
User manual

DATAEAGLE 701x 15UI/3mA/10Rel

installed on DATAEAGLE 701x 2G/3G/4G World

Valid from:

- **Firmware version: 01v036**
- **App. version: 03v000**
- **Server version: 50v007**
- **Hardware version: 1.2**



CE



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Chapter 2 Declarations of conformity

2.1 Data logger (DATAEAGLE 701x 2G/3G/4G World)

2.1.1 DATAEAGLE 701x 2G/3G/4G World



EU-Konformitätserklärung

EU Declaration of Conformity

Wir/ We: Schildknecht AG
Name des Anbieters / supplier's name

Anschrift: Haugweg 26
Address 71711 Murr

erklären in alleiniger Verantwortung, dass das(die) Produkt(e)
declare under our sole responsibility that the product(s)

Bezeichnung, Typ oder Model, Bestellnummer
Name, type or model, ordernumber

DATAEAGLE 701x – 2G/3G/4G 17013-4G World
World

mit den Vorschriften folgender Europäischen Richtlinie(n) übereinstimmt:
complies with the requirements of the following European directive(s):

Die Übereinstimmung der bezeichneten Produkte mit den wesentlichen Anforderungen dieser Richtlinie(n) wurde geprüft durch Anwendung folgender harmonisierter Normen:
The compliance of the above products with the essential requirements of this directive(s) was proved by the application of the following harmonized standards:

EMC Directive (2014/30/EU)	EN61000-4-3 (testlevel 3) EN55032 (Class A) EN61326-1	
LVD Directive (2014/53/EU)	EN61010-1	
RED Directive (2014/53/EU)	Safety & Health 3.1a	EN62368-1 EN62368-1+A11:2017 EN62311 EN62479
	EMC 3.1b	EN301489-1 V2.2.3 EN301489-52 V1.1.0
	Radio spectrum efficiency 3.2	EN301511 V12.5.1 EN301908-1 V13.1.1 EN301908-2 V13.1.1 EN301908-13 V13.1.1 EN300328 V2.1.1
RoHS Directive (2015/863/EU)	Prevention 4.1 EN IEC63000	

Murr

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Date of issue

Thomas Schildknecht
CEO



Chapter 3 Specifications

Voltage supply	9...32VDC (+/-10%) Additional information is provided in "Technical details about the energy supply" on page 67.
Power consumption ¹⁾	typ. 15W (without sensors) max. 27W (without sensors)
Integrated rechargeable buffer battery	Rechargeable Li-Po battery with 500mAh for sending a notification in the event of a power failure. Additional information is provided in "Technical details about the integrated rechargeable buffer battery" on page 65.
Housing	Material: Lexan/Noryl Weight: 480g ¹⁾ Degree of protection: IP20 / IP40 (connection area/operating area) Dimensions (WHD) Data logger: 70 x 92 x 63mm (without antenna) Extension modules: 70 x 92 x 57mm
Operating temperature	-20...+60°C
Air humidity	15...90%rH non-condensing
Storage temperature	-40...+85°C
Charging temperature (rechargeable buffer battery)	0 ...+45°C
Display	Data logger: <ul style="list-style-type: none"> • RGB LED to indicate the operating state and error codes Extension modules: <ul style="list-style-type: none"> • LED signalling that the device is ready for operation • LEDs signalling the state of communication of the CAN interface • LEDs to indicate the switching states of the relays
Operation	Button to trigger <ul style="list-style-type: none"> • a new connection establishment if the online connection has been aborted or • a complete device synchronisation with established online connection In both cases, the server assignments are also checked.
System time	Hardware real-time clock with its own buffer battery (service life > 10 years) and automatic time synchronisation with the server. Additional information is provided in "Technical details about the system time" on page 67.
Antenna connector	2 x SMA-F of mobile radio (Main and aux ²⁾)

<p>Universal inputs</p>	<p>15 x analogue or digital ³⁾</p> <p>Modes:</p> <ul style="list-style-type: none"> • 0/0...20mA: Resolution 6,36µA, max. 23,96mA, load 96Ω • 0...2V: Resolution 610µV, max. 2,5V, load 10k086 • 0...10V: Resolution 7,97mV, max. 32V, load 4k7 • Digital: low <0,99V, high >2,31V, max. 32V, load 4k7 • Day counter: min. pulse length 1ms, max. 32V, load 4k7 • Interval counter: min. pulse length 1ms, max. 32V, load 4k7 <p>Additional information is provided in "Technical details about the universal inputs" on page 61.</p>
<p>Outputs</p>	<p>2 x relay on data logger:</p> <ul style="list-style-type: none"> • U_{max}: 32V • I_{max}: 2A <p>2 x relay on input extension:</p> <ul style="list-style-type: none"> • U_{max}: 230V AC • I_{max}: 2A <p>6 x relay on output extension (2 groups for different potentials):</p> <ul style="list-style-type: none"> • U_{max}: 230V AC • I_{max}: 3A ⁴⁾ <p>3 x analogue output on output extension:</p> <ul style="list-style-type: none"> • active, galvanically separated • max. load voltage: 21,5V • max. load (21,5V, 24mA): 890Ω • $I_{out max}$: 24mA <p>Modes:</p> <ul style="list-style-type: none"> • 0-20mA • 4-20mA • 0-24mA <p>Additional information is provided in "Technical details about the outputs" on page 63.</p>
<p>USB interface</p>	<p>1 x mini-B USB 2.0 slave for the connection to a PC. The DeviceConfig configuration program must be installed on the PC to enable communication with the DATAEAGLE 701x 15UI/3mA/10Rel.</p> <p>Additional information is provided in "Technical details about the USB interface" on page 63.</p>

Data memory	Internal flash memory for up to 27.832 measuring cycles Additional information is provided in "Functionality of the internal data memory" on page 40.
Data type	State of the relay of the output extension: u8 (8Bit unsigned) other measurement data: f32 (32Bit floating point)
Data transmission	2G/3G/4G World (DATAEAGLE 701x 2G/3G/4G World): <ul style="list-style-type: none"> • 2G GPRS 900MHz / 1800MHz • 2G GPRS 850MHz / 1900MHz • UMTS B1, B2, B5, B8 • LTE FDD B1, B2, B3, B4, B5, B7, B8, B12, B13, B18, B19, B20, B26, B28 • LTE TDD B38, B39, B40, B41
SIM	The DATAEAGLE 701x 15UI/3mA/10Rel is equipped with an integrated SIM chip.

1) Applies to the maximum configuration consisting of data logger + input extension + output extension. Specifications of the individual components are provided in the relevant user manuals.

2) Only if a DATAEAGLE 701x 2G/3G/4G World is used as data logger.

3) 3 x universal input on data logger and 12 x universal input on input extension

4) applies to a single relay of the group. However, the current on the entire root (CC) must not exceed 6A .



Chapter 4 General specifications

The information in this manual has been compiled with great care and to the best of our knowledge. The manufacturer, however, assumes no liability for any incorrect specifications that may be provided in this manual. The manufacturer is not responsible for direct, indirect, accidental or consequential damages which arise from errors or omissions in this manual even if advised of the possibility of such damages. In the interest of continuous product development, the manufacturer reserves the right to make improvements to this manual and the products described in it at any time and without prior notification or obligation.

Note: *The specifications in this manual are valid as of the versions listed on the front page. Revised versions of this manual are available via the manufacturer's website (see "Contact information" on page 163).*

4.1 Translation

For deliveries to countries in the European Economic Area, the manual must be translated into the language of the respective country. If there are any discrepancies in the translated text, the original manual (German) must be referenced or the manufacturer contacted for clarification.

4.2 Copyright

The copying and distribution of this document as well as the utilisation and communication of its contents to others without express authorisation is prohibited. Contraventions are liable to compensation. All rights reserved.

4.3 General descriptive names

The use of general descriptive names, trade names, trademarks and the like in this manual does not entitle the reader to assume they may be used freely by everyone. They are often protected registered trademarks even if not marked as such.

4.4 Safety instructions

For the connection, commissioning and operation of the DATAEAGLE 701x 15UI/3mA/10Rel , the following information and higher legal regulations of the country (e.g. VDE regulations), such as valid EX regulations as well as the applicable safety and accident prevention regulations for the respective application case must be observed.

Read this manual completely before unpacking, setting up or operating this device. Observe all hazard, danger and warning information. Non-observance can lead to serious injuries to the operator and/or damage to the device.


Ensure that the safety equipment of this measurement instrument is not impaired. Install and use the measurement system only in the manner and method described in this manual.

Important note: *The product is not approved for use outdoors as it is not protected from penetrating moisture and only provides minimal protection against the ingress of dust.*

4.4.1 Use of the hazard warnings

 **DANGER:**
Indicates a potential or threatening hazardous situation that will result in death or serious injuries if not avoided.

 **WARNING:**
Indicates a potential or threatening hazardous situation that can result in death or serious injuries if not avoided.

 **CAUTION:**
Indicates a potential hazardous situation that can result in minor or moderate injuries or damage to this instrument.


Important note: Indicates a situation that can result in damages to this instrument if it is not avoided. Information that must be particularly emphasised.


Note: Indicates a situation that does not result in any injury to persons.

Note: Information that supplements the specifications in the main text.

4.4.2 General safety instructions

 **WARNING:**
Hazardous electric voltage can cause electric shock or burns. Always switch off all of the used power supplies for the device before installing it, completing any maintenance work or resolving any faults.

 **WARNING:**
Ensure that the device is fully deactivated and cannot activate automatically when sending/returning it as air freight. Information on this is provided in chapter "Storage of the product" on page 27. If you have any unanswered questions, contact the manufacturer (see "Contact information" on page 163).

 **WARNING:**
Never use this device in areas where the use of wireless equipment is prohibited. The device must not be used in hospitals and/or in the vicinity of medical equipment, such as heart pacemakers or hearing aids, as their functionality could be compromised by the mobile network modem contained in the device.

 **WARNING:**
Never use this device in potentially explosive atmospheres and in the vicinity of highly combustible areas (fuel stations, storage areas for combustible material, chemical plants and detonation sites) or in the vicinity of flammable gases, vapours or dust.

4.4.3 Safety and preventative measures for handling mobile network modems

The following safety and preventative measures must be observed during all phases of installation, operation, maintenance or repair of a mobile network modem. The manufacturer is not liable if the customer disregards these preventative measures.

 **CAUTION:**
The mobile radio connection must not be used in hazardous environments.

No guarantee of any kind, whether implicit or explicit, is given by the manufacturer and its suppliers for the use with high risk activities.

In addition to the following safety considerations, all directives of the country in which the device is installed must be complied with.

Important note: *No liability shall be assumed at any time and under no circumstances for connections via a mobile network modem for which wireless signals and networks are utilized. The mobile network modem must be switched on and operated in an area where sufficient signal strength is present.*

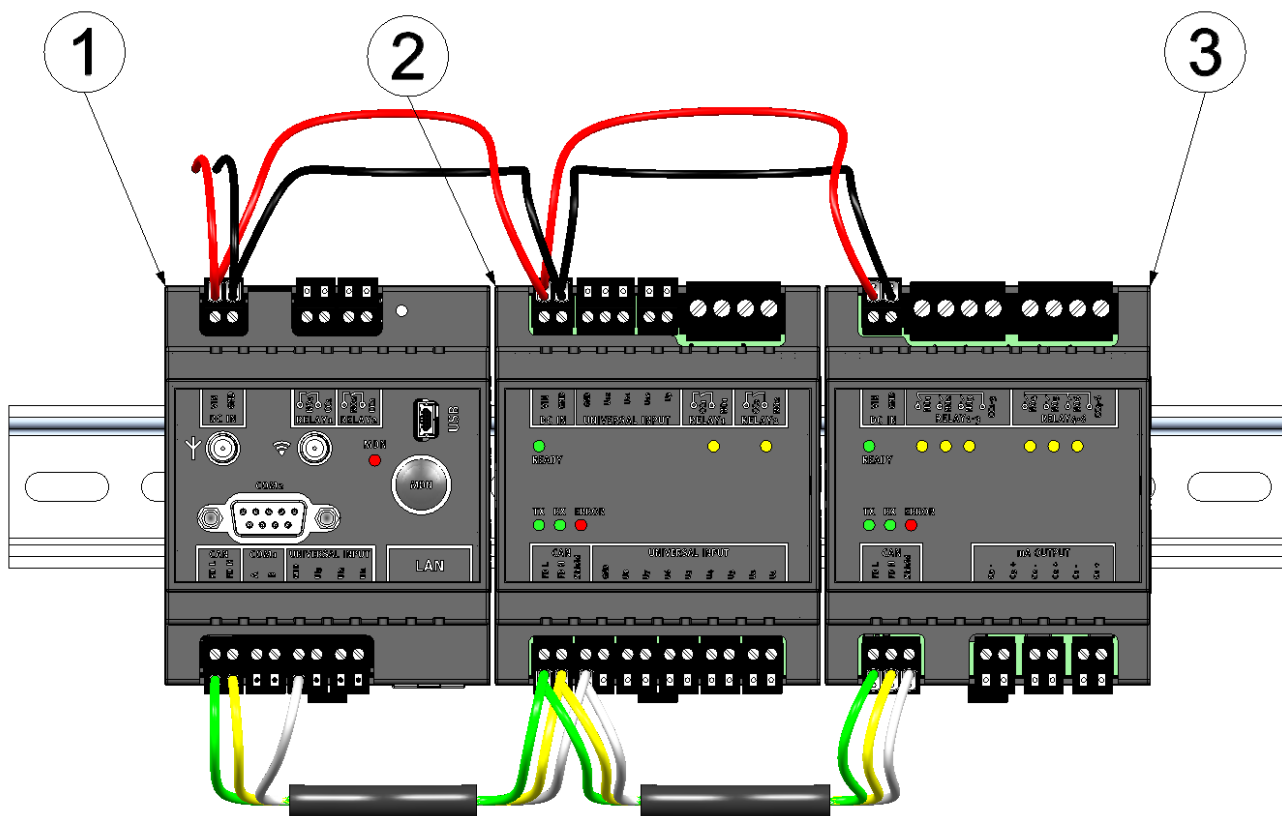
4.4.3.1 Safety and precautionary measures for the mobile network modem installation

- This device must only be installed by a trained technician who applies the recognised installation practices for a radio frequency transmitter including the correct grounding of external antennas.
- The device must not be operated in hospitals and/or in the vicinity of medical equipment such as heart pacemakers or hearing aids.
- The device must not be operated in highly flammable areas such as petrol filling stations, fuel storage sites, chemical factories and explosion sites.
- The device must not be operated in the vicinity of flammable gases, vapours or dusts.
- The device must not be subjected to strong vibrations or impacts.
- The mobile network modem can cause interferences if it is located in the vicinity of television sets, radios or computers.
- Do not open the mobile network modem. Any modification to the device is prohibited and will result in the operating licence being revoked.
- The use of GSM services (SMS messages/data communication/GPRS, etc.) may incur additional costs. The user is solely responsible for any resulting damages and costs.
- Do not install the device in any other way to the one described in the operating instructions. Improper use will invalidate the warranty.

4.4.3.2 Safety measures for installing the antenna

- Only use antennas that are recommended or supplied by the manufacturer.
- The antenna must be installed at a distance of at least 20 cm from individuals.
- The antenna must not be extended outside protected buildings and must be protected against lightning strikes.
- The voltage supply must be switched off before replacing the antenna.

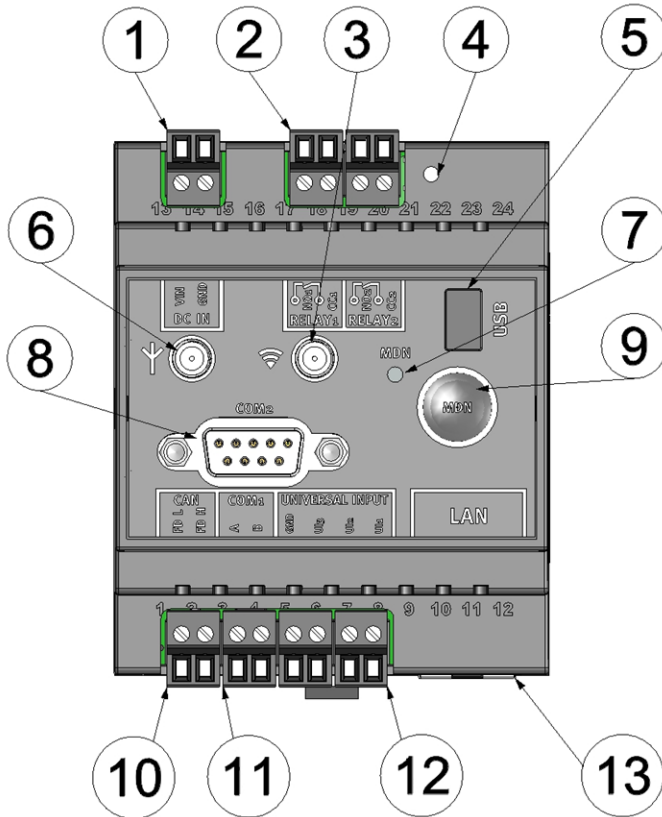
4.5 Overview



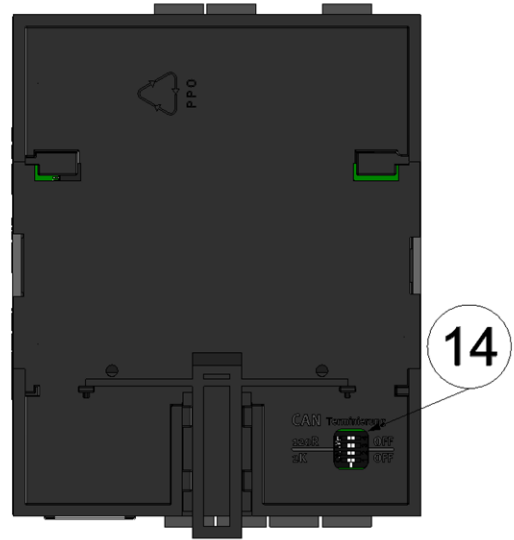
Maximum configuration of the measurement system "DATAEAGLE 701x 15UI/3mA/10Rel "

- | |
|--|
| 1 Data logger (e.g. DATAEAGLE 701x 2G/3G/4G World) |
| 2 Input extension (DATAEAGLE 701x Option 12 UI/2) |
| 3 Output extension (DATAEAGLE 701x Option 3mA/6 Rel.) |

4.5.1 Data logger



Front of the DATAEAGLE 701x 2G/3G/4G World

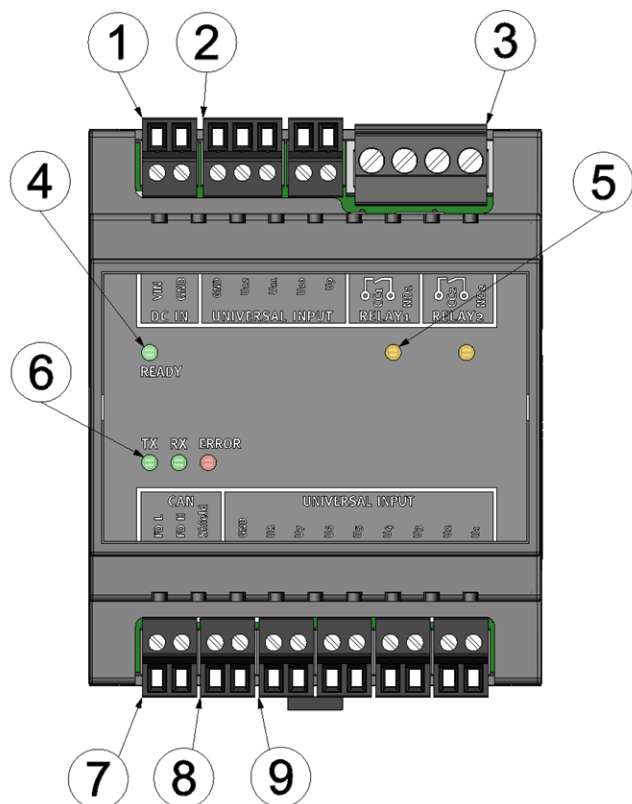


Rear of the DATAEAGLE 701x 2G/3G/4G World

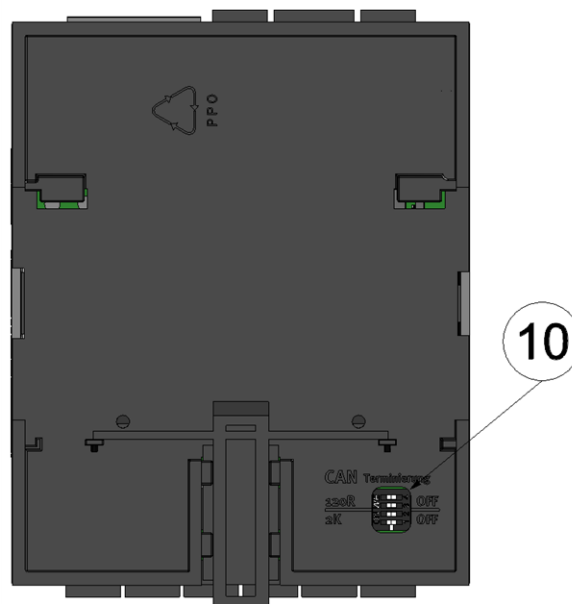
1 Supply (V IN, GND)	8 reserved for extensions
2 Relay 1-2	9 Button to trigger another connection establishment or a complete device synchronisation
3 Connector for the mobile network antenna (Aux) 1)	10 CAN interface for the connection of extension modules
4 Reset button	11 reserved for extension
5 Mini-B USB (only for debugging and device logic update)	12 Universal input 1-3 (incl. GND)
6 Connector for the mobile network antenna (Main)	13 reserved for extensions für Erweiterungen
7 Status LED	14 Dip switch for activating/deactivating the load resistances for the CAN interface

