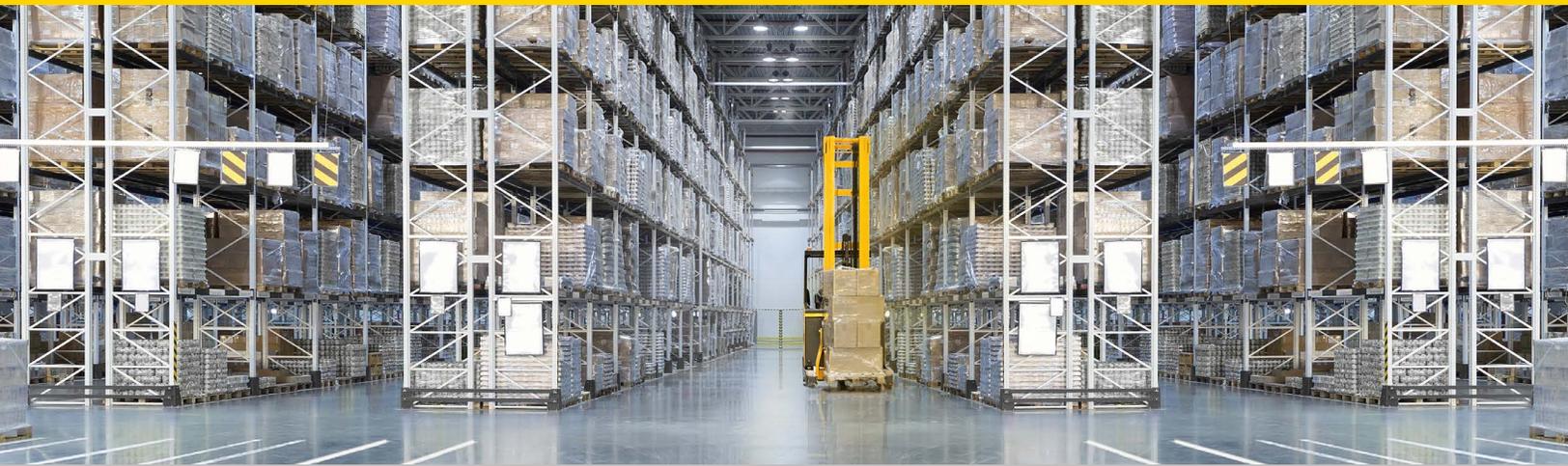


Your Global Automation Partner

# TURCK

## Q300/Q180 RFID Readers UHF RFID with Ethernet





The Q300 and Q180 UHF readers allow connections of 4 external UHF antennas and have an integrated CODESYS runtime. These Ethernet-capable solutions increase the reliability of UHF RFID applications, and thanks to external antennas, are also ideal in factories for continuous identification of objects throughout the production process. They are rated IP67, multiprotocol for multiple platform use and are easy to set up thanks to web based configuration of RFID parameters.

## Applications

### Tag detection at gates

In logistics, incoming and outgoing goods must be detected shortly before loading or unloading the trucks. With UHF-RFID this detection is reliable and also possible over long distances. So-called gates are set up for this purpose, which detect the goods on forklifts or other industrial trucks directly as they pass through. It is helpful to work with several antennas so that all tags can be reliably captured. Using multiple active read/write heads can be costly. The fast, alternating on and off switching of the various read/write heads is also too demanding for many interfaces and prone to error at high forklift driving speeds.

Turck's UHF read/write head Q300 allows the connection of external passive antennas. The pre-programmable multiplex operation of the read/write head responds alternately to the antennas and thus ensures fast recognition of all tags on the pallets. They are reliably detected even when the forklift passes quickly and regardless of the position and distance of the tags to the read/write head.



### Position-accurate detection of components

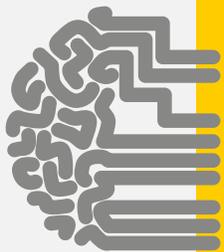
Most components in the automotive industry are equipped with tags, both from Tier X suppliers and later from OEMs. UHF RFID is used due to its long range and resulting flexibility. However, classic UHF read/write heads are less suitable for detecting components in the near field. If several components are lying on one product carrier, all are recognized, but the localization of the components is difficult and has to be done via complex algorithms in the middleware. This is costly and can delay the implementation of the system. In the worst case, filtering via software is even error-prone.

