Where TURCK Partners with You

Technology from TURCK can be embedded in multiple application clusters across the data center mechanical and electrical infrastructure. Each category offers a measurable benefit for customers.

Liquid Cooling, Immersion & CDU

Reliable temperature, flow, pressure, leak detection & pump control on direct-to-chip & rear-door heat exchanger systems.

Leak Detection · IO-Link · Pressure Flow · Temperature & Humidity Sensing

Fan & Pump Control

Precise speed, current & condition monitoring across CRAC, CRAH, fan walls & primary/secondary loops. Fan control via a shielded communication cable.

Temperature · Modular & Block I/O Shielded Communication Cable

Predictive Maintenance

Accurate 3-axis vibration, temperature & humidity data feeds predictive maintenance & DCIM dashboards.

Vibration, Temperature, Humidity Sensing · TAS Edge

Scalable & Modular Distributed Control

Cabinet-free IP67 I/O blocks with onboard logic. TURCK can provide a preconfigured solution to your specifications - ready to plug and use for modular skid design & faster commissioning.

Block I/O · ARGEE Software IP67 Power Supply

Power Distribution & Monitoring

Manage & monitor electrical infrastructure, load monitoring, & power quality. Preconfigured power distribution stations provide streamlined solutions to powering critical infrastructure.

Electronic Fuse · AC/DC Power Stations M12 L-Code Power Cable

Connectivity for Critical Infrastructure

Eliminate the need for conduit & terminating connections during setup. Plug & ready to use solutions speed up implementation. Ethernet for top-of-rack switching & infrastructure networks. Range of customization options.

Shielded M12 Cable, Tees & Splitters X-Code & D-Code Ethernet Cordsets

Automating Sustainable Data Centers

As data centers work to reduce water and power consumption and improve sustainability, automation plays a critical role in optimizing the performance of cooling and power infrastructure. TURCK's intelligent automation solutions provide real-time visibility into equipment health, energy and water usage and system performance through advanced sensing, IO-Link, connectivity and decentralized I/O architectures.

By enabling precise monitoring and control of pumps, CDUs, chillers and other critical systems, TURCK helps operators and equipment manufacturers improve efficiency, reduce waste, achieve sustainability targets and maximize asset utilization.

Liquid Cooling, Immersion & CDU

Data centers are specifically engineered to manage significantly higher thermal outputs. Direct-to-chip and rear-door heat exchanger architectures are now mainstream as rack densities climb beyond 50 kW. Coolant Distribution Units (CDUs), manifolds and secondary loops are the new uptime-critical assets - and they need the same sensing, connectivity and control quality as any process plant. Immersion cooling is rapidly becoming a preferred cooling technology for high-density data centers. Components used within the immersion cooling environment must be engineered to withstand continuous exposure to specialized dielectric fluids. TURCK delivers a unified, IO-Link-based instrumentation line in addition to other automation solutions built for these applications.

- Detect leaks before they reach the rack - non-invasive sensing on every joint and manifold
- Monitor flow, supply/return temperature and differential pressure with IO-Link smart sensors
- In immersion cooling, pressure sensors can monitor coolant circulation and two-phase cooling systems to ensure proper operating conditions
- Integrate the entire CDU skid as a single multiprotocol Ethernet node - PROFINET, EtherNet/IP or Modbus TCP
- Eliminate the central control cabinet on smaller CDU skids using IP67 block I/O with free onboard ARGEE software. Distributed control can reduce demand on a busy PLC and improve scan times
- Stream condition data directly to the customer's building management system (BMS) or data center infrastructure management (DCIM) platform

Liquid Cooling, Immersion & CDU Applications

Coolant Flow & Temperature Monitoring

FS+ Flow Sensor with IO-Link

The FS+ monitors both flow and medium temperature in a single device, with no moving parts. Each sensor reports as an IO-Link node – parameter changes, trend data and diagnostics travel back to the controller without manual recalibration. For a CDU skid, that means one sensor type covers supply, return and bypass legs, with full parameterization stored centrally. In immersion cooling applications, FS+ sensors can verify coolant circulation through pumps, CDUs, and heat exchangers while detecting restrictions or pump failures.

