**REQUIREMENTS**

**LEUZE RFID SYSTEMS**

|  |  |  |  |
| --- | --- | --- | --- |
| Version | Date | Author | Changelist |
| 01 | 01/12/2022 | Fabrizio Picotto | First version |
| 02 | 06/12/2022 | Fabrizio Picotto | Removed I/Os from HF M30 device |
| 03 | 14/03/2023 | Fabrizio Picotto | Changed the classification to reserved  Updated the scope of this document  Added Glossary and Explanation section  Added new products timing and priority info  Updated all the new products names  Updated the new products intro and requirements  New/updated requirements are marked in red  Added the webserver requirements  Added the configuration software requirements |
| 04 | 06/04/2023 | Fabrizio Picotto | Updated the products intro and requirements  New/updated requirements are marked in red |
| 05 | 24/05/2023 | Fabrizio Picotto | New/updated requirements are marked in red |
| 06 | 14/09/2023 | Fabrizio Picotto | New requirements numbering schema  New/updated requirements are marked in red |
| 07 | 18/09/2023 | Fabrizio Picotto | Fixed some requirements numbers |
| 08 | 12/10/2023 | Stefan Dewald | New/updated requirements are marked in red |

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# Scope

The document refers to the business needs of the customer Leuze electronics, extends them and defines the technical requirements of the implementation of 4 new RFID products:

* HF Compact Cylindrical-M30 RFID read/write device
* HF Compact Cubic short-range RFID read/write device
* HF Performance mid-range RFID read/write device
* UHF Performance short/mid-range RFID read/write device

The new RFID products are intended for use in conveyor systems, warehouse technology, tool identification, packaging systems, production control (manufacturing cells), parts tracking, picking systems and assembly lines.

While the compact HF series (cylindrical-M30 and cubic) are used exclusively in so-called closed-loop systems, which are characterized by communication with classic control systems (PLC) and a typically limited number of objects to be identified, the performance HF and UHF series are also suitable for open-loop systems in classic supply chain environments.

# Definitions and Abbreviations

| Abbreviation | Definition |
| --- | --- |
| HF | High Frequency, 13.56MHz |
| RFID | Radio Frequency IDentification |
| RTOS | Real Time Operating System |
| UHF | Ultra High Frequency, 840 – 960MHz |

# Glossary and Explanations

## Timing Priority

|  |  |
| --- | --- |
| 1 | Requirements must be implemented by the time of market launch.  The implementation is part of the project. |
| 2 | Requirements must be prepared and fundamentally possible.  Implementation is not part of the project, but must be planned from the start, since implementation is planned directly as a follow-up project for a subsequent market launch. Functions with Prio 2 are processed directly after project completion and are processed as product maintenance or product variants. |
| 3 | Requirements must be prepared and fundamentally possible.  The implementation is not part of the project and can be done at a later point in time. Implementation is carried out as needed. |

## Evaluation Criteria

|  |  |
| --- | --- |
| F | **Fixed Requirement**  The fixed requirement must be met in full.  Exceeding this requirement does not result in any advantages. |
| M | **Minimum Requirement**  The minimum requirement should be met as a bare minimum.  Exceeding the minimum requirement is not necessary but brings clear advantages. Minimum requirements must be met. |
| D | **Desired Requirement („Nice-to-have“)**  Requirement is a request.  The implementation yields advantages but are not necessary. Advantage is especially beneficial if it can be implemented with little development effort and marginally higher manufacturing costs. |
| N | **Not to be implemented**  The requirement / feature should (must) not be implemented. |

# HF Compact Cylindrical-M30 Short-Range (F, Prio 1)

The HF Compact Cylindrical-M30 device is a short-range RFID read/write device operating at 13.56MHz and suitable for industrial application.



Two versions shall be available with these interfaces:

* RS232 (F, Prio 3)
* IO-Link (F, Prio 1)

## General Requirements

| Requirement | Description |
| --- | --- |
| **REQ\_HFM30\_01.010** | Hardware features:   * ARM core (to be defined) * RTOS based (to be defined) * IO-Link communication interface * 1 bicolor green/red LED * Integrated antenna * Operating frequency 13.56MHz * Operating voltage 24Vdc (18 … 30Vdc) * Protection class III power supply * Max power consumption less than 2W * M12 connection * Operating temperature -32 … +60°C * Storage temperature -40 … +85°C * Relative humidity max 90%, non-condensing * IP67 protection class * Housing cylindrical approx. M30 x 75 mm * M30 x 1.5 thread designation * Metal and plastic (front antenna) housing * Colours and logo to be defined by Leuze * Device label on the plug connection side |
| **REQ\_HFM30\_01.020** | Supported RFID standards:   * ISO 15693: inventory, AFI, read (single block, multiple blocks), write (single block, multiple blocks), lock (block, AFI) * ISO 14443 A: inventory, read, write |
| **REQ\_HFM30\_01.030** | Supported ISO 15693 chips:   * NXP ICODE 1 * NXP ICODE SLI/SLI-L/SLI-S * NXP ICODE SLIX/SLIX-L/SLIX-S * NXP ICODE SLIX2 * TI Tag-it HF-I Standard * TI Tag-it HF-I Plus * STM LRI 512 * Infineon my-d * EM Microelectronics EM4135 * Fujitsu MB89R118C |
| **REQ\_HFM30\_01.040** | Supported ISO 14443 A chips:   * NXP MIFARE Classic * NXP MIFARE Ultralight * NXP NTAG 210/212 * NXP NTAG 213/215/216 |
| **REQ\_HFM30\_01.050** | Read range up to 40mm. But depends on tag chip, form factor and environmental conditions (metal surfaces, …). |
| **REQ\_HFM30\_01.060** | Reliable detection of tags at standstill and in motion.  Maximum speed for moving tags will be tested and specified according to typical applications in production processes no later than the completion of the fully working prototypes. The conditions under which reliable tag detection can be realized at the specified speed are specified. |
| **REQ\_HFM30\_01.070** | Could be installed ‘on’ and ‘in’ metal. This could result in a read range reduction. |
| **REQ\_HFM30\_01.080** | RS232 interface will not be part of the initial product portfolio. Depending on future demand it can be seen as an option and must be negotiated separately. |

## Configuration and Setup

| Requirement | Description |
| --- | --- |
| **REQ\_HFM30\_02.020** | Device must be detected and addressed by Leuze Sensor Studio tool. |

## Communication and Protocol

| Requirement | Description |
| --- | --- |
| **REQ\_HFM30\_03.025** | IO-Link devices   * COM1, COM2, COM3 supported * According to IO-Link specifications v1.1 * Backward compatible with IO-Link specs. V1.0 |
| **REQ\_HFM30\_03.030** | The IODD file is available for IO-Link communication interface. |
| **REQ\_HFM30\_03.040** | Functional blocks for integration into common controllers (PLC) are available. |
| **REQ\_HFM30\_03.050** | It is possible to query the IC type installed in the tag as well as information (size) about all memory via a "Tag Info" command (M, Prio 1). |
| **REQ\_HFM30\_03.060** | Further IC-specific custom commands can be implemented after consultation (M, Prio 2). |