Up to four different external antennas can be connected to the Q300 UHF read/write head for detecting tags in the near field. These can also be used for the exclusive acquisition of tags in the vicinity of the antenna. Since the read/write head recognizes which antenna has read a certain tag, the position of components on product carriers can also be easily determined.



# Advantages and Benefits

Break down the limits between UHF and HF with the Q300 and Q180. The option to connect external near field antennas directly to the UHF read/write head enables the Q300 to also be used in conventional HF areas, such as for the optimal detection of components or workpiece carriers.



## Simple integration through middleware functionality

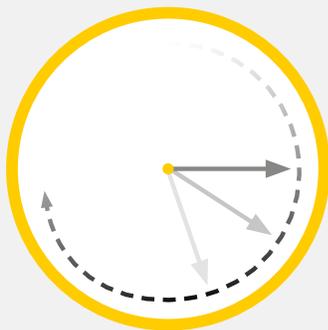
The high platform variability of the read/write heads is suitable for flexible use as middleware for connection to higher-level ERP systems. This enables a simple and seamless integration. The Q300 with middleware functionalities can filter or preprocess RFID data as required and, depending on the platform used, use integrated security protocols and authentication for transmission.

## Maximum application possibilities due to passive antennas

The most diverse requirements from countless application areas in industry and logistics can now be realized with a single device. The Q300 can be extended with passive antennas for the respective application. For example, RFID UHF near-field antennas with a detection range of only a few centimeters (similar to HF technology) provide defined reading ranges. UHF-typical application problems such as "overrange" and "cross-reads" are reliably avoided in this way. With a suitable antenna, the same device can also be used to identify vehicles or reusable containers.



