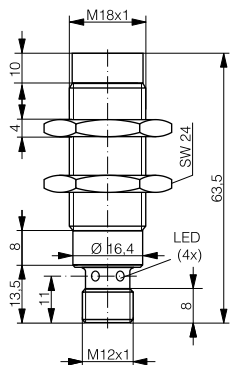
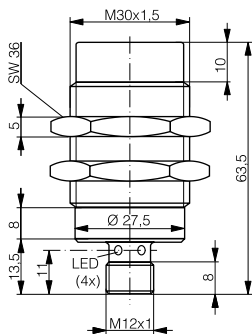


HF RFID SYSTEM READ/WRITE MODULES (RWM) RLH-xxxPA-NIS

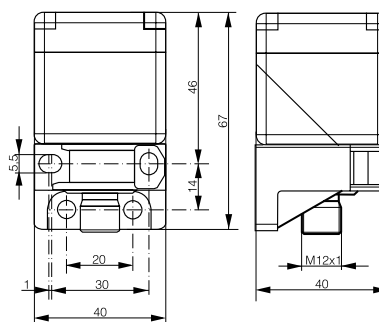
HOUSING	READ/WRITE DISTANCE	✓ Metal threaded housing (M18, M30) ✓ 40×40 mm plastic housing (C44) ✓ Sensing face of PBTP ✓ Insensitive to dirt ✓ IO-Link V1.1 ✓ 2× PNP output in SIO mode configurable
M18	34 mm	
M30	58 mm	
C44	84 mm	



RLH-M18PA-NIS



RLH-M30PA-NIS



RLH-C44PA-NIS

GENERAL DATA		INTERFACE	
Carrier frequency	13.56 MHz	Data transfer rate	230,400 baud
Compatible standard	ISO 15693 ¹	LEDs	See "LED status" on p. 3
Maximum transmission speed	26.5 kbit/s	IO-Link	✓
Maximum field strength (at 3 m/30 m)	RLH-M18PA-NIS: 45.4/4.6 dBμV/m RLH-M30PA-NIS: 55.1/14.9 dBμV/m RLH-C44PA-NIS: 66.7/26.4 dBμV/m	MMTF (@ 40°C)	322 y
Read-write distance max. (RSSI ≥ 0) with Ø50 mm transponder	RLH-M18PA-NIS: 34 mm RLH-M30PA-NIS: 58 mm RLH-C44PA-NIS: 84 mm		

ELECTRICAL DATA		MECHANICAL DATA	
Supply voltage range (U _b)	11...32 VDC	Sensing face material	PBTP
Max. current consumption (no load)	≤ 50 mA	Ambient temperature range T _A ²	–25...+80°C
Max. output current	≤ 200 mA	Storage temperature range T _S ³	–25...+80°C
Short-circuit protection	✓	Housing material	See table "Available types" (p. 2)
Voltage reversal protection	✓	Enclosure rating	See table "Available types" (p. 2)
Cable length max.	≤ 20 m	Max. tightening torque	RLH-M18PA-NIS: 25 Nm RLH-M30PA-NIS: 70 Nm RLH-C44PA-NIS: 0.6 Nm ⁴
		Weight (incl. nuts)	See table "Available types" (p. 2)

¹ Protocol anti-collision excluded. A maximum of one transponder can be detected at a time by the RWM, otherwise "TAGCommError" is reported

² Read/write operations possible

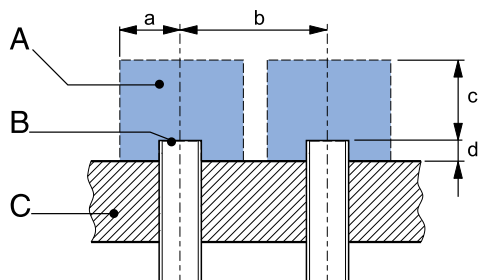
³ Data retention and mechanical stability limit

⁴ (on M12 connector)