50% fewer SKUs on the BOM

Differential Pressure Across the Heat Exchanger

PS+ Pressure Sensor with IO-Link

Heat exchanger fouling and pump degradation show up first as a drift in ΔP. The PS+ family delivers precise pressure measurement with IO-Link diagnostics so the customer's DCIM can flag a CDU before throughput drops. Stainless-steel wetted parts handle glycol and dielectric coolants used in two-phase systems.

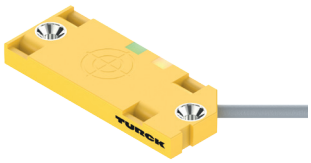
Early-warning maintenance window

Liquid Cooling, Immersion & CDU Applications (continued)

Leak Detection at Manifolds, Immersion Tanks & Drip Pans

Capacitive & Conductive Leak Sensors

A single drop of coolant in the wrong place can take down a row of racks. TURCK sensors detect water, glycol and dielectric fluids and report changes via IO-Link or discrete output. Mount them under every quick-disconnect, manifold and CDU drip tray and feed the data straight into the safety logic. Capacitive sensors can also provide early warning of coolant leaks in immersion tanks to minimize downtime and protect surrounding infrastructure.



Helps maintain a zero-leak architecture

CDU Skid as a Single Network Node

TBEN-L Multiprotocol Block I/O

A complete CDU skid - flow, pressure, temperature, valve actuators, pump start/stop - can run on one or two TBEN blocks instead of using a control cabinet. The same SKU runs PROFINET, EtherNet/IP and Modbus TCP. Receive a preconfigured, drop-in system ready for deployment and instant cooling.

Options for drop-in preconfigured devices

Measure Temperature & Humidity

CMTH Temperature & Humidity Sensor

Get real-time insights into data center environmental control and critical ambient variables to prevent hardware failure. The CMTH sensor provides temperature and humidity monitoring in one device. The sensor calculates dew point internally, helping to prevent moisture from condensing on critical components. Continuous temperature tracking helps prevent overcooling. Condition monitoring sensors track long-term trends to spot or correct anomalies before costly downtime happens.

Monitor critical variables in real time

Fan & Pump Control

Fans and pumps are among the largest non-IT energy consumers in any data center. They are also the most catastrophic single points of failure in cooling infrastructure. TURCK delivers sensing and control solutions that make the operation of every fan wall, every pump skid and every computer room air handler or air conditioning unit more transparent - without the need for a separate condition monitoring system.

- Help protect expensive components from thermal damage
- Fieldbus I/O for fan speed control, pump control, damper actuator control and feedback
- Energy-trend data sent directly to the TURCK Automation Suite (TAS) or the customer's existing analytics platform
- Combine flow, differential pressure and motor current readings on a single I/O block to calculate pump efficiency
- Cordset and splitter solutions for facility cooling and power equipment tied to central Building Management Systems or PLCs

Fan & Pump Control Applications

Maintain Optimal Temperature Conditions

TTM Temperature Transmitter with IO-Link Monitors Mission Critical Cooling

Maintaining optimal temperatures is critical to both uptime and energy efficiency. The TTM Temperature Transmitter with IO-Link is a compact and versatile sensor that can be programmed to function as an analog temperature transmitter, temperature switch, or digital sensor using IO-Link process data. Available with an integrated temperature probe, the TTM is easily configured to meet temperature application requirements.

Choose your design: overmolded or stainless steel housing, integral or remote probe

Improve Data Center Uptime with Shielded Cables

Connect Facility Cooling & Power

TURCK offers industrial-grade, shielded communication cables used in data centers to create a physical layer that connects facility cooling and power equipment to central Building Management Systems or PLCs. For Modbus RTU daisy-chaining, TURCK RS-485 cables can connect these drives sequentially in a daisy-chain configuration and communicate back to the local master controller.