## Firmware Upgrade

| Requirement | Description |
| --- | --- |
| **REQ\_HFM30\_04.015** | A firmware upgrade mechanism is implemented on IO-Link communication interface. |
| **REQ\_HFM30\_04.020** | A firmware image signature and checksum avoid a firmware upgrade with a wrong or corrupted firmware image. |

## Operating Features

| Requirement | Description |
| --- | --- |
| **REQ\_HFM30\_05.010** | Acquisition modes:   * Synchronous * Asynchronous |
| **REQ\_HFM30\_05.020** | In synchronous acquisition mode the acquisition is triggered by a single scan command. The result of each command is sent to the host. Commands can be repeated continuously. |
| **REQ\_HFM30\_05.030** | In asynchronous acquisition mode the acquisition is triggered by a single scan command. As soon as a tag is detected its content is read. Only changes in the detection of the tag are sent to the host. |
| **REQ\_HFM30\_05.040** | Memory areas can be read or written block by block. Read After Detect and Write After Detect features are available. |
| **REQ\_HFM30\_05.050** | ISO 15693 and ISO 14443 A multi tag mode (anticollision) and ISO 15693 AFI features are available. |
| **REQ\_HFM30\_05.054** | It is possible to switch off the multi tag mode. If multi tag mode is switched off, the reader delivers an error message as soon as more than one tag is in the antenna field is detected (for pure single tag applications). |
| **REQ\_HFM30\_05.055** | The maximum number of expected tags in multi tag mode can be set as a Q-value for the anticollision function. |
| **REQ\_HFM30\_05.056** | Multi tag mode allows to capture at least 100 tags. Can be reduced because there is no realistic use case in the market. |
| **REQ\_HFM30\_05.060** | Number of readings per scan for qualitative tag detection monitoring feature is available. |

## Electrical Connections

| Requirement | Description |
| --- | --- |
| **REQ\_HFM30\_06.010** | M12 connections:   * IO-Link variant: 1 x M12-Plug, A-coded, 5 pin, male |
| **REQ\_HFM30\_06.030** | IO-Link variant pin assignment:  1 x M12-Plug, A-coded, 5 pin, male   | Pin | Description | | --- | --- | | 1 | VCC | | 2 | Q | | 3 | GND | | 4 | IO-Link | | 5 | NC | |
| **REQ\_HFM30\_06.040** | The connector does not have a cover cap when delivered. |

## Display Elements

| Requirement | Description |
| --- | --- |
| **REQ\_HFM30\_07.010** | The device is equipped with a 3mm round bicolor green/red LED, bright, clearly visible from the front and from a side angle. |
| **REQ\_HFM30\_07.020** | The LED is mounted on the plug connection side. |
| **REQ\_HFM30\_07.030** | System and tag presence statuses are displayed. |
| **REQ\_HFM30\_07.040** | System and tag presence statuses   | Color | State | Meaning | | --- | --- | --- | | Red | Static on | * System error * System initialization | | Yellow | Static on | * System upgrade | | Green | Blinking 2Hz | * Antenna active, no tag detected | | Green | Blinking 1Hz | * Antenna not active | | Green | Static on | * Antenna active, tag detected | | Off | Static off | * Power supply is missing * Hardware defect | |

## Approvals and Regulations

| Requirement | Description |
| --- | --- |
| **REQ\_HFM30\_08.010** | CE, UKCA, UL/CUL |
| **REQ\_HFM30\_08.020** | Radio regulation according to ETSI, FCC |
| **REQ\_HFM30\_08.030** | Shock test according to IEC 60068-2-27, Test Ea |
| **REQ\_HFM30\_08.040** | Permanent shock test according to IEC 60068-2-27, Test Eb |
| **REQ\_HFM30\_08.050** | Vibration test according to IEC 60068-2-6, Test Fc |
| **REQ\_HFM30\_08.060** | MTTF shall be calculated, target: MTTF > 100 years (M, Prio 1) |

## Accessories and Delivery

| Requirement | Description |
| --- | --- |
| **REQ\_HFM30\_09.010** | Nut 2 x M30 x 1.5, supplied in delivery content |
| **REQ\_HFM30\_09.020** | The delivery content includes:   * 1 x packaging incl. sticker with product info * 1 x device incl. sticker with product info * 1 x quick start guide (installation, safety) |
| **REQ\_HFM30\_09.030** | The following documents are available:   * 3D CAD STEP models * IODD file for IO-Link interface * All the certifications |

# HF Compact Cubic Short-Range (F, Prio 1)

The HF Basic short-range device is a short-range RFID read/write device operating at 13.56MHz and suitable for industrial application.



Two versions shall be available with these interfaces:

* RS232 (F, Prio 1)
* IO-Link (F, Prio 1)

## General Requirements

| Requirement | Description |
| --- | --- |
| **REQ\_HFCUBIC\_01.010** | Hardware features:   * ARM core (to be defined) * RTOS based (to be defined) * RS232 or IO-Link interface * 1 bicolor green/red LED * Integrated antenna * Operating frequency 13.56MHz * Operating voltage 24Vdc (18… 30Vdc) * Protection class III power supply * Max power consumption less than 2W * M12 connection * Operating temperature -32 … +60°C * Storage temperature -40 … +85°C * Relative humidity max 90%, non-condensing * IP67 protection class * Housing cubic approx 75 x 75 x 40 mm * Metal and plastic (front antenna) housing * Colours and logo to be defined by Leuze * Device label on the device side |
| **REQ\_HFCUBIC\_01.011** | RS232 hardware features in addition to REQ\_HFCUBIC\_0110:   * 2 digital inputs (trigger input), max 8mA @24Vdc * 2 digital open-collector outputs, max 60mA @24Vdc * Digitally I/Os are galvanically isolated * Digital I/Os with short circuit protection * Digital I/Os with reverse polarity protection |
| **REQ\_HFCUBIC\_01.020** | Supported RFID standards:   * ISO 15693: inventory, AFI, read (single block, multiple blocks), write (single block, multiple blocks), lock (block, AFI) * ISO 14443 A: inventory, read, write |
| **REQ\_HFCUBIC\_01.030** | Supported ISO 15693 chips:   * NXP ICODE 1 * NXP ICODE SLI/SLI-L/SLI-S * NXP ICODE SLIX/SLIX-L/SLIX-S * NXP ICODE SLIX2 * TI Tag-it HF-I Standard * TI Tag-it HF-I Plus * STM LRI 512 * Infineon my-d * EM Microelectronics EM4135 * Fujitsu MB89R118C |
| **REQ\_HFCUBIC\_01.040** | Supported ISO 14443 A chips:   * NXP MIFARE Classic * NXP MIFARE Ultralight * NXP NTAG 210/212 * NXP NTAG 213/215/216 |
| **REQ\_HFCUBIC\_01.050** | Read range up to 100 mm. But depends on tag chip, form factor and environmental conditions (metal surfaces, …). |
| **REQ\_HFCUBIC\_01.060** | Reliable detection of tags at standstill and in motion.  Maximum speed for moving tags will be tested and specified according to typical applications in production processes no later than the completion of the fully working prototypes. The conditions under which reliable tag detection can be realized at the specified speed are specified. |
| **REQ\_HFCUBIC\_01.070** | Could be installed ‘on’ metal. This could result in a read range reduction. |