MOUNTING RECOMMENDATIONS

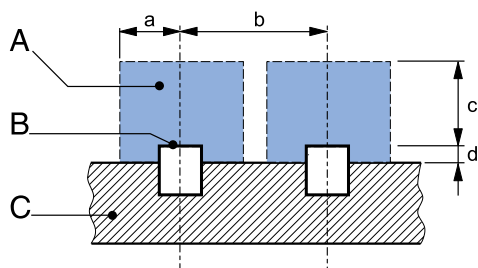
CLEARANCE

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



A : unique transponder zone
B : sensing face
C : support

[mm]	RLH-M18PA-NIS	RLH-M30PA-NIS
a	30	45
b	54	90
c	60	90
d	10	10



[mm]	RLH-C44PA-NIS
a	60
b	120
c	120
d	10

IO-LINK CHARACTERISTICS

VALUE

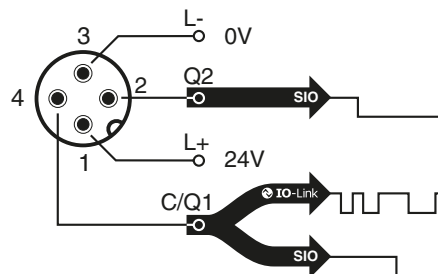
Vendor ID	0x0156
Device ID	0xAB0202
IO-Link Protocol	1.1
SIO-Mode	Supported
Process data	32 bytes input / 32 bytes output
Baudrate	COM3 (230.4 kBaud)
Minimum cycle time	10 ms
Supported Access Locks	Parameter: no, Data Storage: yes, Local Parameterization: no, Local User Interface: no
Sub Index Access	No sub index addressing possible except otherwise specified



IODD files may be downloaded from
www.contrinex.com/product-range/RFID/

Select the product name to display the product page with corresponding downloads.
Alternatively, just click/scan the QR code on the left.

PIN ASSIGNMENT

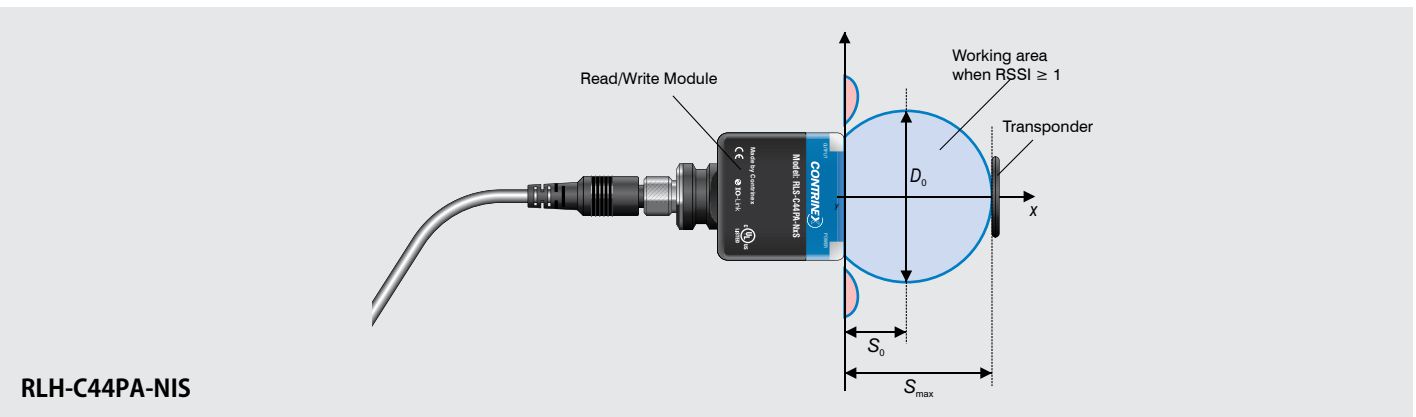
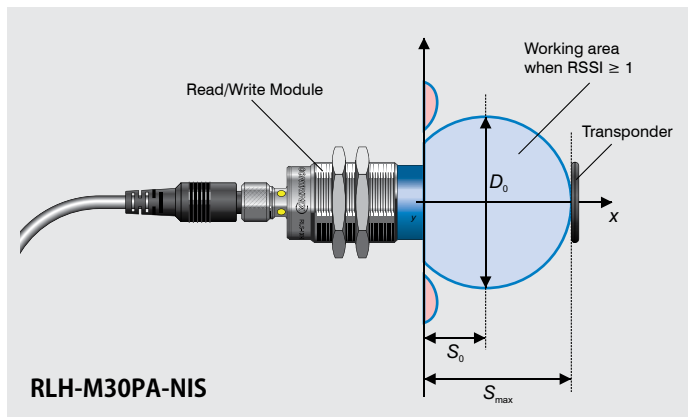
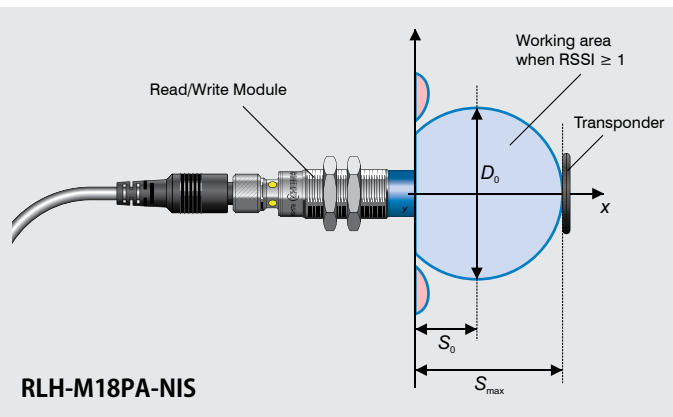