1) Only with DATAEAGLE 701x 2G/3G/4G World

4.5.2 Input extension



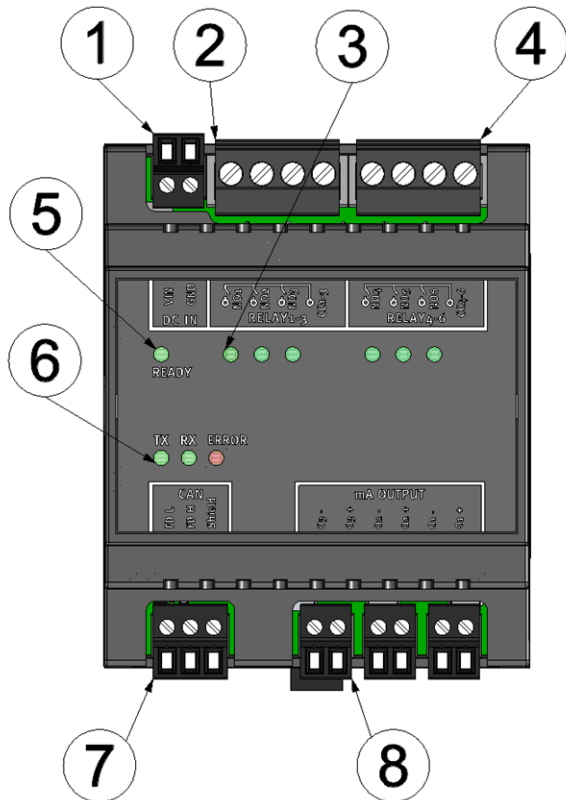
Front of the DATAEAGLE 701x Option 12 UI/2



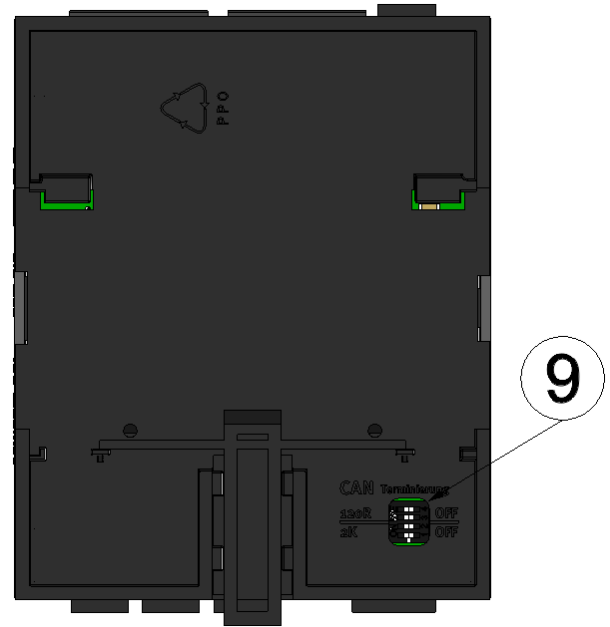
Rear of the DATAEAGLE 701x Option 12 UI/2

1 Supply (V IN, GND)	6 LEDs for displaying the communication state of the CAN interface
2 Universal input 9-12 (incl. GND)	7 CAN interface
3 Relay 1-2	8 Connections for shielding the CAN interface and GND for the universal inputs
4 LED to indicate whether the device is ready for operation	9 Universal input 1-8
5 LEDs for displaying the switching states of the potential-free switching contacts	10 Dip switch for activating/deactivating the load resistances for the CAN interface

4.5.3 Output extension



Front of the DATAEAGLE 701x Option 3mA/6 Rel.

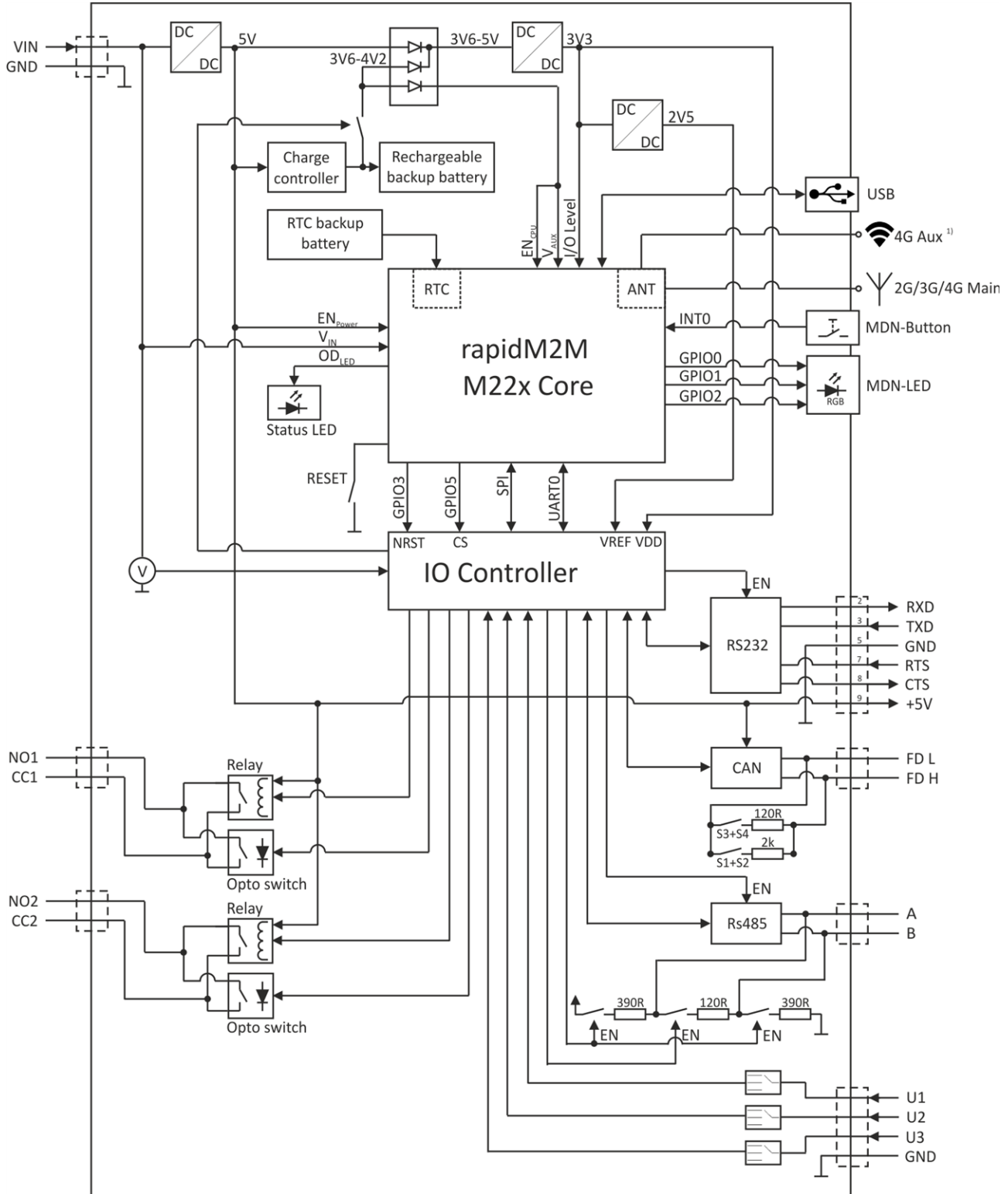


Rear of the DATAEAGLE 701x Option 3mA/6 Rel.

1 Supply (V IN, GND)	6 LEDs for displaying the communication state of the CAN interface
2 Relays 1-3 (group 1 with common root)	7 CAN interface (inkl. Anschluss für die Schirmung)
3 LEDs for displaying the switching states of the potential-free switching contacts	8 Analogue outputs 1-3 (active, galvanically isolated)
4 Relays 4-6 (group 2 with common root)	9 Dip switch for activating/deactivating the load resistances for the CAN interface
5 LED to indicate whether the device is ready for operation	

4.6 Block diagrams

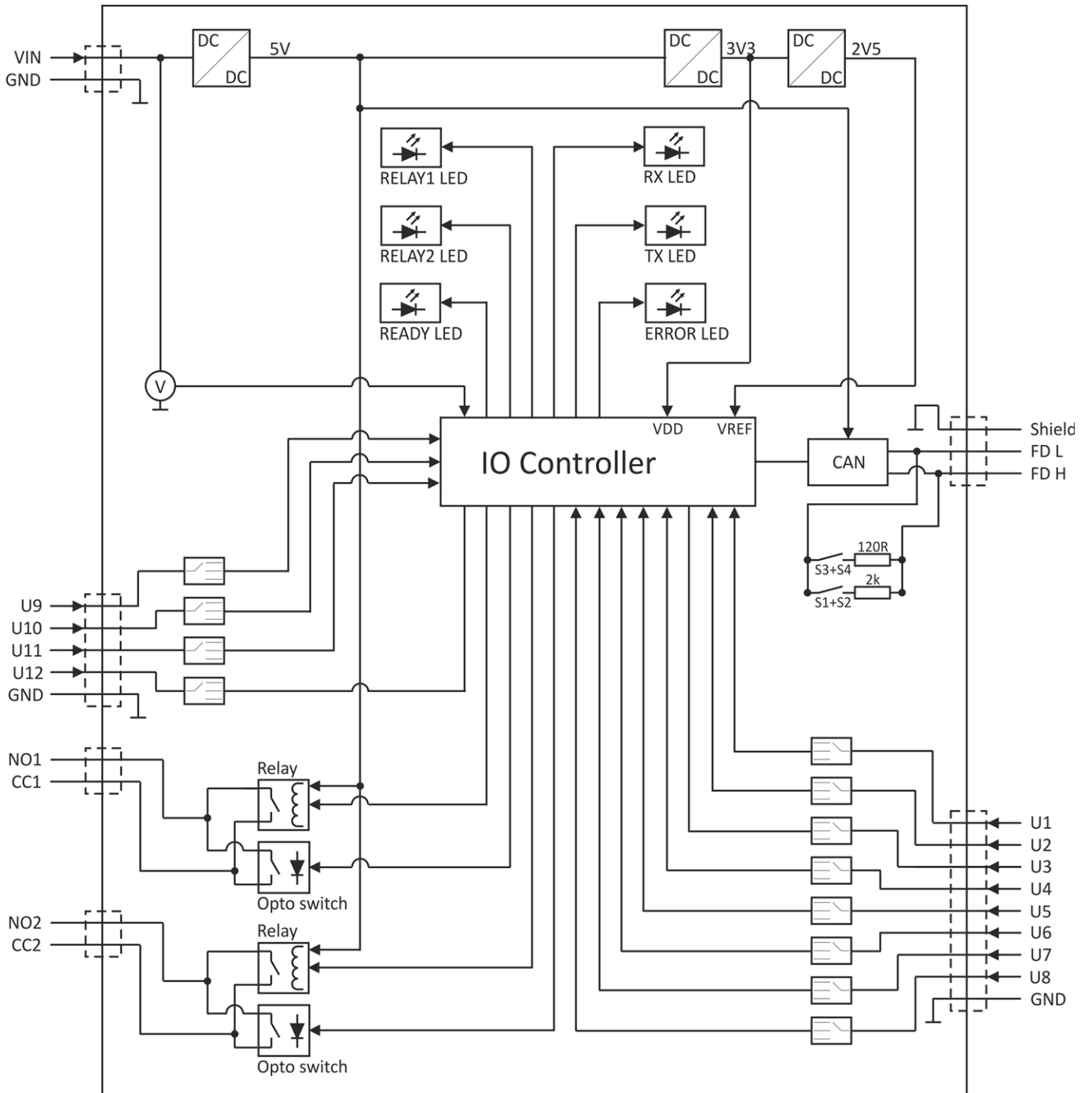
4.6.1 Data logger



Block diagram of the DATAEAGLE 701x 2G/3G/4G World

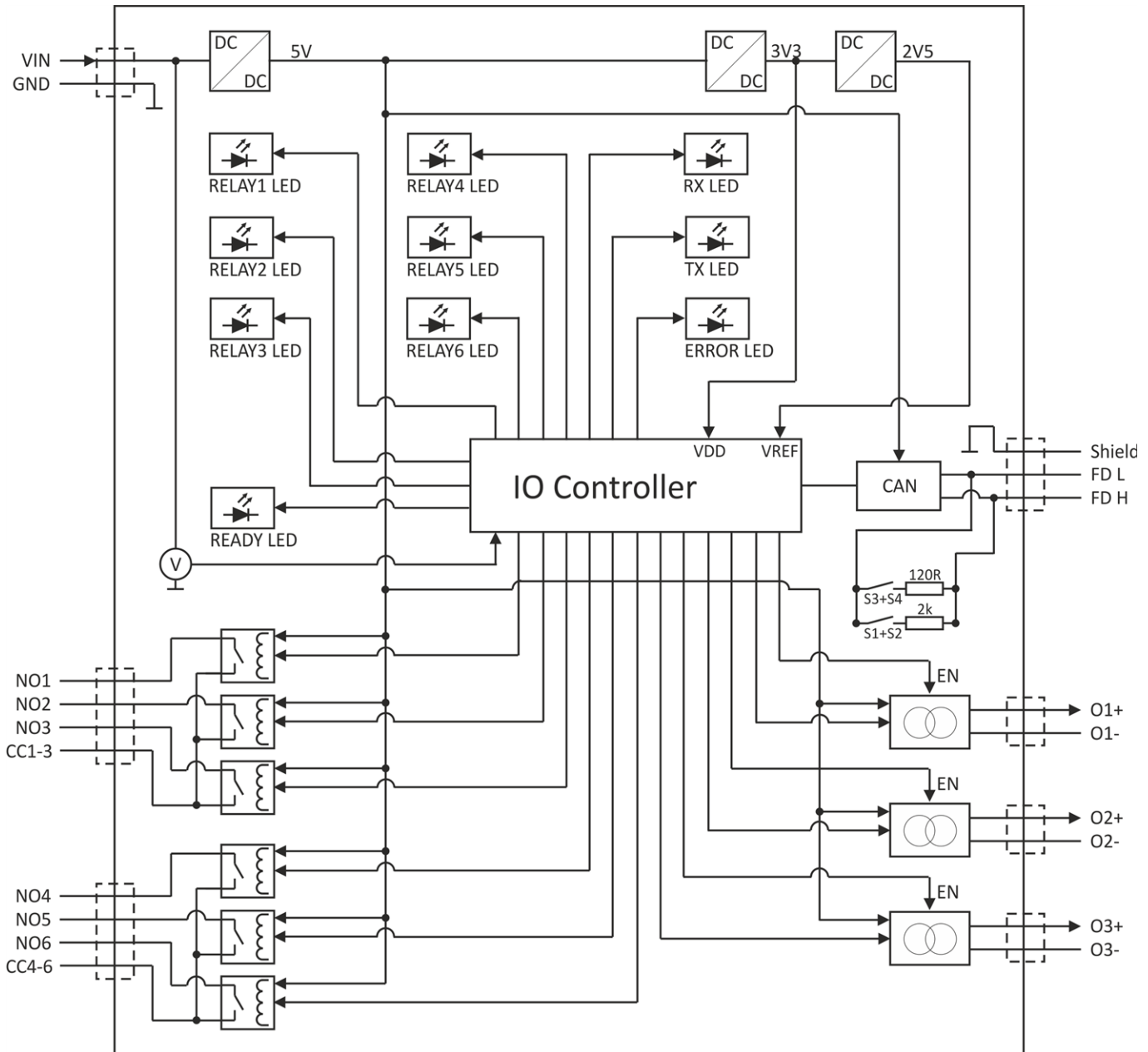
1) Only for DATAEAGLE 701x 2G/3G/4G World

4.6.2 Input extension



Block diagram of the DATAEAGLE 701x Option 12 UI/2

4.6.3 Output extension



Block diagram of the DATAEAGLE 701x Option 3mA/6 Rel.

4.7 Intended use

The stationary, compact measurement system is designed for determining, processing and transferring analogue and digital signals. The device requires a continuous power supply. The measured and recorded data is stored on a non-volatile memory medium. This stored data is sent via the mobile network to a central server for further processing. The measurement system is equipped with an integrated SIM chip for establishing a mobile connection. The maximum permissible limit values specified in chapter "Specifications" on page 11 must be observed. The manufacturer shall not be liable for any operational cases that deviate from these limit values and have not been approved by the manufacturer in writing.

Note: *This device is exclusively intended to be used for the purposes as described before. Any other use or use beyond what is specified or a modification of the device shall be deemed to be not for the intended purpose and is not permitted without the express written consent of the manufacturer. The manufacturer shall not be held liable for any damages that may result from such unauthorised use or modification. The operator alone bears the associated risk.*

Note: *The manufacturer is not liable for data loss of any kind.*

Note: *The integrated SIM chip provides a mobile communications connection to a variety of international service providers. In order to be able to utilise all functions of the device, you must ensure that the device is located in the service area of one of these service providers. You can find a list of all supported countries and associated service providers under www.schildknecht.ag. A Managed Service contract with Schildknecht AG is required for use of the mobile data transmission (see www.schildknecht.ag). This includes the provisioning of the mobile communications connection via the network of the service provider included in the above-mentioned list.*

4.8 General product information

The composed system is a compact, stationary measurement system that can be used for control and regulating tasks in addition to recoding and transferring analogue and digital signals. It is composed of a data logger (see "Suitable data loggers" on page 157) with installed IoT application "DATAEAGLE 701x 15UI/3mA/10Rel", an input extension (DATAEAGLE 701x Option 12 UI/2) and an output extension (DATAEAGLE 701x Option 3mA/6 Rel.). The extensions are optional. I.e. only one or none of the extensions can be used. The communication between the data logger and the extensions takes place via CAN interface, whereas the total length of the CAN bus must not exceed 20m . To simplify matters, the measurement system will be referred to as "DATAEAGLE 701x 15UI/3mA/10Rel ". The DATAEAGLE 701x 15UI/3mA/10Rel requires a constant energy supply. However, the data logger has an integrated rechargeable buffer battery which allows sending a notification in the event of a voltage supply failure (see "Technical details about the integrated rechargeable buffer battery" on page 65).

The following interfaces are available for recording measurement data:

- 3 universal inputs on the data logger that can be operated in different analogue or digital modes,
- 12 universal inputs on the input extension that can be operated in different analogue or digital modes.

