

Operating Instructions

Ethernet IO-Link Master

202-725-0001



Applies to:
HW-V02 | FW-V1.00

Table of Contents

1.	Notes to the user	5
1.1	Structure of the guide	5
1.2	Abbreviations	5
1.3	Deviating views	5
1.4	Purpose	5
1.5	Legal and copyright information	5
2.	Safety instructions	6
2.1	General instructions	6
2.2	IT security	6
3.	Intended use	7
4.	Product Introduction	8
4.1	Overview	8
4.2	LED schema	9
4.3	Dimensions	12
4.4	Electrical connections	13
5.	Technical data	14
5.1	Mechanical data	14
5.2	Environmental conditions	14
5.3	Electrical data	14
5.4	Communication interface	15
6.	JSON for IO-Link	16
6.1	Compact architectural scope	17
6.2	Device data and layer model	17
6.3	Implementation hints	18
7.	JSON interface data access	19
7.1	Gateway endpoints	19
7.1.1	Read gateway identification	19
7.1.2	Read gateway capabilities	20
7.1.3	Read gateway configuration	21
7.1.4	Write gateway configuration	22
7.1.5	Send reset	23

7.1.6	Send reboot	24
7.1.7	Read event log	25
7.2	Masters endpoints	27
7.2.1	Read masters	27
7.2.2	Read master capabilities	28
7.2.3	Read master Identification	29
7.2.4	Write master identification.....	30
7.3	Ports endpoints.....	31
7.3.1	Read port identification.....	31
7.3.2	Read port capabilities.....	32
7.3.3	Read port status	33
7.3.4	Read port configuration	34
7.3.5	Write port configuration.....	36
7.3.6	Read datastorage.....	38
7.3.7	Write datastorage	39
7.4	Devices endpoints	40
7.4.1	Read devices.....	40
7.4.2	Read device capabilities	41
7.4.3	Read device identification	42
7.4.4	Write device identification	43
7.4.5	Read device process data	44
7.4.6	Write device process data	45
7.4.7	Read device process data get data	46
7.4.8	Read device process data set data	47
7.4.9	Read device parameter	48
7.4.10	Write device parameter	49
7.4.11	Read device parameter with subindex	50
7.4.12	Write device parameter with subindex	51
7.4.13	Read device block parameterization.....	52
7.4.14	Write device block parameterization	54
7.4.15	Read device events	56
7.5	Error codes.....	58
7.5.1	General HTTP error codes.....	58

7.5.2	JSON Parsing errors	58
7.5.3	Resource access errors.....	59
7.5.4	Data Storage errors.....	59
7.5.5	Process Data handling.....	59
7.5.6	IODD errors.....	60
7.5.7	Data content errors	60
7.5.8	Vendor specific errors	61
8.	Configuration over web	62
8.1	General	62
8.2	Dashboard	63
8.3	Port management	64
8.4	Device management	65
8.5	Gateway settings	66
8.5.1	General	66
8.5.2	Network setup	67
8.5.3	MQTT setup	67
8.5.4	Event viewer	68
9.	Maintenance	69
9.1	Cleaning.....	69
9.2	Maintenance	69
9.3	Disposal	69

1. Notes to the user

1.1 Structure of the guide

This manual is arranged so that the chapters build upon each other.

Chapter 2: Safety Instructions

Chapter 3: Intended use

...

1.2 Abbreviations

VPN	Virtual Private Network
AS-i	Actuator Sensor Interface
DHCP	Dynamic Host Configuration Protocol

1.3 Deviating views

Product views and illustrations in this manual may differ from the actual product. They are intended only as illustrative material.

1.4 Purpose

This document is only for device Ethernet IO-Link Master 202-725-0001 (ver.01). It contains information about the correct handling of the product. Read this manual before using the device.

1.5 Legal and copyright information

© All rights reserved by nass magnet Hungária Kft.. No part of this manual may be reproduced and used without the consent of nass magnet Hungária Kft..

All product names, pictures, companies or other brands used on our pages are the property of the respective rights owners:

- IO-Link® is the property of the PROFIBUS Nutzerorganisation e.V., Germany (www.io-link.com)

2. Safety instructions

2.1 General instructions

- Read this document before using the product.
- Installation, electrical connection, and configuration must be carried out by a qualified person only.
- Replace damaged units, otherwise the technical data and safety will be impaired
- The manufacturer assumes no liability or warranty for any consequences caused by modifying the product or incorrect use.
- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property may occur.

2.2 IT security

Please note the following points if the product is operated in an unprotected network environment.

- Unauthorized read or write access to data is possible.
- Unauthorized manipulation of the device function is possible.
- Restrict access options to the product:
 - Do not connect the device to open networks or the internet.
- If access from the internet is inevitable:
 - Choose a safe method to connect the device with (e.g. VPN).

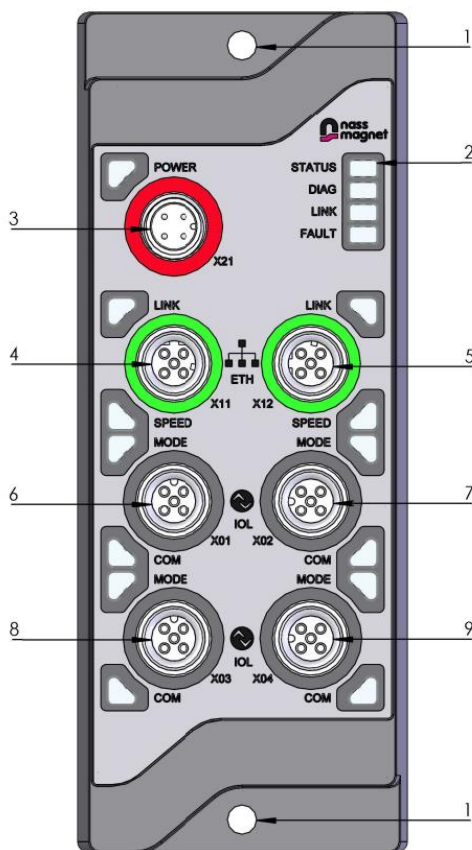
3. Intended use

The product shall only be used for the following purposes:

- As IO-Link master for configuration, administration and operation of IO-Link devices
- As gateway between IO-Link devices and AS-I network
- For IIoT applications in industry 4.0

4. Product Introduction

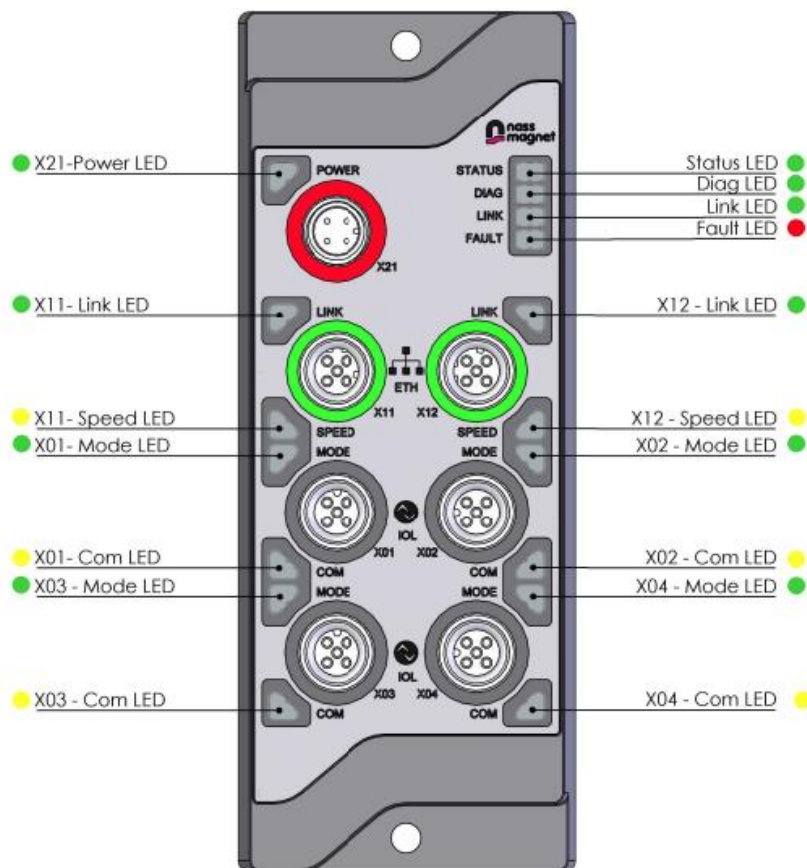
4.1 Overview



1. Figure - Overview

- | | |
|-----------------------|------------------------------|
| 1 Mounting holes | 6 Port X01 - IO-Link Class A |
| 2 General LEDs | 7 Port X02 - IO-Link Class A |
| 3 Port X21 - Power | 8 Port X03 - IO-Link Class A |
| 4 Port X11 - Ethernet | 9 Port X04 - IO-Link Class A |
| 5 Port X12 - Ethernet | |

4.2 LED schema

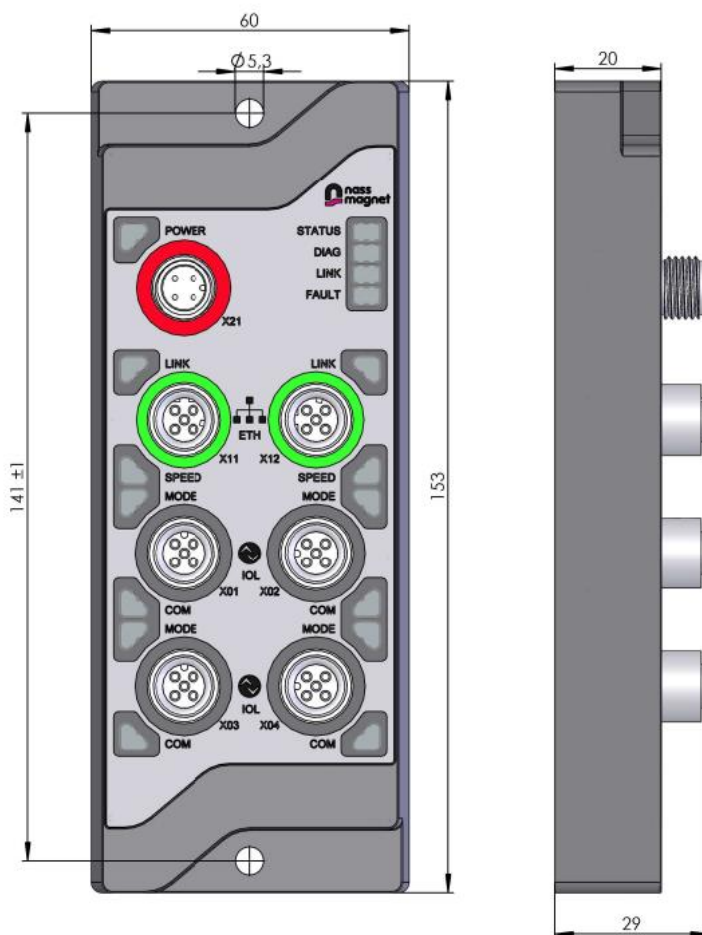


2. Figure - LED schema

LED Name	State/Color	Function	Note
X21 Power LED	Solid / Green	Master Powered ON - as soon as the master receives Stable 24V and MCU powered properly	
	Off / N.A.	Master Powered OFF - please provide the power supply to X21 connector.	
Status LED	Solid / Green	All subsystem of the master is initialized. Master unit is ready to use.	
Diag LED	Solid / Green	External Connection from SMI interface is active. For example, an extern SMI API Compatible Control Tool application is connected.	
Link LED	Solid / Green	Ethernet/TCP-IP stack is active, IP address assigned. Master unit ready for JSON or SMI access.	
Fault LED	Solid / Red	Serious HW or SW/Configuration detected. Please check the online troubleshooting guide or contact your vendor.	
X1n Speed LED (n = 1..2)	Solid / Yellow	100Mbit Link is Up	
	Off / N.A.	10Mbit Link or No link present	
X1n Link LED (n = 1..2)	Solid / Green	Link is UP but no network activity	
	Blinking / Green	Link is UP and network active	
	Off / N.A.	No link present	Check Ethernet cable