AVAILABLE TYPES

Part number	Part reference	Sensing face	Housing material	Mounting	Enclosure rating	Connection	Weight
720-100-213	RLH-M18PA-NIS	Ø18	Chrome-plated brass	Non-embeddable	IP67	M12 4-pin	37 g
720-100-214	RLH-M30PA-NIS	Ø30	Chrome-plated brass	Non-embeddable	IP67	M12 4-pin	87 g
720-100-210	RLH-C44PA-NIS	40×40 mm	PBTP	Non-embeddable	IP68 & IP69K	M12 4-pin	105 g

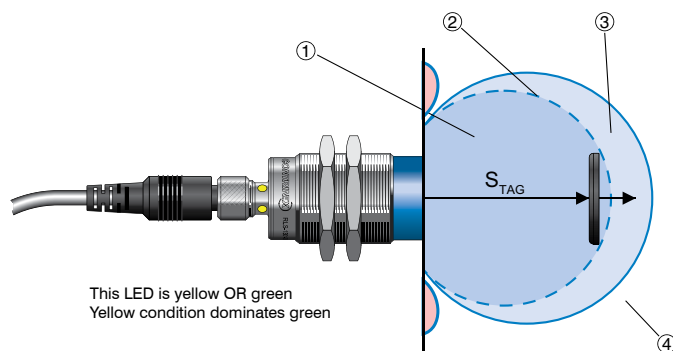
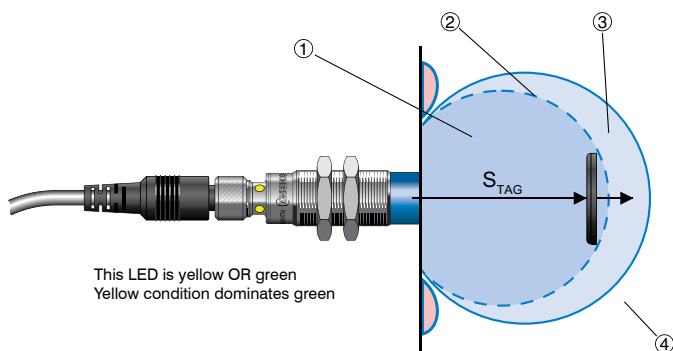
POSSIBLE COMBINATION AND TYPICAL DISTANCE (RSSI ≥ 1)

	RLH-M18PA-NIS			RLH-M30PA-NIS			RLH-C44PA-NIS		
Transponder type	S_{max} [mm]	S_0 [mm]	D_0 [mm]	S_{max} [mm]	S_0 [mm]	D_0 [mm]	S_{max} [mm]	S_0 [mm]	D_0 [mm]
Ø 9 RTP-0090-020	11	3.5	15	17	5.5	24	24	9	32
Ø 16 RTP-0160-020	19	8.5	22	28	13	31	40	20	44
Ø 20 RTH-D20QA-ND0	17	6	21	26	11.5	31	38	17	42
Ø 26 RTP-0263-020	15	4	21	33	15	36	38	17	44
Ø 30 RTH-D30QA-ND0	19	5	28	34	15	38	46	23	52
Ø 50 RTH-D50QA-ND0	20	0	44	44	18	54	58	26	66
Ø 20 RTH-D20QA-NC0	19	8	23	26	11	30	40	18	44
Ø 30 RTH-D30QA-NC0	16	3.5	25	36	16	40	44	21	48
Ø 50 RTH-D50QA-NC0	24	6	42	46	19	54	64	32	68
Ø 50 RTP-0502-022	34	10	42	50	23	54	78	41	80
Ø 50 RTP-0502-062	20	4	39	46	20	52	46	20	52