Real-time communication for smarter facility control

Fan & Pump Control Applications (continued)

Bridge Central Controllers with Cooling Equipment

BL67, Multiprotocol Modular Cabinet-free I/O Systems

These IP67-rated cabinet-free I/O systems mount on a metal plate or DIN Rail, utilizing sealed M8 or M12 connectors that prevent dust and water ingress. This allows for flexible placement of input/output hardware closer to the equipment. TURCK's Multiprotocol design ensures fast, easy integration into multiple automation architectures. The BL67 can also process variable analog signals to dynamically adjust speeds. This modular solution reduces complex wiring, simplifying installation.

No control cabinet needed

Optimize Fan & Pump Monitoring

Cabinet-free TBEN-L Block, Multiprotocol I/O Master

TURCK's IP67 IO-Link masters reduce the costs of decentralized automation in data center applications. Eight Class A ports provide up to 16 universal digital inputs or outputs. IO-Link, Digital I/O, Analog, Serial and other versions available. It acts as a highly flexible interface for pure IO-Link, standard I/O or hybrid applications. TURCK's Multiprotocol design ensures fast, easy integration into multiple automation architectures. An integrated web server with IODD configurator simplifies the parameterization of connected devices and shortens commissioning time. No control cabinet needed.

Digital, analog & serial versions available

Predictive Maintenance

Track real-time asset health to detect equipment failure patterns before an outage occurs. Instead of servicing machines on a fixed schedule, technicians are able to use sensor data to target only the hardware showing early signs of degradation. TURCK delivers a single-source condition monitoring chain: smart sensor -> IO-Link master -> multiprotocol Ethernet -> cloud or DCIM.

- Reliable predictive maintenance ensures operators can see performance metrics in real time via IO-Link
- Detect vibration and thermal anomalies with the CMVT vibration and temperature sensor
- Standard preventative maintenance relies on calendar cycles - solutions from TURCK offer continuous asset monitoring to flag maintenance tasks when data indicates a decline in efficiency
- TAS Edge software flags deviations over time as early signs of equipment wear
- The CMTH temperature and humidity sensor provides predictive maintenance by continuously tracking microclimates inside electrical control cabinets and server aisles

Predictive Maintenance Applications

Predictive Maintenance on Fan Motors

CMVT 3-axis Vibration & Temperature

The CMVT vibration and temperature sensors can be mounted directly on each motor housing or bearing block. Internal evaluation triggers a warning threshold long before a bearing actually fails. No additional cabinet, no separate vibration analyzer, no specialized service contract - and full IO-Link integration into existing control architectures. Magnet-mount & hardware mount options provide flexibility.

Detect mechanical wear early

Measure Temperature & Humidity

CMTH Temperature & Humidity Sensor

Get real-time insights into data center environmental control and critical ambient variables to prevent hardware failure. The CMTH temperature and humidity sensor provides temperature and humidity monitoring in one device. The sensor calculates dew point internally, helping to prevent moisture from condensing on critical components. Continuous temperature tracking helps prevent overcooling. Condition monitoring sensors track long-term trends to spot or correct anomalies before costly downtime happens.

Monitor critical humidity in real time

Predictive Maintenance Applications (continued)

Simplify Condition Monitoring & Reduce Downtime

TAS Edge for Predictive Maintenance

TAS Edge software (license required) is included as part of the TURCK Automation Suite (TAS). TAS turns raw machine and sensor data into actionable maintenance insights before equipment fails. Rather than simply collecting data, it processes information locally at the machine level, allowing users to identify abnormal operating conditions, detect trends, and predict potential failures before they cause unplanned downtime. Get secure access to real-time operational and condition monitoring data from cooling systems, CDUs, pump skids, power infrastructure and other critical assets.