LED Name	State/Color	Function	Note
X0n - Com LED (n = 1 ..4)	Solid / Yellow	Port online, IO-Link Mode	
	Blinking Slow / Yellow	Connected device is in STARTUP / Data Storage RESTORE stage	This is usually barely visible
	Blinking Fast / Yellow	with X0n MODE LED Blinking Fast: Port is configured to IO-Link, but no IO-Link Device is detected, this means failed wake-up on the connected device or there is no device connected at all to the port.	
	Off / N.A.	No communication on port. However, port is maybe powered off but not configured to IO-Link mode. DI/DO mode	
X0n - Mode LED (n = 1 ..4)	Solid / Green	X0n COM LED OFF: Port Power Supply ON, or port is DO/DI mode and no activity	
		X0n COM LED ON: Port Power Supply ON and port is in IO-Link Mode	
	Blinking Slow / Green	Connected device is in STARTUP / Data Storage RESTORE stage	This is usually barely visible
	Blinking Fast / Green	with X0n COM LED Blinking Fast: Port is configured to IO-Link, but no IO-Link Device is detected, this means failed wake-up on the connected device or there is no device connected at all to the port.	
	Off / N.A.	No Power Supply on the port	

4.3 Dimensions

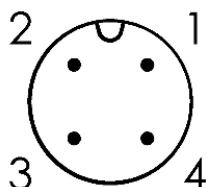


3. Figure - Dimensions

Please note that the values are in millimetres!

4.4 Electrical connections

Power - M12, A-coded, male



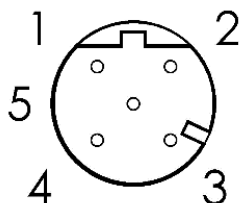
Pin 1 +24 VDC (2000 mA)

Pin 2 -

Pin 3 GND

Pin 4 -

Ethernet - M12, D-coded, female



Pin 1 TX +

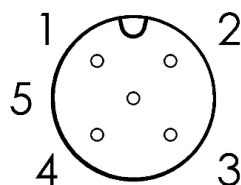
Pin 2 RX +

Pin 3 TX -

Pin 4 RX -

Pin 5 -

IO-Link Class A - M12, A-coded, female



Pin 1 +24 VDC (500 mA)

Pin 2 I/Q

Pin 3 GND

Pin 4 C/Q

Pin 5 -

5. Technical data

5.1 Mechanical data

Mechanical data

Dimension H x W x D	153 x 60 x 29 mm
Weight	340 g
Mounting	2 x M5 (recommended)
Max tightening torque	2 Nm

Material

M12	Brass + Nickel plated
Housing	PA6 GF20 FR

5.2 Environmental conditions

Environmental conditions

Ambient temperature	-20...60 °C
Storage temperature	-20...60 °C
IP rating	IP65/67, when threaded in

5.3 Electrical data

Electrical specifications

Operating voltage	20...30 VDC
Rated operating voltage	24 VDC
Max current	2000 mA (500mA / port)

Electrical connections

Power	1 x M12 male	4-pin A-coded
Ethernet	2 x M12 female	5-pin D-coded
IO-Link	4 x M12 female	5-pin A-coded

5.4 Communication interface

IO-Link

Function	Master Class A
Revision	V1.1.3
Auxiliary interfaces	4 x IO-Link
Supported speed	COM1, COM2, COM3

Ethernet

Interface	Ethernet TCP/IP
Address range	IPv4
Transfer rate	10/100 Mbit/s
Auxiliary interfaces	2 x Ethernet
Web interface	yes
Supported protocols	MQTT (will be supported in a later version)

Factory settings

IP configuration	Manual
IP Address	192.168.23.100
Subnet mask	255.255.255.0
Default gateway	192.168.23.1

6. JSON for IO-Link

All REST API endpoint use the same base URL path.

The base path is: http://<ip_address>/iolink/v1

The default IP address is: 192.168.23.100

(Please note that, the administrator can change the IP address configuration of the master according to the installation environment requirement, thus the default IP address can be different, or can be assigned by DHCP)

Example: <http://192.168.23.100/iolink/v1/gateway>

The JSON interface mapping provides easy and convenient access to the IO-Link master related functions and to the connected IO-Link devices. The Interface uses the HTTP protocol as transport protocol, and data is exchanged between the host system and the master as standardized JSON data packages.

The actual version of the JSON interface provides all JSON based REST API access defined in the JSON – Integration to IO-Link specification (version 1.0.0 – March 2020, Order No: 10.222, https://io-link.com/share/Downloads/IO-Link_Integration/JSON_Integration_10222_V100_Mar20.zip) which does not require IODD upload.

IODD upload function will be supported in a future / upgraded version of the master firmware.

With the following online tool, the .yaml file can be viewed with a user friendly way: <https://editor.swagger.io/>

Maximum Parallely acceptable HTTP/JSON Request is 10.

! Please note, that you should not issue a new HTTP request before response is not arrived.

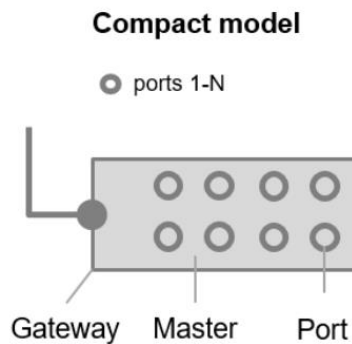
Request Type	Number of HTTP	Best case Request Frequency (ms)
ASYNC (Device Param Read and Param Write, Port Config)	0-5	200 – 300
	5-10	500 – 1000
SYNC	0-10	200 – 300

In IO-Link the devices may delay the response for any ISDU parameter response up to 5 seconds. In addition to this if the device starts responding back in 5 seconds it could take even more couple of seconds to fetch the complete response (especially if you have long parameter and the device is only communicating with COM1)

- ! Be aware that during intensive configuration of the IO-Link Ports (port config state change, or DataStorage activity) the loosing power could make configuration data loss.

6.1 Compact architectural scope

IO-Link system consists of an IO-Link Master, IO-Link Devices and cables connecting the IO-Link Devices to the IO-Link Master. The JSON interface follows the compact model of such a system as shown below.

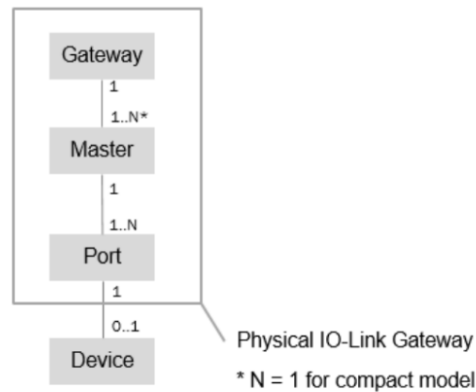


4. Figure – Compact model

A physical IO-Link Gateway consists of one or more Masters containing one or more ports. On each port an IO-Link Device may be connected. The physical IO-Link Gateway may also have one or more Gateway applications (e.g Webserver and MQTT client).

6.2 Device data and layer model

This device layer model (including Gateway, IO-Link Master and Devices) see Figure 5 is used 112 to structure the REST API described in this specification. This layer model comprises compact 113 modules containing one Master as well as modular devices with N Masters.



5. Figure - Device layer model

Each layer has resources which are addressed by a URL path. The model shows that a physical Gateway may have multiple gateway applications and one or more Masters. Each Master has one or more Ports, and on each Port, 0 or 1 device is connected.

6.3 Implementation hints

- If there is more than one error in the request, the parsing is stopped and just the first detected error is returned.
- Errors [101], [150] can be returned to every request.
- Error [103] can be returned to every request which is not included in the base facet.
- Specific error messages have to be provided only if the corresponding operation is supported. So, you do not need to give specific errors for bad IODDs if you do not support the IODD faces, just indicate error [105].
- **Error [301] can be returned to every request where there is available in the URL.**
- If the request was successful and no body part is specified, the response contains nothing in the body.

7. JSON interface data access

In the following section all the implemented endpoints are defined. In the JSON Object properties table, the last column (M/O/C) refers to whether the specific property is mandatory, optional, or conditional.

7.1 Gateway endpoints

7.1.1 Read gateway identification

Description	
Function	Read the identification of the gateway.
Path	{baseUrl}/gateway/identification
Method	GET
Query parameters	-
Responses	
Errors [HTTP]	403 - Forbidden 500 - Internal server error
JSON Error Code	150 - Permission denied 101 - Internal server error
Success [HTTP]	200 - OK

JSON Object properties - Response			
Property	Type	Value	M/O/C
macAddress	string		M
serialNumber	string		O
productId	string		O
vendorName	string		M
productName	string		O
hardwareRevision	string		O
firmwareRevision	string		O
productionInstanceUri	string		O

7.1.2 Read gateway capabilities

Description	
Function	Read the capabilities of the IO-Link Gateway.
Path	{baseUrl}/gateway/capabilities
Method	GET
Query parameters	-

Responses	
Errors [HTTP]	403 – Forbidden 500 – Internal server error
JSON Error Code	101 – Internal server error 150 – Permission denied
Success [HTTP]	200 – OK

JSON Object properties - Response			
Property	Type	Value	M/O/C
ioddSupported	boolean	false	M
mqttSupported	boolean	true	M

7.1.3 Read gateway configuration

Description	
Function	Read the actual active configuration of the IO-Link Gateway. The Gateway may support multiple IPv4 interfaces.
Path	{baseUrl}/gateway/configuration
Method	GET
Query parameters	-
Responses	
Errors [HTTP]	403 – Forbidden 500 – Internal server error
JSON Error Code	150 – Permission denied 101 – Internal server error
Success [HTTP]	200 - OK

JSON Object properties - Response			
Property	Type	Value	M/O/C
ethIPv4	Array of objects		M
ipConfiguration	string	"MANUAL", "DHCP"	M
ipAddress	string	eg: "192.168.23.100"	C
subnetMask	string	eg: "255.255.255.0"	C
standardGateway	string	eg: "192.168.23.1"	C