Furthermore the following outputs are available for control and regulating tasks, of which the setpoints can be determined wirelessly from a central point:

- 2 x relay on the data logger
- 2 x relay on the input extension
- 6 x relay on the output extension (2 groups for different potentials):
- 3 x analogue output (active, galvanically separated) on the output extension:

The measurement data of the input are determined in an adjustable interval (see "Basic settings" on page 107) and together with the states of the outputs they are temporarily stored in an internal data memory. The recorded data is finally transmitted wirelessly to a central point (i.e. a DATAEAGLE-Portalserver) in a freely selectable interval. This connection is also used to transfer the configurations to the measurement system. To do so, the measurement system has an integrated SIM chip. To manage and display the transferred data, the central DATAEAGLE-Portalserver offers various possibilities. Further information is provided in the user manual of the server ("User manual for DATAEAGLE-Portal-Server " - upon request). The measurement system is also configured via the interface of the relevant DATAEAGLE-Portalserver.

4.9 Device labelling

The specifications in this user manual apply exclusively to the measurement system "DATAEAGLE 701x 15UI/3mA/10Rel ", which is composed of the following components:

- IoT application "DATAEAGLE 701x 15UI/3mA/10Rel"
- Data logger "DATAEAGLE 701x 2G/3G/4G World "
- Input extension "DATAEAGLE 701x Option 12 UI/2 " (optional)
- Output extension "DATAEAGLE 701x Option 3mA/6 Rel. " (optional)

The type plate of the DATAEAGLE 701x 2G/3G/4G World is located on the right side of the device and contains the following specifications:

- Type designation
- Serial number
- Item number
- Voltage supply specifications
- Week and year of production
- Country list profile of the SIM chip
- Environmental conditions during operation
- Degree of protect
- Hardware revision
- Name and address of the manufacturer
- Logo for the EU WEEE Directive
- CE marking



Type plate DATAEAGLE 701x 2G/3G/4G World



Note: This symbol indicates the country list profile (see www.schildknecht.ag) of the SIM chip installed in the device.

The correct specification of the type designation and serial number is important for all queries and spare part orders. Only then can we process requests promptly and properly.

Note: These operating instructions are part of the device and must be available to the user at all times. The safety instructions contained therein must be observed.



WARNING:

It is strictly prohibited to disable the safety equipment or modify its mode of operation.

4.10 Installation of spare and wear parts

Be advised that spare and accessory parts that have not been supplied by the manufacturer have also not been inspected or approved by the manufacturer. The installation and/or use of such products can possibly have a negative impact on the specified constructional properties of the device. The manufacturer shall not be liable for any damages that arise from the use of non-original parts and non-original accessory parts.

4.11 Storage of the product

To safeguard the DATAEAGLE 701x 15UI/3mA/10Rel , ensure that all relevant data was transferred to the DATAEAGLE-Portalserver. Since "online" connection is the only connection type used for the DATAEAGLE 701x 15UI/3mA/10Rel , the determined measurement data is immediately transferred to the DATAEAGLE-Portalserver. The data on the server is therefore always up-to-date and the device can be switched off at any time. It is however still possible that, despite the mechanisms for detecting interruptions of the online connection and establishing a new connection implemented in the device, the DATAEAGLE 701x 15UI/3mA/10Rel is temporarily not connected to the DATAEAGLE-Portalserver. This state is indicated via the status LED which is not constantly green (see "Status LED" on page 74). In this case, initiate a transmission directly on the device using the button (see "Button" on page 73) and then check again to see whether all of the relevant data has now been transferred. Then disconnect all components of the DATAEAGLE 701x 15UI/3mA/10Rel (i.e. datalogger and extensions) from the supply voltage. If possible, switch off the supply voltage before disconnecting the cables from the VIN and GND terminals (see "Connection of the sensors, actuators and the supply" on page 53). The colour of the status LED will then change from green to magenta to indicate that the supply has switched to the internal rechargeable buffer battery. As soon as the DATAEAGLE 701x 15UI/3mA/10Rel has been logged out correctly from the mobile network, the status LED switches off and the remaining cabling as well as the antenna can be removed. The duration of the timespan until the status LED switches off depends on the determined "Alarm/Shutdown delay" in the configuration section "basic settings" (see "Basic settings" on page 107) and on whether an alarm notification should be sent. Store all components of the DATAEAGLE 701x 15UI/3mA/10Rel in the original packaging.

The configuration and most recently determined data are retained. The system time also continues to run thanks to the hardware real-time clock equipped with its own buffer battery. This means that a valid time basis is available immediately following recommissioning (see "Technical details about the system time" on page 67).

4.12 Warranty

The device has been functionally tested before delivery. If it is used as intended (see "Intended use" on page 24) and the operating instructions, the applicable documents(see "Applicable documents " on page 69) and the safety notes and instructions contained therein, are observed, no functional restrictions are to be expected and perfect operation should be possible.

***Note:** Please also note in this regard the next chapter "Disclaimer" on page 28.*

Note: Limitation of warranty

In the event of non-compliance with the safety instructions and instructions in this document, the manufacturer reserves the right to limit the warranty.

4.13 Disclaimer

The manufacturer assumes no liability

- for damages owing to **a change** of this document. The manufacturer reserves the right to change the contents of this document and this disclaimer at any time and without any notice.
- for damages to persons or objects resulting from **failure to comply** with applicable **regulations**. For connection, commissioning and operation of the devices/sensors all available information and higher local legal regulations (e.g. in Germany VDE regulations) such as applicable Ex regulations as well as safety requirements and regulations in order to avoid accidents shall be adhered to.
- for damages to persons or objects resulting from **improper use**. For safety and warranty reasons, all internal work on the instruments beyond from that involved in normal installation and connection, must be carried out only by qualified Schildknecht personnel or persons or companies authorised by Schildknecht .
- for damages to persons or objects resulting from the use of instruments in technically **imperfect** condition.
- for damages to persons or objects resulting from the use of instruments **not in accordance with the requirements**.
- for damages to persons or objects resulting from **failure to comply** with **safety information** contained within this instruction manual.
- for missing or incorrect measurement values or resulting consequential damages due to **improper installation**.

4.14 Obligation of the operator



WARNING:

In the EEA (European Economic Area), the national implementation of the framework directive (89/391/EEC) as well as the associated specific directives and from these in particular, the directive (2009/104/EC) about the minimum safety and health requirements for use of work equipment by workers at work, each in their respective version are to be complied with.

The operator must obtain the local operating licence and the associated documents.

In addition, the operator must comply with the local legal requirements for

- the safety of the personnel (accident prevention measures),
- the safety of the equipment (protective equipment and maintenance),
- the product disposal (waste disposal law),
- the material disposal (waste disposal law),
- the cleaning (cleaning agents and disposal) and
- the environmental protection amendments.

Before commissioning, the operator must ensure that the installation and commissioning – provided these were performed by the operator himself – are in compliance with the local regulations.

4.15 Personnel requirements

Installation, commissioning and maintenance may only be completed by personnel who meet the following conditions:

- Qualified specialist personnel with the relevant training
- Authorised by the facility operator

Note: Qualified personnel

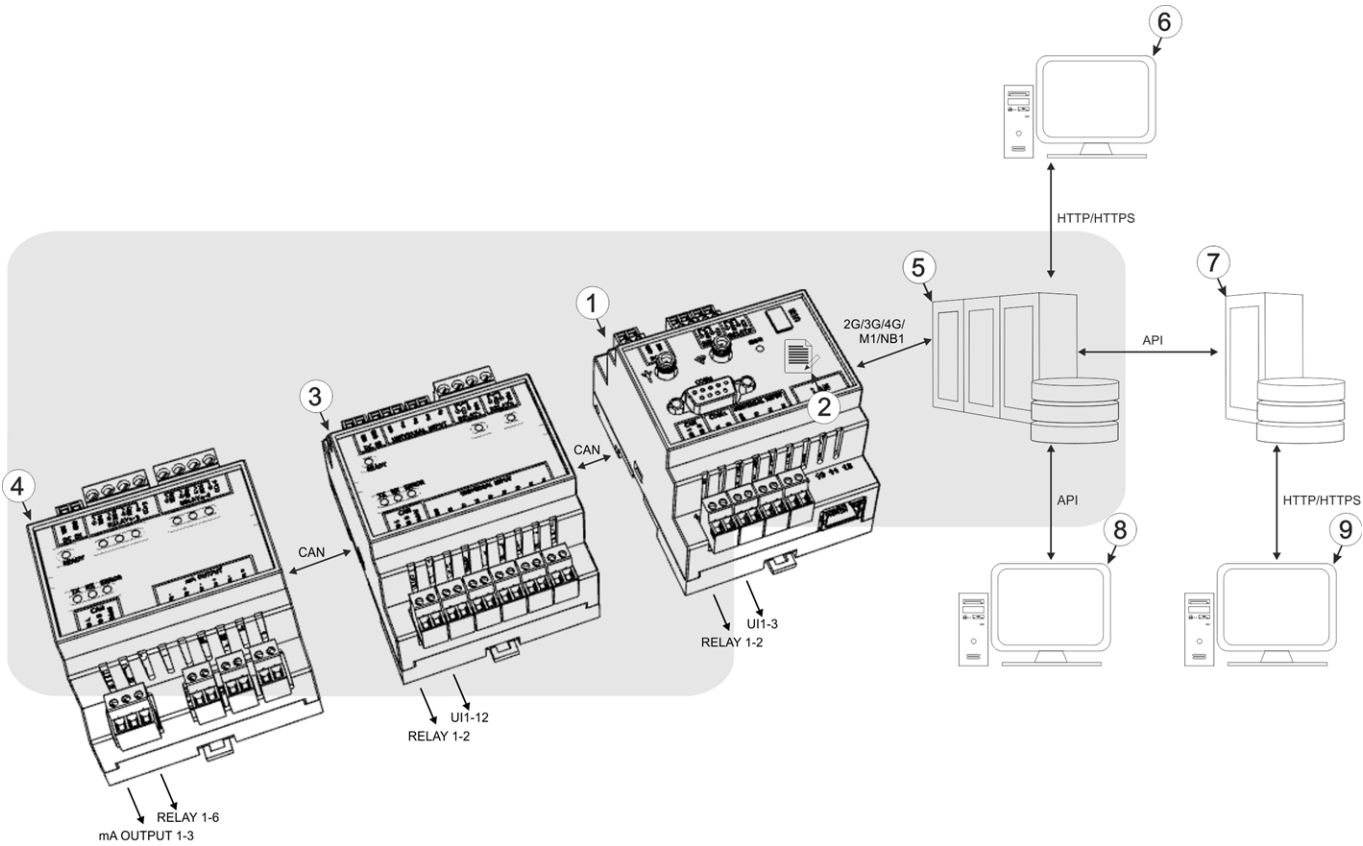
In the context of these instructions and the warnings on the product itself, individuals responsible for the setup, installation, commissioning and operation of the product must have gained relevant qualifications relating to their activities, including, for example:

- *Training, instruction and authorisation to activate/deactivate, ground and label electric circuits and devices/systems in accordance with the standards of safety engineering.*
- *Training or instruction on the maintenance and use of suitable safety equipment in accordance with the standards of safety engineering.*
- *First aid training*



Chapter 5 Functional principle

In the graphic below, all of the components that are part of the "Habitat Schildknecht" are illustrated in grey. All other components must be provided/created by the customer.



Functional principle

1	DATAEAGLE 701x 2G/3G/4G World with integrated Managed Service SIM chip (including data transmission)
2	IoT application "DATAEAGLE 701x 15UI/3mA/10Rel"
3	DATAEAGLE 701x Option 12 UI/2 (optional)
4	DATAEAGLE 701x Option 3mA/6 Rel. (optional)
5	DATAEAGLE-Portalserver to which the data is transferred
6	Client that accesses the interface of the DATAEAGLE-Portalserver via the web browser
7	Customer-specific server that provides clients with their own interface. The customer-specific server obtains the data via the API interface of the DATAEAGLE-Portalserver (see "API" on page 139).
8	Client, on which a PC program is running, that obtains its data via the API interface of the DATAEAGLE-Portalserver (see "API" on page 139)
9	Client that accesses the interface of the customer-specific server via the web browser

Functions and components provided by "Habitat Schildknecht" :

- DATAEAGLE 701x 2G/3G/4G World with installed IoT application "DATAEAGLE 701x 15UI/3mA/10Rel"

Stationary data logger with integrated memory and standardised industrial interfaces (UI1-3, isolated switch contact 1-2) to connect sensors and actuators to the DATAEAGLE-Portalserver (2G/3G/4G/M1/NB1)

- DATAEAGLE 701x Option 12 UI/2 (optional)

Compact, stationary input and output extension with standardised industrial interfaces (UI1-12, isolated switch contact 1-2) to connect sensors and actuators to devices of the DATAEAGLE 701x 2G/3G/4G World family. The DATAEAGLE 701x Option 12 UI/2 is connected to the DATAEAGLE 701x 2G/3G/4G World via a CAN interface.

- DATAEAGLE 701x Option 3mA/6 Rel. (optional)

Compact, stationary output extension with standardised industrial interfaces (RELAY1-6, mA OUTPUT 1-3) to connect actuators to devices of the DATAEAGLE 701x 2G/3G/4G World family. The DATAEAGLE 701x Option 3mA/6 Rel. is connected to the DATAEAGLE 701x 2G/3G/4G World via a CAN interface.

- Managed Service

Managed Service is the basis for operating the devices and provides a wide range of services. Managed Service includes updates for device firmware, mobile data transmission on a global scale and free support - providing you with one contact person for the entire solution.

- DATAEAGLE-Portalserver

Database for saving the measurement data and configurations. Data is either accessed via the API (see "API" on page 139) or the web interface of the server.

Functions and components provided by the customer

- Sensors or actuators

Sensors or actuators that include interfaces that are compatible with the specifications listed in the chapter "Specifications" (see "Specifications" on page 11)

- Customer-specific server with web interface for the clients (optional)

It can be used to create an individual web interface for the clients. Using this method, the data is read out of the DATAEAGLE-Portalserver via the API interface (see "API" on page 139) by the customer-specific server.

5.1 Internal processing of the measurement values

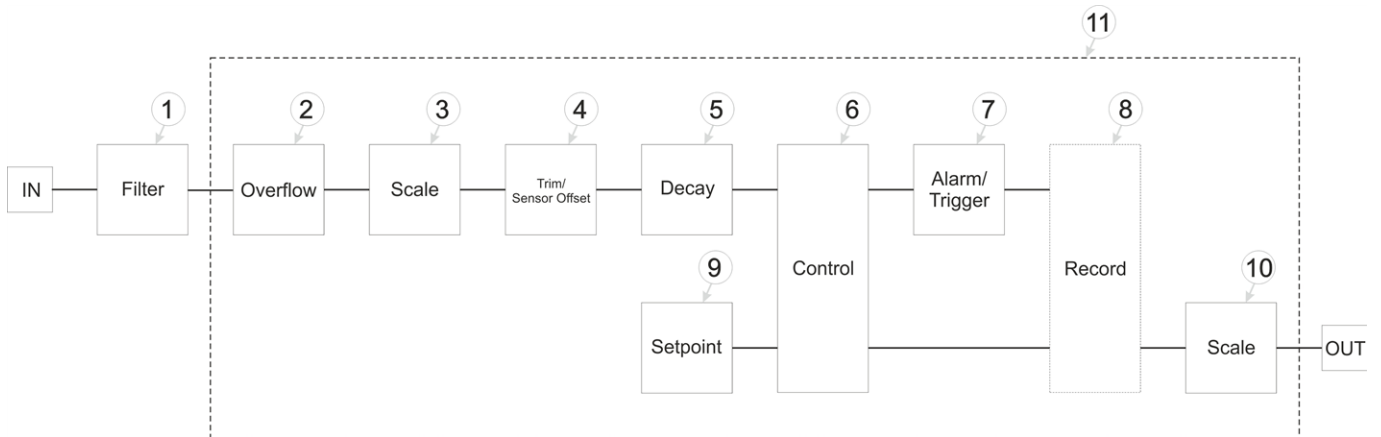


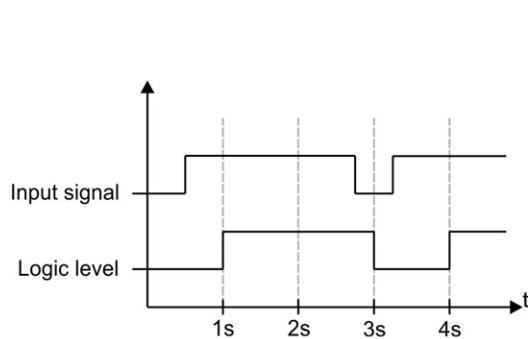
Diagram of the internal processing of the measurement values

<p>1 Filter to compensate for brief signal fluctuations (see "Filter module" on page 34). The filter module is operated permanently.</p>	<p>7 Monitoring of the alarm limits and trigger levels (see "Alarm/trigger module" on page 37)</p>
<p>2 Monitoring of the measurement range limits (see "Overflow module" on page 35)</p>	<p>8 As the record interval and measurement cycle can be selected individually, the measurement values and setpoints are not recorded at the time of every measurement (see "Record module" on page 38).</p>
<p>3 Rescaling from the raw value to the measurement value (see "Scale module (inputs)" on page 35)</p>	<p>9 Specification of the setpoints for the outputs (see "Setpoint module" on page 38)</p>
<p>4 Adds the values entered via the "Trim" and "Sensor offs." configuration parameters to the measurement value (see "Trim/sensor offset module" on page 35)</p>	<p>10 Rescaling from the setpoint to the physical size for the output (see "Scale module (outputs)" on page 39)</p>
<p>5 Decay module to summarise several measurement values (see "Decay module" on page 36)</p>	<p>11 This module chain is started at the time of every measurement and is completed once.</p> <p>For universal inputs that are operated in Digital mode, this module chain (with exception of the control module) is also executed at second intervals to be able to react to level changes as quickly as possible.</p>
<p>6 Determination of the setpoints, (see "Control module" on page 37)</p>	

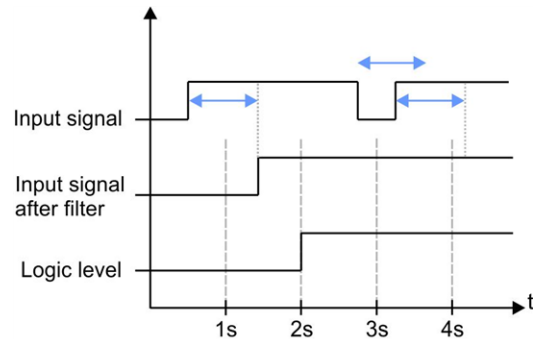
Note: Additional explanation on universal inputs that are operated in Digital mode.

Measurement channels -> Basis		Mode	Digital
Measurement channels -> Config.	↔	Filter time	800ms

Input signal	Input signal at the universal input
Input signal after filter	Input signal taking the "filter time" into consideration
Logic level	The input signal at the universal input is analysed once per second.



Filter module to compensate for brief signal fluctuations disabled ("filter time" = 0)



Filter module to compensate for brief signal fluctuations active ("filter time" not equal to 0)

Explanation: To react to a level change at the universal inputs as quickly as possible, the module chain detailed in "Internal processing of the measurement values" on page 33 (with exception of the control module) for the relevant universal input is operated once per second in Digital operating mode. This ensures that alarms and triggers are detected asynchronously to the measurement cycle. The signal must be present for at least 1 second to definitely detect a pulse safely. Additionally, any brief faults can be eliminated with the help of the "filter time".

5.1.1 Filter module

The filter module is designed to compensate for brief fluctuations to the input signal. This module is only available for the 15 universal inputs.

The following table specifies the relevant parameters for the module:

Configuration section	Mode	Parameter	Explanation
Measurement channels -> Configuration	Digital	Filter time	Time in [ms] during which the signal must remain constant to initiate a level change. Used to suppress brief faults (debouncing).
	Cnt.Day		
	Cnt.Intrvl.		
	4-20mA	Filter time	Time in [ms] during which the analogue signal is averaged for signal smoothing. Used to suppress signal noise (also see "Output channels on the DATAEAGLE 701x 2G/3G/4G World " on page 87).
0-20mA			
0-2V			
0-10V			

5.1.2 Overflow module

This module monitors the measurement range limits of the raw value. If a universal input was, for example, switched to "4-20mA" mode, a raw value of 2mA will violate the measurement range. The overflow module is only available for the 15 universal inputs in "4-20mA", "0-20mA", "0-2V" and "0-10V" channel mode.