## Configuration and Setup

| Requirement | Description |
| --- | --- |
| **REQ\_HFCUBIC\_02.010** | Configuration tool / demo program is available to configure and test the device through serial RS232 communication interfaces. Colours and logo to be defined by Leuze. |
| **REQ\_HFCUBIC\_02.020** | Device must be detected and addressed by Leuze Sensor Studio tool. |

## Communication and Protocol

| Requirement | Description |
| --- | --- |
| **REQ\_HFCUBIC\_03.010** | RS232 or IO-Link communication interfaces are available as device variants. |
| **REQ\_HFCUBIC\_03.020** | The Leuze communication protocol is implemented on the serial RS232 communication interface. |
| **REQ\_HFCUBIC\_03.025** | IO-Link devices   * COM1, COM2, COM3 supported * According to IO-Link specifications v1.1   Backward compatible with IO-Link specs. V1.0 |
| **REQ\_HFCUBIC\_03.030** | The IODD file is available for IO-Link communication interface. |
| **REQ\_HFCUBIC\_03.040** | Functional blocks for integration into common controllers (PLC) are available. |
| **REQ\_HFCUBIC\_03.050** | It must be possible to query the IC type installed in the tag as well as information (size) about all memory via a "Tag Info" command (M, Prio 1). |
| **REQ\_HFCUBIC\_03.060** | Further IC-specific custom commands can be implemented after consultation (M, Prio 2). |

## Firmware Upgrade

| Requirement | Description |
| --- | --- |
| **REQ\_HFCUBIC\_04.010** | A firmware upgrade mechanism is implemented on RS232 communication interface. |
| **REQ\_HFCUBIC\_04.015** | A firmware upgrade mechanism is implemented on IO-Link communication interface. |
| **REQ\_HFCUBIC\_04.020** | A firmware image signature and checksum avoid a firmware upgrade with a wrong or corrupted firmware image. |

## Operating Features

| Requirement | Description |
| --- | --- |
| **REQ\_HFCUBIC\_05.010** | Acquisition modes:   * Synchronous * Asynchronous |
| **REQ\_HFCUBIC\_05.020** | In synchronous acquisition mode the acquisition is triggered by a single scan command or input (configurable). The result of each command is sent to the host. Commands can be repeated continuously. |
| **REQ\_HFCUBIC\_05.030** | In asynchronous acquisition mode the acquisition is triggered by a single scan command. As soon as a tag is detected its content is read. Only changes in the detection of the tag are sent to the host. |
| **REQ\_HFCUBIC\_05.040** | Memory areas can be read or written block by block. Read After Detect and Write After Detect features are available. |
| **REQ\_HFCUBIC\_05.050** | ISO 15693 and ISO 14443 A multi tag mode (anticollision) and ISO 15693 AFI features are available. |
| **REQ\_HFCUBIC\_05.054** | It is possible to switch off the multi tag mode. If multi tag mode is switched off, the reader delivers an error message as soon as more than one tag is in the antenna field is detected (for pure single tag applications). |
| **REQ\_HFCUBIC\_05.055** | The maximum number of expected tags in multi tag mode can be set as a Q-value for the anticollision function. |
| **REQ\_HFCUBIC\_05.056** | Multi tag mode allows to capture at least 100 tags. Can be reduced because there is no realistic use case in the market. |
| **REQ\_HFCUBIC\_05.060** | Number of readings per scan for qualitative tag detection monitoring feature is available. |

## Electrical Connections

| Requirement | Description |
| --- | --- |
| **REQ\_HFCUBIC\_06.010** | M12 connections:   * RS232 variant: 1 x M12-Plug, A-coded, 12 pin, male * IO-Link variant: 1 x M12-Plug, A-coded, 5 pin, male |
| **REQ\_HFCUBIC\_06.020** | RS232 variant pin assignment:  1 x M12-Plug, A-coded, 12 pin, male   | Pin | Description | | --- | --- | | 1 | VCC | | 2 | GND | | 3 | SWIN 1 | | 4 | SWOUT 1 | | 5 | PE | | 6 | NC | | 7 | RESERVED | | 8 | RESERVED | | 9 | RXD | | 10 | TXD | | 11 | SWIN 2 | | 12 | SWOUT 2 | |
| **REQ\_HFCUBIC\_06.030** | IO-Link variant pin assignment:  1 x M12-Plug, A-coded, 5 pin, male   | Pin | Description | | --- | --- | | 1 | VCC | | 2 | Q | | 3 | GND | | 4 | IO-Link | | 5 | NC | |
| **REQ\_HFCUBIC\_06.040** | The connector does not have a cover cap when delivered. |

## Display Elements

| Requirement | Description |
| --- | --- |
| **REQ\_HFCUBIC\_07.010** | The device is equipped with a 3mm round bicolor green/red LED, bright, clearly visible from the front and from a side angle. |
| **REQ\_HFCUBIC\_07.020** | The LED is mounted together on the device top. |
| **REQ\_HFCUBIC\_07.030** | System and tag presence statuses are displayed. |
| **REQ\_HFCUBIC\_07.040** | System and tag presence statuses   | Color | State | Meaning | | --- | --- | --- | | Red | Static on | * System error * System initialization | | Yellow | Static on | * System upgrade | | Green | Blinking 2Hz | * Antenna active, no tag detected | | Green | Blinking 1Hz | * Antenna not active | | Green | Static on | * Antenna active, tag detected | | Off | Static off | * Power supply is missing * Hardware defect | |

## Approvals and Regulations

| Requirement | Description |
| --- | --- |
| **REQ\_HFCUBIC\_08.010** | CE, UKCA, UL/CUL |
| **REQ\_HFCUBIC\_08.020** | Radio regulation according to ETSI, FCC |
| **REQ\_HFCUBIC\_08.030** | Shock test according to IEC 60068-2-27, Test Ea |
| **REQ\_HFCUBIC\_08.040** | Permanent shock test according to IEC 60068-2-27, Test Eb |
| **REQ\_HFCUBIC\_08.050** | Vibration test according to IEC 60068-2-6, Test Fc |
| **REQ\_HFCUBIC\_08.060** | MTTF shall be calculated, target: MTTF > 100 years (M, Prio 1) |

## Accessories and Delivery

| Requirement | Description |
| --- | --- |
| **REQ\_HFCUBIC\_09.010** | The delivery content includes:   * 1 x packaging incl. sticker with product info * 1 x device incl. sticker with product info * 1 x quick start guide (installation, safety) |
| **REQ\_HFCUBIC\_09.020** | The following documents are available:   * 3D CAD STEP models * IODD file for IO-Link interface * All the certifications |

# HF Performance Mid-Range (F, Prio 1)

The HF Performance mid-range device is a mid-range RFID read/write device operating at 13.56MHz and suitable for industrial application.