7.1.4 Write gateway configuration

Description	
Function	Write configuration data to the gateway. Please note that changing the configuration will change the IP Address in the base URL.
Path	{baseUrl}/gateway/configuration
Method	POST
Query parameters	-
Response	
Errors [HTTP]	400 – Bad request 403 – Forbidden 500 – Internal server error
JSON Error Code	<div> 101 – Internal server error 104 – Action locked by another client 201 – JSON parsing failed 202 – JSON data value invalid 203 – JSON data type invalid 204 – Enumeration value unknown 205 – JSON data value out of range </div> <div> 206 – JSON data value out of bounds 208 – POST request without content 701 – Data set incomplete 702 – Data set not applicable 703 – Data set combination incompatible 150 – Permission denied </div>
Success [HTTP]	204 – OK, No content

JSON Object properties - Request				
Property	Type	Value	Comment	M/O/C
ethIPv4	Array of objects			M
ipConfiguration	string	"MANUAL", "DHCP"		M
ipAddress	string	eg: "192.168.23.100"	if MANUAL selected	C
subnetMask	string	eg: "255.255.255.0"	if MANUAL selected	C
standardGateway	string	eg: "192.168.23.1"	if MANUAL selected	C

7.1.5 Send reset

Description	
Function	Invoke a reset of the IO-Link Gateway. This may reset all configuration data and interrupt all 288 communication channels. It adds a log entry within the EventLog.
Path	{baseUrl}/gateway/reboot
Method	POST
Query parameters	-
Response	
Errors [HTTP]	400 – Bad request 403 – Forbidden 500 – Internal server error
JSON Error Code	101 – Internal server error 104 – Action locked by another client 150 – Permission denied
Success [HTTP]	204 – OK, No content

7.1.6 Send reboot

Description	
Function	Reboots the master. No configuration change applied.
Path	{baseUrl}/gateway/reboot
Method	POST
Query parameters	-
Response	
Errors [HTTP]	400 – Bad request 403 – Forbidden 500 – Internal Server Error
JSON Error Code	101 – Internal server error 104 – Action locked by another client 150 – Permission denied
Success [HTTP]	204 – OK, No content

7.1.7 Read event log

Description

Function

Read the event log containing all events from the Gateway, Masters, Ports and Devices.

Path

{baseUrl}/gateway/events

Method

GET

Query parameters

Name	Type	Description	Value
origin	query	The event source to filter.	"ALL", - default "GATEWAY", "MASTERS", "PORTS", "DEVICES"
portNumber	query	portNumber is only applicable with origin="PORTS"	number
deviceAlias	query	deviceAlias is only applicable with origin="DEVICES"	string
top	query	Delivers the oldest n events of the event buffer. Top is mutually exclusive to bottom.	number
bottom	query	Delivers the youngest n events of the event buffer. Bottom is mutually exclusive to top.	number

Responses

Errors [HTTP]

403 – Forbidden
500 – Internal server error

JSON Error Code

150 – Permission denied
101 – Internal server error

Success [HTTP]

200 – OK

JSON Object properties - Response

Property	Type	Value	M/O/C
	array of objects		M
time	string		M
severity	enum	"EMERGENCY", "ALERT", "CRITICAL", "ERROR", "WARNING", "NOTICE", "INFO", "DEBUG"	M
origin	object		M
gateway	string		O
master	number		O
port	number		O
deviceAlias	string		M
message	object		M
code	number		M
mode	enum	"SINGLESHOT", "APPEARS", "DISAPPEARS"	M
text	string		O

7.2 Masters endpoints

Addressing of IO-Link Masters within a Gateway starts with number 1 for the first master. Because in the gateway we have only one master this value can be considered as constant.

7.2.1 Read masters

Description	
Function	The request is returning all Masters within a Gateway. Reads all the available masterNumber keys with the corresponding identification information.
Path	{baseUrl}/masters/
Method	GET
Query parameters	-

Responses	
Errors [HTTP]	403 - Forbidden 500 - Internal server error
JSON Error Code	101 - Internal server error 150 - Permission denied
Success [HTTP]	200 - OK

JSON Object properties - Response			
Property	Type	Value	M/O/C
masterNumber	number		M
serialNumber	string		O
locationTag	string		O

7.2.2 Read master capabilities

Description	
Function	Read the capabilities of the Master.
Path	{baseUrl}/masters/1/capabilities
Method	GET
Query parameters	-

Responses	
Errors [HTTP]	403 - Forbidden 500 - Internal server error
JSON Error Code	101 - Internal server error 102 - Internal communication error 150 - Permission denied 302 - masterNumber not found
Success [HTTP]	200 - OK

JSON Object properties - Response			
Property	Type	Value	M/O/C
numberOfPorts	number	4	M
maxPowerSupply	object		M
value	number	2	M
unit	string	"A"	M

7.2.3 Read master Identification

Description	
Function	Read the identification of the Master
Path	{baseUrl}/masters/1/identification
Method	GET
Query parameters	-
Responses	
Errors [HTTP]	403 - Forbidden 404 - Not found 500 - Internal server error
JSON Error Code	101 - Internal server error 102 - Internal communication error 150 - Permission denied 302 - masterNumber not found
Success [HTTP]	200 - OK

JSON Object properties - Response			
Property	Type	Value	M/O/C
vendorName	string		M
vendorId	number		M
masterId	number		M
masterType	string		M
serialNumber	string		O
orderCode	string		O
productName	string		O
productId	string		O
hardwareRevision	string		O
firmwareRevision	string		O
vendorUrl	string		O
manualUrl	string		O
applicationSpecificTag	string		O
locationTag	string		O
functionTag	string		O

7.2.4 Write master identification

Description	
Function	Write application specific identification to a Master
Path	{baseUrl}/masters/1/identification
Method	POST
Query parameters	-
Response	
Errors [HTTP]	400 – Bad request 403 – Forbidden 404 – Not found 500 – Internal server error
JSON Error Code	101 – Internal server error 102 – Internal communication error 104 – Action locked by another client 150 – Permission denied 201 – JSON parsing failed 202 – JSON data value invalid 203 – JSON data type invalid 208 – POST request without content 302 – masterNumber not found
Success [HTTP]	204 – OK, No content

JSON Object properties - Request		
Property	Type	M/O/C
applicationSpecificTag	string	O
locationTag	string	O
functionTag	string	O

7.3 Ports endpoints

The port related configuration is available as a sub-endpoint of the master end-point. The master ID is always set to a constant 1.

The portNumber path parameter is the port identification number starting from 1.

7.3.1 Read port identification

Description	
Function	Read all the available ports with the corresponding identification information
Path	{baseUrl}/masters/1/ports
Method	GET
Query parameters	-

Responses	
Errors [HTTP]	403 - Forbidden 404 - Not found 500 - Internal server error
JSON Error Code	101 - Internal server error 102 - Internal communication error 150 - Permission denied 302 - masterNumber not found
Success [HTTP]	200 - OK

JSON Object properties - Response			
Property	Type	Value	M/O/C
	array of objects		
portNumber	number		M
statusInfo	string	"COMMUNICATION_LOST", "DEACTIVATED", "INCORRECT_DEVICE", "DEVICE_STARTING", "DEVICE_ONLINE", "DIGITAL_INPUT_C/Q", "DIGITAL_OUTPUT_C/Q", "NOT_AVAILABLE"	M
deviceAlias	string		M

7.3.2 Read port capabilities

Description	
Function	Read the capability information of one specified port
Path	{baseUrl}/masters/1/ports/{portNumber}/capabilities
Method	GET
Query parameters	-
Response	
Errors [HTTP]	403 - Forbidden 404 - Not found 500 - Internal server error
JSON Error Code	101 - Internal server error 102 - Internal communication error 150 - Permission denied 302 - masterNumber not found 303 - portNumber not found
Success [HTTP]	200 - OK

JSON Object properties - Response			
Property	Type	Value	M/O/C
maxPowerSupply	object		M
value	number		M
unit	string	"A"	M
portType	enum	"CLASS_A", "CLASS_B", "CLASS_A_WITH_PORT_POWER_OFF_ON", "FAILSAFE_PORT_A_WITHOUT_SAFETY_DIGITAL_INPUTS", "FAILSAFE_PORT_A_WITH_SAFETY_DIGITAL_INPUTS", "FAILSAFE_PORT_B_WIRELESS_MASTER"	M

7.3.3 Read port status

Description	
Function	Read the actual status of the selected port.
Path	{baseUrl}/masters/1/ports/{portNumber}/status
Method	GET
Query parameters	-
Responses	
Errors [HTTP]	403 - Forbidden 404 - Not found 500 - Internal server error
JSON Error Code	101 - Internal server error 102 - Internal communication error 150 - Permission denied 302 - masterNumber not found 303 - portNumber not found
Success [HTTP]	200 - OK

JSON Object properties - Response			
Property	Type	Value	M/O/C
statusInfo	enum	"COMMUNICATION_LOST", "DEACTIVATED", "INCORRECT_DEVICE", "DEVICE_STARTING", "DEVICE_ONLINE", "DIGITAL_INPUT_C/Q", "DIGITAL_OUTPUT_C/Q", "NOT_AVAILABLE"	M
ioLinkRevision	enum	"1.0", "1.1"	C
transmissionRate	enum	"COM1", "COM2", "COM3"	C
masterCycleTime	object		C
value	number		M
unit	string		M

7.3.4 Read port configuration

Description	
Function	Read the actual configuration of the specified port.
Path	{baseUrl}/masters/1/ports/{portNumber}/configuration
Method	GET
Query parameters	-
Responses	
Errors [HTTP]	403 – Forbidden 404 – Not found 500 – Internal server error
JSON Error Code	101 – Internal server error 102 – Internal communication error 150 – Permission denied 302 – masterNumber not found 303 – portNumber not found
Success [HTTP]	200 - OK

JSON Object properties - Response

Property	Type	Value	Comment	M/O/C
mode	enum	"DEACTIVATED", "IOLINK_MANUAL", "IOLINK_AUTOSTART", "DIGITAL_INPUT", "DIGITAL_OUTPUT"		M
validationAndBackup	enum	"NO_DEVICE_CHECK", "TYPE_COMPATIBLE_DEVICE_V1.0", "TYPE_COMPATIBLE_DEVICE_V1.1", "TYPE_COMPATIBLE_DEVICE_V1.1_ BACKUP_AND_RESTORE", "TYPE_COMPATIBLE_DEVICE_V1.1_ RESTORE"		C
iqConfiguration	enum	"NOT_SUPPORTED", "DIGITAL_INPUT", "DIGITAL_OUTPUT", "POWER_2"	DIGITAL_OUTPUT is not supported	M
cycleTime	object			C
value	number			
unit	enum	"ms"		
vendorId	number			C
deviceId	number			C
deviceAlias	string			M