near-field  
mid-range  
long-range

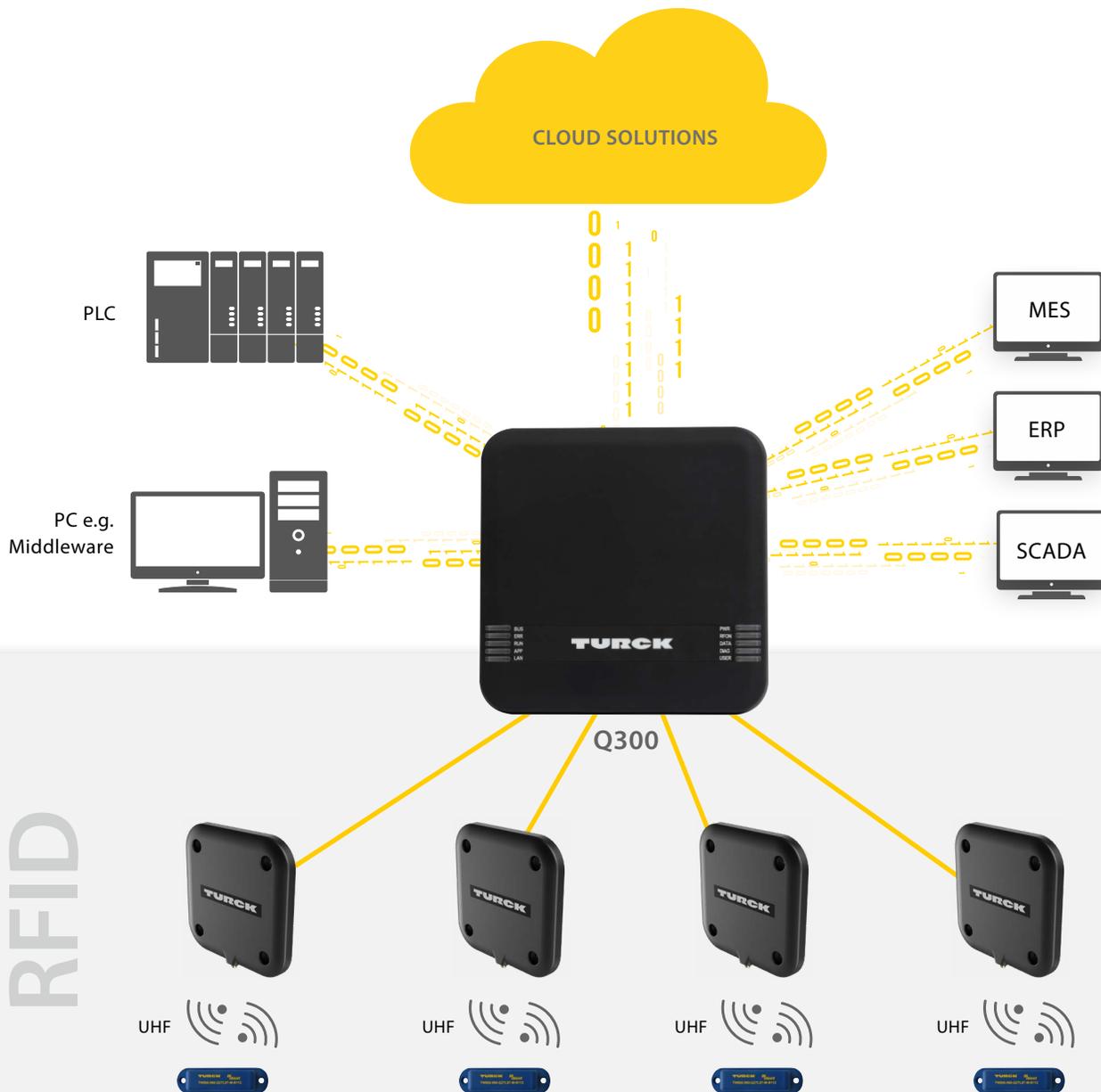


## Safe and reliable detection through polarization switching

Switching the polarization (for example from right-handed circular to left-handed circular) changes the physical characteristics of the electromagnetic field. In this way, transponders that were previously in a communication gap can also be supplied with energy so that they can be reliably read. This increases the security of the data acquisition and increases the reading and data collection rate.

# Q300/Q180 - RFID UHF Reader with Ethernet

Communication in classical automation technology today is characterized by a hierarchical structure with many levels of communication. Ethernet-based RFID readers enable direct provision of information to higher-level systems - such as MES, ERP, cloud or PLC.



## Variety of Interfaces



- Integrated software platforms: Linux, CE embedded, OPC-UA or CODESYS
- 2 W (ERP) maximum output power
- Internal antenna with switchable polarization (Q300 only)
- 4 digital, switchable inputs and outputs
- Connection of up to 4 passive RFID UHF antennas
- PoE+ (Power over Ethernet)
- IP67: robust, industrial design



2 x DXP    PoE    24 VDC    external antennas

- 2 × M12, 5-pin, A-coded
- 4 digital channels, configurable as
- PNP input or 2 A output\*  
\* requires a separate voltage supply

- PoE for communication and power supply: 1 × M12, 4-pin, D-coded
- 24 VDC input for the power supply of the DXP channels: 1 × M12, 5-pin, A-coded
- Integrated COM interface for Q300...-LNx/-WIN connection for the UHF DTM

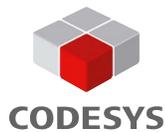
- 4 RP-TNC connectors for passive UHF antennas
- Input impedance of the connections: 50 Ω

## Software Platforms

With variants for a Codesys, Linux or OPC UA platform, the Q300 and Q180 solutions meet the needs for both IT and OT applications, ensuring flexible use. Software can be integrated and run directly on the Q300 and Q180. Using an often-expensive industrial PC is no longer necessary as these solutions can communicate directly with ERP systems or other Ethernet stations.

### CODESYS

Integration into PLC systems can be carried out without special function blocks. The process data transfer takes place cyclically. The integrated UHF interface can provide the required RFID functionality, and RFID data can also be selected depending on the application.