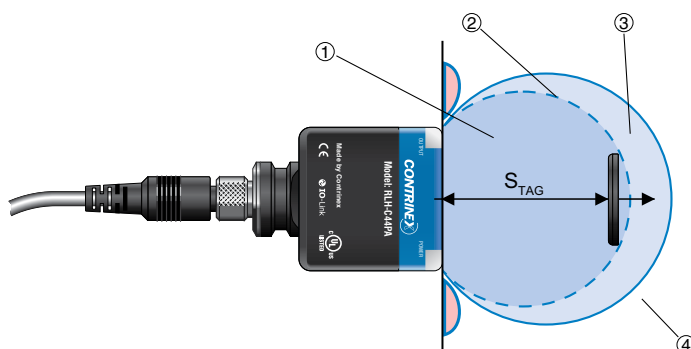
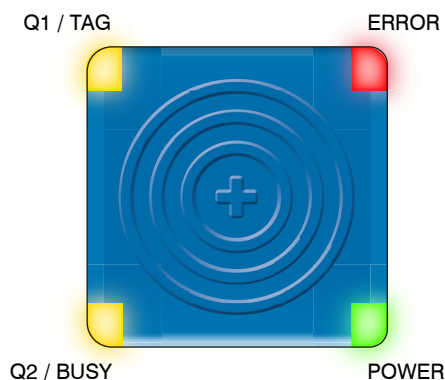
LED STATUS

- 1: Tag RSSI level $\geq$ RSSI threshold – Transponder is located in RWM recommended working area
- 2: RWM RSSI threshold limit set by the end user in the RWM configuration parameter menu (idx: 42_h, sub_idx: 03_h)
- 3: Tag RSSI level < RSSI threshold – Transponder is located in RWM maximal sensing range
- 4: Tag is out of RWM sensing range



RLH-M18PA-NIS			
	Yellow		Green
	IO-Link	SIO	
ON	Area 1	Q1 is ON	RWM is ON and SIO Mode used
OFF	Area 4	Q1 is OFF	RWM is OFF
Blinking 1 Hz	–	–	RWM is ON and IO-Link Mode used
Blinking 5 Hz	Area 3	Q1 is Compare data & Area 3	Q1 is TAG presence & Area 3

RLH-M30PA-NIS			
	Yellow		Green
	IO-Link	SIO	
ON	Area 2	Q1 is ON	RWM is ON and SIO Mode used
OFF	Area 4	Q1 is OFF	RWM is OFF
Blinking 1 Hz	N/A	–	RWM is ON and IO-Link Mode used
Blinking 5 Hz	Area 3	Q1 is Compare data & Area 3	Q1 is TAG presence & Area 3



RLH-C44PA-NIS						
	Q1 / TAG		Q2 / BUSY		ERROR	POWER
	IO-Link	SIO	IO-Link	SIO		
ON	Area 1	Q1 is ON	–	Q1 is ON	Error occurred	RWM is ON and SIO Mode used
OFF	Area 4	Q1 is OFF	No pending CMD	Q2 is OFF	No error	RWM is OFF
Blinking 1 Hz	–	–	RWM is Busy	–	–	RWM is ON and IO-Link Mode used
Blinking 5 Hz	Area 3	Q1 is TAG presence or data compare & Area 3	–	Q2 is TAG presence or data compare & Area 3-	–	–