The following table specifies the relevant parameters for the module:

Configuration section	Mode/Interface	Parameter	Explanation
Measurement channels -> Configuration	Digital	---	Procedure in the event of measurement range violations
	Cnt.Day		
	Cnt.Intrvl.		
	4-20mA	Overflow	
	0-20mA		
	0-2V		
	0-10V		

5.1.3 Scale module (inputs)

This module rescales the raw value (e.g. mA) to the required measurement value (e.g. mm). The scale module is only available for the 15 universal inputs.

The following table specifies the relevant parameters for the module:

Configuration section	Mode	Parameter	Explanation
Measurement channel -> Basic	Digital	Invert	Inverts the input signal
	Cnt.Day	Impulse	Counted measurand of a pulse in the measurement unit
	Cnt.Intrvl.		
	4-20mA	0%	Start of the measurement range in the measurement unit
	0-20mA		
	0-2V	100%	End of the measurement range in the measurement unit
0-10V			

5.1.4 Trim/sensor offset module

The installation height of the sensor can be taken into consideration with the help of this module. It also enables the zero point to be adjusted without having to change the value for the installation height again. The trim/sensor offset module is only available for analogue modes ("0...20mA", "4...20mA", "0-2V", "0-10V"). The "Trimming" parameter value and the "Sensor offset" parameter value are added to the output value of the scale module (see "Scale module (inputs)" on page 35). This means that a negative prefix must be set for the "Trimming" parameter (see "Additional explanation on the zero point adjustment and installation height of the sensor" on page 78) if the scaled measurement value should be reduced during the zero point adjustment.

The following table specifies the relevant parameters for the module:

Configuration section	Mode	Parameter	Explanation
Measurement channels -> Basic	Digital	---	---
	Cnt.Day		
	Cnt.Intrvl.		
	0-20mA 4-20mA 0-2V 0-10V	Trimming	is used to adjust the zero point
		Sensor offset	indicates the mounting height of the sensor

5.1.5 Decay module

The decay module is designed to summarise several measurement values. The average value over a required time frame or the minimum value within a required time frame can be determined, for example. The decay module is only available for the 15 universal inputs, with the exception of "Cnt.Day" channel mode.

The following table specifies the relevant parameters for the module:

Configuration section	Mode	Parameter	Explanation
Measurement channels -> Configuration	Digital	Decay	Temporal function in the measurement cycle
		Quantity	Number of measurement values taken into consideration during the decay (max. 64). In these modes, a measurement value is created upon expiry of the measurement cycle and when the input signal level is changed. The changes to the inputs are monitored at one second intervals.
	Cnt.Day	---	---
	Cnt.Intervl. 0-20mA 4-20mA 0-2V 0-10V	Decay	Temporal function in the measurement cycle
Quantity		Number of measurement values taken into consideration during the decay (max. 64).	

5.1.6 Control module

The control module determines the setpoints for the outputs.

The following table specifies the relevant parameters for the module:

Configuration section	Mode	Parameter	Explanation
Output channels	Off	---	---
	Digital	---	---
Measurement channels - >Trigger	Digital Cnt.Day Cnt.Intrvl. 4-20mA 0-20mA 0-2V 0-10V	D1 ¹⁾	If this checkbox has been selected, the output of the setpoint on the output channel "RELAY1" of the data logger is only released if the trigger is active.
		D2 ¹⁾	If this checkbox has been selected, the output of the setpoint on the output channel "RELAY2" of the data logger is only released if the trigger is active.
Internal channels -> Trigger	---	D1 ¹⁾	If this checkbox has been selected, the output of the setpoint on the output channel "RELAY1" of the data logger is only released if the trigger is active.
		D2 ¹⁾	If this checkbox has been selected, the output of the setpoint on the output channel "RELAY2" of the data logger is only released if the trigger is active.

¹⁾ Only available for the 3 universal inputs of the DATAEAGLE 701x 2G/3G/4G World (i.e. of the data logger) and the internal channels.

5.1.7 Alarm/trigger module

This module monitors the alarm limits and trigger levels and creates an entry in the alarm list if necessary. The alarm/trigger module is available for inputs (universal inputs and internal channels).

All of the parameters of the "Alarms" and "Trigger" tabs of the "Measurement channels" (see "Measurement channels on the DATAEAGLE 701x 2G/3G/4G World" on page 75) and "Internal channels" (see "Internal channels on the DATAEAGLE 701x 2G/3G/4G World" on page 89) configuration sections are relevant to this module.

5.1.8 Record module

The record module records the measurement values. As the record interval and measurement cycle can be selected individually, a record is not saved at the time of every measurement. Depending on the triggers set by the alarm/trigger module, the record interval is modified, the transmission cycle is changed, the transmission is initiated or a new measurement is triggered, if necessary.

The following tables specify the relevant parameters for the module:

Configuration section	Mode	Parameter	Explanation
Measurement channels - >Trigger	Digital Cnt.Day Cnt.Intrvl. 0-20mA 4-20mA 0-2V 0-10V	RI	Execute recording immediately
		XM	Initiate transmission
		RA	The alternative record interval should be used.
		QX	The alternative transmission cycle should be used.
Internal channels -> Trigger	---	RI	Execute recording immediately
		XM	Initiate transmission
		RA	The alternative record interval should be used.
		QX	The alternative transmission cycle should be used.

Configuration section	Parameter	Explanation
Basic settings	Record interval	Time between measurement data recordings
	Alternative record interval	Time between measurement data recordings, if an alternative record interval should be used because of a trigger being initiated

5.1.9 Setpoint module

This module uses the setpoints for the outputs entered via the configuration interface of the DATAEAGLE-Portalserver.

The following table specifies the relevant parameters for the module:

Configuration section	Mode	Parameter	Explanation
Output channels	off	---	--
	Digital	Setpoint	Setpoint (on/off) that should be issued

5.1.10 Scale module (outputs)

This module rescales the setpoint (e.g. mm) into the desired physical size (e.g. frequency) for the output.

The following table specifies the relevant parameters for the module:

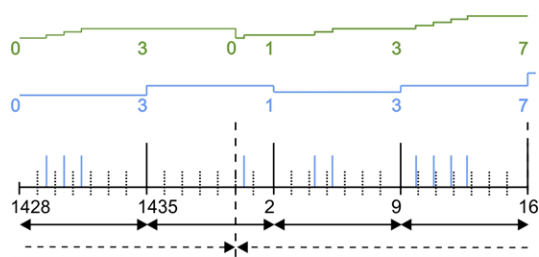
Configuration section	Mode	Parameter	Explanation
Output channels	off	---	---
	Digital	Invert	Inverts the level issued on the device

5.2 Day change

If an input is operated in Cnt.Day mode, all of the pulses up to the day changing time at midnight based on the time zone selected using the "Time zone" parameter are added up. This parameter is located in the "Basic settings" configuration section (see "Basic settings" on page 107). The current counter reading is calculated at the time of every measurement. The counter reading is recorded in the record interval that generates a rising gradient in the measurement value graphics on the DATAEAGLE-Portal server. The highest value of the day equates to the value that was determined during the last record before the day change. At the time of the day change, the temporary memory, in which the counter reading is added up, is set to the difference between the current and last recorded value. This means that if pulses have been detected since the last record before the day change, the measurement value graphic for the new day does not start with 0 but with the calculated counter reading that is dependent on the number of detected pulses. The measurement value graphic for the new day does not start with 0 even if pulses are detected between the day change and first record. The counter reading calculated during the measurement cycle (green line in the following figures) is also required if an unscheduled record should be completed following initiation of a trigger (e.g. by a digital input).

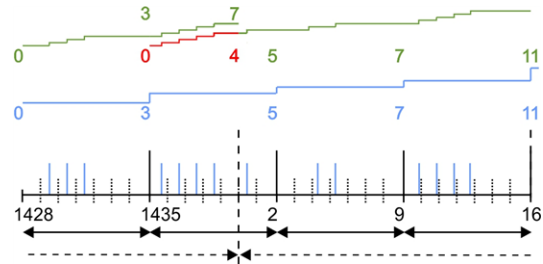
Note: Additional explanation on the day change

	←-----→	Day changing time (cannot be changed)	Midnight	Number of pulses between last record and day change	Red line
"Basic settings" configuration section	←-----→	Measurement cycle	1min.	Calculated counter reading	Green line
	←-----→	Record interval	7min.	Recorded counter reading	Blue line



No new pulses between last record and day change

The counter (green line) is set to 0 when the day changes. A single pulse is detected before the first record. The measurement value graphic (blue line) therefore starts with 1.



New pulses between last record and day change

The counter is set to 4 at the time of the day change so that the pulses detected since the last record are taken into consideration in the first record of the day. Another pulse was also detected before the first record. The measurement value graphic therefore starts with 5.

5.3 Functionality of the internal data memory

Structure	Circular buffer
Total size	27.832 measurement cycles
Number of sectors	8
Sector size	3479 measurement cycles

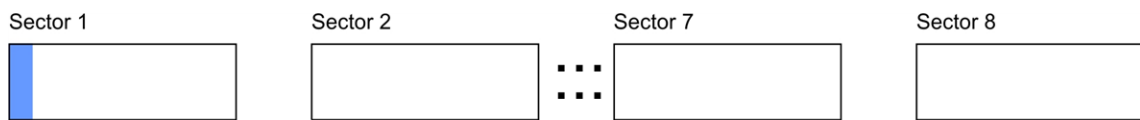
The internal data memory of the DATAEAGLE 701x 15UI/3mA/10Rel is designed as a circular buffer with 8 sectors. If the maximum number of data records (27.832) is achieved, the sector with the oldest data is deleted fully before new data can be saved in this sector again. This means that the internal data memory at the very least contains the measurement values of the last 24.353 cycles, however at most the measurement values of the last 27.832 cycles.

For this reason, it is recommended to coordinate the transmission cycle and record interval in such a way that a maximum of 24.353 measurement cycles have to be recorded between two transmissions. Note, that if the measurement cycle is shorter than the record interval, the record interval still has to be used for the calculation. In this case, the reason for this is that although the measurement is completed in the measurement cycle, the determined data is saved in the data memory in the record interval. If it can be expected that individual transmissions fail due to poor network coverage or the alternative record interval is activated via the trigger, this must also be taken into consideration when calculating the measurement cycles that are to be saved.

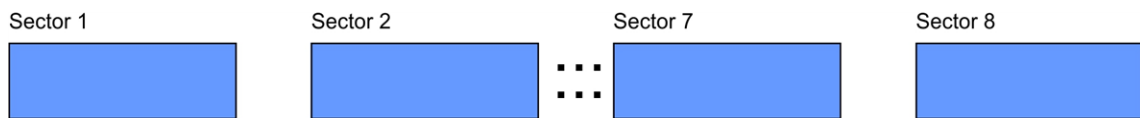
Note:

Additional explanation regarding the functionality of the circular buffer

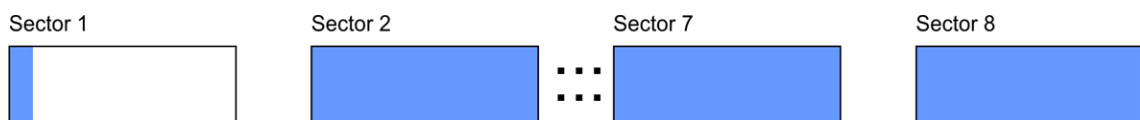
Data memory after the first measurement cycle:



Data memory after 27.832 measurement cycles:



Data memory after 27.832 + 1 measurement cycles:



5.4 Procedure in case of connection aborts

An immediate connection attempt is made if the connection is lost in "online" mode. It is not possible to establish a connection, a standard retry sequence with 2 further attempts after a 2min. delay follows.

If the connection could still not be established, 10 connection attempts are made, each followed by the standard retry sequence with 2 further attempts after a 2min. delay. After a 60min. delay, the sequence of 10 connection attempts is repeated until the connection has been established.

5.5 Automatic selection of the GSM network

The GSM network to which the device should register must be selected, as the DATAEAGLE 701x 15UI/3mA/10Rel is equipped with a SIM chip that provides a mobile connection via a variety of international service providers (see www.schildknecht.ag). This is completed automatically by the device.

5.6 Determining the GSM/UMTS/LTE signal level

The internal update rate of the GSM/UMTS/LTE signal level is 5sec.. Note that the value of the GSM/UMTS/LTE signal level is only read by the system during the measurement cycle and is added to the measurement data.

5.7 Determining the position data

An internal flag is set each time the position cycle expires thus ensuring that the GSM position data will also be determined the next time a connection is established. The position cycle can be selected via the relevant parameter in the "Basic settings" configuration section (see "Basic settings" on page 107). If set to 0, the GSM position data is generated every time a connection is established.



Chapter 6 Storage, delivery and transport

6.1 Inspection of incoming deliveries

Check the shipment immediately upon receipt to ensure it is complete and intact. Immediately report any discovered transport damages to the delivering carrier. Also notify Schildknecht AG in writing about this without delay. Report any incompleteness of the delivery to the responsible representative or directly to the company headquarters of the manufacturer within two weeks (see "Contact information" on page 163).

Note: Any claims received thereafter will not be accepted.

6.2 Scope of supply

Note: All specifications in this user manual apply to the "DATAEAGLE 701x 15UI/3mA/10Rel" measurement system. The components the measurement system is composed of must be ordered individually. A special set with corresponding order number is not available.

The measurement system "DATAEAGLE 701x 15UI/3mA/10Rel" is composed of the following components:

- **Antenna:** see "Antennas" on page 157
- **Data logger:** DATAEAGLE 701x 2G/3G/4G World (see "Suitable data loggers" on page 157)
- **IoT application:** DATAEAGLE 701x 15UI/3mA/10Rel (- upon request)
- **Input extension (optional):** DATAEAGLE 701x Option 12 UI/2 (17015)
- **Output extension (optional):** DATAEAGLE 701x Option 3mA/6 Rel. (- upon request)

Please check further accessories depending on the order against the delivery slip.

6.3 Storage

The following storage conditions must be observed:

DATAEAGLE 701x 2G/3G/4G World	Storage temperature	-40...+85°C
	Humidity	15...90%rH
DATAEAGLE 701x Option 12 UI/2	Storage temperature	-40...+85°C
	Humidity	15...90%rH
DATAEAGLE 701x Option 3mA/6 Rel.	Storage temperature	-40...+85°C
	Humidity	15...90%rH

Store the measurement technology so that it is protected against corrosive and organic solvent vapours, radioactive emissions and strong electromagnetic radiation.

6.4 Transport

Protect the DATAEAGLE 701x 15UI/3mA/10Rel against heavy shocks, bumps, impacts or vibrations. The original packaging must always be used for transport.

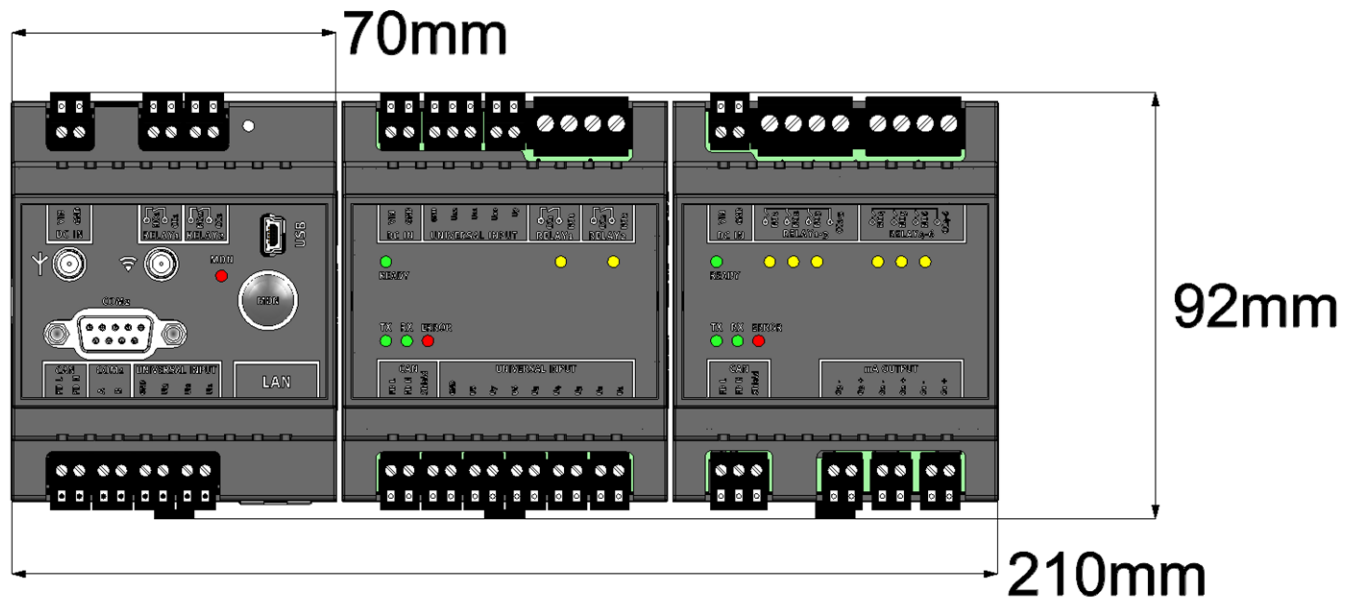
6.5 Return

Every return must be accompanied by a fully field-out return form. This return form is available in the service area of the DATAEAGLE-Portal server. An RMA number is mandatory for any returns and can be obtained from the Support & Service Centre (see "Contact information" on page 163). The return shipment of the DATAEAGLE 701x 15UI/3mA/10Rel must occur in the original packaging and with freight and insurance paid to Schildknecht AG (see "Contact information" on page 163). Insufficiently cleared return shipments will otherwise not be accepted!

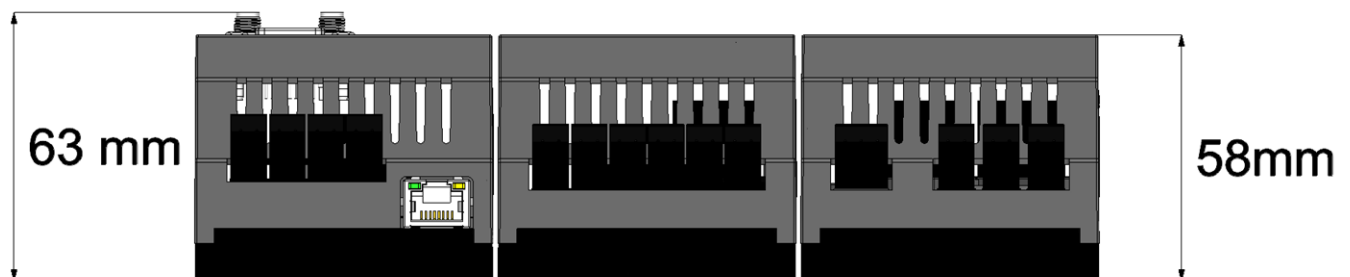
Chapter 7 Installation

Important note: To prevent any damage to the device, the work described in this section of the instructions must only be performed by qualified personnel.

7.1 Dimensions



Dimensions: Width and height



Dimensions: Depth

7.2 Installing the DATAEAGLE 701x 15UI/3mA/10Rel

Important note:

- Ensure installation is completed correctly.
- Comply with existing legal and/or operational directives.
- Improper handling can cause injuries and/or damage to the devices.
- The DATAEAGLE 701x 15UI/3mA/10Rel is not approved for use in closed channels.