Three versions shall be available with these interfaces:

* ProfiNet (M, Prio 1)
* Ethernet/IP (M, Prio 1)
* EtherCAT (M, Prio 1)
* TCP/IP (M, Prio 1)
* TCP/IP with OPC UA (M, Prio 1)

## General Requirements

| Requirement | Description |
| --- | --- |
| **REQ\_HFPERF\_01.010** | Hardware features:   * ARM core (to be defined) * RTOS based (to be defined) * Ethernet fieldbus interface * Ethernet interface (TCP/IP, OPC UA) * USB Virtual COM service interface (optional) * Integrated RTC (Real Time Clock) * Coin-type rechargeable lithium RTC backup battery * 2 digital inputs (trigger input), max 8mA @24Vdc * 2 digital open-collector outputs, max 60mA @24Vdc * Digital I/Os are galvanically isolated * Digital I/Os shares the same hardware lines * Digital I/Os with short circuit protection * Digital I/Os with reverse polarity protection * LEDs (to be defined) * Integrated antenna * Operating frequency 13.56MHz * Operating voltage 24Vdc (18… 30Vdc) * Protection class III power supply * Max power consumption less than 10W * M12 connection * Operating temperature -32 … +60°C * Storage temperature -40 … +85°C * Relative humidity max 90%, non-condensing * IP67 protection class * Housing approx. 80 x 120 x 40 mm * Housing with metal base and plastic top cover * Colours and logo to be defined by Leuze * Device label on the device side |
| **REQ\_HFPERF\_01.020** | Supported RFID standards:   * ISO 15693: inventory, AFI, read (single block, multiple blocks), write (single block, multiple blocks), lock (block, AFI) * ISO 14443 A: inventory, read, write |
| **REQ\_HFPERF\_01.030** | Supported ISO 15693 chips:   * NXP ICODE 1 * NXP ICODE SLI/SLI-L/SLI-S * NXP ICODE SLIX/SLIX-L/SLIX-S * NXP ICODE SLIX2 * TI Tag-it HF-I Standard * TI Tag-it HF-I Plus * STM LRI 512 * Infineon my-d * EM Microelectronics EM4135 * Fujitsu MB89R118C |
| **REQ\_HFPERF\_01.035** | Supported ISO 14443 A chips:   * NXP MIFARE Ultralight * NXP NTAG 210/212 * NXP NTAG 213/215/216 |
| **REQ\_HFPERF\_01.040** | Read range up to 200mm. But depends on tag chip, form factor and environmental conditions (metal surfaces, …) |
| **REQ\_HFPERF\_01.050** | Reliable detection of tags at standstill and in motion.  Maximum speed for moving tags will be tested and specified according to typical applications in production processes no later than the completion of the fully working prototypes. The conditions under which reliable tag detection can be realized at the specified speed are specified. |
| **REQ\_HFPERF\_01.060** | Could be installed ‘on’ metal. This could result in a read range reduction. |

## Configuration and Setup

| Requirement | Description |
| --- | --- |
| **REQ\_HFPERF\_02.010** | Configuration tool / demo program is available to configure and test the device through Ethernet TCP/IP with OPC UA or Leuze Protocol communication interfaces. Colours and logo to be defined by Leuze. |
| **REQ\_HFPERF\_02.020** | Configuration tool / demo program is available to configure and test the device through USB Virtual COM communication interface. Colours and logo to be defined by Leuze. |
| **REQ\_HFPERF\_02.030** | Webserver is available to configure the device through the Ethernet communication interface. Colours and logo to be defined by Leuze. |
| **REQ\_HFPERF\_02.040** | Must be able to be found and managed by Leuze Device Finder tool. |
| **REQ\_HFPERF\_02.050** | Configurable RF parameters to manual adjust the detection range depending on the detection situations. |

## Communication and Protocol

| Requirement | Description |
| --- | --- |
| **REQ\_HFPERF\_03.010** | Ethernet based fieldbus interface is available. ProfiNet, Ethernet/IP and EtherCAT are available. |
| **REQ\_HFPERF\_03.014** | ProfiNet devices can operate as individual devices (stand-alone) in ProfiNet star, tree, or line, with integrated switch, topology with individual device names:   * The factory preset IP address is 192.168.60.101 * If possible, a fixed MAC address which will be provide by Leuze will be assigned. Can’t be guaranteed. * 100Mbit/s transmission rates is supported |
| **REQ\_HFPERF\_03.015** | Ethernet/IP devices can operate as individual devices (stand-alone) in an Ethernet/IP star, tree, or line, with integrated switch, topology with individual device names:   * The factory preset IP address is 192.168.60.101 * If possible, a fixed MAC address which will be provide by Leuze will be assigned. Can’t be guaranteed. * 100Mbit/s transmission rates is supported |
| **REQ\_HFPERF\_03.016** | EtherCAT devices can operate as individual devices (stand-alone) in an EtherCAT star, tree, or line, with integrated switch, topology with individual device names:   * The factory preset IP address is 192.168.60.101 * If possible, a fixed MAC address which will be provide by Leuze will be assigned. Can’t be guaranteed. * 100Mbit/s transmission rates is supported |
| **REQ\_HFPERF\_03.020** | Ethernet TCP/IP is available as device variant. |
| **REQ\_HFPERF\_03.030** | Ethernet TCP/IP with OPC UA protocol is available as device variant.  The OPC UA variant is OPC UA (Client/Server) capable and fully supports the OPC UA AutoID Companion Spec V1.1.  Each unit is assigned a fixed MAC address which will be provided by Leuze. |
| **REQ\_HFPERF\_03.031** | Ethernet TCP/IP with Leuze protocol is available as device variant.  Each unit is assigned a fixed MAC address which will be provided by Leuze. |
| **REQ\_HFPERF\_03.040** | Ethernet devices can operate as individual devices in an Ethernet star, or tree topology with individual IP addresses:   * The factory preset IP address is 192.168.60.101 * Each unit is assigned a fixed MAC address * 10/100Mbit/s transmission rates are supported * Auto-negotiation and auto-crossover supported * PING, TCP, UDP, DHCP, Telnet, HTTP supported |
| **REQ\_HFPERF\_03.050** | The GSDML file is available for ProfiNet |
| **REQ\_HFPERF\_03.060** | The EDS file is available for Ethernet/IP |
| **REQ\_HFPERF\_03.070** | The ESI file is available for EtherCAT |
| **REQ\_HFPERF\_03.080** | Functional blocks for integration into common controllers (PLC) are available for:  Siemens S7,  and further PLC types which will be defined and developed in coordination with Leuze no later than the completion of the fully working prototypes. (Additional costs may be incurred) |
| **REQ\_HFPERF\_03.090** | It must be possible to query the IC type installed in the tag as well as information (size) about all memory via a "Tag Info" command (M, Prio 1). |
| **REQ\_HFPERF\_03.100** | Further IC-specific custom commands can be implemented after consultation (M, Prio 2). |
| **REQ\_HFPERF\_03.110** | USB Virtual COM service interface is available. |
| **REQ\_HFPERF\_03.120** | The Leuze communication protocol is implemented on the USB Virtual COM service interface. |

## Firmware Upgrade

| Requirement | Description |
| --- | --- |
| **REQ\_HFPERF\_04.010** | A firmware upgrade mechanism is implemented on USB Virtual COM service interface, Ethernet interface and via webserver. |
| **REQ\_HFPERF\_04.020** | A firmware image signature and checksum avoid a firmware upgrade with a wrong or corrupted firmware image. |

