TURCK

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Overview
RFID UHF Readers

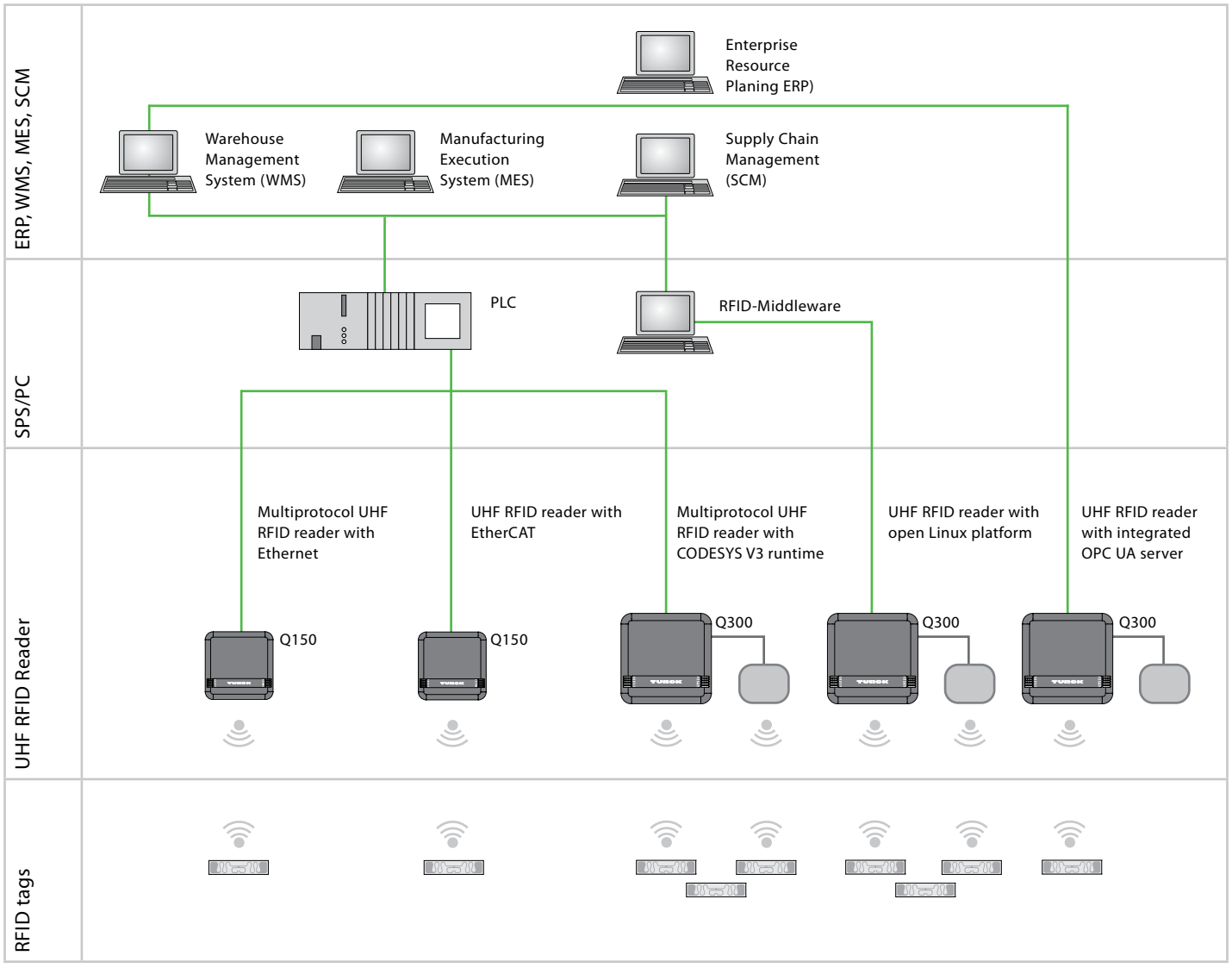
Products are linked with further information.