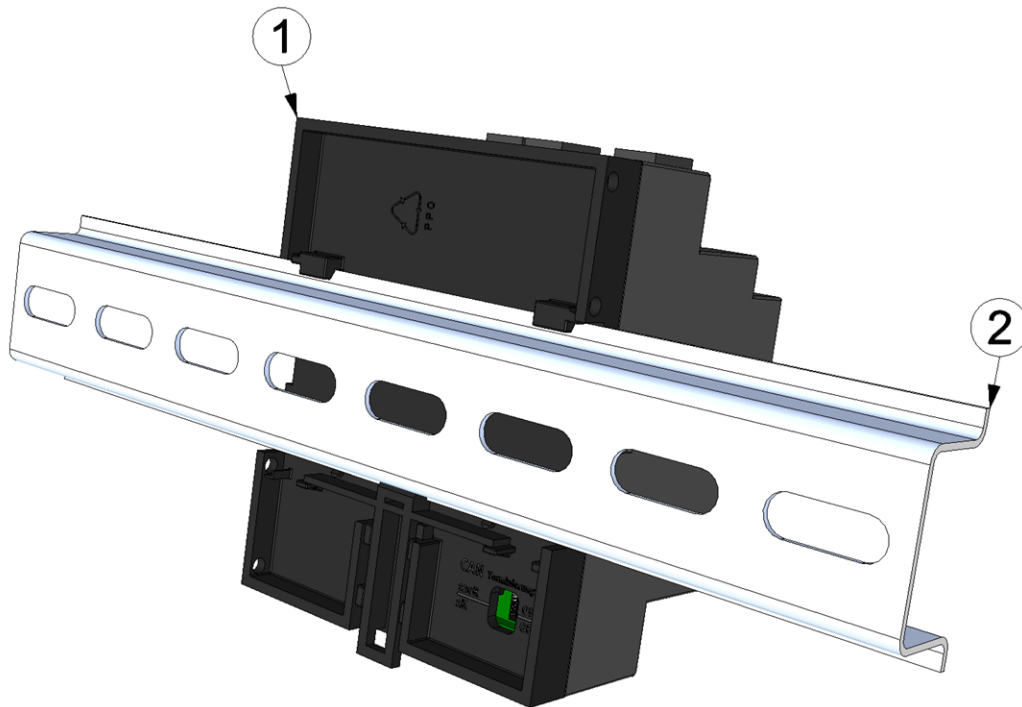
The installation site must be selected according to specific criteria. The following conditions must be avoided in any case:

- Direct sunlight
- Direct weather exposure (rain, snow, etc.)
- Objects that radiate intense heat (maximum ambient temperature: -20...+60°C)
- Objects with a strong electromagnetic field (frequency converter or similar)
- Corrosive chemicals or gases
- Mechanical impacts
- Direct installation on paths or roads
- Vibrations
- Radioactive emissions

Note: Approx. 2-5 cm of space must be left above and below the device for the cable connections. The antenna connections are located at the front of the device. The space required depends on the antennas used. Further information regarding the installation dimensions can be found in the relevant sub-chapter.

7.2.1 Top hat rail assembly

The installation on the top hat rail is carried out in the same way for all components of the DATAEAGLE 701x 15UI/3mA/10Rel (data logger, input extension and output extension) and is described in the following.



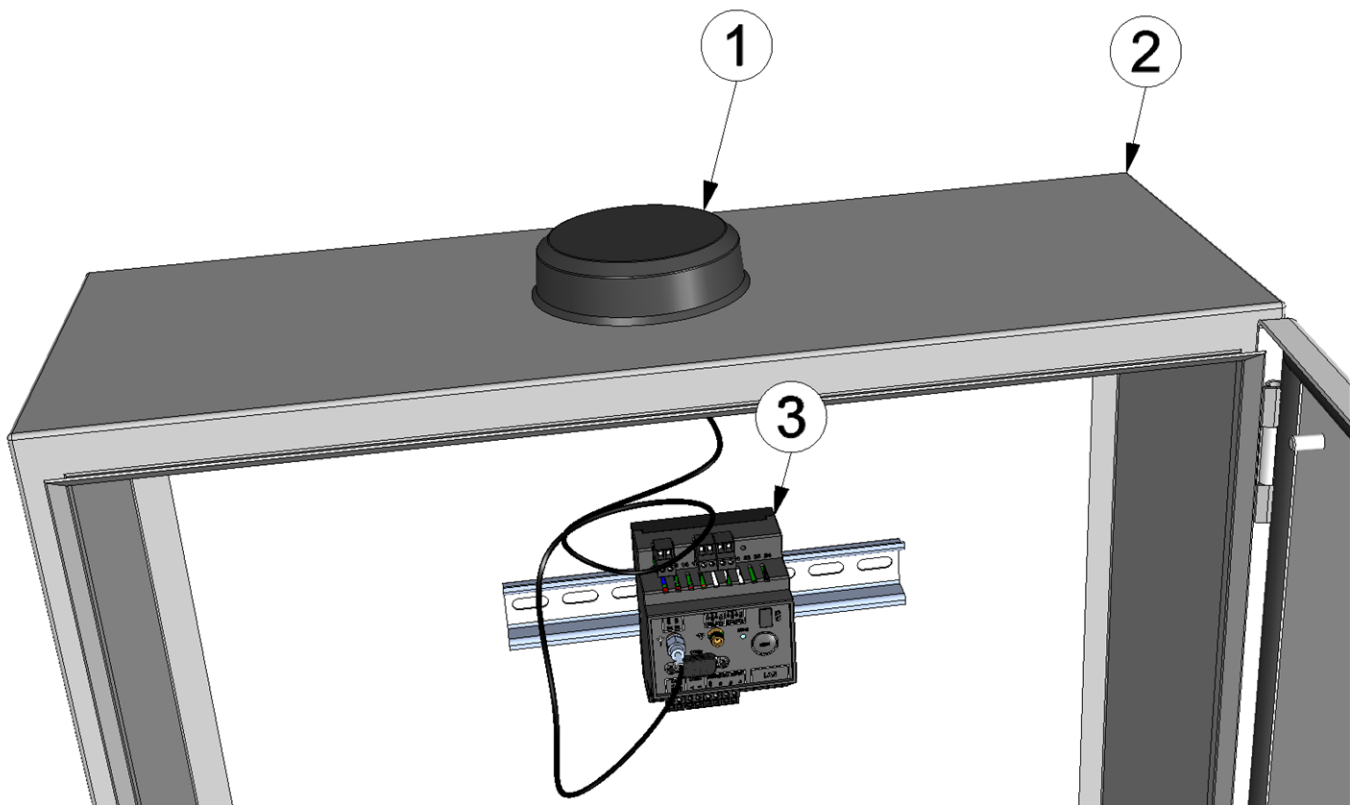
Top hat rail assembly

1 Components of the DATAEAGLE 701x 15UI/3mA/10Rel (e.g. DATAEAGLE 701x 2G/3G/4G World)	2 Top hat rail
--	-----------------------

1. Place the component on to the top edge of the top-hat rail. Turn slightly around the horizontal axis so that the component clicks into the top-hat rail (see figure "Top hat rail assembly" on page 46).

7.2.2 Assembly in a control cabinet

Antennas mounted directly on the DATAEAGLE 701x 15UI/3mA/10Rel are not suitable for assembly within a control cabinet as the mobile network signal is shielded by the metal of the cabinet. In this case, the manufacturer recommends using flat antennas that are available as accessories.



Control cabinet with mounted flat antenna

1 Flat antenna	3 DATAEAGLE 701x 15UI/3mA/10Rel
2 Control cabinet	

7.3 Safety instructions for cabling

Important note: To avoid any damage, always switch off the voltage supply to the device when performing electrical connections.

When connections are made to the DATAEAGLE 701x 15UI/3mA/10Rel , the following warnings and information must be observed, in addition to the warnings and information found in the individual chapters on the installation. Further safety information is included in "Safety instructions" on page 15.

7.3.1 Information on preventing electrostatic discharges (ESD)

Important note: Maintenance procedures that do not require the device to be connected to the power supply should only be performed once the device has been disconnected from the mains power supply to minimise hazards and ESD risks.

The sensitive electronic components inside the device can be damaged by static electricity, which can impair the device performance or even cause the device to fail. The manufacturer recommends the following steps to prevent any damage to the device caused by electrostatic discharges:

- Discharge any static electricity present on your body before handling the electronic components of the device (such as circuit boards and components attached thereto). To do this, you can touch a grounded metallic surface such as the housing frame of a device or a metal pipe.
- Avoid any unnecessary movements to prevent the build-up of static charges.
- Use antistatic containers or packaging to transport components that are sensitive to static.
- Wear an antistatic wristband that is grounded via a cable to discharge your body and keep it free of static electricity.
- Only touch components that are sensitive to electric charges in an antistatic working area. If possible, use antistatic mats and work pads.

7.4 Electrical installation

Important note: Only qualified personnel should undertake the installation described in this chapter of the operating instructions to avoid any damage to the device.

7.4.1 Connection of the extension modules

Important note:

- All wiring work must be performed in the de-energised state!
- Ensure installation is completed correctly!
- Comply with existing legal and/or operational directives!
- Improper handling can cause injuries and/or damage to the instruments!
- Run all data and power cables so that they do not pose a trip hazard and ensure that cables do not have any sharp bends!
- The length of data and current cables must not exceed 30m!

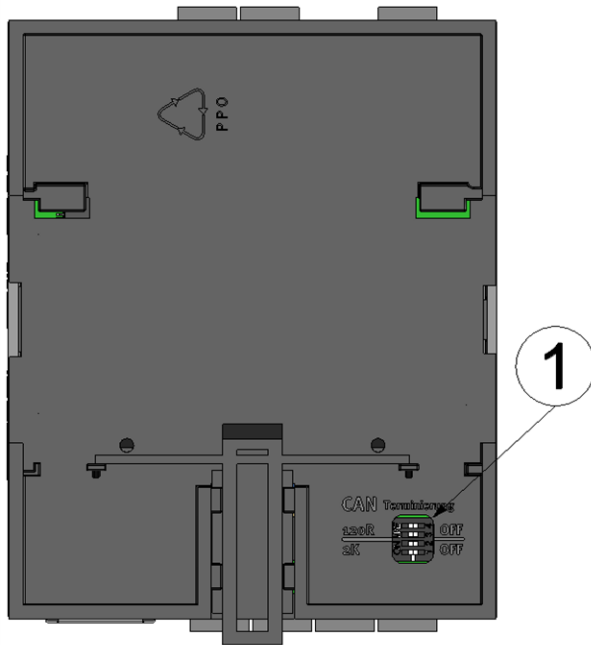
With the DATAEAGLE 701x 15UI/3mA/10Rel it is possible to connect an input extension (DATAEAGLE 701x Option 12 UI/2) and an output extension (DATAEAGLE 701x Option 3mA/6 Rel.) via CAN bus to the data logger (see "Suitable data loggers" on page 157). In doing so, the total length of the CAN bus must not exceed 20m . In addition, no other bus participants except for the extension modules and the data logger should be connected to the CAN bus (i.e. a separate, encapsulated CAN bus is required for the connection of extension modules).

7.4.1.1 CAN bus without branch lines

Important note: All wiring work must be performed in the de-energised state.

1. Set the load resistances for the CAN interface on all of the bus participants (extension modules and DATAEAGLE 701x 2G/3G/4G World) based on the position they will have on the bus. The 120Ω load resistances (S3 and S4 of the dip switch) must be activated on the first and last bus participant.

Note: Setting the load resistances before installation of the devices is recommended as the dip switches to activate/deactivate the load resistances for the CAN interface are located on the rear of the device.

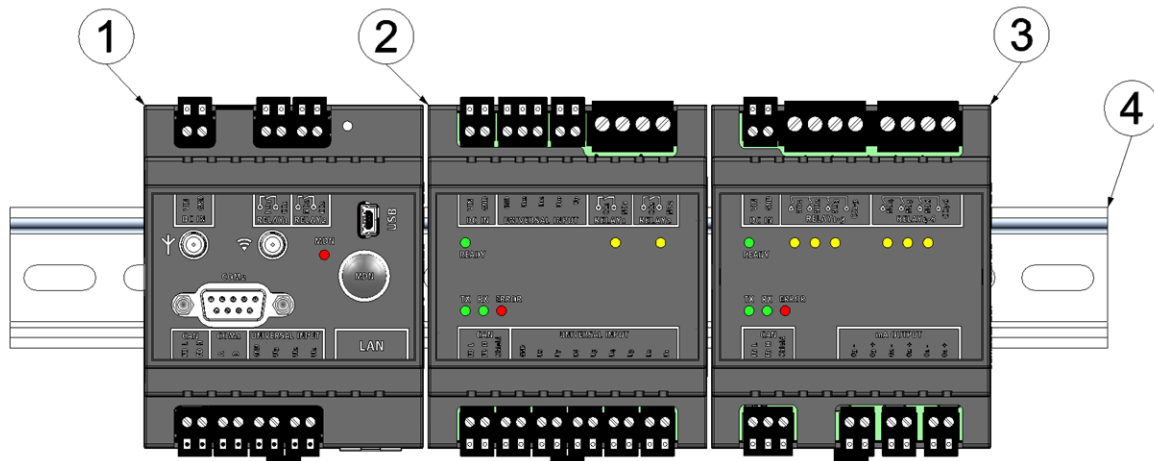


Rear of the DATAEAGLE 701x 2G/3G/4G World or of an extension module

- | |
|--|
| 1 Dip switch for activating/deactivating the load resistances for the CAN interface |
|--|

- Position the DATAEAGLE 701x 2G/3G/4G World and the extension modules in the final installation position (e.g. next to one another on a top-hat rail). Information regarding the correct installation of the DATAEAGLE 701x 15UI/3mA/10Rel is provided in chapter "Installing the DATAEAGLE 701x 15UI/3mA/10Rel" on page 45.

Note: When selecting the installation position for the individual devices, ensure that the total length of the CAN bus 20m must not be exceeded



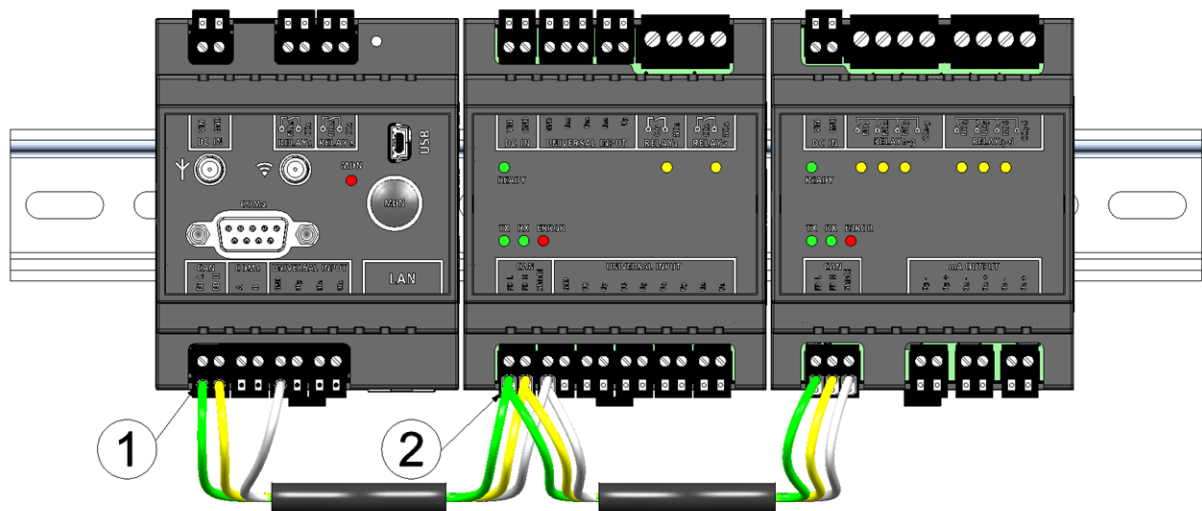
Top-hat rail with DATAEAGLE 701x 2G/3G/4G World and extension modules attached

1 DATAEAGLE 701x 2G/3G/4G World (120Ω load resistance activated)	3 DATAEAGLE 701x Option 3mA/6 Rel. (120Ω load resistance activated)
2 DATAEAGLE 701x Option 12 UI/2	4 Top-hat rail

3. Connect the CAN interface of the DATAEAGLE 701x 2G/3G/4G World with those of the extension modules. All of the "FD L" terminals and all of the "FD H" terminals must be connected with one another during this process. Ensure that no current is present!

Note: Use a shielded cable to connect the CAN interfaces. The "Shield" terminal is available on the extension modules to connect the cable shield. The cable shield on the DATAEAGLE 701x 2G/3G/4G World must be connected to the GND terminal. Use a twin wire end sleeve or distributor terminal if you want to connect several cables to the GND terminal.

Note: As there is only one terminal for each signal on the DATAEAGLE 701x 2G/3G/4G World and on the extension modules, you should use twin wire end sleeves if you want to use more than one extension module.

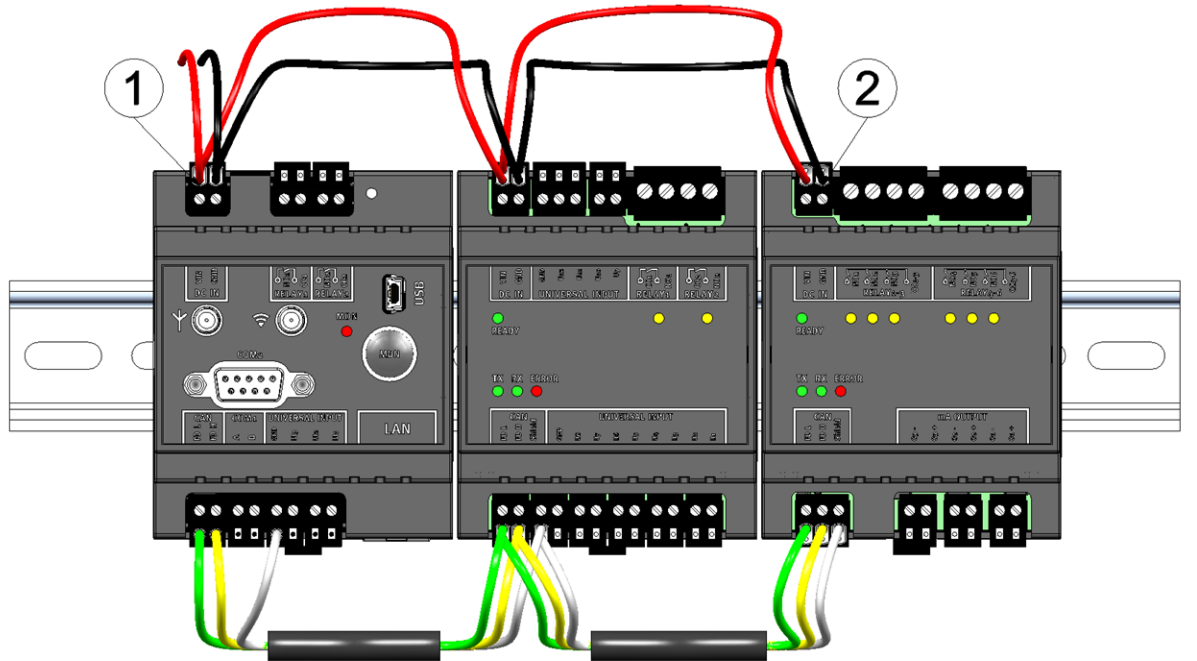


Connecting the cables of the CAN interface

1 Wire end sleeve	2 Twin wire end sleeve (wire end sleeve for two cables)
-------------------	---

4. Connect your sensors and actuators with the inputs and outputs of the DATAEAGLE 701x 2G/3G/4G World and the extension module. Ensure that no current is present!

5. Connect the cables for the power supply of the DATAEAGLE 701x 2G/3G/4G World and the extension modules with the VIN and GND terminals. Ensure that no current is present when establishing the connection. In this case, use twin wire end sleeves if more than one cable should be connected per terminal.



