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TURCK

TN-M...-IOL-H1141 HF Read/Write Heads

IO-Link parameters – IO-Link version 1.1

Contents

1	About These Instructions	4
1.1	Target groups	4
1.2	Explanation of symbols	4
1.3	Other documents	4
1.4	Feedback about these instructions	5
2	Information About the Product	5
2.1	Product identification	5
2.2	Manufacturer and service	5
3	Software-Supported IO-Link Parameterization	6
4	IO-Link Parameters	7
4.1	General parameters	7
4.2	Process data – Parameters	7
4.3	Process data – Reading the UID	8
4.3.1	Process input data	8
4.3.2	Process output data	8
4.4	Process data – Reading the Fixed Memory Area of a Tag	9
4.4.1	Process input data	9
4.4.2	Process output data	9
4.5	Process data – Read or Write User Data	10
4.5.1	Process input data	10
4.5.2	Process output data	11
4.6	Process data – Error Codes	12
4.7	Default parameters	12
4.8	SIO mode – Parameters	13

1 About These Instructions

These instructions describe the parameterization of the TN-M...-IOL-H1141 HF read/write heads with IO-Link. They include the description of operation via IO-Link, information on the available functions and a list of all parameters necessary for operation.

1.1 Target groups

These instructions are intended for qualified personnel and must be read carefully by anyone mounting, commissioning, operating, maintaining, dismantling or disposing of the device.

1.2 Explanation of symbols

The following symbols are used in these instructions:



DANGER

DANGER indicates an imminently hazardous, high-risk situation which, if not avoided, will result in death or serious injury.



WARNING

WARNING indicates a potentially hazardous, medium-risk situation which, if not avoided, could result in death or serious injury.



CAUTION

CAUTION indicates a situation that may result in material damage if not avoided.



NOTE

NOTE indicates tips, recommendations and important information. The notes will facilitate work, provide more information on specific actions and help prevent additional work due to incorrect processes.



CALL TO ACTION

This symbol denotes action steps that the user must carry out.



RESULT OF ACTION

This symbol denotes the relevant results of actions and action sequences.

1.3 Other documents

Besides this document, the following material can be found on the Internet at www.turck.com:

- Data sheet
- Quick start guide
- Operating instructions

1.4 Feedback about these instructions

We make every effort to ensure that these instructions are as informative and as clear as possible. If you have any suggestions for improving the design or if any information is missing from the instructions, please send your suggestions to techdoc@turck.com.

2 Information About the Product

2.1 Product identification

These instructions apply to the following devices:

Type	Ident-No.
TN-M18-IOL-H1141	100000974
TN-M30-IOL-H1141	100000975

2.2 Manufacturer and service

Hans Turck GmbH & Co. KG
 Witzlebenstraße 7
 45472 Mülheim an der Ruhr
 Germany

Turck provides you with support and assistance for your projects – from the initial analysis to commissioning your application. The Turck product database contains software tools for programming, configuration and commissioning, as well as data sheets and CAD files in numerous export formats. You can access the product database at the following address:

www.turck.de/products

Should you have any further questions, please contact the sales and service team in Germany on the following telephone numbers:

Sales: +49 208 4952-380

Technology: +49 208 4952-390

Outside Germany, please contact your Turck representative.

3 Software-Supported IO-Link Parameterization

The ports of the IO-Link master can be configured in IO-Link mode (IOL) or in the standard-IO mode (SIO).

If a port is configured in SIO mode, the IO-Link master on this port behaves like a normal digital input, and the connected IO-Link device sends the standard switching output to the IO-Link master – there is no communication between the device and the master.

If the port is configured in IOL mode, the IO-Link master tries to "wake" the connected IO-Link device using the "wake-up request". If the master receives a response from the signal processor, both devices start to communicate with each other. First the communication parameters are exchanged, and then the cyclic data exchange of process data (objects) starts.

In the case of active IO-Link communication (IOL mode), both cyclic and acyclic communication services are available.

Parameterization via IO-Link can occur in two different ways:

- via on-request data objects (e.g. IO-Link function block close to the control)
- via tool-based engineering with FDT/DTM (e.g. PACTware™ with the use of DTM or the IODD)

Device parameters (on-request data objects)

Device parameters are exchanged in an acyclical manner and upon the request of the IO-Link master. The IO-Link master always sends a request to the device first, and then the device responds. This is the case both when the data is written into the device and read from the device. With the help of on-request data objects (ORDO), the parameters can be written into the device (Write) or the device status can be read from the device (Read).