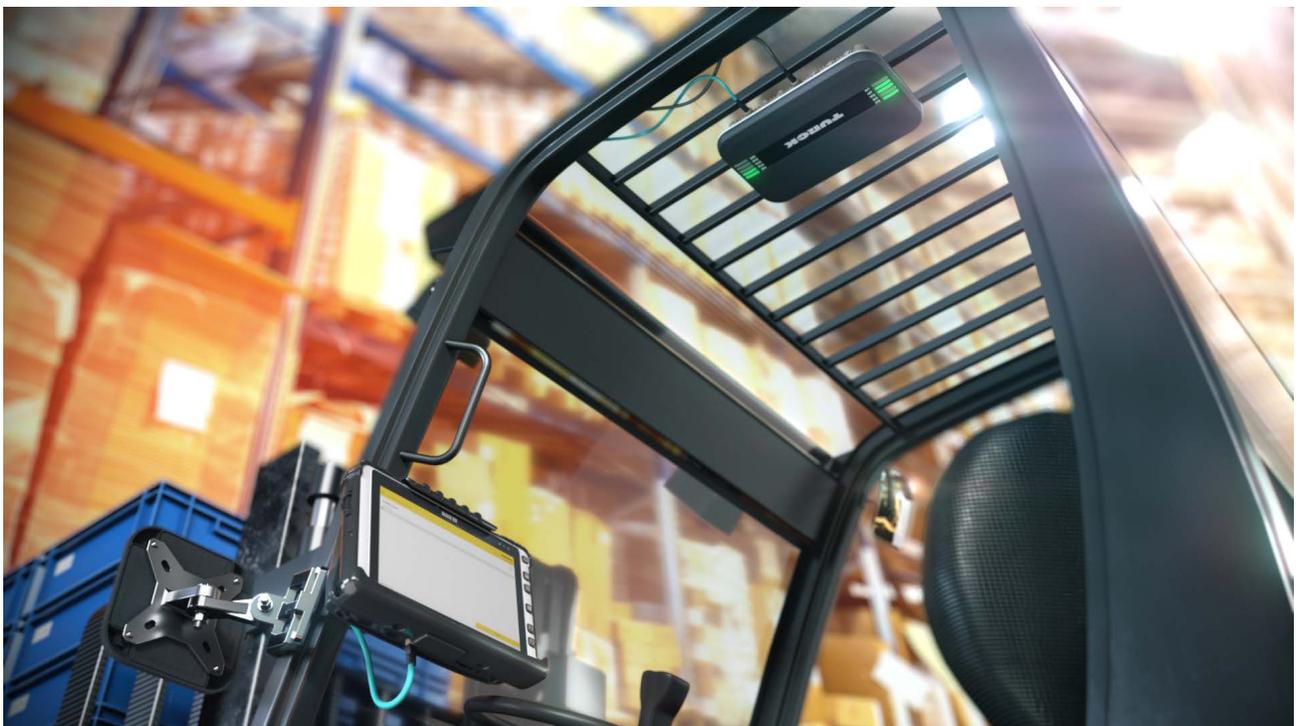
### Linux

The Q300 read/write heads with Linux are specially offered for implementation by system integrators.



### OPC-UA

OPC-UA stands for "Open Platform Communication Unified Architecture" and is a global, flexible and secure communication standard. This standard enables use on any platform, regardless of its operating system or programming language.



# Types and Features

<b>UHF-RFID read/write heads</b>	<b>Ident-No.</b>	<b>Type designation</b>
	100000900	TN-UHF-Q300-NA-CDS
	100000934	TN-UHF-Q180L300-NA-CDS
<b>Passive UHF antennas</b>	<b>Ident-No.</b>	<b>Type designation</b>
	100028596	TN-UHF-ANT-Q150-FCC
	100028594	TN-UHF-ANT-NF-Q150-ETSI-FCC
	100028600	TN-UHF-ANT-Q250-FCC
	100028602	TN-UHF-ANT-Q280-FCC
<b>Cabling for passive UHF antennas</b>	<b>Ident-No.</b>	<b>Type designation</b>
	100028191	TN-UHF-CBL-HF240-RPTNC-1-SMA
	100028192	TN-UHF-CBL-HF240-RPTNC-2-SMA
	100028193	TN-UHF-CBL-HF240-RPTNC-4-SMA
	100028194	TN-UHF-CBL-HF240-RPTNC-6-SMA
	100028195	TN-UHF-CBL-HF240-RPTNC-8-SMA
	100028196	TN-UHF-CBL-HF240-RPTNC-10-SMA
	100028197	TN-UHF-CBL-HF240-RPTNC-12-SMA
<b>Ethernet cable</b>	<b>Ident-No.</b>	<b>Type designation</b>
	U-55725	PSGS 4M RJ45S 4413-1M
<b>I/O connector</b>	<b>Ident-No.</b>	<b>Type designation</b>
	UX18721	VBRS 4.4-2RK 4T-1/1/S679
	UX19110	EKRT-ESRT-A5.500-GC2K-2
<b>Connector – voltage M12 to 7/8"</b>	<b>Ident-No.</b>	<b>Type designation</b>
	UX18415	RKC 4.4T-0.5-RSM 40/S3520
	UX18416	RKC 4.4T-2-RSM 40/S3520
	UX14184	RKC 4.4T-3-RSM 40/S3520
	UX14185	RKC 4.4T-5-RSM 40/S3520
<b>Tag</b>	<b>Ident-No.</b>	<b>Type designation</b>
	100002997	TW860-960-L53-53-F-B44-5KPCS
	100004169	TW865-868-Q14L37-M-HT-B112
	100003973	TW860-960-Q21L85-M-B110