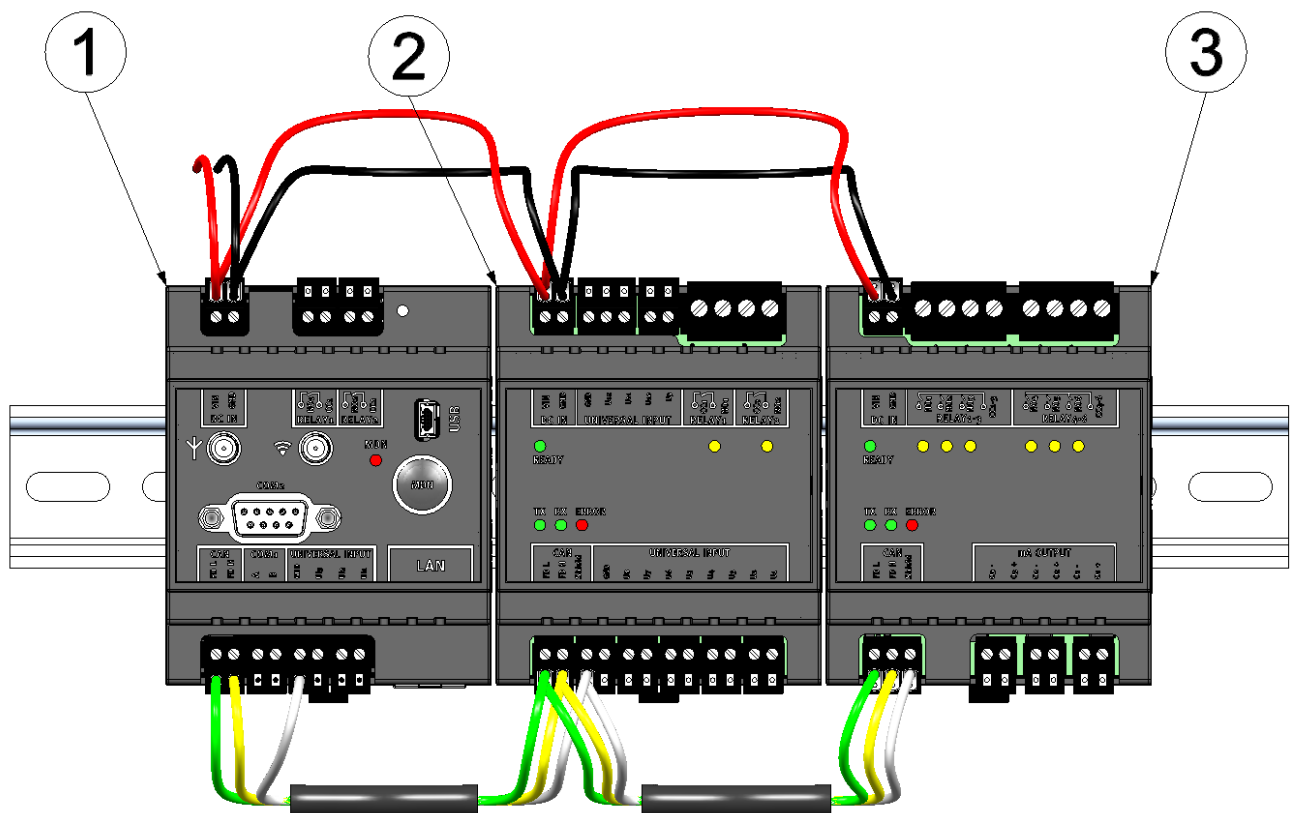
Connecting the power supply

1 Twin wire end sleeve	2 Wire end sleeve
------------------------	-------------------

7.4.2 Connection of the sensors, actuators and the supply

Important note:

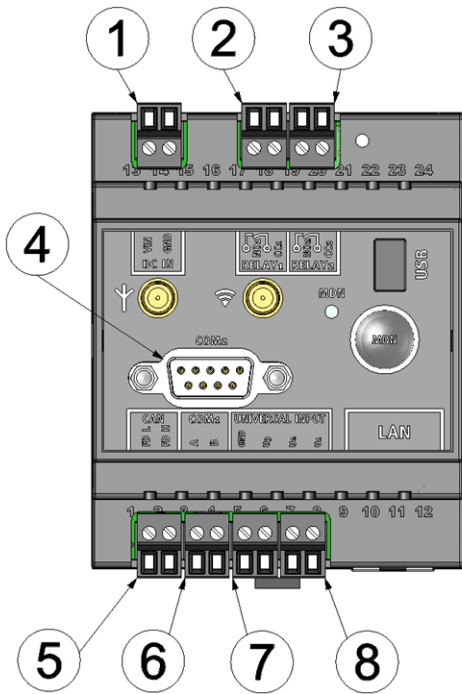
- All wiring work must be performed in the de-energised state!
- Ensure installation is completed correctly!
- Comply with existing legal and/or operational directives!
- Improper handling can cause injuries and/or damage to the instruments!
- Run all data and power cables so that they do not pose a trip hazard and ensure that cables do not have any sharp bends!
- The length of data and current cables must not exceed 30m!



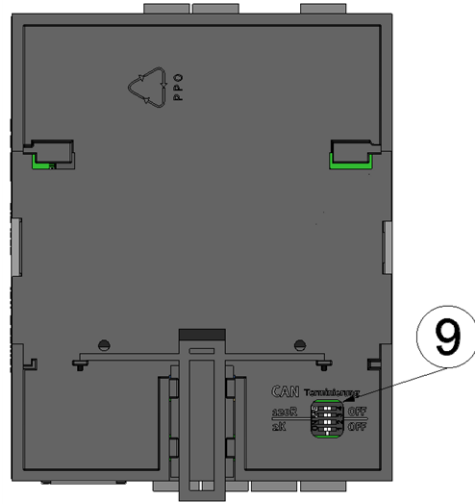
Maximum configuration of the measurement system "DATAEAGLE 701x 15UI/3mA/10Rel "

- | | |
|---|--|
| 1 | Data logger (e.g. DATAEAGLE 701x 2G/3G/4G World) |
| 2 | Input extension (DATAEAGLE 701x Option 12 UI/2) |
| 3 | Output extension (DATAEAGLE 701x Option 3mA/6 Rel.) |

Data logger (e.g. DATAEAGLE 701x 2G/3G/4G World):



Connection of the sensors, actuators and the supply (Front of the DATAEAGLE 701x 2G/3G/4G World)



Connection of the sensors, actuators and the supply (Rear of the DATAEAGLE 701x 2G/3G/4G World)

1 Supply (V IN, GND)	6 Reserved for extensions
2 Relay 1	7 Ground and universal input 1
3 Relay 2	8 Universal input 2-3
4 Reserved for extensions	9 Dip switch for activating/deactivating the load resistances for the CAN interface
5 CAN interface for the connection of extension modules	

DC IN

VIN	Supply voltage: 9...32VDC (+/-10%), max. 9W
GND	Ground

RELAY1

NO1	Operating contact of relay 1 (Normally Open)
CC1	Root of relay 1

RELAY2

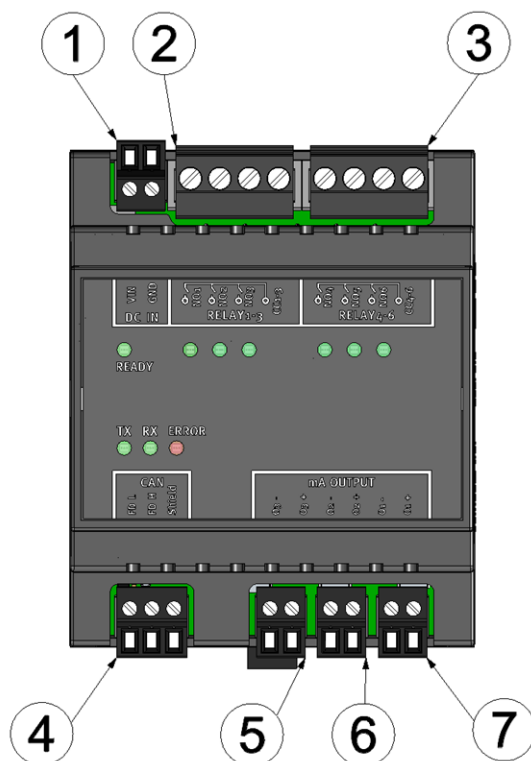
NO2	Operating contact of relay 2 (Normally Open)
CC2	Root of relay 2

CAN

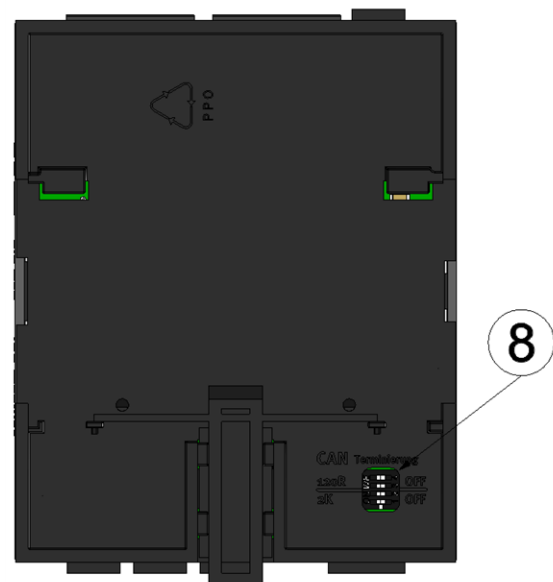
FD L	CAN Low line of the CAN interface
FD H	CAN High line of the CAN interface

UNIVERSAL INPUT

GND	Ground
UI3	Universal input 3
UI2	Universal input 2
UI1	Universal input 1

Input extension (DATAEAGLE 701x Option 12 UI/2):

Connection of the sensors, actuators and the supply (Front of the DATAEAGLE 701x Option 3mA/6 Rel.)



Connection of the sensors, actuators and the supply (Rear of the DATAEAGLE 701x Option 3mA/6 Rel.)

1 Supply (V IN, GND)	5 Analogue output 3 (active, galvanically separated)
2 Relays 1-3 (group 1 with common root)	6 Analogue output 2 (active, galvanically separated)
3 Relays 4-6 (group 2 with common root)	7 Analogue output 1 (active, galvanically separated)
4 CAN interface (incl. connection for shielding)	8 Dip switch for activating/deactivating the load resistances for the CAN interface

DC IN

VIN	Supply voltage: 9...32VDC (+/-10%), max. 9W
GND	Ground

RELAY 1-3

NO1	Operating contact of relay 1 (Normally Open)
NO2	Operating contact of relay 2 (Normally Open)
NO3	Operating contact of relay 3 (Normally Open)
CC1-3	Common root for relays 1-3

RELAY 4-6

NO4	Operating contact of relay 4 (Normally Open)
NO5	Operating contact of relay 5 (Normally Open)
NO6	Operating contact of relay 6 (Normally Open)
CC4-6	Common root for relays 4-6

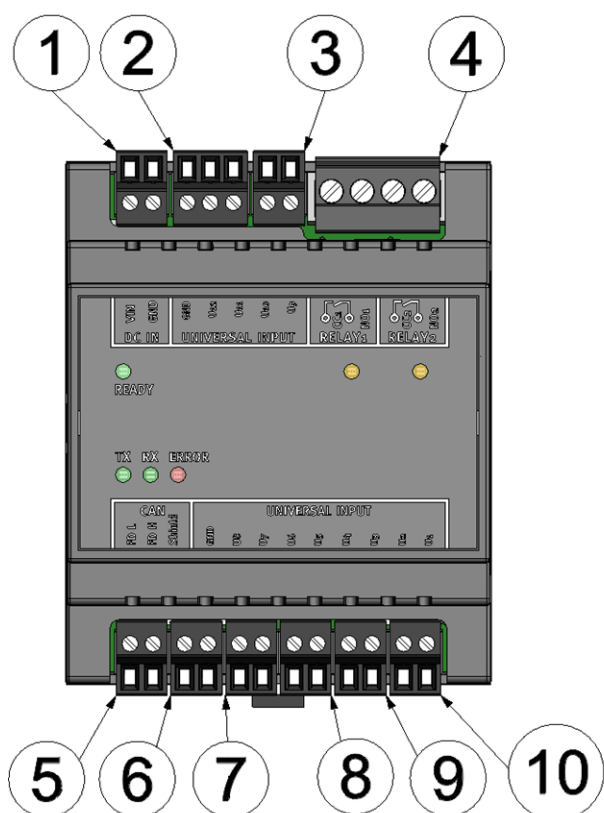
mA OUTPUT

O3-	Ground (analogue output 3)
O3+	mA output signal (analogue output 3)
O2-	Ground (analogue output 2)
O2+	mA output signal (analogue output 2)
O1-	Ground (analogue output 1)
O1+	mA output signal (analogue output 1)

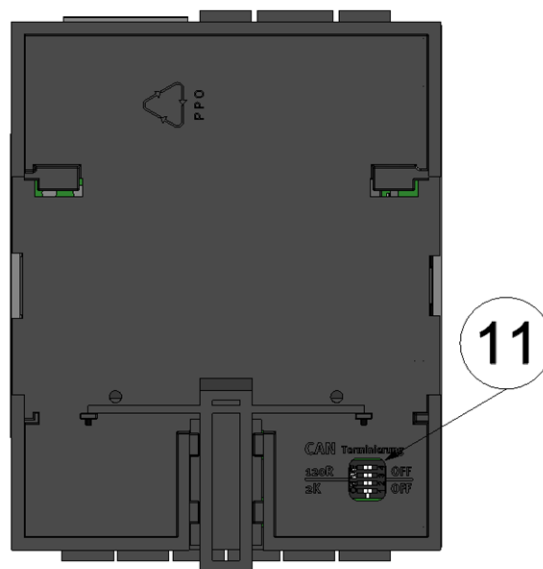
CAN

FD L	CAN Low line of the CAN interface
FD H	CAN High line of the CAN interface
Shield	Shield of the CAN interface

Output extension (DATAEAGLE 701x Option 3mA/6 Rel.):



Connection of the sensors, actuators and the supply (Front of the DATAEAGLE 701x Option 12 UI/2)



Connection of the sensors, actuators and the supply (Rear of the DATAEAGLE 701x Option 12 UI/2)

1 Supply (V IN, GND)	7 Universal input 7-8
2 Ground and universal input 11-12	8 Universal input 5-6
3 Universal input 9-10	9 Universal input 3-4
4 Relay 1-2	10 Universal input 1-2
5 CAN interface	11 Dip switch for activating/deactivating the load resistances for the CAN interface
6 Connections for shielding the CAN interface and GND for the universal inputs	

DC IN

VIN	Supply voltage: 9...32VDC (+/-10%), max. 9W
GND	Ground

UNIVERSAL INPUT

GND	Ground
U12	Universal input 12
U11	Universal input 11
U10	Universal input 10
U9	Universal input 9
GND	Ground
U8	Universal input 8
U7	Universal input 7
U6	Universal input 6
U5	Universal input 5
U4	Universal input 4
U3	Universal input 3
U2	Universal input 2
U1	Universal input 1

RELAY1

NO1	Operating contact of relay 1 (Normally Open)
CC1	Root of relay 1

RELAY2

NO2	Operating contact of relay 2 (Normally Open)
CC2	Root of relay 2

CAN

FD L	CAN Low line of the CAN interface
FD H	CAN High line of the CAN interface
Shield	Shield of the CAN interface

1. Connect your sensors and actuators to the inputs and outputs. Ensure that no current is present! The cable for the supply of the DATAEAGLE 701x 15UI/3mA/10Rel should be connected to the supply terminal with no current present.
2. Connect the antenna (see "Connection of the GSM antenna" on page 60).
3. Switch on the 9...32VDC supply voltage of the DATAEAGLE 701x 15UI/3mA/10Rel .

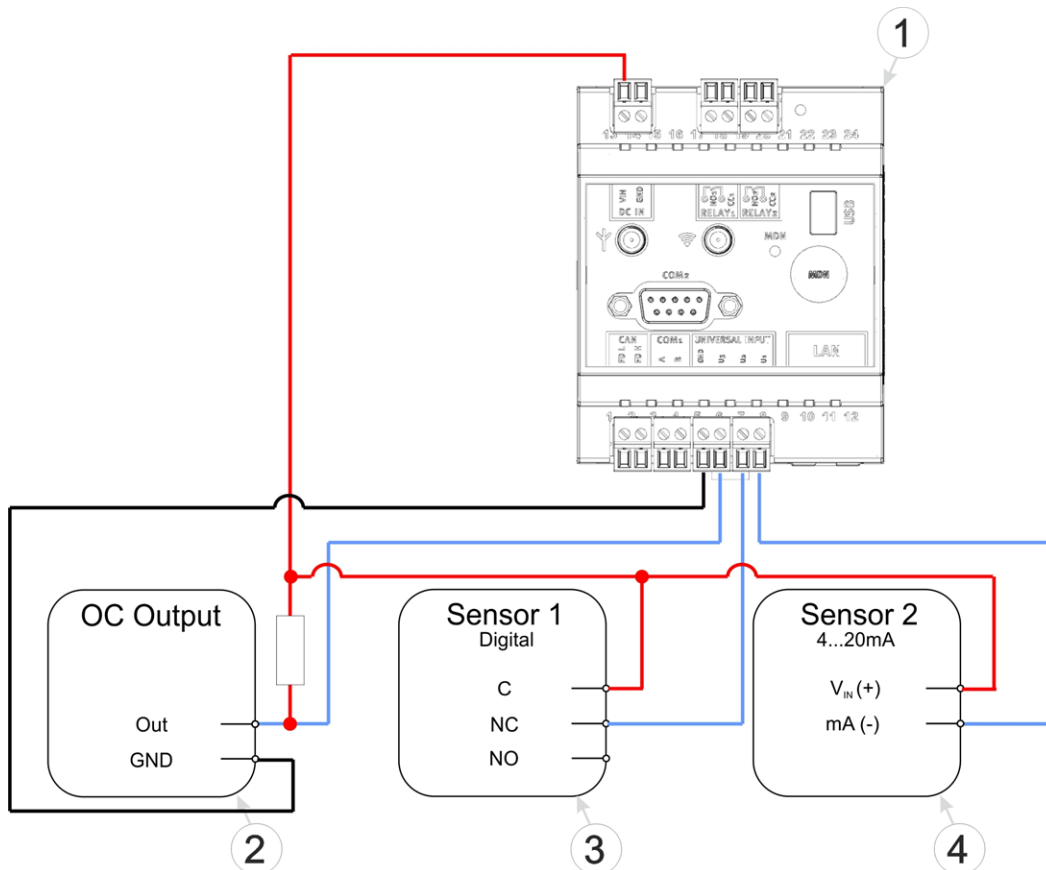
The following step is not mandatory.

4. Check whether the connection to the DATAEAGLE-Portal was established correctly (see "Testing communication with the device" on page 70).

7.4.2.1 Connection examples

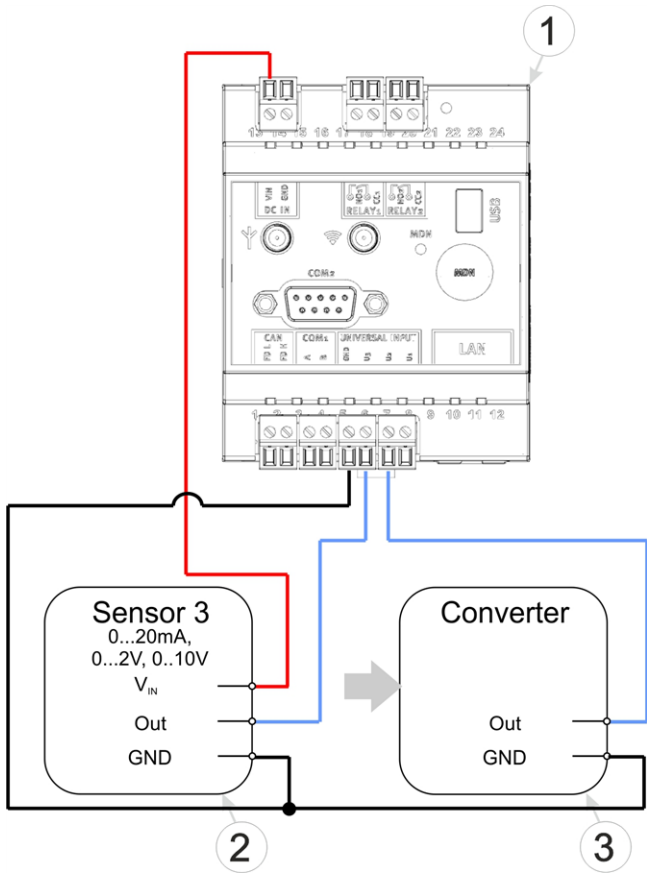
Note: As the universal inputs of the device are not galvanically separated, it is not possible to include the DATAEAGLE 701x 15UI/3mA/10Rel in an existing 4-20mA current loop (e.g. between sensor and SPS). In this case, use a suitable isolation transformer.

7.4.2.1.1 Data logger



Connection examples (OC Output, digital, 4...20mA)

1 Data logger (e.g. DATAEAGLE 701x 2G/3G/4G World)	4 Isolated relay contact
2 Sensor with open collector output	4 2-wire mA sensor



Connection examples (0...20mA, 0...2V, 0...10V, converter)

1 Data logger (e.g. DATAEAGLE 701x 2G/3G/4G World)	3 Signal transformer, isolation transformer
2 3-wire mA sensor or 3-wire U-sensor	

7.4.3 Connection of the GSM antenna

Important note: To ensure the correct functionality, only use antennas that are supplied by the manufacturer.