## Operating Features

| Requirement | Description |
| --- | --- |
| **REQ\_HFPERF\_05.010** | Acquisition modes:   * Synchronous * Asynchronous |
| **REQ\_HFPERF\_05.020** | In synchronous acquisition mode the acquisition is triggered by a single scan command or input (configurable). The result of each command is sent to the host. Commands can be repeated continuously. |
| **REQ\_HFPERF\_05.030** | In asynchronous acquisition mode the acquisition is triggered by a single scan command. As soon as a tag is detected its content is read. Only changes in the detection of the tag are sent to the host. |
| **REQ\_HFPERF\_05.040** | Memory areas can be read or written block by block. Read After Detect and Write After Detect features are available. |
| **REQ\_HFPERF\_05.050** | ISO 15693 multi tag mode (anticollision) and ISO 15693 AFI features are available. |
| **REQ\_HFPERF\_05.054** | It is possible to switch off the multi tag mode. If multi tag mode is switched off, the reader delivers an error message as soon as more than one tag is in the antenna field is detected (for pure single tag applications). |
| **REQ\_HFPERF\_05.055** | The maximum number of expected tags in multi tag mode can be set as a Q-value for the anticollision function. |
| **REQ\_HFPERF\_05.056** | Multi tag mode allows to capture at least 100 tags. Can be reduced because there is no realistic use case in the market. |
| **REQ\_HFPERF\_05.060** | Number of readings per scan for qualitative tag detection monitoring feature is available. |

## Electrical Connections

| Requirement | Description |
| --- | --- |
| **REQ\_HFPERF\_06.010** | M12 connections:   * Ethernet variant:   + Power and IO: 1 x M12, A-coded, 5 pin, male   + Ethernet: 1 x M12, D-coded, 4 pin, female   + USB: 1 x M12, Mini USB B (optional) * ProfiNet variant:   + Power: 1 x M12, L-coded, 4-pin, male   + Ethernet: 2 x M12, D-coded, 4 pin, female   + USB: 1 x M12, Mini USB B (optional) * Ethernet/IP variant:   + Power and I/O: 1 x M12, A-coded, 5 pin, male   + Ethernet: 2 x M12, D-coded, 4 pin, female   + USB: 1 x M12, Mini USB B (optional) * EtherCAT variant:   + Power and I/O: 1 x M12, A-coded, 5 pin, male   + Ethernet: 2 x M12, D-coded, 4 pin, female   + USB: 1 x M12, Mini USB B (optional) |
| **REQ\_HFPERF\_06.020** | Power and I/O connection pin assignment:  1 x M12, A-coded, 5 pin, male   | Pin | Description | | --- | --- | | 1 | VCC | | 2 | SWIO 1 | | 3 | GND | | 4 | SWIO 2 | | 5 | PE | |
| **REQ\_HFPERF\_06.030** | Ethernet connection pin assignment:  1 x M12, D-coded, 4 pin, female   | Pin | Description | | --- | --- | | 1 | TD+ | | 2 | RD+ | | 3 | TD- | | 4 | RD- | | Thread | PE | |
| **REQ\_HFPERF\_06.040** | The connectors do not have a cover cap when delivered |

## Display Elements

| Requirement | Description |
| --- | --- |
| **REQ\_HFPERF\_07.010** | The device is equipped with 3mm round bicolor LEDs, bright, clearly visible from the front and from a side angle |
| **REQ\_HFPERF\_07.020** | The LEDs are mounted together on the device top |
| **REQ\_HFPERF\_07.030** | System, network, link and antenna statuses are displayed |
| **REQ\_HFPERF\_07.040** | System statuses (SYS)   | Color | State | Meaning | | --- | --- | --- | | Red | Static on | * System error * System initialization | | Yellow | Static on | * System upgrade | | Green | Blinking 2Hz | * System running | | Off | Static off | * Power supply is missing * Hardware defect | |
| **REQ\_HFPERF\_07.050** | Antenna statuses (ANT)   | Color | State | Meaning | | --- | --- | --- | | Red | Static on | * Antenna error * System initialization | | Green | Blinking 2Hz | * Antenna active, no tag detected | | Green | Blinking 1Hz | * Antenna not active | | Green | Static on | * Antenna active, tag detected | | Off | Static off | * Power supply is missing * Hardware defect * System upgrade | |
| **REQ\_HFPERF\_07.060** | Ethernet, link statuses (ETH)   | Color | State | Meaning | | --- | --- | --- | | Red | Static on | * Antenna error * System initialization | | Green | Blinking 2Hz | * Antenna active, no tag detected | | Off | Static off | * Power supply is missing * Hardware defect * System upgrade | |

## Approvals and Regulations

| Requirement | Description |
| --- | --- |
| **REQ\_HFPERF\_08.010** | CE, UKCA, UL/CUL |
| **REQ\_HFPERF\_08.015** | Radio regulation according to ETSI, FCC |
| **REQ\_HFPERF\_08.020** | PNO for ProfiNet |
| **REQ\_HFPERF\_08.030** | ODVA for Ethernet/IP |
| **REQ\_HFPERF\_08.035** | ETC for EtherCAT |
| **REQ\_HFPERF\_08.040** | Shock test according to IEC 60068-2-27, Test Ea |
| **REQ\_HFPERF\_08.050** | Permanent shock test according to IEC 60068-2-27, Test Eb |
| **REQ\_HFPERF\_08.060** | Vibration test according to IEC 60068-2-6, Test Fc |
| **REQ\_HFPERF\_08.070** | MTTF shall be calculated, target: MTTF > 100 years (M, Prio 1) |
| **REQ\_HFPERF\_08.080** | Radio Equipment Directive (RED) cybersecurity compliance as an essential requirement must be evaluated separately |
| **REQ\_HFPERF\_08.090** | Radio regulation approvals for other countries not ETSI nor FCC must be evaluated separately |

## Accessories and Delivery

| Requirement | Description |
| --- | --- |
| **REQ\_HFPERF\_09.010** | The delivery content includes:   * 1 x packaging incl. sticker with product info * 1 x device incl. sticker with product info * 1 x quick start guide (installation, safety) |
| **REQ\_HFPERF\_09.020** | The following documents are available:   * 3D CAD STEP models * GSDML file for ProfiNet interface * EDS file for Ethernet/IP interface * ESI file for EtherCAT interface * All the certifications |

# UHF Performance Short/Mid-Range (F, Prio 1)

The UHF Performance short/mid-range device is a mid-range RFID read/write device operating at 840-960MHz and suitable for industrial application.