7.3.5 Write port configuration

Description	
Function	Write the configuration of the specified port.
Path	{baseUrl}/masters/1/ports/{portNumber}/configuration
Method	POST
Query parameters	-
Response	
Errors [HTTP]	400 – Bad request 403 – Forbidden 404 – Not found 500 – Internal server error
JSON Error Code	<div> 101 – Internal server error 102 – Internal communication error 104 – Action locked by another client 150 – Permission denied 201 – JSON parsing failed 202 – JSON data value invalid 203 – JSON data type invalid 205 – JSON data value out of range </div> <div> 207 – deviceAlias is not unique 208 – POST request without content 302 – masterNumber not found 303 – portNumber not found 701 – Data set incomplete 702 – Data set not applicable 703 – Data set incompatible </div>
Success [HTTP]	204 – OK, No content

JSON Object properties - Request

Property	Type	Value	Comment	M/O/C
mode	enum	"DEACTIVATED", "IOLINK_MANUAL", "IOLINK_AUTOSTART", "DIGITAL_INPUT", "DIGITAL_OUTPUT"		O
validationAndBackup	enum	"NO_DEVICE_CHECK", "TYPE_COMPATIBLE_DEVICE_V1.0", "TYPE_COMPATIBLE_DEVICE_V1.1", "TYPE_COMPATIBLE_DEVICE_V1.1_ BACKUP_AND_RESTORE", "TYPE_COMPATIBLE_DEVICE_V1.1_ RESTORE"		C
iqConfiguration	enum	"NOT_SUPPORTED", "DIGITAL_INPUT", "DIGITAL_OUTPUT", "POWER_2"	DIGITAL_OUTPUT is not supported	O
cycleTime	object			O
value	number			M
unit	enum	"ms"		M
vendorId	number			C
deviceId	number			C
deviceAlias	string			O

7.3.6 Read datastorage

Description	
Function	Read the data storage content of a specific port.
Path	{baseUrl}/masters/1/ports/{portNumber}/datastorage
Method	GET
Query parameters	
Responses	
Errors [HTTP]	403 - Forbidden 404 - Not found 500 - Internal server error
JSON Error Code	101 - Internal server error 102 - Internal communication error 150 - Permission denied 302 - masterNumber not found 303 - portNumber not found
Success [HTTP]	200 - OK

JSON Object properties - Response				
Property	Type	Value	Comment	M/O/C
header	object			M
vendorId	number			M
deviceId	number			M
ioLinkRevision	enum	"1.0", "1.1"		M
content	string		Base64 coded DS data Objects. Max size = 2KB*1.33	M

7.3.7 Write data storage

Description													
Function	Writes the data storage content of a specific port.												
Path	{baseUrl}/masters/1/ports/{portNumber}/datastorage												
Method	POST												
Query parameters	-												
Response													
Errors [HTTP]	400 – Bad request 403 – Forbidden 404 – Not found 500 – Internal server error												
JSON Error Code	<table> <tr> <td>101 – Internal server error</td><td>203 – JSON data type invalid</td></tr> <tr> <td>102 – Internal communication error</td><td>204 – Enumeration value unknown</td></tr> <tr> <td>104 – Action locked by another client</td><td>205 – JSON data value out of range</td></tr> <tr> <td>150 – Permission denied</td><td>206 – JSON data value out of bounds</td></tr> <tr> <td>201 – JSON parsing failed</td><td>208 – POST request without content</td></tr> <tr> <td>202 – JSON data value invalid</td><td>302 – masterNumber not found</td></tr> </table>	101 – Internal server error	203 – JSON data type invalid	102 – Internal communication error	204 – Enumeration value unknown	104 – Action locked by another client	205 – JSON data value out of range	150 – Permission denied	206 – JSON data value out of bounds	201 – JSON parsing failed	208 – POST request without content	202 – JSON data value invalid	302 – masterNumber not found
101 – Internal server error	203 – JSON data type invalid												
102 – Internal communication error	204 – Enumeration value unknown												
104 – Action locked by another client	205 – JSON data value out of range												
150 – Permission denied	206 – JSON data value out of bounds												
201 – JSON parsing failed	208 – POST request without content												
202 – JSON data value invalid	302 – masterNumber not found												
Success [HTTP]	204 – OK, No content												

JSON Object properties - Request				
Property	Type	Value	Comment	M/O/C
header	object			M
vendorId	number			M
deviceId	number			M
ioLinkRevision	enum	"1.0", "1.1"		M
content	string		Base64 coded DS data Objects. Max size = 2KB*1.33	M

7.4 Devices endpoints

The deviceAlias path parameter is the device name configured with the port/configuration URL. Default deviceAlias: master1portN where N means the portNumber.

The index and subindex path parameters are the specific ISDU index and subindex of the given parameter of the IO-Link Device.

7.4.1 Read devices

Description	
Function	Get all available deviceAlias keys and the location by Master number and Port number.
Path	{baseUrl}/devices
Method	GET
Query parameters	-

Responses	
Errors [HTTP]	403 - Forbidden 500 - Internal server error
JSON Error Code	101 - Internal server error 102 - Internal communication error 150 - Permission denied
Success [HTTP]	200 - OK

JSON Object properties - Response			
Property	Type	Value	M/O/C
	Array of objects		M
deviceAlias	string		M
masterNumber	number	1	M
portNumber	number	1..4	M

7.4.2 Read device capabilities

Description	
Function	Read the capabilities from the specific Device.
Path	{baseUrl}/devices/{deviceAlias}/capabilities
Method	GET
Query parameters	-

Responses	
Errors [HTTP]	400 - Bad request 403 - Forbidden 404 - Not found 500 - Internal server error
JSON Error Code	101 - Internal server error 102 - Internal communication error 150 - Permission denied 304 - deviceAlias not found 307 - Port is not configured to IO-Link 308 - IO-Link Device is not accessible
Success [HTTP]	200 - OK

JSON Object properties - Response			
Property	Type	Value	M/O/C
minimumCycleTime	object		M
value	number		M
unit	enum	"ms"	M
supportedProfiles	array of numbers		M

7.4.3 Read device identification

Description	
Function	Read the identification from the specific Device.
Path	{baseUrl}/devices/{deviceAlias}/identification
Method	GET
Query parameters	-
Responses	
Errors [HTTP]	400 - Bad request 403 - Forbidden 404 - Not found 500 - Internal server error
JSON Error Code	101 - Internal server error 102 - Internal communication error 150 - Permission denied 304 - deviceAlias not found 307 - Port is not configured to IO-Link 308 - IO-Link Device is not accessible
Success [HTTP]	200 - OK

JSON Object properties - Response			
Property	Type	Value	M/O/C
vendorId	number		M
deviceId	number		M
ioLinkRevision	enum	"1.0", "1.1"	M
vendorName	array of numbers		C
vendorText	string		O
productName	string		C
productId	string		O
productText	string		O
serialNumber	string		O
hardwareRevision	string		O
firmwareRevision	string		O
applicationSpecificTag	string		O
locationTag	string		O
functionTag	string		O

7.4.4 Write device identification

Description	
Function	Write the application specific identification to the Device.
Path	{baseUrl}/devices/{deviceAlias}/identification
Method	POST
Query parameters	-
Response	
Errors [HTTP]	400 – Bad request 403 – Forbidden 404 – Not found 500 – Internal server error
JSON Error Code	<div> 101 – Internal server error 102 – Internal communication error 104 – Action locked by another client 150 – Permission denied 201 – JSON parsing failed 202 – JSON data value invalid 203 – JSON data type invalid 206 – JSON data value out of bounds </div> <div> 208 – POST request without content 304 – deviceAlias not found 307 – Port is not configured to IO-Link 308 – IO-Link Device is not accessible 309 – IO-Link parameter not found 310 – IO-Link parameter access not supported by the device </div>
Success [HTTP]	204 – OK, No content

JSON Object properties - Request				
Property	Type	Value	Comment	M/O/C
applicationSpecificTag	string			M
locationTag	string			M
functionTag	string			M

7.4.5 Read device process data

Description	
Function	Read the process data values (input and output) from the specified Device.
Path	{baseUrl}/devices/{deviceAlias}/processdata/value
Method	GET
Query parameters	-
Responses	
Errors [HTTP]	400 – Bad request 403 – Forbidden 404 – Not found 500 – Internal Server Error
JSON Error Code	101 – Internal server error 102 – Internal communication error 103 – Operation not supported 150 – Permission denied 304 – deviceAlias not found 308 – IO-Link Device is not accessible
Success [HTTP]	200 – OK

JSON Object properties - Response				
Property	Type	Value	Comment	M/O/C
getData	object			O
ioLink	object			O
valid	boolean			M
value	array of numbers			M
cqValue	boolean		IO-Link cable CQ (pin4) level if it is used as digital input or output	O
iqValue	boolean		IO-Link cable IQ (pin2) level if it is used as digital input	O
setData	object			O
ioLink	object			O
valid	boolean			M
value	array of numbers			M
cqValue	boolean		IO-Link cable CQ (pin4) level if it is used as digital input or output	O
iqValue	boolean		IO-Link cable IQ (pin2) level if it is used as digital input	O

7.4.6 Write device process data

Description	
Function	Write the process data output values to the specified Device.
Path	{baseUrl}/devices/{deviceAlias}/identification
Method	POST
Query parameters	-
Response	
Errors [HTTP]	400 – Bad request 403 – Forbidden 404 – Not found 500 – Internal server error
JSON Error Code	<div> 101 – Internal server error 102 – Internal communication error 103 – Operation not supported 104 – Action locked by another client 150 – Permission denied 201 – JSON parsing failed 202 – JSON data value invalid 203 – JSON data type invalid 205 – JSON data value out of range 206 – JSON data value out of bounds 208 – POST request without content </div> <div> 304 – deviceAlias not found 307 – Port is not configured to IO-Link 308 – IO-Link Device is not accessible 501 – I/Q is not configured as DIGITAL_OUTPUT 502 – C/Q is not configured as DIGITAL_OUTPUT 503 – IO-Link Device has no output process data </div>
Success [HTTP]	204 – OK, No content

JSON Object properties - Request				
Property	Type	Value	Comment	M/O/C
ioLink	object			M
valid	boolean			M
value	array of numbers			M
cqValue	boolean		IO-Link cable CQ (pin4) level if it is used as digital input or output	C
iqValue	boolean		IO-Link cable IQ (pin2) level if it is used as digital input	C

7.4.7 Read device process data get data

Description	
Function	Read the process data input values from the specified device.
Path	{baseUrl}/devices/{deviceAlias}/processdata/getdata/value
Method	GET
Query parameters	-
Responses	
Errors [HTTP]	400 - Bad request 403 - Forbidden 404 - Not found 500 - Internal server error
JSON Error Code	101 - Internal server error 102 - Internal communication error 103 - Operation not supported 150 - Permission denied 304 - deviceAlias not found 308 - IO-Link Device is not accessible
Success [HTTP]	200 - OK

JSON Object properties - Response				
Property	Type	Value	Comment	M/O/C
ioLink	object			O
valid	boolean			M
value	array of numbers			M
cqValue	boolean		IO-Link cable CQ (pin4) level if it is used as digital input or output	O
iqValue	boolean		IO-Link cable IQ (pin2) level if it is used as digital input	O