The standard antenna is directly attached to the antenna connector (see "Overview" on page 18) of the DATAEAGLE 701x 15UI/3mA/10Rel . In the event of a low radio signal strength, you can use the Dome antenna multi band SMA-M 3m (- upon request) or Flat antenna Disc Multi Band 2xSMA-M 2m (- upon request).

If the distance between the antenna position and the DATAEAGLE 701x 15UI/3mA/10Rel is too great, you can use a 2.5m Extension cable for antenna SMA-M/SMA-F 2,5m (17211).

1. Ensure that the DATAEAGLE 701x 15UI/3mA/10Rel is de-energised.
2. If you need an antenna extension, connect this to the antenna first.
3. Connect the antenna extension or antenna directly to the antenna connector of the DATAEAGLE 701x 15UI/3mA/10Rel (see "Overview" on page 18).

Important note: Do not apply too much force when tightening the antenna. Do not use any tools to tighten the antenna or antenna extension; only tighten it manually.

- Switch the voltage supply of the DATAEAGLE 701x 15UI/3mA/10Rel back on.

The following step is not mandatory.

- Check whether the connection to the DATAEAGLE-Portal has worked correctly (see "Testing communication with the device" on page 70).

7.4.4 Technical details about the universal inputs

Note: The universal inputs are not galvanically isolated.

7.4.4.1 0/4...20mA mode

Note: Above 23,96mA, the relevant input becomes highly resistive (safety shutdown to prevent damage to the universal input).

Resolution	6,36 μ A
I _{max}	23,96mA
Load	96 Ω

7.4.4.2 0...2V mode

Resolution	610 μ V
U _{max}	2,5V
Load	10k086

7.4.4.3 0...10V mode

Resolution	7,97mV
U _{max}	32V
Load	4k7

7.4.4.4 Standard digital modes (Digital, day counter, interval counter)

General	U _{max}	32V
	Low	<0,99V
	High	>2,31V
	Load	4k7
Day and interval counter	Minimum pulse length	1ms

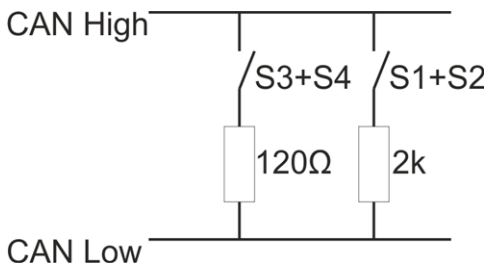
7.4.5 Technical details about the CAN interface

Note: The CAN interface of the DATAEAGLE 701x 15UI/3mA/10Rel is compatible with standard ISO-11898, including the requirements for 24 V.

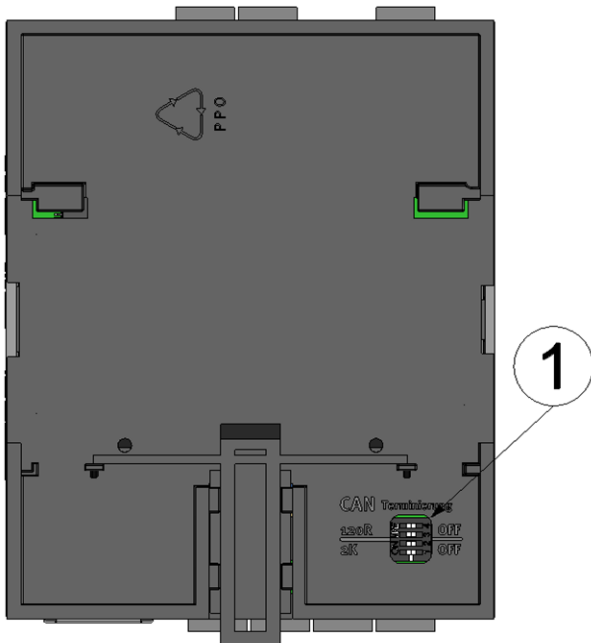
The components of the DATAEAGLE 701x 15UI/3mA/10Rel (i.e. data logger and extensions) are connected via CAN bus (see "Connection of the extension modules" on page 48). No other bus participants should be connected with this CAN bus (i.e. a separate, encapsulated CAN bus is required). The CAN interfaces of the components have no galvanic separation between the CAN bus and the CAN controller. However, the output drivers of the CAN interface are protected against overloading and are not damaged by a short circuit. For components located at the end of the CAN bus, the 120Ω resistance integrated in the device must be activated via S3 and S4 of the dip switch. Neither of the two resistances are active in the delivered condition. The dip switch to activate/deactivate the load resistances is located on the rear of the DATAEAGLE 701x 15UI/3mA/10Rel.

Dip switches SW1

S1 and S2	2k load resistance between CAN high and CAN low
S3 and S4	120Ω load resistance between CAN high and CAN low



Schematic diagram of the switchable load resistances



Position of the dip switches

1 Dip switch for activating/deactivating the load resistances for the CAN interface
--

7.4.6 Technical details about the USB interface

The connection to a PC is established via the USB slave interface. It is only designated for the communication with the DeviceConfig configuration program. A detailed description of the DeviceConfig configuration program is provided in the manual for the DeviceConfig ("User manual for DATAEAGLE-DeviceConfig" - upon request). The DeviceConfig configuration program can be downloaded free of charge from the following website:

<https://www.schildknecht.com/products/download-2/>

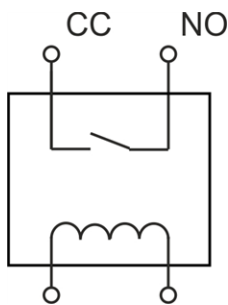
Important note: *If the antenna of the device is earthed or connected to the ground potential of another object (e.g. installation on a control cabinet), remove the antennas before you connect the device with the USB interface of a PC. Otherwise, this can cause a potential displacement between the ground of the antenna and the ground of the PC, which could damage the USB interface of the device.*

7.4.7 Technical details about the outputs

7.4.7.1 Relay on the data logger (NO, CC)

Important note: *The user must ensure that the current on the relay does not exceed 2A .*

In idle state, the make contact of the relay is open (normally open).



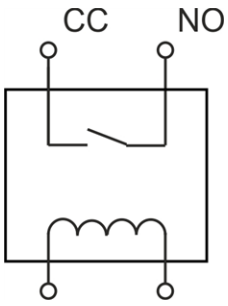
Equivalent circuit diagram for the relay

Proof voltage (CC, NO)	32V AC
galv. separation	1,5kV AC
U_{\max}	32V AC and DC
I	max. 2A
P_{\max}	64VA , 60W

7.4.7.2 Relay on the input extension (NO, CC)

Important note: *The user must ensure that the current on the relay does not exceed 2A .*

In idle state, the make contact of the mechanical relay is open (normally open).



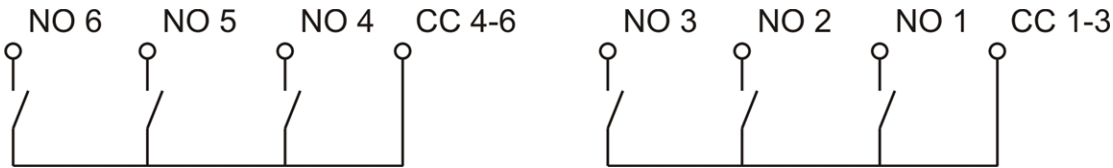
Equivalent circuit diagram for the relay

Proof voltage (CC, NO)	230V AC
galv. separation	1,5kV AC
U_{max}	230V AC , 220V DC
I	max. 2A
P_{max}	125VA , 60W

7.4.7.3 Relays on output extension (RELAY1-3, RELAY 4-6)

3 relays are grouped to a common root. In idle state, the make contact of all relays are open (normally open).

Important note: Up to 3A can flow through each of the relays in a group. However, the current through the common root of a group (CC) must not exceed 6A .



Equivalent circuit diagram for the relays

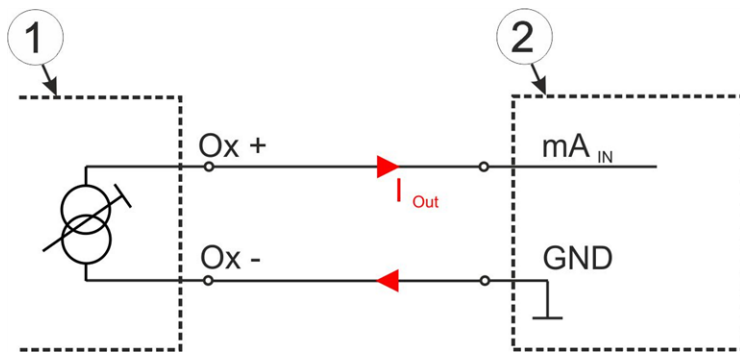
Proof voltage (CC, NO)	230V AC
galv. separation	2,5kV AC
U_{max}	230V AC , 30V DC
I_{max}	3A ¹⁾
P_{max}	750VA

¹⁾ applies to one relay. However, the current through the common root (CC) must not exceed 6A gilt pro Relais.

7.4.7.4 Analogue outputs on output extension (mA OUTPUT)

Note: The analogue outputs of the DATAEAGLE 701x Option 3mA/6 Rel. are active, galvanically isolated current outputs.

max. load voltage	21,5V
max. load (21,5V , 24mA)	890Ω
I_{out}	0-20mA , 4-20mA or 0-24mA (depending on selected mode)
$I_{out max}$	24mA



Schematic diagram: connection of an actuator

1 DATAEAGLE 701x 15UI/3mA/10Rel	2 Actuator (e.g. metering pump controllable via analogue signal)
---------------------------------	--

7.4.8 Technical details about the integrated rechargeable buffer battery

The integrated rechargeable buffer battery enables sending a notification in case of a power failure. However, in order for an alarm to be generated, it has to be activated in the configuration section "basic settings" (see "Basic settings" on page 107) of the "Alarm" parameter.

As soon as the supply voltage falls below 8,65V, the failure report is triggered - provided there is no delay for triggering the failure report set via the "Alarm/shutdown delay" parameter in the configuration section "basic settings" (see "Basic settings" on page 107), or triggering the failure report has not been deactivated via the "Alarm" parameter. In any case, falling below the threshold and switching the power supply to the rechargeable buffer battery and is noted in the device log via the log entry "MODULE INFO (402), 5" and the colour of the status LED switches to magenta. If a delay has been configured, the DATAEAGLE 701x 15UI/3mA/10Rel works as per usual until the end of the delay, apart from the modules that fail when supplied via the rechargeable buffer battery. If the supply voltage increases again above 8,65V during the delay, the supply is switched from the rechargeable buffer battery back to the supply voltage. This is entered in the device log via the log entry "MODULE INFO (402), 1" and the colour of the status LED switches back to green. If the supply voltage is below 8,65V after the delay has expired, the failure report is triggered - provided the failure report has been activated via the "Alarms" parameter.

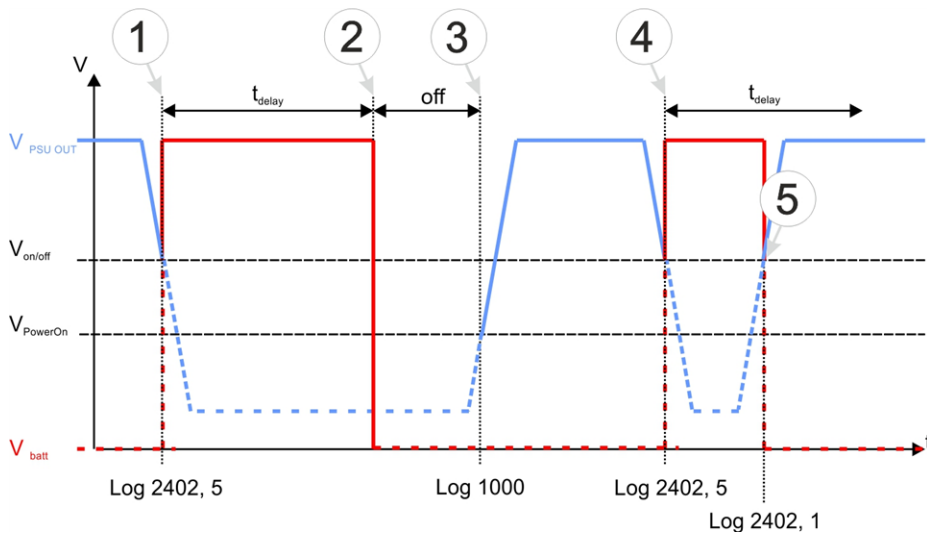
As soon as the DATAEAGLE 701x 15UI/3mA/10Rel is exclusively supplied by the rechargeable buffer battery, the following assembly groups fail:

- Extension modules
- Control of the relays on data logger (i.e. the make contacts switch to idle state "NO")

While the device remains connected to the server to send the failure report, the status LED is switched on in colour magenta. After that, the rechargeable buffer battery is deactivated and the status LED goes out. All operations are terminated and the device is completely deactivated. Only when the supply increases above 7,06V again, the DATAEAGLE 701x 15UI/3mA/10Rel resumes normal operation.

A hardware-regulated controller ensures that the rechargeable buffer battery is only charged when the ambient temperature is in the permitted range (0 ... +45°C).

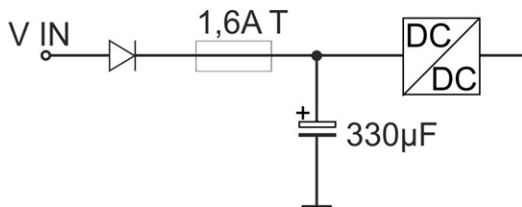
V _{IN}	Supply voltage: 9...32VDC (+/-10%)
V _{on/off}	Threshold for switching between normal operation and the rechargeable buffer battery supply: 8,65V
V _{PowerOn}	Threshold for reactivating the device after it was switched off completely: 7,06V
t _{delay}	Delay for sending a failure report. It is configured via the "Alarm/shutdown delay" parameter which is in the configuration section "basic settings" (see "Basic settings" on page 107).
Backup	Voltage of the rechargeable buffer battery



Supply of the DATAEAGLE 701x 15UI/3mA/10Rel

1	<ul style="list-style-type: none"> • The power supply is switched to the rechargeable buffer battery. • The log entry "MODULE INFO (402), 5" is created. • The device continues to operate normally (except for the components that fail when supplied by the rechargeable buffer battery).
2	<ul style="list-style-type: none"> • The delay for sending the failure report has expired. • The failure report is sent (provided this function has been activated via the "Alarms" parameter). After that, the rechargeable buffer battery is deactivated. Then the DATAEAGLE 701x 15UI/3mA/10Rel is switched off.
3	<ul style="list-style-type: none"> • The supply voltage exceeds the threshold for reactivating the device. • The log entry "POWER ON" is created. • The DATAEAGLE 701x 15UI/3mA/10Rel resumes normal operation again.
4	<ul style="list-style-type: none"> • The power supply is switched to the rechargeable buffer battery. • The log entry "MODULE INFO (402), 5" is created. • The device continues to operate normally (except for the components that fail when supplied by the rechargeable buffer battery).
5	<ul style="list-style-type: none"> • The supply voltage exceeds the threshold for switching to normal operation again. • The delay for sending a failure report has not yet expired. • The log entry "MODULE INFO (402), 1" is created. • NO failure report is set off.

7.4.9 Technical details about the energy supply



Schematic diagram of the energy supply (applies to each component of the DATAEAGLE 701x 15UI/3mA/10Rel)

	DATAEAGLE 701x 2G/3G/4G World	DATAEAGLE 701x Option 12 UI/2	DATAEAGLE 701x Option 3mA/6 Rel.
V IN	9...32VDC (+/-10%)	9...32VDC (+/-10%)	9...32VDC (+/-10%)
Power consumption ¹⁾ (sithout sensors)	typ. 5W max. 9W	typ. 5W max. 9W	typ. 5W max. 9W
Input capacity	330µF	330µF	330µF
Fuse	1,6A T	1,6A T	1,6A T
Reverse voltage protection	yes	yes	yes

¹⁾ applies to ongoing operation. A current peak is caused by the input capacity at the time of activation.

All components of the DATAEAGLE 701x 15UI/3mA/10Rel (i.e. data logger and extensions) are equipped with a relatively large input capacity (330µF). For the DATAEAGLE 701x 2G/3G/4G World , this serves among other things to ensure a reliable switchover to the integrated rechargeable buffer battery in the event of a supply voltage failure. When selecting the power supply please ensure that it is able to supply the required initial current. The supply voltage input is also equipped with a diode to protect against polarity reversal and 1,6A T fuses.

7.4.10 Technical details about the system time

The DATAEAGLE 701x 15UI/3mA/10Rel is equipped with a hardware real-time clock that has its own buffer battery with an expected service life of >10 years. The system time continues to run even if the device is removed from the supply voltage. This means that following recommissioning, valid time stamps for the measurement and log data can be generated immediately. Additionally, the system time is synchronised with the server each time a connection to the DATAEAGLE-Portalserver is established.



Chapter 8 Initial Start-Up

8.1 User information

Before you connect the DATAEAGLE 701x 15UI/3mA/10Rel and place it into operation, you must observe and comply with the following user information!

This manual contains all information that is required for using the device.

Is intended for technically qualified personnel who have the relevant knowledge and experience in the area of measurement technology.

Read this manual carefully and completely in order to ensure the proper functioning of the DATAEAGLE 701x 15UI/3mA/10Rel .

Contact Schildknecht AG(see "Contact information" on page 163) if anything is unclear or if you encounter difficulties with regard to installation, connection or configuration.

8.2 Applicable documents

In addition to this operating instructions, additional instructions or technical descriptions may be required for the installation, commissioning and operation of the entire system.

These instructions are enclosed to the respective additional devices or sensors or are available for download on the Schildknecht website.

8.3 General principles

The entire measurement system may only be placed into operation after completion and inspection of the installation. Study the manual thoroughly before placing into operation to prevent faulty or incorrect configuration.

Utilise the manual to familiarise yourself with the operation of the DATAEAGLE 701x 15UI/3mA/10Rel and the input screens of the DATAEAGLE-Portal server before you begin with the configuration.

8.4 Commissioning the system

Note: *It is recommended that the DATAEAGLE 701x 15UI/3mA/10Rel is first placed into operation in the office before mounting the device permanently at the place of use. During this process, you should create a site for the later operation on the DATAEAGLE-Portalserver (see "Creating the site" on page 135) and determine a site configuration (see "Site configuration" on page 75). Take the opportunity to get to know the functions of the device in a stable environment. You can also use suitable test signals to simulate the sensors to establish the optimum configuration of the DATAEAGLE 701x 15UI/3mA/10Rel prior to its actual first use. This reduces the amount of time required for on-site installation to a minimum.*

The following work should be completed in the office before you go to the future location of the device:

1. If necessary, create a customer on the DATAEAGLE-Portalserver (see "User manual for DATAEAGLE-Portal-Server " - upon request).
2. Within the selected customer, create a site/application based on the "DATAEAGLE 701x 15UI/3mA/10Rel" application for operation on the DATAEAGLE-Portalserver (see "Creating the site" on page 135).
3. Configure the created site/application according to your requirements (see "Site configuration" on page 75).
4. Connect the antenna (see "Connection of the GSM antenna" on page 60).
5. Trigger a connection establishment so that the configuration of the site/application is transferred to the DATAEAGLE 701x 15UI/3mA/10Rel . You can achieve this by establishing the power supply (see "Connecting the sensors, actuators and power supply" on page 46). If a device logic has already been loaded into the device, execute the operations provided in the device logic to trigger the establishment of a connection. You can achieve this by establishing the power supply (see "Connection of the sensors, actuators and the supply" on page 53). The status LED should then start flickering (see "Status LED" on page 74) to signalise the connection establishment.

***Note:** You can also skip this step, as a connection must be established during the installation on site, which transfers the configuration settings to the DATAEAGLE 701x 15UI/3mA/10Rel at the same time.*

6. Then disconnect the cables of the supply voltage from the device preferably in a de-energised state. The colour of the status LED will then change from green to magenta in order to signalise that the supply has been switched to the internal rechargeable buffer battery. After that, wait until the device has shut down in a controlled manner. You can see it has when the status LED is switched off. Ensure that the DATAEAGLE 701x 15UI/3mA/10Rel is completely deactivated. Should the status LED remain switched on for a longer time, you can press the reset button (see "Operating elements" on page 73) to switch it off.
7. Remove the antenna again.