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60 representations worldwide!

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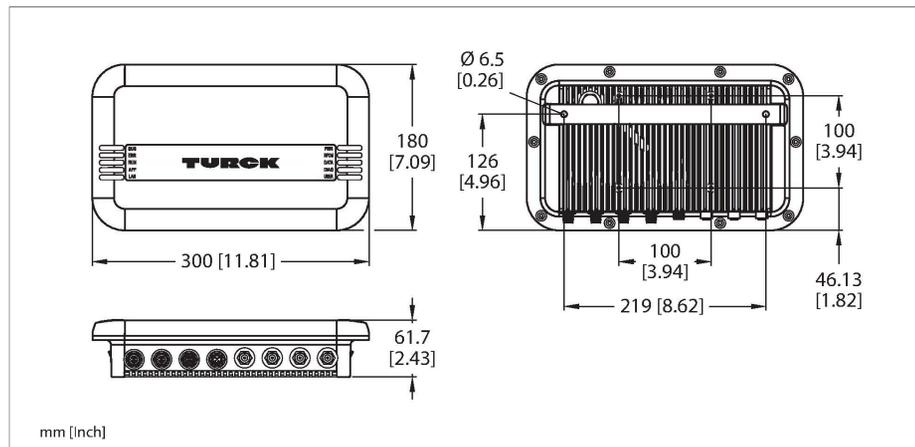
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[www.turck.com](http://www.turck.com)

# TN-UHF-Q180L300-NA-CDS

## UHF Reader



### Technical data

Type	TN-UHF-Q180L300-NA-CDS
ID	100000934
Approvals	UL FCC IC IFETEL
<b>Electrical data</b>	
Operating voltage	18...30 VDC
DC rated operational current	≤ 3500 mA
PoE standard	IEEE 802.3at (PoE+)
Data transfer	Alternating electromagnetic field
Technology	UHF RFID
Region (UHF)	USA, Canada, Mexico (902...928 MHz)
Radio communication and protocol standards	ISO 18000-63 EPCglobal Gen 2
Channel spacing	500 kHz
Output power	Conducted power: ≤ 30 dBm, adjustable
Output function	Read/Write
<b>Mechanical data</b>	
Mounting conditions	Non-flush
Ambient temperature	-20...+50 °C
Design	Rectangular
Dimensions	300 x 180 x 61.7 mm
Housing material	Aluminium, AL, Silver
Active area material	Glass fiber-reinforced polyamide, PA6-GF30, black
Vibration resistance	55 Hz (1 mm)

### Features

- Integrated web server with reader parameterization
- Web-based UHF RFID test tool for easy air interface evaluation
- Active face in front, UV resistance
- 4 connections for passive UHF RFID antennas
- 4 configurable digital channels as PNP inputs and/or outputs with 0.5 A per channel
- Programmable according to IEC 61131-3 with CODESYS V3
- Codesys V3 PLC Runtime
- Codesys OPC-UA Server
- PROFINET device, EtherNet/IP device or Modbus TCP master/slave
- "U" data interface for convenient use of the RFID functionality
- Close-to-control integration in PLC systems without the use of a special function block
- LEDs and diagnostics
- Device only suitable for operation in North America (NA) at 902...928 MHz (USA, Canada, Mexico)

### Functional principle

The UHF readers form a transmission zone, the size of which may vary depending on the combination of reader and tag used. The achievable distances may be different due to component tolerances, mounting location in the application, ambient conditions and the effect of materials (particularly metal). Testing of the application under real operating conditions is therefore essential, especially with on-the-fly reading and writing!