7.4.8 Read device process data set data

Description	
Function	Read the process data output values from the specified device.
Path	{baseUrl}/devices/{deviceAlias}/processdata/setdata/value
Method	GET
Query parameters	-
Responses	
Errors [HTTP]	400 – Bad request 403 – Forbidden 404 – Not found 500 – Internal server error
JSON Error Code	101 – Internal server error 102 – Internal communication error 103 – Operation not supported 150 – Permission denied 304 – deviceAlias not found 308 – IO-Link Device is not accessible
Success [HTTP]	200 – OK

JSON Object properties - Response				
Property	Type	Value	Comment	M/O/C
ioLink	object			O
valid	boolean			M
value	array of numbers			M
cqValue	boolean		IO-Link cable CQ (pin4) level if it is used as digital input or output	O
iqValue	boolean		IO-Link cable IQ (pin2) level if it is used as digital input	O

7.4.9 Read device parameter

Description			
Function	Read a parameter value from the specific device with the given index.		
Path	{baseUrl}/devices/{deviceAlias}/parameter/{index}/value		
Method	GET		
Query parameters	-		
Responses			
Errors [HTTP]	400 – Bad request 403 – Forbidden 404 – Not found 500 – Internal server error		
JSON Error Code	101 – Internal server error 102 – Internal communication error 103 – Operation not supported	150 – Permission denied 304 – deviceAlias not found 308 – IO-Link Device is not accessible	
Success [HTTP]	200 - OK		
JSON Object properties - Response			
Property	Type	Value	M/O/C
	array of numbers		M

7.4.10 Write device parameter

Description	
Function	Write a parameter value with the given index to the specified device.
Path	{baseUrl}/devices/{deviceAlias}/parameters/{index}/value
Method	POST
Query parameters	-
Response	
Errors [HTTP]	400 – Bad request 403 – Forbidden 404 – Not found 500 – Internal server error
JSON Error Code	<div> 101 – Internal server error 102 – Internal communication error 103 – Operation not supported 104 – Action locked by another client 150 – Permission denied 201 – JSON parsing failed 202 – JSON data value invalid 203 – JSON data type invalid 205 – JSON data value out of range 206 – JSON data value out of bounds 208 – POST request without content </div> <div> 304 – deviceAlias not found 307 – Port is not configured to IO-Link 308 – IO-Link Device is not accessible 310 – IO-Link parameter access not supported by the device 311 – IO-Link parameter access error 501 – I/Q is not configured as DIGITAL_OUTPUT 502 – C/Q is not configured as DIGITAL_OUTPUT 503 – IO-Link Device has no output process data </div>
Success [HTTP]	204 – OK, No content

JSON Object properties - Request				
Property	Type	Value	Comment	M/O/C
	array of numbers			M

7.4.11 Read device parameter with subindex

Description	
Function	Read a parameter value from the specific device with the given index and subindex.
Path	{baseUrl}/devices/{deviceAlias}/parameter/{index}/subindices/{subindex}/value
Method	GET
Query parameters	-

Responses													
Errors [HTTP]	400 – Bad request 403 – Forbidden 404 – Not found 500 – Internal server error												
JSON Error Code	<table> <tr> <td>101 – Internal server error</td><td>308 – IO-Link Device is not accessible</td></tr> <tr> <td>102 – Internal communication error</td><td>309 – IO-Link parameter not found</td></tr> <tr> <td>103 – Operation not supported</td><td>310 – IO-Link parameter access not supported by the device</td></tr> <tr> <td>150 – Permission denied</td><td>311 – IO-Link parameter access error</td></tr> <tr> <td>304 – deviceAlias not found</td><td></td></tr> <tr> <td>307 – Port is not configured to IO-Link</td><td></td></tr> </table>	101 – Internal server error	308 – IO-Link Device is not accessible	102 – Internal communication error	309 – IO-Link parameter not found	103 – Operation not supported	310 – IO-Link parameter access not supported by the device	150 – Permission denied	311 – IO-Link parameter access error	304 – deviceAlias not found		307 – Port is not configured to IO-Link	
101 – Internal server error	308 – IO-Link Device is not accessible												
102 – Internal communication error	309 – IO-Link parameter not found												
103 – Operation not supported	310 – IO-Link parameter access not supported by the device												
150 – Permission denied	311 – IO-Link parameter access error												
304 – deviceAlias not found													
307 – Port is not configured to IO-Link													
Success [HTTP]	200 – OK												

JSON Object properties - Response			
Property	Type	Value	M/O/C
	array of numbers		

7.4.12 Write device parameter with subindex

Description	
Function	Write the parameter with the given index and subindex.
Path	{baseUrl}/devices/{deviceAlias}/parameters/{index}/subindices/{subindex}/value
Method	POST
Query parameters	-

Response	
Errors [HTTP]	400 – Bad request 403 – Forbidden 404 – Not found 500 – Internal server error
JSON Error Code	<div> 101 – Internal server error 102 – Internal communication error 103 – Operation not supported 104 – Action locked by another client 150 – Permission denied 201 – JSON parsing failed 202 – JSON data value invalid 203 – JSON data type invalid 205 – JSON data value out of range </div> <div> 206 – JSON data value out of bounds 208 – POST request without content 304 – deviceAlias not found 307 – Port is not configured to IO-Link 308 – IO-Link Device is not accessible 310 – IO-Link parameter access not supported by the device 311 – IO-Link parameter access error </div>
Success [HTTP]	204 – OK, No content

JSON Object properties - Request				
Property	Type	Value	Comment	M/O/C
	array of numbers			M

7.4.13 Read device block parameterization

Description	
Function	Read one or more parameters using the block parameterization method.
Path	{baseUrl}/devices/{deviceAlias}/blockparameterization
Method	POST
Query parameters	-
Response	
Errors [HTTP]	400 – Bad request 403 – Forbidden 404 – Not found 500 – Internal Server Error
JSON Error Code	<div> 101 – Internal server error 102 – Internal communication error 103 – Operation not supported 104 – Action locked by another client 150 – Permission denied 201 – JSON parsing failed 202 – JSON data value invalid 203 – JSON data type invalid 205 – JSON data value out of range </div> <div> 206 – JSON data value out of bounds 208 – POST request without content 304 – deviceAlias not found 307 – Port is not configured to IO-Link 308 – IO-Link Device is not accessible 310 – IO-Link parameter access not supported by the device 311 – IO-Link parameter access error </div>
Success [HTTP]	200 – OK

JSON Object properties - Request				
Property	Type	Value	Comment	M/O/C
direction	enum	"READ"		M
parameters	array of objects			M
identifier	object			M
index	number			M
subindex	number			O

JSON Object properties – Response OK

Property	Type	Value	Comment	M/O/C
	array of objects			M
identifier	object			M
index	number			M
subindex	number			O
result	object			M
parameterExchangeResult	enum	"READ_SUCCESS"		M
content	array of numbers			O

JSON Object properties – Response ERROR

Property	Type	Value	Comment	M/O/C
	array of objects			M
identifier	object			M
index	number			M
subindex	number			O
result	object			M
parameterExchangeResult	enum	"ERROR"		M
iolinkError	object			O
code	number			M
message	string			M

7.4.14 Write device block parameterization

Description	
Function	Write or read one or more parameters using the block parameterization method.
Path	{baseUrl}/devices/{deviceAlias}/blockparameterization
Method	POST
Query parameters	-
Response	
Errors [HTTP]	400 – Bad request 403 – Forbidden 404 – Not found 500 – Internal Server Error
JSON Error Code	<div> 101 – Internal server error 102 – Internal communication error 103 – Operation not supported 104 – Action locked by another client 150 – Permission denied 201 – JSON parsing failed 202 – JSON data value invalid 203 – JSON data type invalid 205 – JSON data value out of range </div> <div> 206 – JSON data value out of bounds 208 – POST request without content 304 – deviceAlias not found 307 – Port is not configured to IO-Link 308 – IO-Link Device is not accessible 310 – IO-Link parameter access not supported by the device 311 – IO-Link parameter access error </div>
Success [HTTP]	204 – OK, No content

JSON Object properties - Request				
Property	Type	Value	Comment	M/O/C
direction	enum	"WRITE"		M
parameters	array of objects			M
identifier	object			M
index	number			M
subindex	number			O
content	array of numbers			M

JSON Object properties – Response OK

Property	Type	Value	Comment	M/O/C
	array of objects			M
identifier	object			M
index	number			M
subindex	number			O
result	object			M
parameterExchangeResult	enum	"WRITE_SUCCESS"		M

JSON Object properties – Response ERROR

Property	Type	Value	Comment	M/O/C
	array of objects			M
identifier	object			M
index	number			M
subindex	number			O
result	object			M
parameterExchangeResult	enum	"ERROR"		M
iolinkError	object			M
code	number			M
message	string			M

7.4.15 Read device events

Description

Function

Reading the EventLog filtered for a specific Device.

Path

{baseUrl}/devices/{deviceAlias}/events

Method

GET

Query parameters

Name	Description	Value
top	Delivers the oldest n event of the event buffer. Top is mutually exclusive to bottom.	number
bottom	Delivers the youngest n events of the event buffer. Bottom is mutually exclusive to top.	number

Responses

Errors [HTTP]

400 – Bad request
403 – Forbidden
404 – Not found
500 – Internal Server Error

JSON Error Code

101 – Internal server error
102 – Internal communication error
103 – Operation not supported

304 – deviceAlias not found
307 – Port is not configured to IO-Link

Success [HTTP]

200 - OK

JSON Object properties - Response

Property	Type	Value	M/O/C
	array of objects		M
time	string		M
severity	enum	"EMERGENCY", "ALERT", "CRITICAL", "ERROR", "WARNING", "NOTICE", "INFO", "DEBUG"	M
origin	object		M
gateway	string		O
master	number		O
port	number		O
deviceAlias	string		M
message	object		M
code	number		M
mode	enum	"SINGLESHOT", "APPEARS", "DISAPPEARS"	M
text	string		O

7.5 Error codes

7.5.1 General HTTP error codes

JSON Code	HTTP Code	Remark
101	HTTP Status 500: Internal server error	
102	HTTP Status 500: Internal communication error	
103	HTTP Status 404: Operation not supported	
104	HTTP Status 400: Action locked by another client	Another gateway protocol has claimed priority
105	HTTP Status 501: IODD feature not supported	
106	HTTP Status 501: MQTT feature not supported	MQTT feature not supported
150	HTTP Status 403: Permission denied	Due to user management restrictions

7.5.2 JSON Parsing errors

JSON Code	HTTP Code	Remark
201	HTTP Status 400: JSON parsing failed	Error while parsing the incoming JSON object
202	HTTP Status 400: JSON data value invalid	Error while parsing a specific JSON value, e.g. malformed IP address
203	HTTP Status 400: JSON data type invalid	e.g. string instead of number
204	HTTP Status 400: Enumeration value unknown	
205	HTTP Status 400: JSON data value out of range	Exceeds the minimum or maximum value
206	HTTP Status 400: JSON data value out of bounds	An array/string was accessed exceeding its maximum length
207	HTTP Status 400: deviceAlias is not unique	
208	HTTP Status 400: POST request without content	

