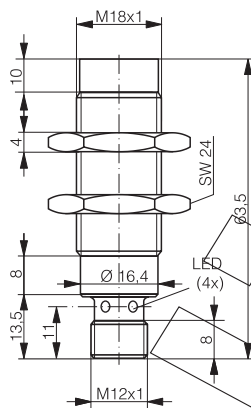


HOUSING	READ/WRITE DISTANCE	
M18	40.5 mm*	<ul style="list-style-type: none"> <li>✓ M18 Metal threaded housing</li> <li>✓ Sensing face of PBTP</li> <li>✓ Insensible to dirt</li> <li>✓ IO-Link V1.1</li> <li>✓ 2 x PNP output in SIO mode configurable</li> <li>✓ RWM reconfigurable via a Master Tag</li> </ul>



\* Please refer to table page 8

GENERAL DATA		INTERFACE	
Carrier frequency	13.56 MHz	Data transfer rate	38 400 baud
Compatible standard	ISO 15693	LED green on	RWM live
Maximum transmission speed	26.5 kbit/s	LED green blinking	IO-Link communication
Read-write distance max.	40.5 mm with RTP-0502-082	LED yellow on	Transponder detected
		LED yellow blinking	Transponder + IO-Link communication
		IO-Link	✓

ELECTRICAL DATA		MECHANICAL DATA	
Supply voltage range (U <sub>b</sub> )	11...32 VDC	Protection degree	IP67
No-load supply current (field off)	20 mA	Ambient temperature range TA**	-25...+80 °C
Max. current consumption (no load)	50 mA	Storage temperature range TS***	-25...+80 °C
Polling current	30 mA	Sensing face material	PBTP
Short-circuit protection	✓	Housing material	Chrome-plated brass
Voltage reversal protection	✓	Connector type	M12 4-pin
Max. output current	≤ 200 mA	Weight (incl. nuts)	37 g

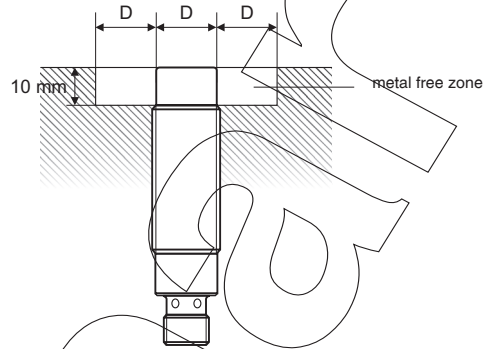
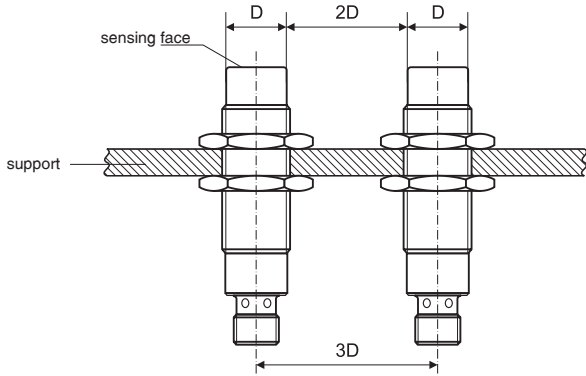
\*\* Read/write operations possible

\*\*\* Data retention and mechanical stability limit

## MOUNTING RECOMMENDATIONS

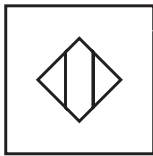
### CLEARANCE

Read/write modules must not mutually influence each other. For this reason, a minimum distance of  $2 \times D$  between the devices must be observed.