## Technical data

Shock resistance	30 g (11 ms)
Protection class	IP67
Electrical connection	RP-TNC
Input impedance	50 Ohm
MTTF	49 years acc. to SN 29500 (Ed. 99) 20 °C

### System description

Processor	ARM Cortex A8, 32 Bit, 800 MHz
Memory	256 MB Flash
RAM memory	512 MB DDR3
Programming	CODESYS V3
Released for CODESYS version	V 3.5.11.20
Programming languages	IEC 61131-3 (IL, LD, FBD, SFC, ST)
Application tasks	10
Number of POUs	1024
Programming interface	Ethernet
Cycle time	< 1 ms for 1000 IL commands (without I/O cycle)
Input data	8
Output data	8
RFID data interface	UHF

### System data

Transmission rate Ethernet	10/100 Mbps
Connection technology Ethernet	1 x M12, 4-pin, D-coded
Web server	Default: 192.168.1.254

### Modbus TCP

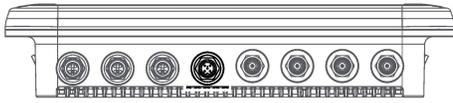
Addressing	Static IP, BOOTP, DHCP
Supported function codes	FC1, FC2, FC3, FC4, FC5, FC6, FC15, FC16, FC23
Number of TCP connections	8
Output Data Size	max. 1024
Input Data Size	max. 2014

### Ethernet/IP

Addressing	acc. to EtherNet/IP specification
Device Level Ring (DLR)	supported
Input Assembly Instance	103
Input Data Size	248
Output Assembly Instance	104
Output Data Size	248
Class 1 connections (CIP)	10

## Technical data

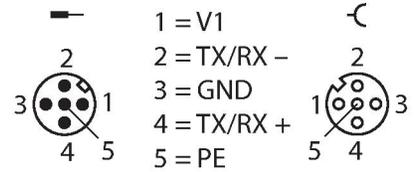
Class 3 connections (TCP)	3
Configuration Assembly Instance	106
<b>PROFINET</b>	
Addressing	DCP
MinCycleTime	4 ms
Diagnostics	acc. to PROFINET alarm handling
Automatic addressing	supported
Media Redundancy Protocol (MRP)	supported
Input Data Size	max. 512
Output Data Size	max. 512
<b>Digital inputs</b>	
Number of channels	4
Connectivity inputs	M12, 5-pin
Input type	PNP
Switching threshold	EN 61131-2 type 3, PNP
Low level signal voltage	< 5 V
High level signal voltage	> 11 V
Low level signal current	< 1.5 mA
High level signal current	> 2 mA
Type of input diagnostics	Channel diagnostics
<b>Digital outputs</b>	
Number of channels	4
Connectivity outputs	M12, 5-pin
Output type	PNP
Type of output diagnostics	Channel diagnostics
<b>General Information</b>	
Packaging unit	1



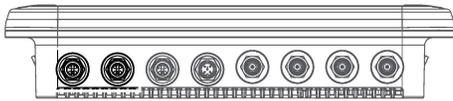
**Accessories**

Power supply cable (example):  
RSM RKM 50-2M  
Ident no. U2282-0

**M12 x 1 Power Supply**



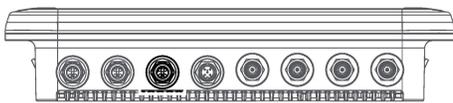
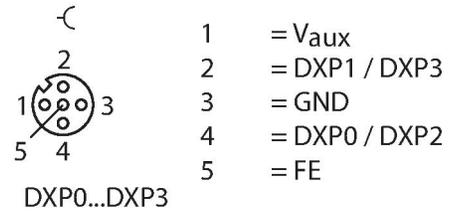
24VDC / COM