Four versions shall be available with these interfaces:

* ProfiNet (M, Prio 1)
* Ethernet/IP (M, Prio 1)
* EtherCAT (M, Prio 1)
* TCP/IP (M, Prio 1)
* TCP/IP with OPC UA (M, Prio 1)

## General Requirements

| Requirement | Description |
| --- | --- |
| **REQ\_UHFPERF\_01.010** | Hardware features:   * ARM core (to be defined) * RTOS based (to be defined) * Ethernet fieldbus interface * Ethernet interface (TCP/IP, OPC UA) * USB Virtual COM service interface (optional) * Integrated RTC (Real Time Clock) * Coin-type rechargeable lithium RTC backup battery * 2 digital inputs (trigger input), max 8mA @24Vdc * 2 digital open-collector outputs, max 60mA @24Vdc * Digital I/Os are galvanically isolated * Digital I/Os shares the same hardware lines * Digital I/Os with short circuit protection * Digital I/Os with reverse polarity protection * LEDs (to be defined) * Integrated antenna and optionally 1 external * Operating frequency 840 … 960MHz * Operating voltage 24Vdc (18… 30Vdc) * Protection class III power supply * Max power consumption less than 10W * M12 connection * TNC connection for external antenna * Operating temperature -32 … +60°C * Storage temperature -40 … +85°C * Relative humidity max 90%, non-condensing * IP67 protection class * Housing approx. 140 x 140 x 140 mm * Housing with metal base and plastic top cover * Colours and logo to be defined by Leuze * Device label on the device side |
| **REQ\_UHFPERF\_01.020** | Supported RFID standards:   * ISO 18000-63: inventory, AFI, read, write, lock, kill * EPC UHF Gen2v2 |
| **REQ\_UHFPERF\_01.030** | Supported ISO 18000-63 chips:   * NXP UCODE G2im, 7/8/9, DNA * Impinj Monza 4, Monza R6, Monza M700, Monza X * Alien Higgs-3, Higgs-4, Higgs-9, Higgs-10 |
| **REQ\_UHFPERF\_01.040** | Read range up to 2mt. But depends on tag chip, form factor and environmental conditions (metal surfaces, …) |
| **REQ\_UHFPERF\_01.050** | Reliable detection of tags at standstill and in motion.  Maximum speed for moving tags will be tested and specified according to typical applications in production processes no later than the completion of the fully working prototypes. The conditions under which reliable tag detection can be realized at the specified speed are specified. |
| **REQ\_UHFPERF\_01.060** | Could be installed ‘on’ metal. This could result in a read range reduction |

## Configuration and Setup

| Requirement | Description |
| --- | --- |
| **REQ\_UHFPERF\_02.010** | Configuration tool / demo program is available to configure and test the device through Ethernet TCP/IP communication interface. Colours and logo to be defined by Leuze |
| **REQ\_UHFPERF\_02.020** | Configuration tool / demo program is available to configure and test the device through USB Virtual COM communication interface. Colours and logo to be defined by Leuze |
| **REQ\_UHFPERF\_02.030** | Webserver is available to configure the device through the Ethernet communication interface. Colours and logo to be defined by Leuze |
| **REQ\_UHFPERF\_02.040** | Must be able to be found and managed by Leuze Device Finder tool |
| **REQ\_UHFPERF\_02.050** | Configurable RF parameters to manual adjust the detection range depending on the detection situations:   * TX transmit power in 1dB steps. The default setting has to be defined * RX receive sensitivity in 1dB steps. The default setting has to be defined later * Radio profiles (modulation, …). The default setting has to be defined later * In ETSI frequency band both FHSS on all the channels and single channel mode are allowed. FHSS is the default setting |
| **REQ\_UHFPERF\_02.060** | Automatic TX transmit power adjustment for a reliable tag detection in a given reading environment is available (M, Prio 2) |
| **REQ\_UHFPERF\_02.070** | It is possible to set the RF transmit power of the UHF unit in 1 dB steps. Alternatively, it is also possible to enter the max. radiated power in W (ERP or EIRP), which adjusts the RF transmit power accordingly |
| **REQ\_UHFPERF\_02.080** | When operating an external antenna, it is possible to enter the gain and the polarization of the external antenna as well as the length of the antenna cable and the attenuation of the antenna cable. The correct dB value for the antenna type used (linear or circular polarised) must be entered |

## Communication and Protocol

| Requirement | Description |
| --- | --- |
| **REQ\_UHFPERF\_03.010** | Ethernet based fieldbus interface is available. ProfiNet, Ethernet/IP and EtherCAT are available |
| **REQ\_UHFPERF\_03.014** | ProfiNet devices can operate as individual devices (stand-alone) in ProfiNet star, tree, or line, with integrated switch, topology with individual device names:   * The factory preset IP address is 192.168.60.101 * If possible, a fixed MAC address which will be provide by Leuze will be assigned. Can’t be guaranteed. * 100Mbit/s transmission rates is supported |
| **REQ\_UHFPERF\_03.015** | Ethernet/IP devices can operate as individual devices (stand-alone) in an Ethernet/IP star, tree, or line, with integrated switch, topology with individual device names:   * The factory preset IP address is 192.168.60.101 * If possible, a fixed MAC address which will be provide by Leuze will be assigned. Can’t be guaranteed. * 100Mbit/s transmission rates is supported |
| **REQ\_UHFPERF\_03.016** | EthernetCAT devices can operate as individual devices (stand-alone) in an EthernetCAT star, tree, or line, with integrated switch, topology with individual device names:   * The factory preset IP address is 192.168.60.101 * If possible, a fixed MAC address which will be provide by Leuze will be assigned. Can’t be guaranteed. * 100Mbit/s transmission rates is supported |
| **REQ\_UHFPERF\_03.020** | Ethernet TCP/IP is available as device variant |
| **REQ\_UHFPERF\_03.030** | Ethernet TCP/IP with OPC UA protocol is available as device variant.  The OPC UA variant is OPC UA (Client/Server) capable and fully supports the OPC UA AutoID Companion Spec V1.1.  Each unit is assigned a fixed MAC address which will be provided by Leuze. |
| **REQ\_UHFPERF\_03.031** | Ethernet TCP/IP with Leuze protocol is available as device variant.  Each unit is assigned a fixed MAC address which will be provided by Leuze. |
| **REQ\_UHFPERF\_03.040** | Ethernet devices can operate as individual devices in an Ethernet star, or tree topology with individual IP addresses:   * The factory preset IP address is 192.168.60.101 * Each unit is assigned a fixed MAC address * 10/100Mbit/s transmission rates are supported * Auto-nogotiation and auto-crossover supported * PING, TCP, UDP, DHCP, Telnet, HTTP supported |
| **REQ\_UHFPERF\_03.050** | The GSDML file is available for ProfiNet |
| **REQ\_UHFPERF\_03.060** | The EDS file is available for Ethernet/IP |
| **REQ\_UHFPERF\_03.070** | The ESI file is available for EtherCAT |
| **REQ\_UHFPERF\_03.080** | Functional blocks for integration into common controllers (PLC) are available for:  Siemens S7,  and further PLC types which will be defined and developed in coordination with Leuze no later than the completion of the fully working prototypes. (Additional costs may be incurred) |
| **REQ\_UHFPERF\_03.090** | It must be possible to query the IC type installed in the tag as well as information (size) about all memory via a "Tag Info" command (M, Prio 1) |
| **REQ\_UHFPERF\_03.100** | Further IC-specific custom commands can be implemented after consultation (M, Prio 2) |
| **REQ\_UHFPERF\_03.110** | USB Virtual COM service interface is available |
| **REQ\_UHFPERF\_03.110** | The Leuze communication protocol is implemented on the USB Virtual COM service interface |