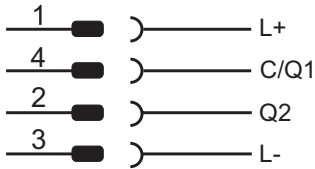


### WIRING DIAGRAM

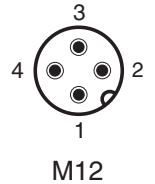
### PIN ASSIGNMENT



bn  
bk  
wh  
bu



Pin	Signal	Function
1	L+	+24 V
2	Q2	DO (tag presence or data comparison)
3	L-	OV
4	C/Q1	SDCI/SIO (tag presence or data comparison)



### IO-Link characteristics

### Value for RLS-1181-320

IO-Link Protocol	1.1
COM-Mode	COM2 (38.4 kBaud)
Min. cycle time	14.4 ms
Process data width in	9 bytes
Process data width out	10 bytes
Profile	Smart Sensor Profile
SIO-Mode support	Yes
Port type	A
Memory request for data management	41 bytes
Device ID	0xAB0201
Vendor ID	0x0156

CONFIGURATION PARAMETER (IO-LINK / SIO MODE)						
Index	Sub Hex	Name	Access	Data Type	Value	Default
<b>IDENTIFICATION</b>						
10 <sub>h</sub>		Vendor Name	R	char []	"Contrinex"	
11 <sub>h</sub>		Vendor Text	R	char []	"www.contrinex.com"	
12 <sub>h</sub>		Product Name	R	char []	"RLS-1301-320"	
13 <sub>h</sub>		Product ID	R	char []	"00000000"	
14 <sub>h</sub>		Product Text	R	char []	"IO-Link RFID reader"	
15 <sub>h</sub>		Serial Number	R	char []	"00000001"	
17 <sub>h</sub>		Firmware Revision	R	char []	"01.09.01"	
18 <sub>h</sub>		Application Specific Tag	R/W	char []	<user string, 16 byte (variable length)>	<vendor specific>
<b>READER PARAMETER PROCESS DATA</b>						
40 <sub>h</sub>	01 <sub>h</sub>	Operating Mode	R/W	uint8	FF <sub>h</sub> : Scan UID 00 <sub>h</sub> : Scan User Data 01 <sub>h</sub> : Read / Write Command	FF <sub>h</sub>
	02 <sub>h</sub>	Data Hold Time	R/W	uint8	FF <sub>h</sub> : No Hold Time 00 <sub>h</sub> : Hold Time 100 ms 01 <sub>h</sub> : Hold Time 200 ms 02 <sub>h</sub> : Hold Time 500 ms 03 <sub>h</sub> : Hold Time 1000 ms 04 <sub>h</sub> : Hold Time 2000 ms	FF <sub>h</sub>
	03 <sub>h</sub>	Scan Address	R/W	uint8	Address to scan	FF <sub>h</sub>
<b>READER PARAMETER SIO</b>						
41 <sub>h</sub>	01 <sub>h</sub>	C/Q1 PIN SIO Operating Mode	R/W	uint8	FF <sub>h</sub> : Presence Transponder 00 <sub>h</sub> : Compare Data 01 <sub>h</sub> : No SIO	FF <sub>h</sub>
	02 <sub>h</sub>	C/Q1 SIO Data to compare H	R/W	uint32	Comparison value Byte 7 to 4	FF <sub>h</sub> , FF <sub>h</sub> , FF <sub>h</sub> , FF <sub>h</sub>
	03 <sub>h</sub>	C/Q1 SIO Data to compare L	R/W	uint32	Comparison value Byte 3 to 0	FF <sub>h</sub> , FF <sub>h</sub> , FF <sub>h</sub> , FF <sub>h</sub>
	04 <sub>h</sub>	SIO Compare Data Address (C/Q1 & Q2)	R/W	uint8	Comparison address for C/Q1 and Q2 (A valid address must be chosen)	FF <sub>h</sub>
	05 <sub>h</sub>	Data Hold Time Output (C/Q1 & Q2)	R/W	uint8	FF <sub>h</sub> : No Hold Time 00 <sub>h</sub> : Hold Time 100 ms 01 <sub>h</sub> : Hold Time 200 ms 02 <sub>h</sub> : Hold Time 500 ms 03 <sub>h</sub> : Hold Time 1000 ms 04 <sub>h</sub> : Hold Time 2000 ms	FF <sub>h</sub>
	06 <sub>h</sub>	C/Q1 PIN SIO Polarity	R/W	uint8	FF <sub>h</sub> : Output "close" if condition = true 00 <sub>h</sub> : Output "open" if condition = true	FF <sub>h</sub>
	07 <sub>h</sub>	Q2 PIN SIO Operating Mode	R/W	uint8	FF <sub>h</sub> : Presence Transponder 00 <sub>h</sub> : Compare data (C/Q1 must be also in compare data) 01 <sub>h</sub> : No SIO	FF <sub>h</sub>
	08 <sub>h</sub>	Q2 SIO Data to compare H	R/W	uint32	Comparison value Byte 7 to 4	FF <sub>h</sub> , FF <sub>h</sub> , FF <sub>h</sub> , FF <sub>h</sub>
	09 <sub>h</sub>	Q2 SIO Data to compare L	R/W	uint32	Comparison value Byte 3 to 0	FF <sub>h</sub> , FF <sub>h</sub> , FF <sub>h</sub> , FF <sub>h</sub>
	0A <sub>h</sub>	Q2 PIN SIO Polarity	R/W	uint8	FF <sub>h</sub> : Output "close" if condition = true 00 <sub>h</sub> : Output "open" if condition = true	FF <sub>h</sub>