Transform operational data into actionable insights

Detailed Device-level Diagnostics with IO-Link

Real-time Visibility Into Critical Infrastructure Health

Maintaining the health of cooling and power infrastructure is essential to ensuring continuous uptime. TURCK's wide range of solutions with IO-Link provides access to detailed device-level diagnostics and real-time operational data from sensors monitoring pumps, valves, filters, flow rates, temperatures and more. By collecting and communicating this information through a standardized digital interface, IO-Link enables users to identify performance deviations, detect early signs of wear and monitor equipment health before failures occur.

Reduce downtime, improve asset reliability & optimize maintenance schedules

Distributed Control

A data center is a modular building. Every CDU, every cooler, every pump skid is built off-site, trucked in and quickly integrated. TURCK's out-of-cabinet IP67 I/O blocks with onboard logic mount directly on the skid - no cabinet, no rewiring between regions. It can work independently or be connected to the PLC via plug-and-play connectivity.

- Cut commissioning time: prebuilt modules arrive pre-wired with M12 plug-and-play connectivity
- Shrink - or eliminate - the local control cabinet on CDU and cooler skids
- Run small-to-medium control tasks directly on the I/O block with ARGEE (no PLC programming license required)
- Multiprotocol design ensures easy integration into multiple architectures. Switch between PROFINET, EtherNet/IP and Modbus TCP on the same hardware
- Distribute IP67 power supplies on the skid instead of routing 24 VDC over long control panel runs

Distributed Control Applications

Cabinet-free, Decentralized Data Center Automation

TBEN-L Multiprotocol Block I/O with Options for Drop-in Preconfigured Devices

Create a decentralized automation architecture in data halls by replacing centralized control cabinets with the TBEN series IP67 modules. Eight Class A ports provide up to 16 universal digital inputs or outputs. IO-Link, Digital I/O, Analog, Serial and other versions available. These devices enable infrastructure management (such as liquid cooling, PDUs and airflow sensors) to run locally in the data hall while reducing cabling and system downtime. Because the TBEN modules are fully potted and feature IP65, IP67 and IP69K protection ratings (depending on variant), they can be mounted directly on racks, cooling manifolds or containment aisles. This eliminates the need to run long, space-consuming cables back to a central control room.

Control unit on the machine instead of in the cabinet

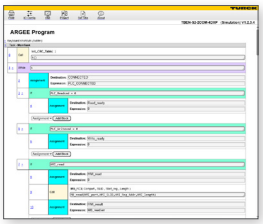
Direct Field Mounting with IP67 Protection

IP67 Rated Power Supply with IO-Link

The PSU67 24-48 VDC power supplies can be safely mounted in the data center, eliminating the need for bulky central control cabinets. No protective housing is needed with IP67 protection, these units can be installed directly on the equipment.

Built-in electronic no-load, overload & short-circuit protection

Localized Logic with Free ARGEE Software



Run Control Tasks Directly on the I/O Block

ARGEE software is a logic programming environment embedded in TURCK's I/O devices, allowing PLC-free local control of automation systems. It enables TURCK's block I/O to function as logic controllers, improving machine responsiveness. No deep PLC programming knowledge is needed, making it more accessible for data center maintenance teams.

Process sensor & actuator signals directly at the I/O block

Power Distribution & Monitoring

Data centers can improve power distribution and monitoring by leveraging IO-Link technology and industrial-grade TURCK M12 L-Code power cordsets. Decentralized I/O modules and power supply units replace complex control cabinets with plug-and-play field solutions, providing real-time diagnostic data and continuous system availability without requiring massive cable runs. In addition, TURCK's AC and DC Power Distribution Stations provide a streamlined, connectorized approach to powering critical data center infrastructure.