7.5.3 Resource access errors

JSON Code	HTTP Code	Remark
301	HTTP Status 404: Resource not found	e.g. wrong URL
302	HTTP Status 404: masterNumber not found	
303	HTTP Status 404: portNumber not found	e.g. string instead of number
304	HTTP Status 404: deviceAlias not found	
305	HTTP Status 400: Query parameter name invalid	
306	HTTP Status 400: Query parameter value invalid	
307	HTTP Status 400: Port is not configured to IO-Link	e.g. not in IOLINK_MANUAL or IOLINK_AUTOSTART mode
308	HTTP Status 404: IO-Link Device is not accessible	e.g. not connected or communication error
309	HTTP Status 404: IO-Link parameter not found	
310	HTTP Status 404: IO-Link access not supported by Device	
311	HTTP Status 400: IO-Link parameter access error	The additional iolinkErrorCode and iolinkErrorMessage fields contain the IO-Link error code and the incident text from the ErrorTypes table
312	HTTP Status 404: IO-Link parameter name is not unique	Please use the {name}_{index} format

7.5.4 Data Storage errors

JSON Code	HTTP Code	Remark
401	HTTP Status 400: Data storage mismatch	Mismatch between meta data of device and data storage

7.5.5 Process Data handling

JSON Code	HTTP Code	Remark
501	HTTP Status 400: I/Q is not configured as DIGITAL_OUTPUT	Not supported DIGITAL_OUTPUT on the I/Q pin
502	HTTP Status 400: C/Q is not configured as DIGITAL_OUTPUT	
503	HTTP Status 400: IO-Link device has no output process data	

7.5.6 IODD errors

JSON Code	HTTP Code	Remark
601	HTTP Status 400: IODD (representation) is not available	IODD representation for the IO-Link Device is not available
602	HTTP Status 500: IODD upload failed: not enough memory	
603	HTTP Status 400: IODD upload failed: IODD XML invalid	Check the file content superficially to ensure that the IODD is an XML, and that the mandatory fields match (e.g. vendorId, deviceId, VendorName, ProductName, etc.)
604	HTTP Status 400: IODD upload failed: CRC error	
605	HTTP Status 400: IODD upload failed: parsing error	All those systems that do not want to store the IODD have to parse it immediately

7.5.7 Data content errors

JSON Code	HTTP Code	Remark
701	HTTP Status 400: Data set incomplete	
702	HTTP Status 400: Data set not applicable	whole data set is rejected
703	HTTP Status 400: Data set combination incompatible	whole data set is rejected

7.5.8 Vendor specific errors

Code	Description	Action
0x1FD0	IOLM_PORT_EVENTS_IOL_INITIALIZED_NOTIFICATION	IOL port initialized notification (state machines are reset, port configuration, DS loaded from NVM, port is ready to receive SMI commands).
0x1800	IOLM_PORT_EVENTS_COMLOST	No Device (communication)
0x1802	IOLM_PORT_EVENTS_COMPFAULT_VID	Incorrect Device ID - Inspection level mismatch
0x1803	IOLM_PORT_EVENTS_COMPFAULT_DID	Short circuit at C/Q - check wire connection
0x1804	IOLM_PORT_EVENTS_SHORT_CIRCUIT_CQ	PHY over-temperature
0x1805	IOLM_PORT_EVENTS_PHY_OVERRTEMPERATURE	Short circuit at L+ - check wire connection
0x1806	IOLM_PORT_EVENTS_SHORT_CIRCUIT_LP	Over-current at L+ - check power supply (e.g. L1+)
0x1807	IOLM_PORT_EVENTS_OVER_CURRENT_LP	Short circuit at I/Q - check wiring
0x1810	IOLM_PORT_EVENTS_SHORT_CIRCUIT_IQ	Short circuit at C/Q (if digital output)
0x1811	IOLM_PORT_EVENTS_SHORT_CIRCUIT_CQ_DO	Over-current at I/Q - check load
0x1812	IOLM_PORT_EVENTS_OVER_CURRENT_IQ	Over-current at C/Q (if digital output) - check load
0x1813	IOLM_PORT_EVENTS_OVER_CURRENT_CQ_DO	Backup inconsistency - memory out of range (2048 octets)
0x1809	IOLM_PORT_EVENTS_DSFAULT_SIZE	Backup inconsistency - identity fault
0x180A	IOLM_PORT_EVENTS_DSFAULT_IDENT	Backup inconsistency - Data Storage unspecific error
0x180B	IOLM_PORT_EVENTS_DSFAULT	Backup inconsistency - upload fault
0x180C	IOLM_PORT_EVENTS_DSFAULT_UPLOAD	Parameter inconsistency - download fault
0x180D	IOLM_PORT_EVENTS_DSFAULT_DOWNLOAD	Invalid cycle time
0x6000	IOLM_PORT_EVENTS_CYCTIMEFAULT	Revision fault - incompatible protocol version
0x6001	IOLM_PORT_EVENTS_REVFAULT	Serial number fault
0x1814	IOLM_PORT_EVENTS_SERNUMFAULT	Port status changed
0xFF26	IOLM_PORT_EVENTS_PORT_STATUS_CHANGED	Data Storage upload completed and new data object available
0x1FF0	IOLM_PORT_EVENTS_DATA_STORAGE_UPDATE	Non-volatile memory access error
0x1FF1	IOLM_PORT_EVENTS_NVM_ACCESS_ERROR	PHY communication error
0x1FF2	IOLM_PORT_EVENTS_PHY_COMMUNICATION_ERROR	IOL port fatal error
0x1FF3	IOLM_PORT_EVENTS_PHY_POWER_ERROR	IOL port power supply error

8. Configuration over web

8.1 General

This product includes a built-in web server to retrieve information and facilitate basic configuration.

In order to access the web interface ensure proper integration into your network and that the PC running the browser can access the master's IP subnet. For open a connection with the web server, go to the following url:

<http://<ip address>:8080/webgui>

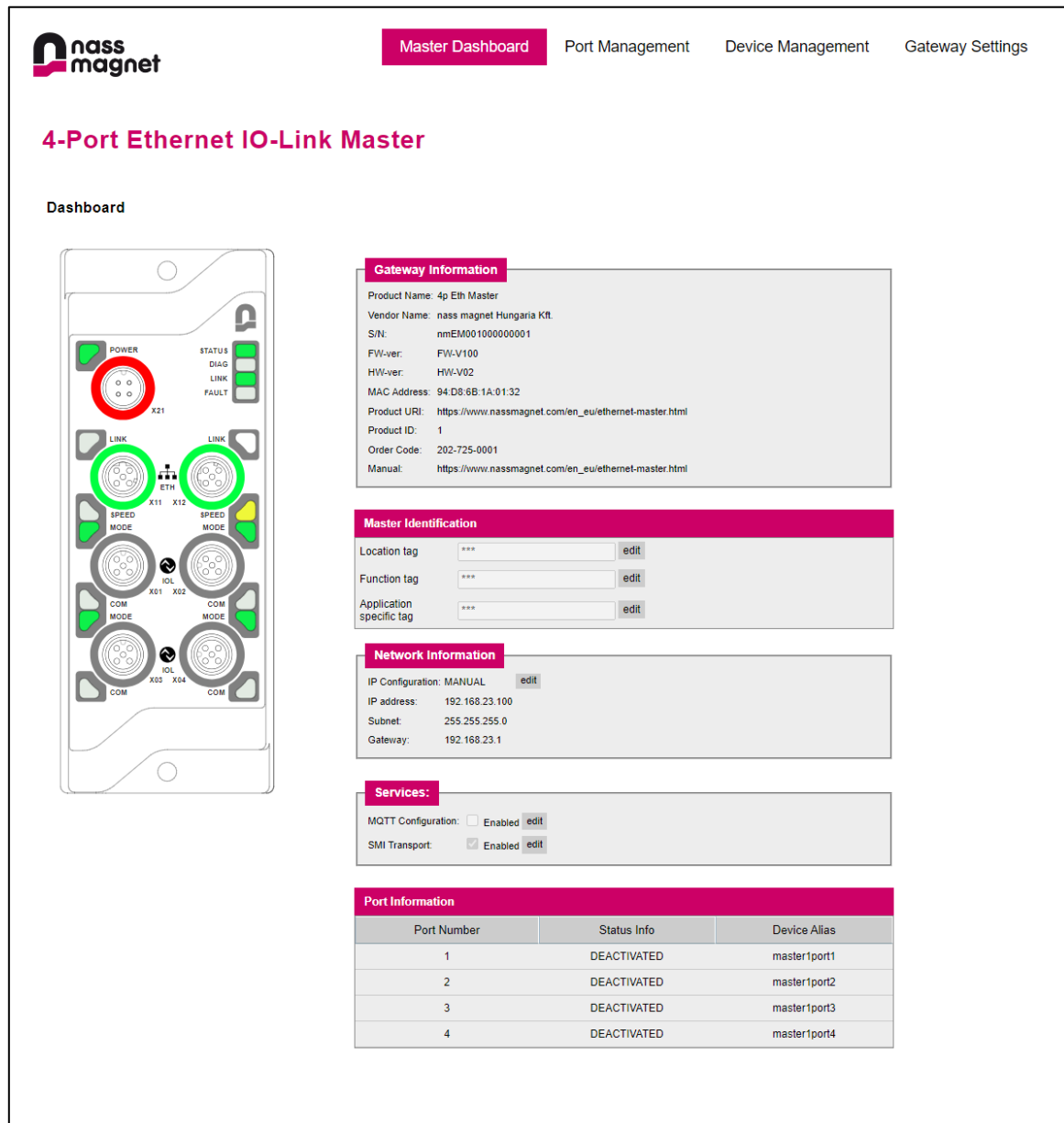
By default the ip address is: 192.168.23.100 .

Upon visiting the url of the web interface, the master dashboard displays essential information.

8.2 Dashboard

The Master Dashboard page contains base information about the operating status, and links for changing the core functions.

The navigation bar in the upper right corner allows you to reach the additional pages for further configuration possibilities.