RFID System Overview

UHF readers are an important part of an RFID system: They are responsible for the safe and correct reading of information stored on the tags. This is irrespective of whether these tags are present individually or in large groups (bulk reading).

In general, Turck UHF readers can be divided into two families:

- Readers for connection to controllers with industrial fieldbuses.
- Readers with integrated middleware for connection to higher-level systems.



Single-Read-Point UHF RFID Readers for Intralogistics

Example: Q150 reader with integrated communication module

The Q150 readers can be connected directly to higher-level systems via industrial fieldbuses (Profinet, ModbusTCP, EthernetIP or EtherCAT).

This type of reader is particularly suitable for systems with widely distributed single read points, where individual or few tags are to be read at the same location.

The combination of an integrated antenna and an integrated communication module makes it easy and cost-effective to implement a wide range of single read points directly in the field. An ideal example of such a single read point would be a conveyor belt application. If required, an external passive antenna can also be connected to the Q150.

Multi-Read-Point UHF RFID Readers for Logistics

Example: Q300 reader with integrated communication module

Communication in conventional automation technology is nowadays characterized by a hierarchical structure with many communication levels (PLC/fieldbus/I/O level). Ethernet-based RFID readers enable the direct information transfer to higher-level systems – such as MES, ERP, cloud or PLC. Depending on requirements, this is implemented with integrated middleware, which runs directly on the reader with CODESYS, Linux and thus handles the communication with the higher-level system. Applications with direct communication are usually implemented in the logistics sector.

Another feature of this type of device is the possibility to connect passive UHF-RFID antennas. This is the most cost-efficient variant, particularly for applications in the logistics sector, where many tags have to be read in a bulk read operation or an object has to be scanned from several spatial directions. Several antennas have to be used at one read point so that all tags can be detected reliably. If several antennas are used at one read point, this is called a multi-read point.

Readers with External Communication Module

Example: Q175 reader on TBEN-L communication module with RFID functionality

The Q175 reader can be connected with the communication module via a serial interface (RS485). Our RFID interface accesses the readers and calls the data of an RFID tag.

This type of reader can be used for installations with widely and separated single read points where one or a few tags have to be read at the same position.

Large cable lengths (up to 50 m) can be implemented by combining antenna integrated readers and external communication modules. All data is transferred to the module via the serial interface. The choice of communication module determines the upper system to which the readers can be connected and how they communicate with this system.

If for example the reader shall be integrated in PLC systems, interface modules with industrial fieldbuses (Profinet, ModbusTCP, EthernetIP or EtherCAT) are preferred. Alternatively the readers can also be connected via OPC-UA interface modules to databases and upper systems.