- Leverage the TBIF for decentralized power distribution, circuit protection and diagnostic feedback
- Reduce installation time and wiring costs by minimizing long cable runs
- Gain real-time diagnostics and power monitoring for greater system visibility
- Simplify power delivery with connectorized AC and DC Power Distribution Stations

Power Applications

Power Distribution with Load Protection & Real-time Monitoring

Rugged TBIF Intelligent Electronic Fuse

In data center infrastructure, the TURCK TBIF electronic circuit breaker module provides a solution for smart 24 VDC power distribution, load protection and real-time monitoring. Designed with a rugged IP67/IP69K rating, the TBIF eliminates the need for bulky control cabinets. The TBIF fuse allows individual output channels to be toggled on and off directly through the IO-Link interface, providing greater flexibility. The TBIF features selective load protection across its channels and can be remotely reset or switched on/off via the data center's control network.

Secures & monitors electrical circuits directly in the data center

Optimize Space & Power

M12 L-Code Power with Quick Disconnect

TURCK's L-Code M12 Powerfast™ family includes cordsets, receptacles, field wireables, tees and splitters for industrial automation and networking. These solutions offer up to 14 amps of power in a space-saving M12 size, enabling a high-power distribution system to fit into compact areas such as powering the localized sensors, monitoring gateways and small DC pump motors used in direct-to-chip or rack-level liquid cooling.

Fast assembly & commissioning reduces installation time

Direct Field Mounting with IP67 Protection

IP67 Rated Power Supply with IO-Link

The PSU67 family of power supplies supports decentralized automation by bringing 24–28 VDC power directly into the data center, eliminating the need for bulky central control cabinets. Thanks to IO-Link, the devices can be monitored, configured and reset remotely if an output trips. In addition, remote switching on/off is possible through the IO-Link network. With IP67 protection, these units can be installed directly on the equipment.

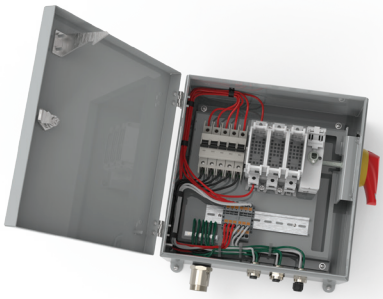
Built-in electronic no-load, overload & short-circuit protection

Power Applications (continued)

Flexible AC Power Distribution Station

Simplify AC Power Delivery

Deliver power where and when it's needed with TURCK's AC power distribution solutions. Designed as a clean, connectorized system, the solution seamlessly integrates with facility power and distributes AC power to DC power distribution stations, AC outlet boxes, and other AC-powered devices throughout the installation. The stand-alone design simplifies deployment while providing reliable power distribution across multiple components. A convenient side disconnect allows quick and easy access to the station for maintenance and service. It is available in both 120 VAC and 480 VAC versions. The system can also be customized to meet specific application requirements.



Clean, connectorized power distribution with customizable options

Reliable DC Power Distribution Station

Rugged Connectorized & Customizable Design

Power critical data center infrastructure with TURCK's DC Power Distribution Station. Designed to provide reliable, centralized DC power distribution, this station supports cooling systems, control panels, sensors, gateways, and other essential equipment throughout the facility. Housed in a factory-assembled industrial enclosure, the station features rugged connectorized interfaces that simplify installation and reduce commissioning time. Custom configurations are available to meet the specific requirements of data center cooling, power distribution and infrastructure applications.

DC power distribution for cooling equipment, sensors, controllers & networked devices

Connectivity for Critical Infrastructure

Data centers depend on reliable communication networks to maintain uptime, optimize operations and support the increasing demands of digital infrastructure. TURCK's industrial connectivity solutions provide secure, high-performance connections engineered to withstand challenging environments while simplifying installation and maintenance. From high-speed Ethernet communication to rugged signal and power distribution, TURCK delivers the durability, flexibility and performance required to keep critical systems operating efficiently.