Gateway Information

Product Name: 4p Eth Master
 Vendor Name: nass magnet Hungaria Kft.
 S/N: nmEM001000000001
 FW-ver: FW-V100
 HW-ver: HW-V02
 MAC Address: 94 D8 6B 1A 01 32
 Product URI: https://www.nassmagnet.com/en_eu/ethernet-master.html
 Product ID: 1
 Order Code: 202-725-0001
 Manual: https://www.nassmagnet.com/en_eu/ethernet-master.html

Master Identification

Location tag: [edit](#)
 Function tag: [edit](#)
 Application specific tag: [edit](#)

Network Information

IP Configuration: MANUAL [edit](#)
 IP address: 192.168.23.100
 Subnet: 255.255.255.0
 Gateway: 192.168.23.1

Services:

MQTT Configuration: ☐ Enabled [edit](#)
 SMI Transport: ☒ Enabled [edit](#)

Port Information

Port Number	Status Info	Device Alias
1	DEACTIVATED	master1port1
2	DEACTIVATED	master1port2
3	DEACTIVATED	master1port3
4	DEACTIVATED	master1port4

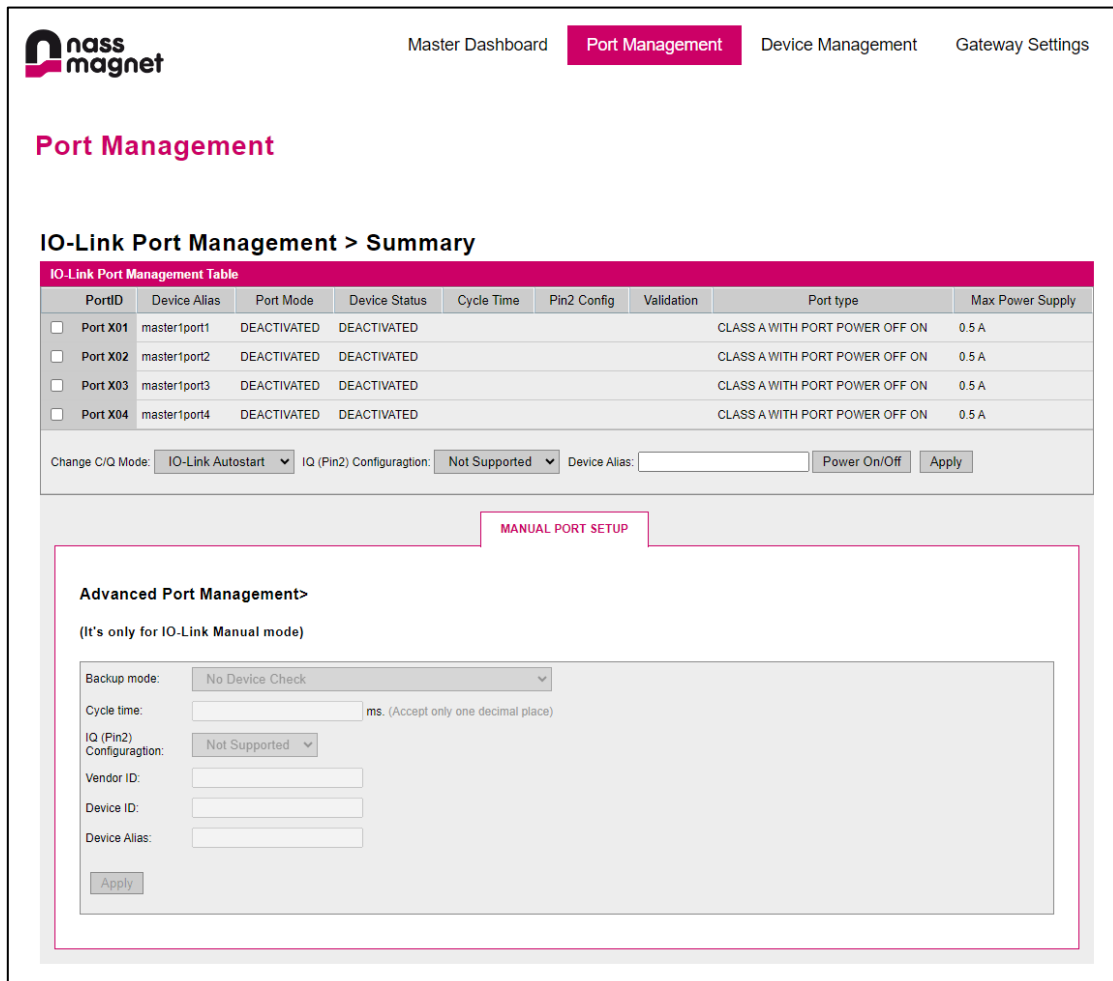
6. Figure – Web Interface: Master Dashboard page

8.3 Port management

Under the Port Management tab the status of each port is displayed and can be configured.

Port modes can be changed to one of the following options:

- Deactivated
- Digital Input
- Digital Output
- IO-Link Autostart
- IO-Link Manual



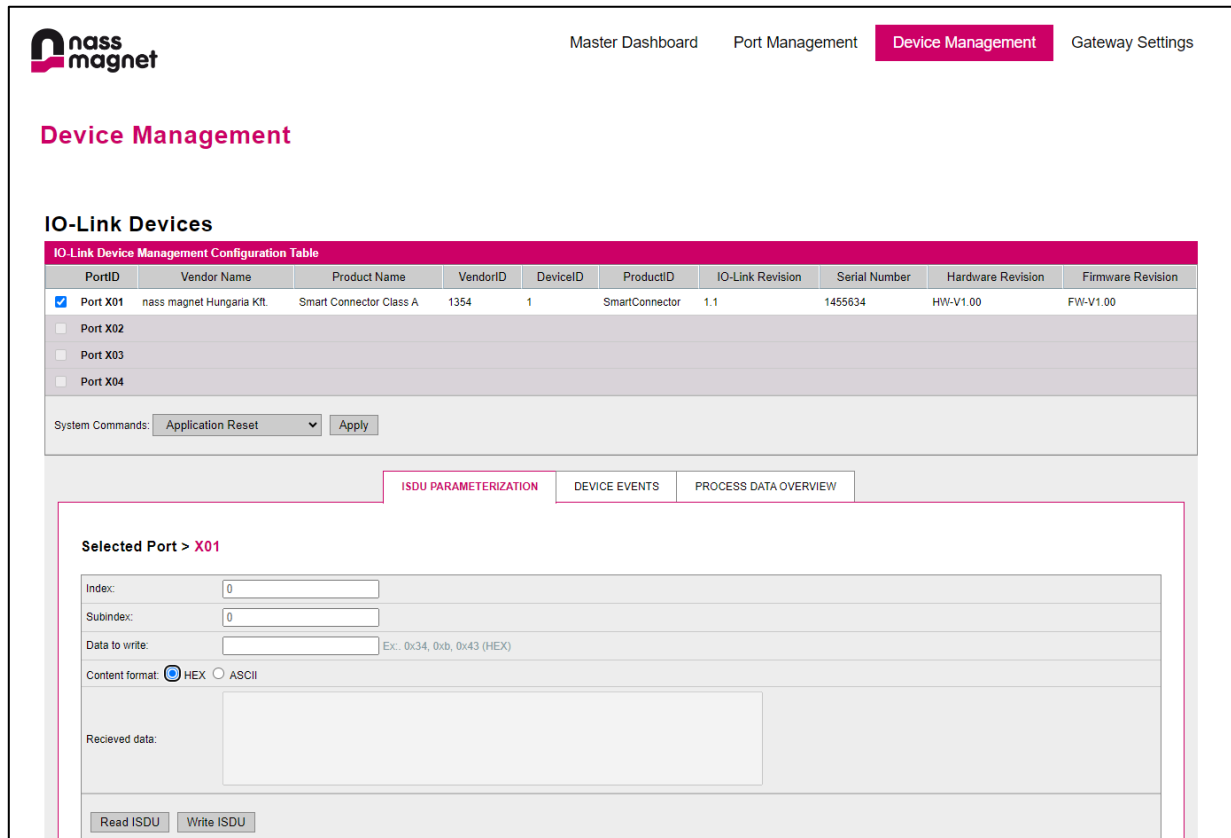
The screenshot shows the 'Port Management' tab in the web interface. At the top, there are navigation links: 'Master Dashboard', 'Port Management' (active), 'Device Management', and 'Gateway Settings'. Below the navigation bar, the title 'Port Management' is displayed. The main content area is titled 'IO-Link Port Management > Summary'. It features a table with the following columns: PortID, Device Alias, Port Mode, Device Status, Cycle Time, Pin2 Config, Validation, Port type, and Max Power Supply. The table lists four ports (Port X01 to Port X04), all of which are 'DEACTIVATED' and have a 'Max Power Supply' of '0.5 A'. Below the table, there is a section for 'Change C/IQ Mode' with a dropdown menu set to 'IO-Link Autostart', a field for 'IQ (Pin2) Configuragtion' set to 'Not Supported', a 'Device Alias' input field, and 'Power On/Off' and 'Apply' buttons. A 'MANUAL PORT SETUP' tab is visible, and the 'Advanced Port Management' section is expanded, showing settings for 'Backup mode' (No Device Check), 'Cycle time' (ms), 'IQ (Pin2) Configuragtion' (Not Supported), and fields for 'Vendor ID', 'Device ID', and 'Device Alias', with an 'Apply' button at the bottom.

7. Figure – Web Interface: Port Management page

Additionally, the power state of the ports can be controlled from this page as well.

8.4 Device management

The Device Management page allows monitoring the status of connected devices. Additionally, it supports ISDU parameterization, display of IO-Link events, and the transmission and reception of process data.



The screenshot displays the 'Device Management' page of the Ethernet IO-Link Master web interface. The top navigation bar includes 'Master Dashboard', 'Port Management', 'Device Management' (highlighted), and 'Gateway Settings'. The main heading is 'Device Management'. Below it, the 'IO-Link Devices' section features a table titled 'IO-Link Device Management Configuration Table'.

PortID	Vendor Name	Product Name	VendorID	DeviceID	ProductID	IO-Link Revision	Serial Number	Hardware Revision	Firmware Revision
<input checked="" type="checkbox"/> Port X01	nass magnet Hungaria Kft.	Smart Connector Class A	1354	1	SmartConnector	1.1	1455634	HW-V1.00	FW-V1.00
<input type="checkbox"/> Port X02									
<input type="checkbox"/> Port X03									
<input type="checkbox"/> Port X04									

Below the table, there is a 'System Commands' section with a dropdown menu set to 'Application Reset' and an 'Apply' button. Further down, there are three tabs: 'ISDU PARAMETERIZATION' (selected), 'DEVICE EVENTS', and 'PROCESS DATA OVERVIEW'.

The 'ISDU PARAMETERIZATION' section shows 'Selected Port > X01'. It includes input fields for 'Index' (0) and 'Subindex' (0), a 'Data to write' field with a hint 'Ex.: 0x34, 0xb, 0x43 (HEX)', and a 'Content format' section with radio buttons for 'HEX' (selected) and 'ASCII'. There is also a 'Received data' section with a large text area. At the bottom, there are 'Read ISDU' and 'Write ISDU' buttons.