**Accessories**

Accessories:  
Connection cable , 2-channel (example):  
RK 4.4T-2-RS 4.4T  
Ident no. U2445  
Splitter, 1-channel (example):  
YB2-FSM 4.5-2FKM 4.5  
Ident no. U0875-78

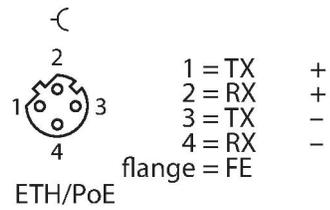
**I/O port M12 x 1**



**Accessories**

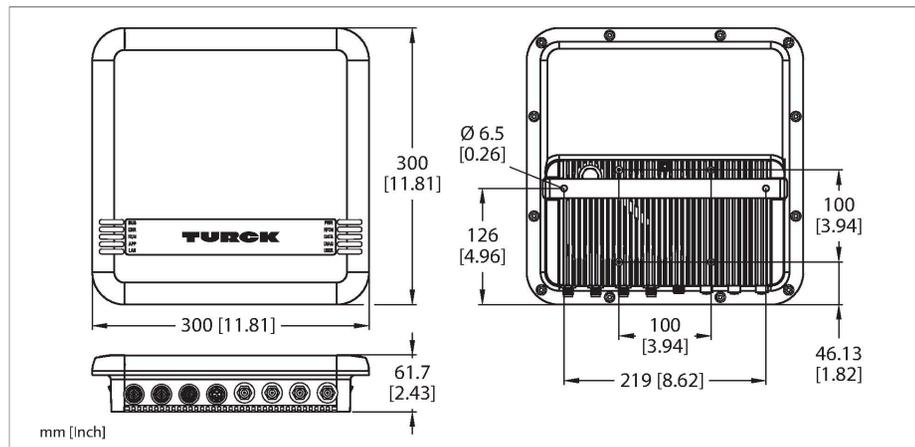
Ethernet cable (example):  
RSSD RSSD 441-2M  
Ident no. U-02482

**M12 x 1 Ethernet**



# TN-UHF-Q300-NA-CDS

## UHF Reader



### Technical data

Type	TN-UHF-Q300-NA-CDS
ID	100000900
Approvals	UL FCC IC IFETEL
<b>Electrical data</b>	
Operating voltage	18...30 VDC
DC rated operational current	≤ 3500 mA
PoE standard	IEEE 802.3at (PoE+)
Data transfer	Alternating electromagnetic field
Technology	UHF RFID
Region (UHF)	USA, Canada, Mexico (902...928 MHz)
Radio communication and protocol standards	ISO 18000-63 EPCglobal Gen 2
Channel spacing	500 kHz
Output power	≤ 36 dBm (EIRP), adjustable
Antenna polarization	circular/linear, adjustable
Antenna HPBW	65°
Output function	Read/Write
<b>Mechanical data</b>	
Mounting conditions	Non-flush
Ambient temperature	-20...+50 °C
Design	Rectangular
Dimensions	300 x 300 x 61.7 mm
Housing material	Aluminium, AL, Silver

### Features

- Integrated web server with reader parameterization
- Web-based UHF RFID test tool for easy air interface evaluation
- Active face in front, UV resistance
- 4 connections for passive UHF RFID antennas
- 4 configurable digital channels as PNP inputs and/or outputs with 0.5 A per channel
- Programmable according to IEC 61131-3 with CODESYS V3
- Codesys V3 PLC Runtime
- Codesys OPC-UA Server
- PROFINET device, EtherNet/IP device or Modbus TCP master/slave
- "U" data interface for convenient use of the RFID functionality
- Close-to-control integration in PLC systems without the use of a special function block
- LEDs and diagnostics
- Device only suitable for operation in North America (NA) at 902...928 MHz (USA, Canada, Mexico)

### Functional principle

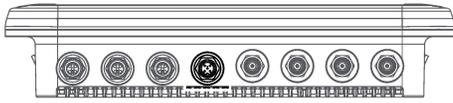
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## Technical data