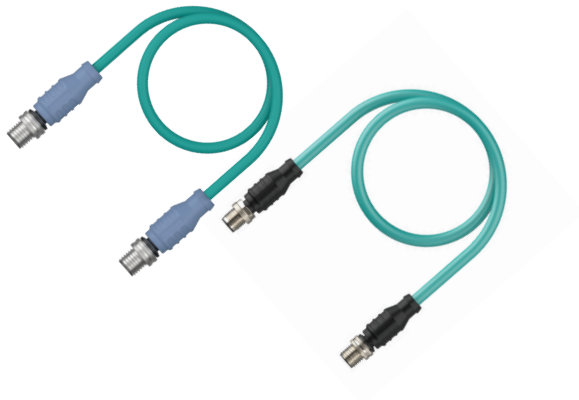
- Maintain signal integrity through shielded cable construction that helps minimize electromagnetic interference in densely populated equipment environments
- Optimize rack layouts and infrastructure organization with modular tees, splitters and extension cables that reduce cable clutter and simplify device replacement
- Get reliable network performance with data transfer capabilities ranging from 100 Mbps to 10 Gbps to accommodate both control networks and high-bandwidth applications
- Simplify installation and commissioning with molded plug-and-play designs that reduce field termination, minimize errors and accelerate deployment

Connectivity Applications

Ethernet Cordsets for Fast Data Transfer Rates, Up to 10 Gb

M12 X-Code (CAT6A) & M12 D-Code (CAT5e)

TURCK offers robust M12 Ethernet cordsets designed to simplify network commissioning and maximize data center uptime by utilizing molded, industrial-grade components that withstand shock, vibration, and humid environments. For high-bandwidth applications, the 8-pin, fully shielded M12 X-Code (CAT6A) options utilize four shielded twisted pairs to deliver data transfer rates up to 10 Gbps over a continuous 100-meter cable run. Alternatively, for standard industrial control networks, the 4-pin, two-twisted-pair M12 D-Code (CAT5e) options provide a reliable 100 Mbps communication solution. Both options feature highly flexible, easy-to-route industrial cables that resist interference and eliminate the need for manual termination.



Streamline network commissioning

Connectivity Applications (continued)

Engineered for Data Center Performance & Durability

Shielded M12 Cables

Designed for mission-critical infrastructure, these TURCK M12 cordsets deliver highly reliable connectivity. Built to minimize Electromagnetic Interference (EMI), the cables feature aluminum/polyester shielding and tinned copper drain wires. Available in straight or right-angle male and female configurations. They accommodate tight cable management trays and high-density rack environments. An optional shielded coupling nut is also available.

➡ **Reliable data transmission with shielded cable that reduces cross-talk & EMI**

Molded Plug & Ready-to-Use Design for Fast Installation

Rugged M12 Tees & Splitters

Minimize and organize your facility cabling with TURCK's signal, data and power splitter and tees. These molded solutions provide quick, organized and scalable deployments in data centers. Modular designs reduce cable clutter, simplify device replacements and optimize rack space. TURCK uses the highest quality cable, plastics and metal components for longevity and safety. Each style can be configured with different connector variants, coding, wire sizes, cable types and color options.

➡ **Flexible connectivity options tailored to your layout**

TURCK Automation Suite (TAS)

Simplify configuration and device management: TAS can simplify the deployment of many of TURCK's solutions. Using batch configuration, technicians can assign IP addresses, load parameters, and update firmware across multiple devices simultaneously. This significantly reduces startup time.

Why Use TAS?

TURCK Automation Suite Desktop is a unique IIoT platform, which enables you to batch configure, troubleshoot, perform real-time monitoring and more from your TURCK devices. Functionality includes a complete solution for updates, device management and tapping into smart sensors. It also offers usage data. With TAS Edge (license required), users can now set up an MQTT messaging protocol designed for machine-to-machine communication that expands data exchange for industrial equipment.

This software runs in your browser and does not require advanced programming knowledge, making it easy for maintenance and operations staff to perform TAS functions. TAS also improves device replacement and commissioning.