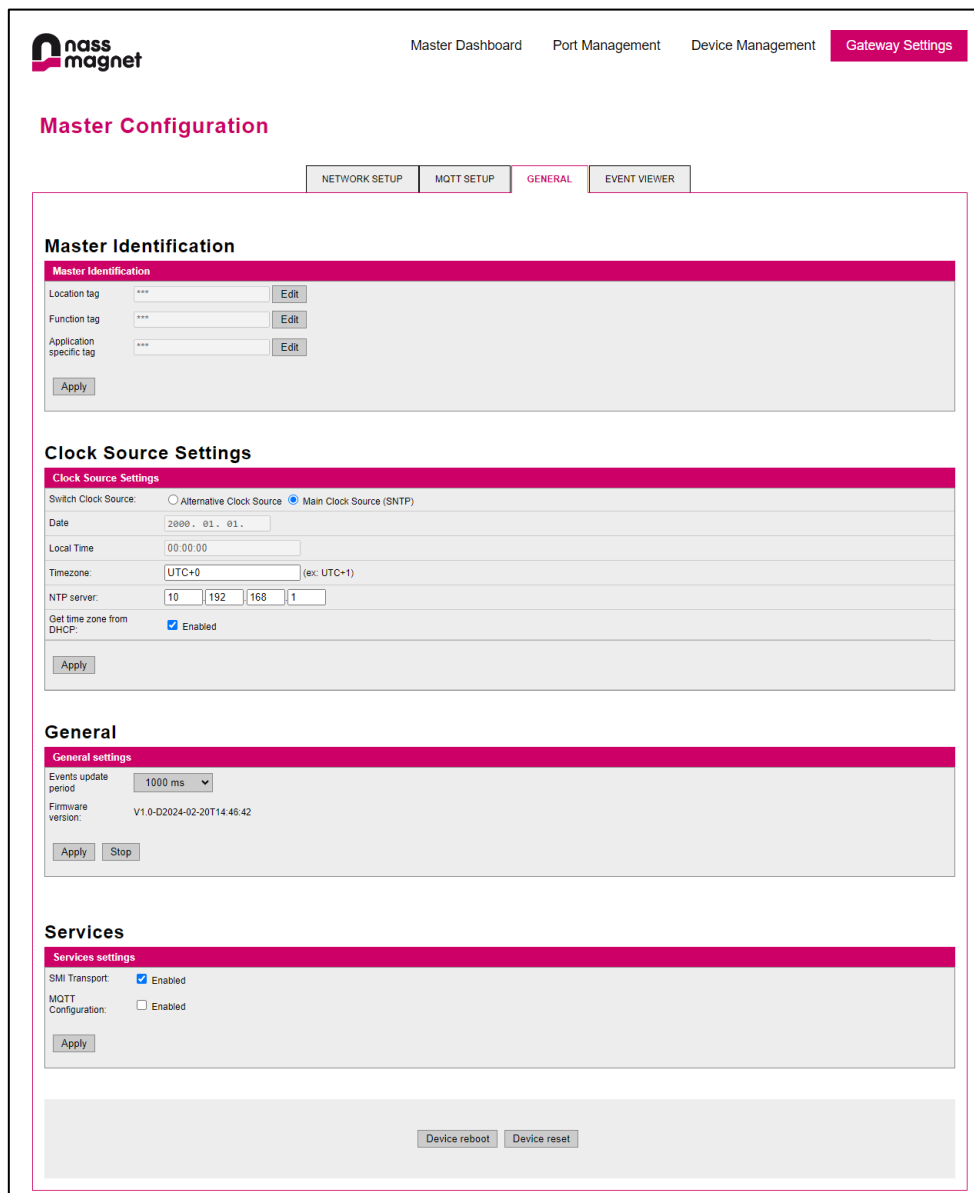
8. Figure – Web Interface: Device Management page

8.5 Gateway settings

The Gateway Settings page contains all other configuration options about the master. The settings are categorized into four additional pages:

- Network setup
- MQTT setup
- General
- Event viewer

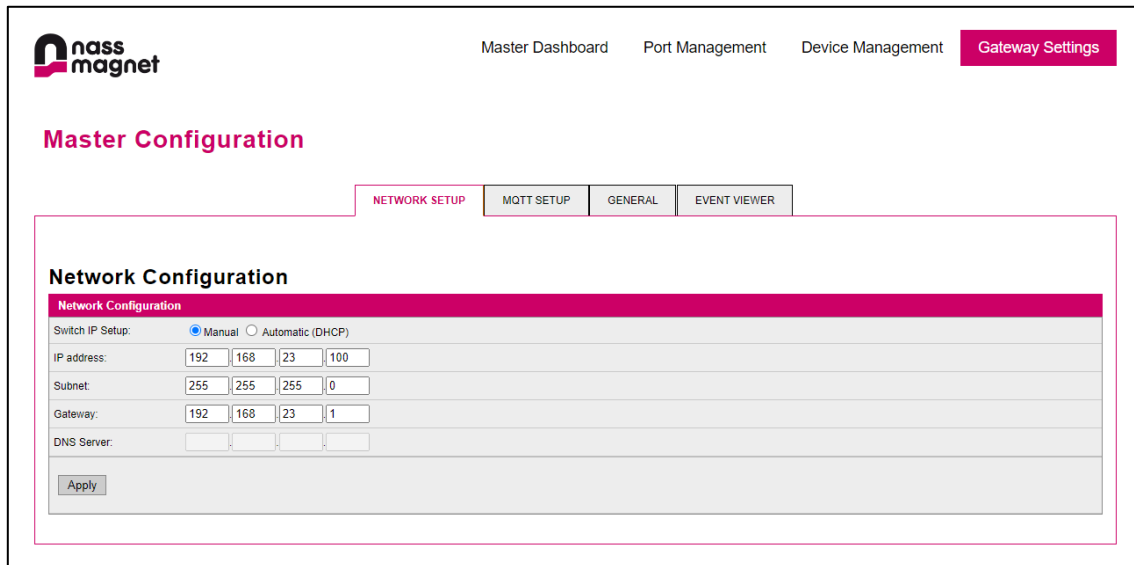
8.5.1 General



The screenshot shows the 'Gateway Settings' page with the 'GENERAL' tab selected. The page is titled 'Master Configuration' and includes a navigation bar with 'NETWORK SETUP', 'MQTT SETUP', 'GENERAL', and 'EVENT VIEWER'. The 'GENERAL' tab contains three main sections: 'Master Identification', 'Clock Source Settings', and 'General'. The 'Master Identification' section has fields for 'Location tag', 'Function tag', and 'Application specific tag', each with an 'Edit' button. The 'Clock Source Settings' section has a 'Switch Clock Source' dropdown with 'Alternative Clock Source' and 'Main Clock Source (SNTP)' options. It also includes fields for 'Date', 'Local Time', 'Timezone', 'NTP server', and 'Get time zone from DHCP'. The 'General' section has a 'General settings' section with 'Events update period' (1000 ms) and 'Firmware version' (V1.0-D2024-02-20T14:46:42). The 'Services' section has 'SMI Transport' (Enabled) and 'MQTT Configuration' (Enabled). At the bottom, there are 'Device reboot' and 'Device reset' buttons.

9. Figure – Web Interface: Gateway Settings page, General

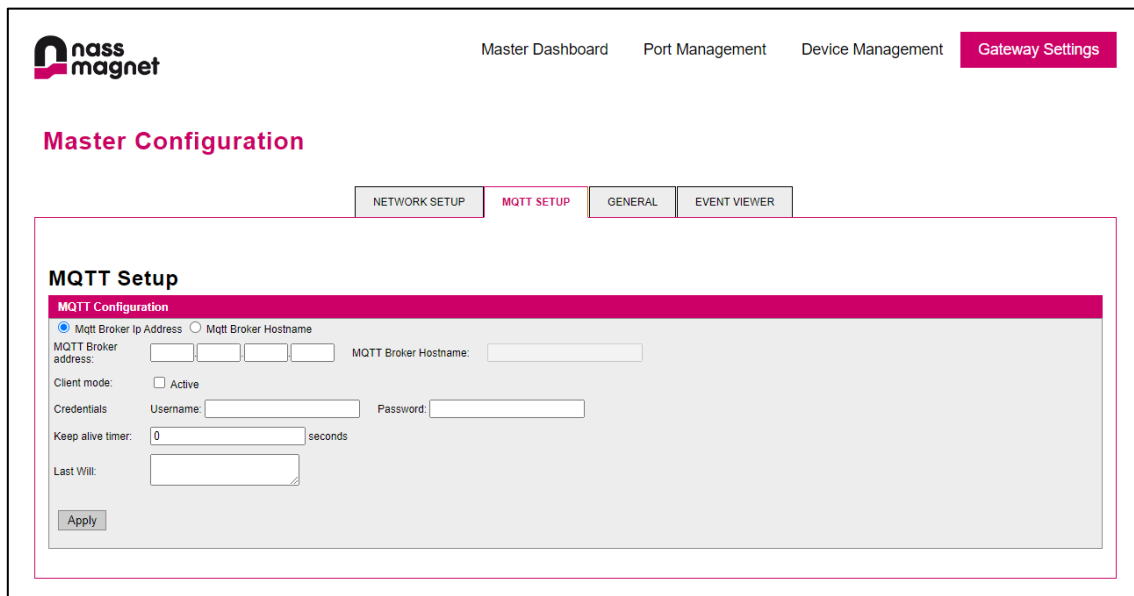
8.5.2 Network setup



The screenshot shows the 'Gateway Settings' page with the 'Network Setup' tab selected. The 'Network Configuration' section is highlighted. It includes a 'Switch IP Setup' section with 'Manual' selected and 'Automatic (DHCP)' unselected. Below this are input fields for IP address (192, 168, 23, 100), Subnet (255, 255, 255, 0), Gateway (192, 168, 23, 1), and DNS Server (empty). An 'Apply' button is at the bottom.

10. Figure - Web Interface: Gateway Settings page, Network Setup

8.5.3 MQTT setup




The screenshot shows the 'Gateway Settings' page with the 'MQTT Setup' tab selected. The 'MQTT Configuration' section is highlighted. It includes a 'MQTT Broker Ip Address' section with 'MQTT Broker Ip Address' selected and 'MQTT Broker Hostname' unselected. Below this are input fields for MQTT Broker address (empty), MQTT Broker Hostname (empty), Client mode (Active unselected), Credentials (Username and Password empty), Keep alive timer (0 seconds), and Last Will (empty). An 'Apply' button is at the bottom.

11. Figure - Web Interface: Gateway Settings page, MQTT Setup



Please note, MQTT feature is not yet implemented, will be available in a later version.

8.5.4 Event viewer


nass magnet

[Master Dashboard](#)
[Port Management](#)
[Device Management](#)
[Gateway Settings](#)

Master Configuration

[NETWORK SETUP](#)
[MQTT SETUP](#)
[GENERAL](#)
[EVENT VIEWER](#)

Event Lists

ALL

Masters: 1
Port Numbers: 1
Device Alias: master1port1
Event Numbers: 10

Time ↕	Severity	Master Number	Port Number	Code	Mode	Text

Event Origins: ALL
Query Settings: Top
Apply
Delete all

12. Figure - Web Interface: Gateway Settings page, Event Viewer

9. Maintenance

9.1 Cleaning

- Clean the surface of the unit when necessary.
- Use a damp cloth for cleaning.

9.2 Maintenance

- In case of material damage the functioning of the product is not guaranteed.
- In the event of maintenance work, you can replace the module with the same type.

9.3 Disposal

- Dispose of the unit in an environmentally friendly way according to the applicable national regulations when it is no longer used.