4 IO-Link Parameters

4.1 General parameters

Name	Index (dec.)	Index (hex.)	Access	Byte length	Description
Vendor name	16	0x10	Read	32	Manufacturer ID, fixed: "Turck"
Vendor text	17	0x11	Read	32	Fixed: "www.turck.com"
Product name	18	0x12	Read	32	Type designation, fixed: e.g. "TN-M18-IOL-H1141"
Product ID	19	0x13	Read	16	Device ID, fixed: e.g. : "100000974"
Product text	20	0x14	Read	32	Fixed: "IO-Link RFID reader"
Hardware version	22	0x16	Read	8	Current hardware version (3-point notation)
Firmware revision	23	0x17	Read	16	Current firmware version (3-point notation)
Application specific name	24	0x18	Read/Write	16	Default settings: "***", max. 32 bytes can be written by the customer

4.2 Process data – Parameters

Name	Index (dec.)	Index (hex.)	Sub-index (dec.)	Sub-index (hex.)	Access	Format	Value	Description
Operating Mode	64	0x40	1	0x01	Read/Write	UInteger	0xFF	Read the UID
							0x00	Read the fixed memory area of a tag
							0x01	Read or write the user data
Data Hold Time			2	0x02	Read/Write	UInteger	0xFF	No data hold time
							0x01	200 ms
							0x02	500 ms
							0x03	1000 ms
							0x04	2000 ms
Scan Address			3	0x03	Read/Write	UInteger		Block address Default: 0x00

4.3 Process data – Reading the UID

4.3.1 Process input data

Name	Index (dec.)	Index (hex.)	Access	Bit offset	Bit length	Format	Value	Description
Process input data	40	0x28	Read		72	Record		Process input data, depending on the "reader parameter process data" parameter
Tag				69	1	Boolean	True	Tags in the sensing range
							False	No tags in the sensing range
Antenna State				68	1	Boolean	True	RF field is switched on
							False	RF field is switched off
NB Tag				64	4	UInteger		Number of tags in the sensing range
UID0				56	8	UInteger		UID LSB
UID1				48	8	UInteger		...
UID2				40	8	UInteger		...
UID3				32	8	UInteger		...
UID4				24	8	UInteger		...
UID5				16	8	UInteger		...
UID6				8	8	UInteger		...
UID7				0	8	UInteger		UID MSB

4.3.2 Process output data

Name	Index (dec.)	Index (hex.)	Access	Bit offset	Bit length	Format	Value	Description
Process output data	41	0x29	Read/Write		80	Record		Process output data, depending on the "reader parameter process data" parameter
Antenna State				76	1	Boolean	True	Switch on the RF field
							False	Switch off the RF field
Tag NB				72	4	UInteger		Index of the tag whose UID is to be read

4.4 Process data – Reading the fixed memory area of a tag

4.4.1 Process input data

Name	Index (dec.)	Index (hex.)	Access	Bit offset	Bit length	Format	Value	Description
Process input data	40	0x28	Read		72	Record		Process input data, depending on the "reader parameter process data" parameter
Ready Flag				71	1	Boolean	True	Data available
							False	No data available
Error				70	1	Boolean	True	Error
							False	No error
Tag				69	1	Boolean	True	Tags in the sensing range
							False	No tags in the sensing range
Antenna State				68	1	Boolean	True	RF field is switched on
							False	RF field is switched off
Ext. Data				64	1	Boolean	True	8 data bytes
							False	4 data bytes
Data 0/Error Code				56	8	UInteger		LSB data or error code
Data 1				48	8	UInteger		...
Data 2				40	8	UInteger		...
Data 3				32	8	UInteger		...
Extended Data 4				24	8	UInteger		...
Extended Data 5				16	8	UInteger		...
Extended Data 6				8	8	UInteger		...
Extended Data 7				0	8	UInteger		MSB data

4.4.2 Process output data

Name	Index (dec.)	Index (hex.)	Access	Bit offset	Bit length	Format	Value	Description
Process output data	41	0x29	Read/Write		80	Record		Process output data, depending on the "reader parameter process data" parameter
Antenna State				76	1	Boolean	True	Switch on the RF field
							False	Switch off the RF field