CONFIGURATION PARAMETER (IO-LINK / SIO MODE)						
Index	Sub Hex	Name	Access	Data Type	Value	Default
SYSTEM						
02 _h	–	Standard Command	W	uint8	5 = ParamDownloadStore, 128 = Device Reset, 130 = Restore Factory Settings, 160 = Locate device (force all LEDs to blink during 30 seconds)	N/A
0C _h	–	Device Access Lock	R/W	uint16	Parameter Access, Data Storage, Local Parametrization and Local User Interface Locks	0000 _h
0D _h	–	Profile Characteristic	R	uint16	No profile for identification devices - 0000 _h	–
0E _h	–	PD Input Descriptor	R	array	Scan UID Mode {{1, 3, 4}, {1, 2, 8}, {2, 6, 10}, {2, 8, 16}, {2, 64, 24}, {2, 64, 88}, {2, 64, 152}} Scan R/W Mode {{2, 3, 0}, {1, 4, 4}, {1, 2, 8}, {2, 5, 10}, {2, 8, 16}, {0, 224, 24}}	–
0F _h	–	PD Output Descriptor	R	array	Scan UID Mode {{1, 1, 4}} Scan R/W Mode {{2, 4, 0}, {1, 1, 4}, {1, 1, 7}, {2, 3, 8}, {2, 8, 16}, {0, 224, 24}}	–
IDENTIFICATION						
10 _h	–	Vendor Name	R	char []	“Contrinex”	–
11 _h	–	Vendor Text	R	char []	“www.contrinex.com”	–
12 _h	–	Product Name	R	char []	RLH-M18PA-NIS: “RLH-M18PA-NIS” RLH-M30PA-NIS: “RLH-M30PA-NIS” RLH-C44PA-NIS: “RLH-C44PA-NIS”	–
13 _h	–	Product ID	R	char []	“00000000”	–
14 _h	–	Product Text	R	char []	“IO-Link RFID reader”	–
15 _h	–	Serial Number	R	char []	“00000000”	–
17 _h	–	Firmware Revision	R	char []	“2.2.7”	–
18 _h	–	Application Specific Tag	R/W	char []	<user string, 32 byte (variable length)>	<vendor specific>
READER PARAMETER SIO						
41 _h	01 _h	C/Q1 PIN SIO Operating Mode	R/W	uint8	00 _h : Transponder Presence 01 _h : Compare Data 02 _h : Alarm 1 03 _h : Alarm 2 04 _h : No SIO	00 _h
	02 _h	SIO Start Address C/Q1	R/W	uint8	Transponder memory block address where to make the “Compare Data” operation	00 _h
	03 _h	C/Q1 SIO Data to compare	R/W	uint32	Reference data value stored in RWM memory to be compared to transponder data	00 _h , 00 _h , 00 _h , 00 _h
	04 _h	C/Q1 PIN SIO Polarity	R/W	uint8	00 _h : Output “close” if condition = true 01 _h : Output “open” if condition = true	00 _h
	05 _h	Data Hold Time Output (C/Q1 & Q2)	R/W	uint8	00 _h : No Hold Time 01 _h : Hold Time 100 ms 02 _h : Hold Time 200 ms 03 _h : Hold Time 500 ms 04 _h : Hold Time 1000 ms 05 _h : Hold Time 2000 ms	00 _h
	06 _h	Q2 PIN SIO Operating Mode	R/W	uint8	00 _h : Transponder Presence 01 _h : Compare Data 02 _h : Alarm 1 03 _h : Alarm 2 04 _h : No SIO	00 _h
	07 _h	SIO Start Address Q2	R/W	uint8	Transponder memory block address where to make the “Compare Data” operation	00 _h
	08 _h	Q2 SIO Data to compare	R/W	uint32	Reference data value stored in RWM memory to be compared to transponder data	00 _h , 00 _h , 00 _h , 00 _h
	09 _h	Q2 PIN SIO Polarity	R/W	uint8	00 _h : Output “close” if condition = true 01 _h : Output “open” if condition = true	00 _h