## Firmware Upgrade

| Requirement | Description |
| --- | --- |
| **REQ\_UHFPERF\_04.010** | A firmware upgrade mechanism is implemented on USB Virtual COM service interface, Ethernet interface and via webserver |
| **REQ\_UHFPERF\_04.020** | A firmware image signature and checksum avoid a firmware upgrade with a wrong or corrupted firmware image |

## Operating Features

| Requirement | Description |
| --- | --- |
| **REQ\_UHFPERF\_05.010** | Acquisition modes:   * Synchronous * Asynchronous |
| **REQ\_UHFPERF\_05.020** | In synchronous acquisition mode the acquisition is triggered by a single scan command or input (configurable). The result of each command is sent to the host. Commands can be repeated continuously. |
| **REQ\_UHFPERF\_05.030** | In asynchronous acquisition mode the acquisition is triggered by a single scan command. As soon as a tag is detected its content is read. Only changes in the detection of the tag are sent to the host. |
| **REQ\_UHFPERF\_05.040** | Memory areas can be read or written block by block. Read After Detect and Write After Detect features are available |
| **REQ\_UHFPERF\_05.050** | ISO 18000-63 multi tag mode (anticollision) and ISO 18000-63 AFI features are available |
| **REQ\_UHFPERF\_05.054** | It is possible to switch off the multi tag mode. If multi tag mode is switched off, the reader delivers an error message as soon as more than one tag is in the antenna field is detected (for pure single tag applications) |
| **REQ\_UHFPERF\_05.055** | The maximum number of expected tags in multi tag mode can be set as a Q-value for the anticollision function |
| **REQ\_UHFPERF\_05.056** | Multi tag mode allows to capture at least 100 tags |
| **REQ\_UHFPERF\_05.060** | Number of readings per scan for qualitative tag detection monitoring feature is available |
| **REQ\_UHFPERF\_05.070** | RSSI acquisition for qualitative tag detection monitoring feature is available |

## Electrical Connections

|  |  |
| --- | --- |
| Requirement | Description |
| **REQ\_UHFPERF\_06.010** | M12 connections:   * Ethernet variant:   + Power and IO: 1 x M12, A-coded, 5 pin, male   + Ethernet: 1 x M12, D-coded, 4 pin, female   + USB: 1 x M12, Mini USB B (optional) * ProfiNet variant:   + Power: 1 x M12, L-coded, 4-pin, male   + Ethernet: 2 x M12, D-coded, 4 pin, female   + USB: 1 x M12, Mini USB B (optional) * Ethernet/IP variant:   + Power and I/O: 1 x M12, A-coded, 5 pin, male   + Ethernet: 2 x M12, D-coded, 4 pin, female   + USB: 1 x M12, Mini USB B (optional) * EtherCAT variant:   + Power and I/O: 1 x M12, A-coded, 5 pin, male   + Ethernet: 2 x M12, D-coded, 4 pin, female   + USB: 1 x M12, Mini USB B (optional)   TNC connections:   * External antenna: 1 x TNC, female |
| **REQ\_UHFPERF\_06.020** | Power and I/O connection pin assignment:  1 x M12, A-coded, 5 pin, male   | Pin | Description | | --- | --- | | 1 | VCC | | 2 | SWIO 1 | | 3 | GND | | 4 | SWIO 2 | | 5 | PE | |
| **REQ\_UHFPERF\_06.030** | Ethernet connection pin assignment:  1 x M12, D-coded, 4 pin, female   | Pin | Description | | --- | --- | | 1 | TD+ | | 2 | RD+ | | 3 | TD- | | 4 | RD- | | Thread | PE | |
| **REQ\_UHFPERF\_06.040** | The M12 connectors do not have a cover cap when delivered, the TNC connector has a cover cap when delivered |

## Display Elements

| Requirement | Description |
| --- | --- |
| **REQ\_UHFPERF\_07.010** | The device is equipped with 3mm round bicolor LEDs, bright, clearly visible from the front and from a side angle |
| **REQ\_UHFPERF\_07.020** | The LEDs are mounted together on the device top |
| **REQ\_UHFPERF\_07.030** | System, network, link and antenna statuses are displayed |
| **REQ\_UHFPERF\_07.040** | System statuses (SYS)   | Color | State | Meaning | | --- | --- | --- | | Red | Static on | * System error * System initialization | | Yellow | Static on | * System upgrade | | Green | Blinking 2Hz | * System running | | Off | Static off | * Power supply is missing * Hardware defect | |
| **REQ\_UHFPERF\_07.050** | Antenna statuses (ANT)   | Color | State | Meaning | | --- | --- | --- | | Red | Static on | * Antenna error * System initialization | | Green | Blinking 2Hz | * Antenna active, no tag detected | | Green | Blinking 1Hz | * Antenna not active | | Green | Static on | * Antenna active, tag detected | | Off | Static off | * Power supply is missing * Hardware defect * System upgrade | |

## Approvals and Regulations

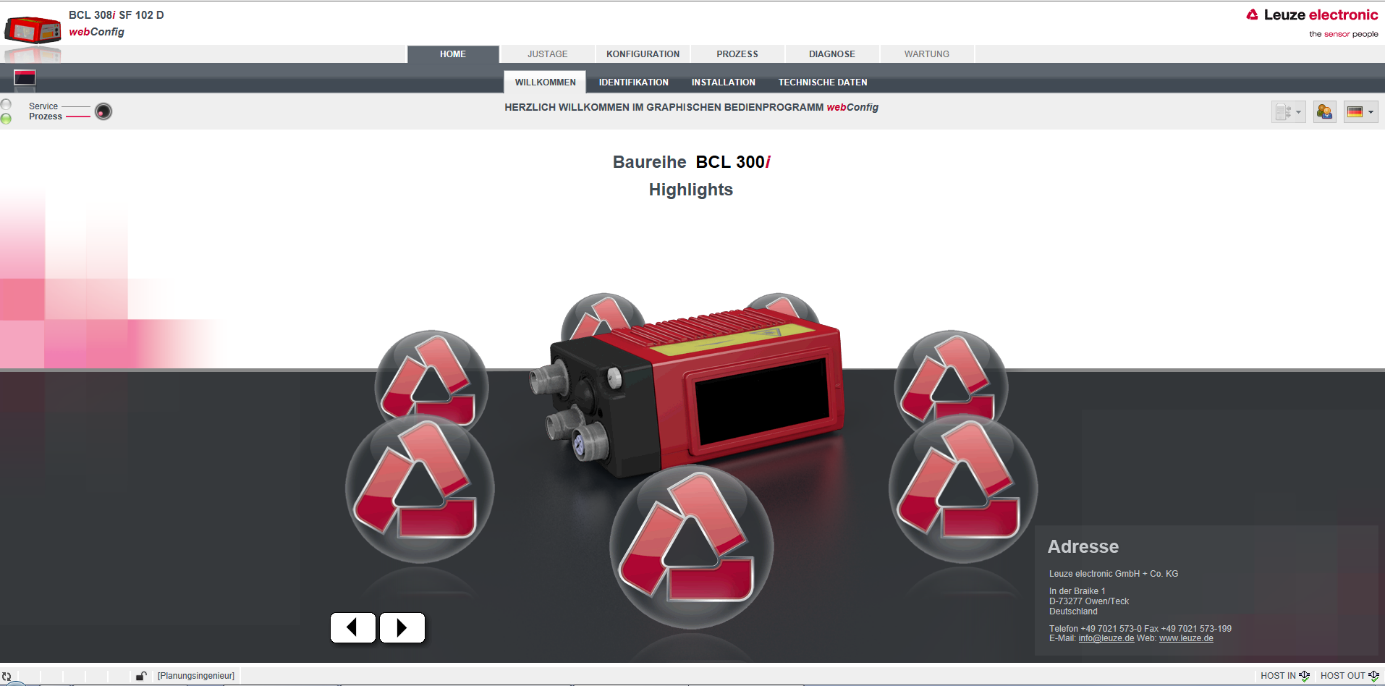
| Requirement | Description |
| --- | --- |
| **REQ\_UHFPERF\_08.010** | CE, UKCA, UL/CUL |
| **REQ\_UHFPERF\_08.015** | Radio regulation according to ETSI, FCC |
| **REQ\_UHFPERF\_08.020** | PNO for ProfiNet |
| **REQ\_UHFPERF\_08.030** | ODVA for Ethernet/IP |
| **REQ\_UHFPERF\_08.035** | ETC for EtherCAT |
| **REQ\_UHFPERF\_08.040** | Shock test according to IEC 60068-2-27, Test Ea |
| **REQ\_UHFPERF\_08.050** | Permanent shock test according to IEC 60068-2-27, Test Eb |
| **REQ\_UHFPERF\_08.060** | Vibration test according to IEC 60068-2-6, Test Fc |
| **REQ\_UHFPERF\_08.070** | MTTF shall be calculated, target: MTTF > 100 years (M, Prio 1) |
| **REQ\_UHFPERF\_08.080** | Radio Equipment Directive (RED) cybersecurity compliance as an essential requirement must be evaluated separately |
| **REQ\_UHFPERF\_08.090** | Radio regulation approvals for other countries not ETSI nor FCC must be evaluated separately |