## PROCESS DATA REPRESENTATION

### PROCESS DATA MODE SCAN UID MODE

#### PROCESS DATA INPUT

Bitoffset

	7	6	5	4	3	2	1	0
0			TAG	ANT	NB TAG			
1				UID 0				
2				UID 1				
3				UID 2				
4				UID 3				
5				UID 4				
6				UID 5				
7				UID 6				
8				UID 7				

TAG : 0 = No tag present in front of the RWM  
1 = 1 tag or more present in front of the RWM  
ANT : 0 = RF field off  
1 = RF field on  
NB TAG : Number of tag in front of the RWM  
UID 0 : UID LSB  
UID 7 : UID MSB

#### PROCESS DATA OUTPUT

Bitoffset

	7	6	5	4	3	2	1	0
0				N_ANT	TAG NB			
1								
2								
3								
4								
5								
6								
7								
8								
9								

N\_ANT : 0 = Switch on RF field  
1 = Switch off RF field  
TAG NB : Index of tag to be printed in UID area (index from 0)

### PROCESS DATA MODE SCAN USER DATA

#### PROCESS DATA INPUT

Bitoffset

	7	6	5	4	3	2	1	0
0	RDY	ERR	TAG	ANT				EXT
1	Data 0 / Error Code							
2	Data 1							
3	Data 2							
4	Data 3							
5	Extended Data 4							
6	Extended Data 5							
7	Extended Data 6							
8	Extended Data 7							

RDY : 0 = No data available yet  
1 = Memory scanned and data available  
ERR : 0 = Memory scanned and no error  
1 = Memory scanned but error;  
TAG : 0 = No tag present in front of the RWM  
1 = Tag present in front of the RWM  
ANT : 0 = RF field off  
1 = RF field on  
EXT : 0 = 4 bytes data  
1 = 8 bytes data  
Data 0 : User data LSB / Error Code  
Data 3 / 7 : User data MSB

#### PROCESS DATA OUTPUT

Bitoffset

	7	6	5	4	3	2	1	0
0				N_ANT				
1								
2								
3								
4								
5								
6								
7								
8								
9								

N\_ANT : 0 = Switch on RF field  
1 = Switch off RF field

## PROCESS DATA MODE READ/WRITE

### PROCESS DATA INPUT

Bitoffset

	7	6	5	4	3	2	1	0
0	<b>RDY</b>	<b>ERR</b>	<b>TAG</b>	<b>ANT</b>				<b>EXT</b>
1	<b>Data 0 / Error Code</b>							
2	<b>Data 1</b>							
3	<b>Data 2</b>							
4	<b>Data 3</b>							
5	<b>Extended Data 4</b>							
6	<b>Extended Data 5</b>							
7	<b>Extended Data 6</b>							
8	<b>Extended Data 7</b>							