CONFIGURATION PARAMETER (IO-LINK / SIO MODE)						
Index	Sub Hex	Name	Access	Data Type	Value	Default
RF CONFIGURATION						
42 _h	03 _h	RSSI Threshold	R/W	uint8	0 = 0 1 = 1 2 = 2 3 = 3 4 = 4 5 = 5 6 = 6 7 = 7	01 _h
TAG INFO						
43 _h	01 _h	UID	R	uint64	Data available only if transponder is in the RWM detection range when TAG INFO fields are read	–
	02 _h	Transponder DSFID	R	uint8	Data available only if transponder is in the RWM detection range when TAG INFO fields are read	–
	03 _h	Transponder AFI	R	uint8	Data available only if transponder is in the RWM detection range when TAG INFO fields are read	–
	04 _h	Number of Memory Blocks	R	uint8	Data available only if transponder is in the RWM detection range when TAG INFO fields are read	–
	05 _h	Memory Block Size	R	uint8	Data available only if transponder is in the RWM detection range when TAG INFO fields are read	–
	06 _h	RSSI	R	uint8	Data available only if transponder is in the RWM detection range when TAG INFO fields are read	–
	07 _h	IC Manufacturer Code	R	uint8	Data available only if transponder is in the RWM detection range when TAG INFO fields are read	–
	08 _h	IC Reference	R	uint8	Data available only if transponder is in the RWM detection range when TAG INFO fields are read	–
UID LIST						
44 _h	01 _h	Tag history 1	R	uint64	Last transponder UID seen by RWM	–
	02 _h	Time stamp Tag history 1	R	uint64	System time record when tag 1 entered in the RWM range	–
	03 _h	Tag history 2	R	uint64	–	–
	04 _h	Time stamp Tag history 2	R	uint64	System time record when tag 2 entered in the RWM range	–
	05 _h	Tag history 3	R	uint64	–	–
	06 _h	Time stamp Tag history 3	R	uint64	System time record when tag 3 entered in the RWM range	–
	07 _h	Tag history 4	R	uint64	–	–
	08 _h	Time stamp Tag history 4	R	uint64	System time record when tag 4 entered in the RWM range	–
	09 _h	Tag history 5	R	uint64	First transponder UID seen by RWM (on a shift register of 5 UIDs)	–
	0A _h	Time stamp Tag history 5	R	uint64	System time record when tag 5 enters in the RWM range	–
ALARM						
47 _h	01 _h	Measurement Alarm 1 Configuration	R/W	uint8	0 = Always OFF 1 = Active	
	02 _h	Measurement Alarm 1 Threshold	R/W	uint32	ALR1 goes TRUE if : RSSI ≤ Alarm 1 Threshold Tag IN RANGE Time ≤ Alarm 1 Threshold	
	03 _h	Measurement Alarm 1 Source	R/W	uint8	2 = RSSI 3 = Tag IN RANGE Time [ms]	
	04 _h	Measurement Alarm 2 Configuration	R/W	uint8	0 = Always OFF 1 = Active	00 _h
	05 _h	Measurement Alarm 2 Threshold	R/W	uint32	ALR2 goes TRUE if : RSSI ≤ Alarm 2 Threshold Tag IN RANGE Time ≤ Alarm 2 Threshold	00 _h , 00 _h , 00 _h , 00 _h
	06 _h	Measurement Alarm 2 Source	R/W	uint8	2 = RSSI 3 = Tag IN RANGE Time [ms]	00 _h

CONFIGURATION PARAMETER (IO-LINK / SIO MODE)						
Index	Sub Hex	Name	Access	Data Type	Value	Default
DEVICE DESCRIPTION						
48 _h	01 _h	Function Tag	R/W	char []	<user string, 32 byte (variable length)>	<vendor specific>
	02 _h	Location Tag	R/W	char []	<user string, 32 byte (variable length)>	<vendor specific>
DEVICE CHARACTERISTIC						
49 _h	01 _h	RFID Compatibility	R	char []	"13.56 MHz, ISO 15693"	–
	02 _h	Read-write distance max	R	char []	RLH-M18PA-NIS: "20 mm with diam 30 mm SLIX tag" RLH-M30PA-NIS: "40 mm with diam 30 mm SLIX tag" RLH-C44PA-NIS: "60 mm with diam 50 mm SLIX tag"	–
	03 _h	Supply voltage range (Ub)	R	char []	"11 ... 32 VDC"	–
	04 _h	Max. output current	R	char []	"≤ 200 mA"	–
	05 _h	Ambient temperature range TA	R	char []	"–25 ... +80°C"	–
	06 _h	Storage temperature range TS	R	char []	"–25 ... +80°C"	–
	07 _h	Enclosure rating	R	char []	"IP67"	–
TRANSPONDER TIME MONITORING						
4A _h	01 _h	System Time – Transponder IN	R	uint64	Record system time when transponder enters the RWM detection range [ms]	–
	02 _h	System Time – Transponder OUT	R	uint64	Record system time when transponder leaves the RWM detection range [ms]	–
	03 _h	Transponder IN RANGE Time	R	uint64	IN RANGE = Transponder OUT – Transponder IN	–
SECURITY						
58 _h	01 _h	Security Mode	R/W	uint8	0 = Security mode inactive 1 = SLI-S or SLIX-2 Security mode active (perform a login with the specified password before each read or write operation) 12 = EM4233SLIC Security mode active (perform a login with the specified password before each read or write operation)	00 _h
	02 _h	Password	W	uint32	Password is never readable to avoid end-user application counterfeiting	8 × 00 _h
DIAGNOSTIC						
59 _h	01 _h	System Time	R	uint64	The system time is reset at each RWM power down or in case the standard command 128 = Device Reset is sent to the RWM. System Time is given in [ms]	–
	02 _h	Successful Login counter	R	uint32	Counter which counts the number of successful transponder Login since last RWM startup/reset	–
	03 _h	Error Login counter	R	uint32	Counter which counts the number of unsuccessful transponder Login since last RWM startup/reset	–
	04 _h	Error counter	R	uint32	Counter which counts the number of RMW error since last RWM startup/reset	–
	05 _h	Power-on cycles	R	uint32	Counter which counts the number of RMW Power on. This counter cannot be reset. Device must be powered > 550 ms to see the power on cycle counter incremented	–