## Accessories and Delivery

| Requirement | Description |
| --- | --- |
| **REQ\_UHFPERF\_09.010** | The delivery content includes:   * 1 x packaging incl. sticker with product info * 1 x device incl. sticker with product info * 1 x quick start guide (installation, safety) |
| **REQ\_UHFPERF\_09.020** | The following documents are available:   * 3D CAD STEP models * GSDML file for ProfiNet interface * EDS file for Etehrnet/IP interface * ESI file for EtherCAT interface * All the certifications |

# Webserver (F, Prio 1)

The webserver is intended to be used to configure and manage the performance devices. Below the welcome page of the current Leuze Webconfig as orientation.



## General Requirements

| Requirement | Description |
| --- | --- |
| **REQ\_WEBSRV\_01.010** | Integrated webserver. Appearance and structure are based on the Leuze Webconfig design and layout.  Leuze is currently developing a new Webconfig layout.  As soon as the new Leuze Webconfig Layout has been finished, Leuze will provide screenshots and styleguide information of the new design. |
| **REQ\_WEBSRV\_01.020** | Colours and logo to be defined by Leuze |
| **REQ\_WEBSRV\_01.030** | Languages that can be selected in the web server:   * DE, German (F, Prio 1) * EN, English (F, Prio 1) * IT, Italian (D, Prio 1) * ES, Spanish (D, Prio 1) * FR, French (D, Prio 1) * CN, Chinese (D, Prio 1) |
| **REQ\_WEBSRV\_01.050** | Offers different user levels:   * Level 1: user, which has the possibility to carry out the essential basic settings * Level 2: service, which has the option to carry out more extensive settings * Level 3: expert/developer, which has the possibility to change any setting (only accessible by Leuze)   The user level are protected by access authorizations and password |
| **REQ\_WEBSRV\_01.040** | The following pages are provided:   * Home * Configuration * User settings * Functions * Data * Input/Output * Diagnostic * Maintenance |

## Read/Write Functions

| Requirement | Description |
| --- | --- |
| **REQ\_WEBSRV\_02.010** | When reading out and writing to the memory areas, the option of switching between hex, binary and ASCII representation is offered |
| **REQ\_WEBSRV\_02.020** | When writing to the memory areas, access to memory areas is possible bit by bit to individual memory addresses |
| **REQ\_WEBSRV\_02.030** | Automatic coding or decoding (6-bit coding) of UID (for HF) or EPC/UII (for UHF) according to VDA guideline 5500 ff. and GS1 logistics standards is possible |

## Miscellaneous Functions

| Requirement | Description |
| --- | --- |
| **REQ\_WEBSRV\_03.010** | The UHF configuration software offers typical application environments (e.g. conveyor line < 2 m/s, conveyor line > 2 m/s, part tracking production line, etc.) that contain optimised parameter sets for the selected application environment. When an application environment is selected, the corresponding parameter set is preset. It is possible to change these parameters individually in expert mode (see user role setting). This function facilitates optimal commissioning for the user and supports the Leuze claim of "usability" |

# Configuration Software (F, Prio 1)

The configuration software is intended to be used to configure and manage the compact and the performance devices

## General Requirements

| Requirement | Description |
| --- | --- |
| **REQ\_CONFIG\_01.010** | Windows PC software; appearance and structure are based on the current Leuze Webconfig as orientation |
| **REQ\_CONFIG\_01.020** | Colours and logo to be defined by Leuze |
| **REQ\_CONFIG\_01.030** | Languages that can be selected in the web server:   * DE, German (F, Prio 1) * EN, English (F, Prio 1) * IT, Italian (D, Prio 1) * ES, Spanish (D, Prio 1) * FR, French (D, Prio 1) * CN, Chinese (D, Prio 1) |
| **REQ\_CONFIG\_01.040** | Offers different user levels:   * Level 1: user, which has the possibility to carry out the essential basic settings * Level 2: service, which has the option to carry out more extensive settings * Level 3: expert/developer, which has the possibility to change any setting (only accessible by Leuze)   The user level are protected by access authorizations and password |
| **REQ\_CONFIG\_01.050** | The following pages are provided:   * Home * Configuration * User settings * Functions * Data * Input/Output * Diagnostic * Maintenance |

## Read/Write Functions

|  |  |
| --- | --- |
| Requirement | Description |
| **REQ\_CONFIG\_02.010** | When reading out and writing to the memory areas, the option of switching between hex, binary and ASCII representation is offered |
| **REQ\_CONFIG\_02.020** | When writing to the memory areas, access to memory areas is possible bit by bit to individual memory addresses |
| **REQ\_CONFIG\_02.030** | Automatic coding or decoding (6-bit coding) of UID (for HF) or EPC/UII (for UHF) according to VDA guideline 5500 ff. and GS1 logistics standards is possible |

## Miscellaneous Functions

| Requirement | Description |
| --- | --- |
| **REQ\_CONFIG\_03.010** | The UHF configuration software offers typical application environments (e.g. conveyor line < 2 m/s, conveyor line > 2 m/s, part tracking production line, etc.) that contain optimised parameter sets for the selected application environment. When an application environment is selected, the corresponding parameter set is preset. It is possible to change these parameters individually in expert mode (see user role setting). This function facilitates optimal commissioning for the user and supports the Leuze claim of "usability" |