RDY : 0 = No data available yet  
1 = Command executed and data ready for user

ERR : 0 = Command executed and no error  
1 = Command executed but error

TAG : 0 = No tag present in front of the RWM  
1 = Tag present in front of the RWM

ANT : 0 = RF field off  
1 = RF field on

EXT : 0 = 4 bytes data  
1 = 8 bytes data

Data 0 : Read data LSB / Error Code  
Data 3 / 7 : Read data MSB

#### Error Code Definition

CommandNotSupported = 1,  
FormatError = 2,  
OptionNotSupported = 3,  
CommandProblem = 5,  
CommTagError = 6,  
TagError = 15,  
NoMemoryBloc = 16,  
BlocProtected = 18,

### PROCESS DATA OUTPUT

Bitoffset

	7	6	5	4	3	2	1	0
0	<b>START</b>			<b>N_ANT</b>		<b>CMD</b>		<b>EXT</b>
1	<b>ADD</b>							
2	<b>Data 0</b>							
3	<b>Data 1</b>							
4	<b>Data 2</b>							
5	<b>Data 3</b>							
6	<b>Extended Data 4</b>							
7	<b>Extended Data 5</b>							
8	<b>Extended Data 6</b>							
9	<b>Extended Data 7</b>							

START : 0 = Do not execute the command  
1 = Execute the command

N\_ANT : 0 = Switch on RF field  
1 = Switch off RF field

CMD : 0 = No command  
1 = Read  
2 = Write

EXT : 0 = 4 bytes data  
1 = 8 bytes data

ADD : Block address  
Data 0 : Write data LSB  
Data 3 / 7 : Write data MSB

### SYSTEM COMMAND (idx 02<sub>n</sub>)

Value hex	Value dec	Function
05 <sub>n</sub>	5	ParamDownloadStore
80 <sub>n</sub>	128	Device Reset
82 <sub>n</sub>	130	Restore factory settings*

\*always do a reset after the restore of factory settings

## MASTER TAG CONFIGURATION

For the RLS-1181-320, the IO-Link mode or the SIO (standard I/O mode) can be configured via IO-Link or via a Master Tag.

For the configuration via a Master Tag, a transponder (called Master Tag) will contain all the data used for the configuration.

There is a simple procedure to configure the RWM. Once all the data are written in the Master Tag, you need to put it in front of the RWM sensing face, to switch off the RWM power supply and to switch on again. The RWM will detect that it's a Master Tag and read all the data and configure the outputs accordingly.

On the Contrinex RFID product finder page (<https://www.contrinex.com/product-finder/rfid/>) of any ContrINET RWM USB, it is possible to download a software to setup the Master Tag using a ContrINET RWM USB. This program is called "IO-Link Master Tag Programmer" and it is included in the "Softwares" zip file.

### SIO MODE POSSIBILITIES

If you use the RLS-1181-320 in an SIO mode, you will have two main possibilities:

1. Presence Transponder:  
In this mode, the output will switch if a transponder is in the field of the RWM.
2. Compare Data:  
In this mode, the output will switch if the data read in the defined block memory of the transponder matches with the data stocked in the RWM.