Types and Features

Readers with integrated interface



Type	TN-UHF-Q150-…-EN	TN-UHF-Q150-…-EC	TN-UHF-Q180L300-…	TN-UHF-Q300-…
Electrical data				
Power supply	12…30 VDC		18…30 VDC	
Communication interface	Ethernet, Turck multiprotocol	EtherCAT	Ethernet	
RFID				
Integrated antenna	Yes		No	Yes
Polarization	RHCP, LHCP (adjustable)		–	RHCP, LHCP, horizontal, vertical (adjustable)
Max. output power	500 mW ERP/500 mW cond.		2 W cond. (1 W when operating with PoE)	2 W ERP/2 W cond. (1 W ERP/1 W with PoE)
3 dB cone angle	90°		–	65°
Number of ports for external antennas	1 (RP-TNC)		4 (RP-TNC)	
Sensitivity of antenna or ports	Typically -80 dBm			
Radio and protocol standard	EPC Global Class 1 Gen 2 v2			
Ports/GPIO				
DXP channels	–		4 (switchable, for PoE operation: digital inputs only)	
DXP ports	–		M12, 5-pin, A-coded	
Power supply	M12, 5-pin		M12, 4-pin	
PoE	Yes (according to PoE)	–	Yes (according to PoE+)	
Ethernet	2 × M12, 4-pin, D-coded		M12, 4-pin, D-coded	
Mechanical data				
Dimensions [mm]	150 × 150 × 61.7		180 × 300 × 61	300 × 300 × 61
Bracket	VESA 100			
Operating temperature	-30 °C…+50 °C		-20 °C…+50 °C	
Housing material	Aluminum, AL			
Active face material	Glass fiber-reinforced polyamide, PA6-GF30			
Protection class	IP67			
Hardware				
Processor	–		ARM Cortex A8, 32-bit, 800 MHz	
RAM	–		256 MB DDR3 (CODESYS), 512 MB DDR3 (Linux)	
ROM	–		512 MB	
Other				
ARGEE support	Yes	–	–	
Approvals	Europe, India, Türkiye, North America (USA, Canada, Mexico), China		Valid for all variants – TN-UHF-Q…-…, Europe, India, Türkiye, North America (USA, Canada, Mexico), China, Korea, Singapore	
Configuration software	–		UHF DTM for PACTware 5, web-based configuration	UHF DTM for PACTware 5, web-based configuration (from FW 1.1.1.0)
Device-specific for readers with CODESYS V3 runtime – TN-UHF-Q…-CDS				
Programming	–		CODESYS V3 – 3.5.12	
Programming languages	–		IEC 61131-3 (IL, LD, FBD, SFC, ST)	
Industrial fieldbuses	–		Profinet, Modbus TCP, Ethernet/IP, TCP/IP	
Configuration software	Web-based configuration		UHF DTM for PACTware 5, web-based configuration	UHF DTM for PACTware 5, web-based configuration (from FW 1.1.1.0)
Device-specific for readers with Linux – TN-UHF-Q…-LNX				
Software components	–		SSH, SFTP, HTTP, IBTP, MTXP, DHCP, SNTP, Node.js 6.9.5 (LTS), Python 3.x, programming language C, C++, NodeJS, Python	
Device-specific for readers with OPC-UA – TN-UHF-Q…-OPC-UA				
Software components	–		Integrated OPC-UA server, standardized in accordance with AutoID Companion Specification V. 1.01	

Products are linked with further information.

Readers without interface

Type	TN...Q120L130-H1147	TN...Q175L200-H1147
Electrical data		
Power supply voltage	12…24 VDC (power supply via external RFID communication module)	
Communication interface	RS485, connection to an RFID interface required	
RFID		
Integrated antenna	Yes	
Max. output power	< 500 mW ERP	< 1W ERP
Polarization	RHCP (clockwise)	
3dB opening angle	110°	90°
Antenna sensitivity	Typically -65 dBm	Typically -75 dBm
Wireless and protocol standard	EPC Global Class 1 Gen 2 v1	
Configuration software	UHF DTM for Pactware 5.0, web-based configuration (depending on RFID interface, Web 2.0 required)	
Approvals	Europe, India, Turkey, North America (USA, Canada, Mexico) China, Korea, Russia, Brazil, Australia, New Zealand, Singapore, others on request	
Mechanical data		
Dimensions [mm]	130 x 120 x 60	200 x 175 x 60
Operating temperature	-20 °C…+50 °C	
Electrical connection	Connector, M2, 4-pin	
Housing material	Aluminum, AL	
Material of active face	Plastic, ABS	
Protection class	IP67	
Mounting	M6 x 8 (2x)	

External RFID communication modules

Communication protocols	
Profinet	TBEN-S2-2RFID... or TBEN-Lx-4RFID... block modules with integrated RFID interface
Modbus TCP	
Ethernet/IP	
EtherCat	TBEC-LL block module with integrated RFID interface
OPC-UA	TBEN-L…-OPC-UA block module

Products are linked with further information.

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