PROCESS DATA REPRESENTATION

PROCESS DATA STRUCTURE

PROCESS DATA INPUT

Bitoffset

Byte	7	6	5	4	3	2	1	0
0	RDY	ERR	TAG	ANT	RFU	CMDCOPY		
1	ERROR CODE					ALR2	ALR1	
2	RSSI							
3	ADDRESS							
4-31	DATA 0 ... 27 / UID7 ... 0, STTI7 ... 0, TIRT7 ... 0							

ERROR CODE	Error Name	Description
1	CommandNotSupported	Error code values replied by the transponder to the RWM interrogation. Depend of ISO 15693 command set supported by the different transponder IC of the market. These are error code values defined by the ISO 15693 standard
2	FormatError	
3	OptionNotSupported	
5	CommandProblem	
6	CommTagError	
15	TagError	
16	NoMemoryBlock	RWM password (index 0x58) is not matching transponder password
18	BlockProtected	
27	AppLOGError	Indicates a transponder communication error (e.g. more than 1 transponder detected or transponder reply not understood)
30	TAGCommError	
255	AppGeneralError	General Error

Name	Value	Description
RDY	0 → 1 1 → 0	Command executed and new data available. If Auto-Read, Auto-Write or UID command is selected, bit toggling runs automatically as long as a transponder is inside the RWM range
	0 1	No new data available yet
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
RSSI	RSSI signal level coming from the transponder	
ERROR CODE	See ERROR CODE list on the left	
ALR2	0	Alarm 2 OFF
	1	Alarm 2 ON
ALR1	0	Alarm 1 OFF
	1	Alarm 1 ON
ADDRESS	First transponder memory block address where the R/W command was executed	
DATA 0 ... 27	Read data LSB	
UID7 ... 0	Transponder unique ID number	
STTI7 ... 0	System time transponder IN. Data record when a transponder enters in the RWM range	
TIRT7 ... 0	Transponder IN RANGE time	

PROCESS DATA OUTPUT

Bitoffset

Byte	7	6	5	4	3	2	1	0
0	START	RFU		N_ANT	RFU	CMD		
1	RFU				NB BLOCK			
2	RFU							
3	ADDRESS							
4-31	DATA 0 – DATA 27							

Name	Value	Description
START	0 → 1 1 → 0	Start the selected RFID operation when bit toggles. If Auto-Read, Auto-Write or UID command is selected, the bit is not used. The RFID command are sent automatically as long as a transponder is inside the RWM range
	0 1	IDLE
N_ANT	0	Switch ON RF Field
	1	Switch OFF RF Field
CMD	0	No command
	1	Auto-Read
	2	Auto-Write
	3	Read
	4	Write
	5	UID and tag timings
NB BLOCK	Number of transponder memory block to R/W	
ADDRESS	First transponder memory block address where the R/W command will be executed	
Data 0	Data to be written LSB	
Data 27	Data to be written MSB	

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.