### MASTER TAG

To build a Master Tag it's possible to use any ISO15693 chip with at least eight memory blocks with 32 bits each. Two screenshots of the "IO-Link Master Tag Programmer" are placed below to serve as an example of one possible Master Tag configuration

**IO-Link Master tag configurator**

CONTRINEX USB RWM Selection: RLS-1301-220-120

SIO Mode: IO-Link Mode

**SIO Output configuration**

C/Q1

C/Q1 PIN SIO Operating Mode: Compare data

C/Q1 SIO Data to compare H: 150

C/Q1 SIO Data to compare L: 150

C/Q1 PIN SIO Polarity: Output closed if condition = true

Q2

Q2 PIN SIO Operating Mode: TAG presence

Q2 SIO Data to compare H: 0

Q2 SIO Data to compare L: 0

Q2 PIN SIO Polarity: Output closed if condition = true

SIO Compare Data address (C/Q1, Q2): 0

Data Hold Time output (C/Q1, Q2): No hold time

Program Master TAG

Read Master TAG

Read/Write Module used

Output switch condition selection for C/Q1 (Compare data)

Compare data value (DEC) to switch output C/Q1

Output switch condition selection for Q2 (Tag presence)

Tag memory address value (DEC) where to perform the compare data operation

Timer value during which the switching state is maintained after the transponder left the RWM detection range

**IO-Link Master tag configurator**

CONTRINEX USB RWM Selection: RLS-1301-220-120

SIO Mode: IO-Link Mode

**IO-Link process data configuration**

Operating Mode: Scan UID

Data Hold Time: No hold time

Scan address: 0

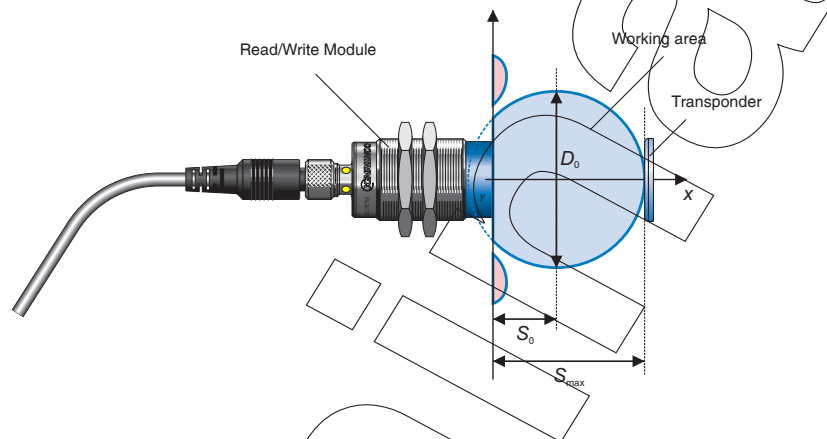
Selection box for the IO-Link operation mode (Scan UID, Scan User Data and Scan Read/Write Command)

Scan address where to read the RFID data (only available when Scan User Data mode is selected)

When Tag Master data (SIO & IO-Link Mode) is successfully programmed in to the tag memory, the "Program Master TAG" button turns green, otherwise it turns red

## POSSIBLE COMBINATION AND TYPICAL DISTANCE - RLS-1181-320

Transponder type	$S_{max}$	$S_0$	$D_0$
Ø 9 RTP-0090-020	9	2.5	13
Ø 16 RTP-0160-020	22	10	24
Ø 20 RTP-0201-020	14	4.5	19
Ø 26 RTP-0263-020	22	9	26
Ø 30 RTP-0301-020	29	12	34
Ø 50 RTP-0501-020	24	1	46
Ø 50 RTP-0502-022	37	13.5	47
Ø 50 RTP-0502-062	29	7	44
Ø 50 RTP-0502-082	40.5	15.5	50



## AVAILABLE TYPES

Part number	Part reference	Ø	Mounting	Connection
720 100 206	RLS-1181-320	M18	Non-embeddable	M12 4-pin

## DISCLAIMERS

### FCC information

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### IC information

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) L'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

### Contrinex information

Operators of the products we supply are responsible for compliance with measures for the protection of persons. The use of our equipment in applications where the safety of persons might be at risk is only authorized if the operator observes and implements separate, appropriate and necessary measures for the protection of persons and machines. Terms of delivery and rights to change design reserved.