Active area material	Glass fiber-reinforced polyamide, PA6-GF30, black
Vibration resistance	55 Hz (1 mm)
Shock resistance	30 g (11 ms)
Protection class	IP67
Electrical connection	RP-TNC
Input impedance	50 Ohm
MTTF	49 years acc. to SN 29500 (Ed. 99) 20 °C
<b>System description</b>	
Processor	ARM Cortex A8, 32 Bit, 800 MHz
Memory	256 MB Flash
RAM memory	512 MB DDR3
Programming	CODESYS V3
Released for CODESYS version	V 3.5.11.20
Programming languages	IEC 61131-3 (IL, LD, FBD, SFC, ST)
Application tasks	10
Number of POUs	1024
Programming interface	Ethernet
Cycle time	< 1 ms for 1000 IL commands (without I/O cycle)
Input data	8
Output data	8
RFID data interface	UHF
<b>System data</b>	
Transmission rate Ethernet	10/100 Mbps
Connection technology Ethernet	1 x M12, 4-pin, D-coded
Web server	Default: 192.168.1.254
<b>Modbus TCP</b>	
Addressing	Static IP, BOOTP, DHCP
Supported function codes	FC1, FC2, FC3, FC4, FC5, FC6, FC15, FC16, FC23
Number of TCP connections	8
Output Data Size	max. 1024
Input Data Size	max. 2014
<b>Ethernet/IP</b>	
Addressing	acc. to EtherNet/IP specification
Device Level Ring (DLR)	supported
Input Assembly Instance	103
Input Data Size	248

## Technical data

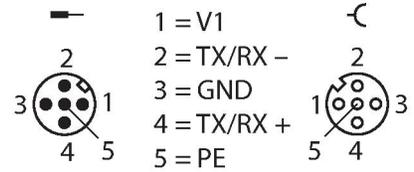
Output Assembly Instance	104
Output Data Size	248
Class 1 connections (CIP)	10
Class 3 connections (TCP)	3
Configuration Assembly Instance	106
<b>PROFINET</b>	
Addressing	DCP
MinCycleTime	4 ms
Diagnostics	acc. to PROFINET alarm handling
Automatic addressing	supported
Media Redundancy Protocol (MRP)	supported
Input Data Size	max. 512
Output Data Size	max. 512
<b>Digital inputs</b>	
Number of channels	4
Connectivity inputs	M12, 5-pin
Input type	PNP
Switching threshold	EN 61131-2 type 3, PNP
Low level signal voltage	< 5 V
High level signal voltage	> 11 V
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High level signal current	> 2 mA
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<b>Digital outputs</b>	
Number of channels	4
Connectivity outputs	M12, 5-pin
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Type of output diagnostics	Channel diagnostics
<b>General Information</b>	
Packaging unit	1



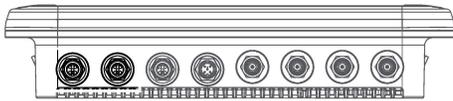
**Accessories**

Power supply cable (example):  
RSM RKM 50-2M  
Ident no. U2282-0

**M12 x 1 Power Supply**



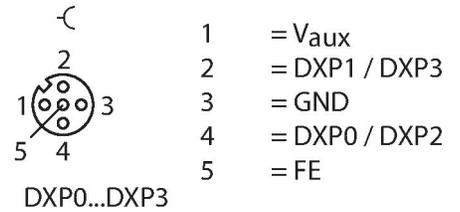
24VDC / COM



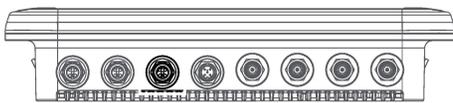
**Accessories**

Accessories:  
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RK 4.4T-2-RS 4.4T  
Ident no. U2445  
Splitter, 1-channel (example):  
YB2-FSM 4.5-2FKM 4.5  
Ident no. U0875-78

**I/O port M12 x 1**



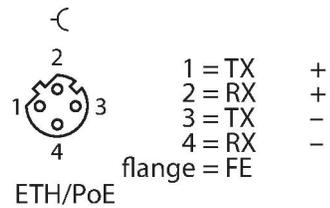
DXP0...DXP3



**Accessories**

Ethernet cable (example):  
RSSD RSSD 441-2M  
Ident no. U-02482

**M12 x 1 Ethernet**



ETH/PoE