4.5 Process data – Read or write user data

4.5.1 Process input data

Name	Index (dec.)	Index (hex.)	Access	Bit offset	Bit length	Format	Value	Description
Process input data	40	0x28	Read		72	Record		Process input data, depending on the "reader parameter process data" parameter
Ready Flag				71	1	Boolean	True	Data available
							False	No data available
Error				70	1	Boolean	True	Error
							False	No error
Tag				69	1	Boolean	True	Tags in the sensing range
							False	No tags in the sensing range
Antenna State				68	1	Boolean	True	RF field is switched on
							False	RF field is switched off
Ext. Data				64	1	Boolean	True	8 data bytes
							False	4 data bytes
Data 0/Error Code				56	8	UInteger		LSB data or error code
Data 1				48	8	UInteger		...
Data 2				40	8	UInteger		...
Data 3				32	8	UInteger		...
Extended Data 4				24	8	UInteger		...
Extended Data 5				16	8	UInteger		...
Extended Data 6				8	8	UInteger		...
Extended Data 7				0	8	UInteger		MSB data

4.5.2 Process output data

Name	Index (dec.)	Index (hex.)	Access	Bit offset	Bit length	Format	Value	Description
Process output data	41	0x29	Read/Write		80	Record		Process output data, depending on the "reader parameter process data" parameter
Start				79		Boolean	True	Run command
							False	Do not run command
Antenna State				76	1	Boolean	True	Switch on the RF field
							False	Switch off the RF field
Command				73	3	UInteger	0	No command
							1	Read
							2	Write
Ext. Data				72	1	Boolean	True	8 data bytes
							False	4 data bytes
Add				64	8	UInteger		Block address
Data 0				56	8			LSB data or error code
Data 1				48	8			...
Data 2				40	8			...
Data 3				32	8			...
Extended Data 4				24	8			...
Extended Data 5				16	8			...
Extended Data 6				8	8			...
Extended Data 7				0	8			MSB data

4.6 Process data – Error codes

Error code (dec.)	Error code (hex.)	Description
1	0x01	Command not supported
2	0x02	Format error
3	0x03	Option not supported
5	0x05	Problem with command execution
6	0x06	Tag error during command execution
15	0x0F	Tag error
16	0x10	No memory block selected
18	0x12	Memory block protected

4.7 Default parameters

Name	Index (dec.)	Index (hex.)	Access	Bit offset	Byte length	Format	Value	Description
Standard command	2	0x02	Write		8	UInteger	128	Reset device
							130	Restore factory settings
Device access locks	12	0x0C	Read/Write		16	Record		
Parameter access lock			Read/Write	0	1	Boolean	False	No lock
							True	Lock
Data storage lock			Read/Write	1		Boolean	False	No lock
							True	Lock
Local user interface lock			Read/Write	2		Boolean	False	No lock
							True	Lock
Data storage and user interface lock			Read/Write	3		Boolean	False	No lock
							True	Lock

4.8 SIO mode – Parameters

Name	Index (dec.)	Index (hex.)	Sub index (dec.)	Sub index (hex.)	Access	Format	Value	Description
C/Q1 PIN SIO Operating Mode	65	0x41	1	0x01	Read/Write	UInteger	0xFF	Check for presence of tags
							0x00	Compare data
C/Q1 SIO Data to compare H			2	0x02	Read/Write	UInteger		Comparison value (byte 7...4)
C/Q1 SIO Data to compare L			3	0x03	Read/Write	UInteger		Comparison value (byte 3...0)
SIO Compare Data Address (C/Q1 & Q2)			4	0x04	Read/Write	UInteger		Address for the comparison (C/Q1 and C/Q2) Default: 0x00
Data Hold Time Output			5	0x05	Read/Write	UInteger	0xFF	No data hold time
							0x01	200 ms
							0x02	500 ms
							0x03	1000 ms
							0x04	2000 ms
C/Q1 PIN SIO Polarity			6	0x06	Read/Write	UInteger	0xFF	NO contact
							0x00	NC contact
Q2 PIN SIO Operating Mode			7	0x07	Read/Write	UInteger	0xFF	Check for presence of tags
							0x00	Compare data
Q2 SIO Data to compare H			8	0x08	Read/Write	UInteger		Comparison value (byte 7...4)
Q2 SIO Data to compare L			9	0x09	Read/Write	UInteger		Comparison value (byte 3...0)
Q2 PIN SIO Polarity			10	0x0A	Read/Write	UInteger	0xFF	NO contact
							0x00	NC contact

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