TAS
TURCK AUTOMATION SUITE

In data centers, the TURCK Automation Suite (TAS) can be used as a commissioning, monitoring and diagnostics platform for the growing number of intelligent field devices used in cooling, power distribution and facility management systems.

Key Functions

Network Scan
TAS finds all available TURCK Ethernet devices in the network and displays the relevant device information.

IO-Link View
See an overview of IO-Link masters in the network as well as connected IO-Link devices. Easily read device information and execute device actions like wink, open master, open IODD configurator and open device monitor.

Network View
Enables the issuing of IP addresses and passwords as well as the execution of firmware updates for all devices in the network. The device-specific web pages of all Ethernet devices can be accessed directly from TAS.

Batch Functions
Save time with Batch Functions. This feature allows many devices to be updated and processed faster. Users change the first device and then subsequent devices are automatically changed in order, saving commissioning time and maintaining large networks – without a PLC.

Links OT and IT Worlds *
With TAS Edge**, users can transfer data via MQTT and to higher-level systems. In addition, many other features are possible including automatic configuration routines for service tasks. TAS will considerably increase the connectivity of your production system and thus combine OT data and IT data without any barriers.

**OPC-UA to be added in a future release*
***Continuous operation of TAS Edge requires a license*

Glossary of Terms

Term	Explanation
BMS (Building Management System)	Software that monitors and controls a building's core systems, such as heating, cooling, ventilation, lighting, fire, and security. Broader in scope compared to a DCIM.
BOM (Bill of Materials)	The complete list of every part and component needed to build a piece of equipment.
CDU (Coolant Distribution Unit)	Equipment that takes chilled coolant from the building's cooling plant, distributes it to the server racks, then collects the warm return fluid and sends it back to be re-cooled.
Central Control Cabinet	A centralized enclosure that houses control hardware and wiring for a system.
Chiller	The central refrigeration unit that cools the coolant or water used throughout a facility's cooling system, then sends it back out to absorb more heat.
CRAC (Computer Room Air Conditioner)	A unit that cools data center air using refrigerant.
CRAH (Computer Room Air Handler)	A unit that cools data center air using chilled water supplied from a chiller.
DCIM (Data Center Infrastructure Management)	Software that monitors and manages a data center's physical infrastructure, such as power, cooling, capacity, and equipment health, in a single platform.
Differential Pressure (ΔP)	The difference in pressure between two points in a system. A rising differential pressure across a component often signals clogging, fouling, or wear.

Continued on next page.

Glossary of Terms (continued)

Term	Explanation
Direct-to-Chip Cooling	A liquid cooling method that runs coolant straight to the processor, removing heat at its source rather than cooling the surrounding air.
Free Cooling	Using outside air to cool a facility when temperatures and conditions allow, reducing reliance on mechanical chillers and saving energy.
Liquid Cooling	Cooling that uses a circulating fluid rather than air to remove heat, necessary as rack densities climb beyond what air cooling can handle.
OEM (Original Equipment Manufacturer)	A company that designs and builds physical equipment.
PLC (Programmable Logic Controller)	An industrial computer that controls automated equipment by continuously reading inputs and outputs.
Rack Density	The amount of power and heat concentrated in a single server rack, measured in kilowatts. Higher density drives the shift to liquid cooling.
Rear-Door Heat Exchanger	A cooling unit mounted on the back of a server cabinet that cools the hot exhaust air as it leaves the rack.
Secondary Loop	The cooling circuit that runs from the CDU out to the racks and back, separate from the primary loop that runs between the chiller and the CDU.
SKU (Stock Keeping Unit)	A unique part number identifying a specific product for inventory and ordering.
Skid	A factory-assembled equipment module that can hold electrical, power, cooling, or other critical systems. These systems are built on a frame and shipped as one complete, ready-to-install unit.

Notes

TURCK

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