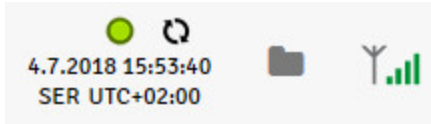
The following tasks are to be completed directly at the deployment site of the device:

8. If you would like to use extension modules, complete all steps described in chapter "Connection of the extension modules" on page 48 before proceeding.
9. Then complete all steps described in chapter "Connection of the sensors, actuators and the supply" on page 53.
10. Check whether the connection to the DATAEAGLE-Portalserver has worked correctly (see "Testing communication with the device" on page 70).

8.5 Testing communication with the device

1. Create a new site/application based on the "DATAEAGLE 701x 15UI/3mA/10Rel" application for operation on the DATAEAGLE-Portalserver (see "Creating the site" on page 135).
2. Configure the created site/application according to your requirements (see "Site configuration" on page 75).
3. Connect the antenna (see "Connection of the GSM antenna" on page 60).

4. You can achieve this by establishing the power supply (see "Connection of the sensors, actuators and the supply" on page 53). The status LED should then start flickering (see "Status LED" on page 74) to signalise the connection establishment.
5. Wait until it is indicated in the list of measurement instruments that the device is connected to the server (rotating arrows).



The following steps are only necessary, if you simultaneously want to test the measurement value acquisition and data transmission..

6. Complete all of the steps detailed in the chapters "Connection of the extension modules" on page 48 and "Connection of the sensors, actuators and the supply" on page 53. This includes connecting the sensors.

Important note: All wiring work must be performed in the de-energised state!

7. Click on the "Direct report" symbol in the list of sites / applications to display the data stored on the DATAEAGLE-Portalserver.



8. Wait until several measurement values have been recorded. The "online" connection type is used for the DATAEAGLE 701x 15UI/3mA/10Rel . In this operating mode, the determined measurement data is immediately transmitted to the DATAEAGLE-Portalserver. I.e. the data displayed on the DATAEAGLE-Portalserver is updated in record interval (see "Basic settings" on page 107).
9. Check whether the data available is up to date and plausible (especially the measurement value "voltage" and "GSM").

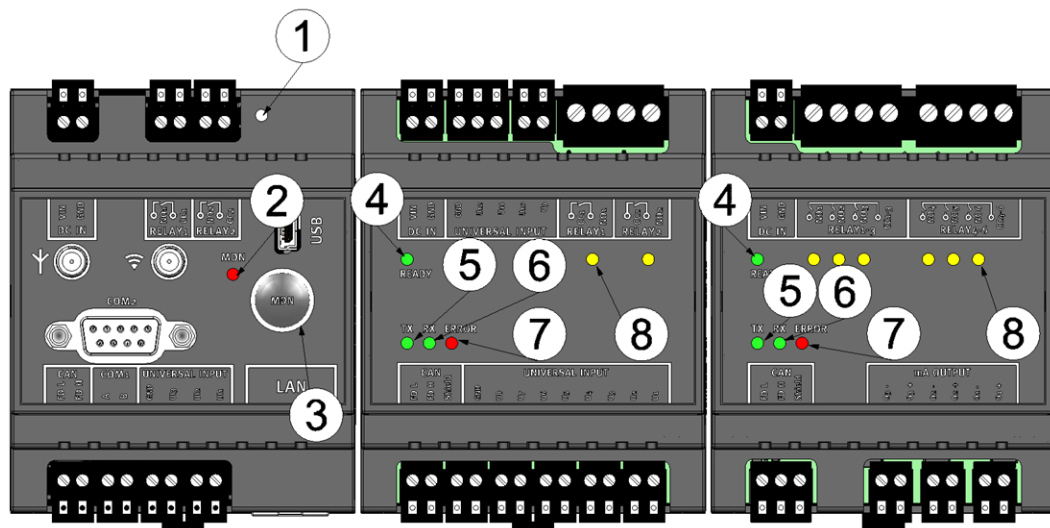


Chapter 9 User interfaces

The configuration of the DATAEAGLE 701x 15UI/3mA/10Rel is carried out via the web interface on the DATAEAGLE-Portal server (see "User interface on the DATAEAGLE-Portalserver" on page 75), which your responsible sales partner will provide to you.

9.1 User interface on the DATAEAGLE 701x 15UI/3mA/10Rel

9.1.1 Operating elements



Operating elements

1 Reset button	5 LED to indicate that data is sent via the CAN interface
2 Status LED	6 LED to indicate that data is received via the CAN interface
3 Button to trigger another connection establishment or a complete device synchronisation	7 LED for displaying communication problems (CAN interface)
4 LED to indicate whether the device is ready for operation	8 LEDs for displaying the switching states of the potential-free switching contacts

9.1.1.1 Button

The button can be used to trigger either a new connection establishment or a complete device synchronisation.

User action	Device reaction	Operation after releasing the button
press and hold for 3sec.	Status LED switches to blue.	<ul style="list-style-type: none"> establishing connection again if the online connection was aborted or complete device synchronisation at established online connection <p>In both cases, the server assignment is checked again.</p>

9.1.1.2 Status LED

The status LED is used both to display the error/status codes and to indicate the current operating state.

The status LED is used both to display the error/status codes and to indicate the current operating state. If the Aloha transmission mode was activated or the power supply was provided (PowerOn), the status LED shows the current operating state for ten minutes. During these ten minutes, the error/status codes are transmitted every three seconds as long as there is no GPRS connection.

Error/status codes

Blinking code	Colour	Description	Solution/Cause
2x	red	Last transmission faulty	<ul style="list-style-type: none">• Try again later
7x	red	Network block/no matching provider	<ul style="list-style-type: none">• Improve position of the antenna• Check whether the device is within the coverage of one of the service providers supported by the integrated SIM chip (www.schildknecht.ag)• Unlock network (see "User manual for DATAEAGLE-DeviceConfig" - upon request)
8x	red	No GSM network	<ul style="list-style-type: none">• Try again later• Improve position of the antenna
10x	red	No GPRS connection	Improve position of the antenna
11x	red	no DATAEAGLE-Portalserver available	<ul style="list-style-type: none">• Check whether port 51241 is unlocked on the DATAEAGLE-Portalserver• Try again later
12x	red	Faulty SIM chip	Contact support

Operating states

Status LED	Colour	Description
flickering	green	Establishing connection
on	green	Mobile network connection established
off	---	Normal measuring operation according to configuration until the next transmission
on	magenta	The DATAEAGLE 701x 15UI/3mA/10Rel is supplied by the rechargeable buffer battery.

9.1.1.3 Ready LED

LED	Colour	Description
on	green	extension module is ready for operation (voltage supply established and IO controller booted)
off	---	No supply voltage or IO controller booting not yet finished

9.1.1.4 Error LED

LED	Colour	Description
on	red	Electrical connection faulty. No communication via CAN interface possible.
blinking	red	extension module has not yet been initialised through the DATAEAGLE 701x 2G/3G/4G World
off	---	Communication between the extension module and the DATAEAGLE 701x 2G/3G/4G World via the CAN interface works correctly

9.1.1.5 LEDs for displaying the switching states the of the relays

LED	Colour	Description
on	green	mechanical relay closed
off	---	mechanical relay open

9.2 User interface on the DATAEAGLE-Portalserver

9.2.1 Site configuration

Note: Depending on the respective user level, some of the configuration fields mentioned in the following sub-chapters may be hidden. In this case, please contact the administrator of the DATAEAGLE-Portal server.

Click on the name of the site in the list of sites to open the specific input screen for configuring the site. Clicking on the symbol to edit the site will take you to the default input screen for configuring the site (see "User manual for DATAEAGLE-Portal-Server" - upon request).

9.2.1.1 Specific input screen for configuring the site

9.2.1.1.1 Measurement channels on the DATAEAGLE 701x 2G/3G/4G World

Configuration section to configure the settings for the 3 universal inputs on the DATAEAGLE 701x 2G/3G/4G World (i.e. on the data logger). The basic settings are configured in the "Basic" tab. The advanced configuration of the measurement channel is done via the "configuration" tab, whereas the available configuration parameters depend on the "mode" selected in the "Basic" tab. The "Alarms" tab is used to set alarm thresholds and the "trigger" tab to determine the trigger thresholds as well as the actions to be performed in case the trigger conditions are met.

9.2.1.1.1.1 Basic

The screenshot shows the 'Measurement channels' configuration section for 'rapidM2M C3xx'. It features three channels: 'Kanal 1', 'Kanal 2', and 'Kanal 3'. Channel 1 is in 'digital' mode with 'Invert' set to 'off'. Channels 2 and 3 are in counter modes ('cnt.day' and 'cnt.intrvl' respectively) with 'Impulse' set to 0 and 'Max' set to 20. The 'Unit' and 'Decimal pl.' fields are set to 'default'. The interface includes tabs for 'Basic', 'Configuration', 'Alarms', and 'Trigger'.

"Measurement channels on the DATAEAGLE 701x 2G/3G/4G World " configuration section, "Basic" tab (digital mode & counter modes)

1	Freely selectable channel title for the universal inputs
2	Basic settings for the measurement channel
off	Measurement channel deactivated
xxx	Analogue- and digital modes

Mode "digital"

3	Inverts the input signal
----------	--------------------------

Modes "Cnt.Day ¹⁾" and "Cnt.Intrvl."

4	Metered measurand of a pulse in the "Imp. unit"
5	Defines the upper scale end of the pointer instruments
6	String that is used as a measurement unit by all of the server display elements [0-16 8 characters]
7	Number of decimal places that are used by all of the server display elements

¹⁾ The daycounter is reset to the time zone selected via the "time zone" parameter in the "basic settings" configuration section (see "Basic settings" on page 107) at 00:00 hours.

▼ rapidM2M C3xx

▼ Measurement channels

Basic Configuration Alarms Trigger

Title	Mode	0%	100%	Trim	Sensor offs.	Unit	Decimal pl.
Kanal 1	0-20mA	0	0	0	0		default
Kanal 2	4-20mA	0	20	0	0		default
Kanal 3	0-10V	0	20	0	0		default

► Output channels

► Internal channels

Basic Alarms Trigger

"Measurement channels on the DATAEAGLE 701x 2G/3G/4G World " configuration section, "Basic" tab (analogue modes)

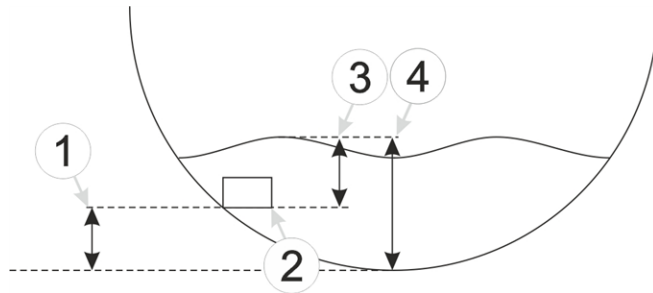
Modes "0-20mA", "4-20mA", "0-2V" and "0-10V"

1	Start of the measurement range in the measurement unit
2	End of the measurement range in the measurement unit
3	is used to adjust the zero point(see "Additional explanation on the zero point adjustment and installation height of the sensor" on page 78)
4	indicates the mounting height of the sensor
5	String that is used as a measurement unit by all of the server display elements [0-16 8 characters]
6	Number of decimal places that are used by all of the server display elements

Note:

Additional explanation on the zero point adjustment and installation height of the sensor

Assumption: Measurement range of the 4-20mA pressure sensor 0-5m



Installation situation of the pressure sensor

1 Installation height: 15cm	3 Output value of the sensor: 6cm
2 Pressure sensor	4 Measured fill level: 20cm

Required configuration

Parameter	Value
Mode	4-20mA
0%	0
100%	5
Trim	-0.01
Sensor offset	0.15
Unit	m

Explanation: When comparing the measured fill level with the output value of the sensor taking the installation height into consideration, it was determined that the value was 1cm too high. As the "Trim" and "Sensor offset" parameters are added to the scaled measurement value, this error can be balanced out by setting the "Trim" parameter value to -0.01m.

9.2.1.1.1.2 Configuration

rapidM2M C3xx

Measurement channels Basic Configuration Alarms Trigger

Title 1 Filter time **1** Decay **2** Count **3**

Kanal 1 0 up 15

Title 2 Filter time

Kanal 2 0

Title 3 Filter time Decay Count

Kanal 3 0 min **4** 10 **5**

Output channels

Internal channels Basic Alarms Trigger

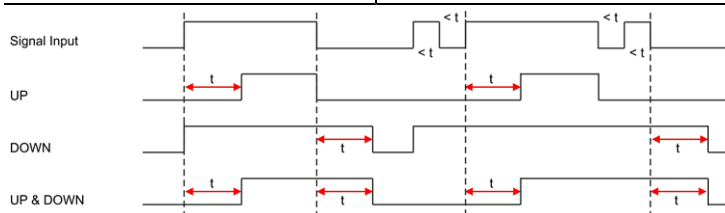
"Measurement channels on the DATAEAGLE 701x 2G/3G/4G World " configuration section, "Configuration" tab (digital mode & counter modes)

Mode "digital"

1 Time in [ms] during which the signal must remain constant to initiate a level change. Used to suppress brief faults (debouncing).

2 Temporal function in the measurement cycle

off	Decay deactivated
up	At least x consecutive measurement values must be "High" for "High" to be recorded.
down	At least x consecutive measurement values must be "Low" for "Low" to be recorded.
up&down	At least x consecutive measurement values must be "High" for "High" to be recorded. At least x consecutive measurement values must be "Low" for "Low" to be recorded.



3 Number of measurement values taken into consideration during the decay (max. 64). In these modes, a measurement value is created upon expiry of the measurement cycle and when the input signal level is changed. The changes to the inputs are monitored at one second intervals.

Mode "Cnt.Day"

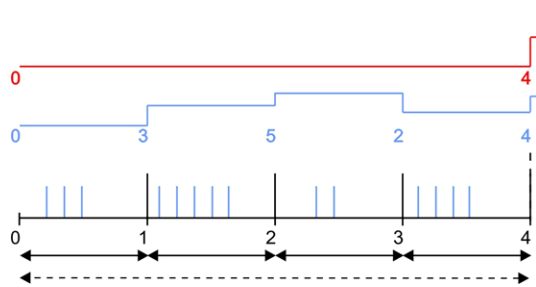
1 Time in [ms] during which the signal must remain constant to initiate a level change. Used to suppress brief faults (debouncing).

Mode "Cnt.Intrvl."

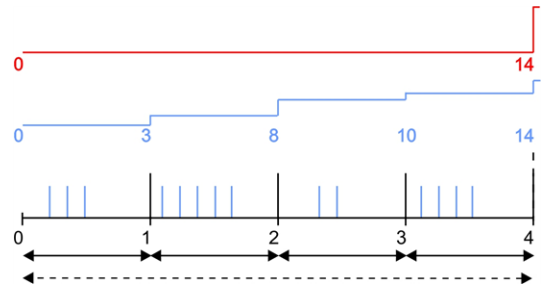
1	Time in [ms] during which the signal must remain constant to initiate a level change. Used to suppress brief faults (debouncing).
4	Temporal function in the measurement cycle
aus	Decay deactivated
min	The minimum of the last x measurement values is recorded.
max	The maximum of the last x measurement values is recorded.
avg	The arithmetic mean of the last x measurement values is recorded.
med	The median of the last x measurement values is recorded.
rms	The root mean square of the last x measurement values is recorded.
sum	The pulses are added up and are not reset every time a measurement value is generated but only after the measurement value has been recorded. This mode is thus recommended if the record interval is longer than the measurement cycle.
5	Number of measurement values taken into consideration during the decay (max. 64). This configuration parameter is not available if "sum" mode was selected for the decay.

Note: Additional explanation regarding the difference between "Cnt.Day" and "Cnt.Intrvl."

Basic setting	←-----→	Record interval	4 min.	Recorded value	red line
	↔	Measurement cycle	1 min.	Measurement value	blue line



"Cnt.Intrvl." mode: The pulses are added up and reset every time a measurement value is generated.



"Cnt.Day" mode: All of the pulses up to the reset time are added up.

Note on "Cnt.Intrvl." mode: If the record interval is longer than the measurement cycle, by default only the number of pulses registered the last time the measurement value was generated is recorded. If all pulses within a record interval should be collected and recorded, "sum" mode must be selected for the decay.

rapidM2M C3xx

Measurement channels Basic Configuration Alarms Trigger

Title	Filter time	Decay	Count	Overflow
Title 1 Kanal 1	0	min	1	ignore
Title 2 Kanal 2	0	min	1	ignore
Title 3 Kanal 3	0	min	1	ignore

Output channels

Internal channels Basic Alarms Trigger

"Measurement channels on the DATAEAGLE 701x 2G/3G/4G World " configuration section, "Configuration" tab (analogue modes)

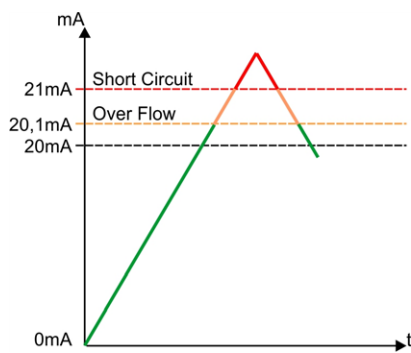
Modes "0-20mA", "4-20mA", "0-2V" and "0-10V"

1	Time in [ms] during which the analogue signal is averaged for signal smoothing. Used to suppress signal noise (also see "Output channels on the DATAEAGLE 701x 2G/3G/4G World " on page 87).
2	Temporal function in the measurement cycle
off	Decay deactivated
min	The minimum of the last x measurement values is recorded.
max	The maximum of the last x measurement values is recorded.
avg	The arithmetic mean of the last x measurement values is recorded.
med	The median of the last x measurement values is recorded.
rms	The root mean square of the last x measurement values is recorded.
3	Number of measurement values taken into consideration during the decay (max. 64).

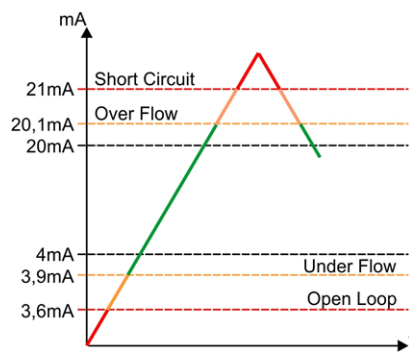
4 Procedure in the event of measurement range violations

Ignore	The measurement value is calculated beyond the range limits.
Silent cutoff	The measurement value is truncated at the range limits.
NAMUR borders	<p>Mode "0-20mA":</p> <ul style="list-style-type: none"> The error value "OF" (overflow) is issued if the measurement value is between 20.1mA and 21mA. If the measurement value is above 21mA, the error value "SC" (short circuit) is issued. <p>Mode "4-20mA":</p> <ul style="list-style-type: none"> The error value "OL" (open loop) is issued, if the measurement value is below 3.6mA. The error value "UF" (underflow) is issued, if the measurement value is between 3.6mA and 3.9mA. The error value "OF" (overflow) is issued if the measurement value is between 20.1mA and 21mA. If the measurement value is above 21mA, the error value "SC" (short circuit) is issued. <p>Mode "0-2V":</p> <ul style="list-style-type: none"> The error value "OF" (overflow) is issued, if the measurement value is above 2.01V. <p>Mode "0-10V":</p> <ul style="list-style-type: none"> The error value "OF" (overflow) is issued, if the measurement value is above 10.05V.

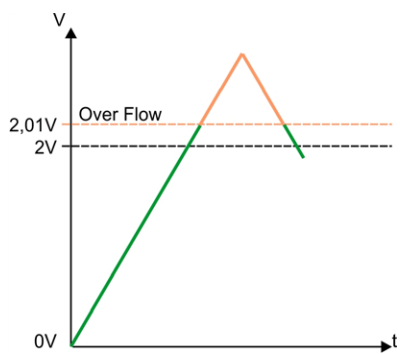
Note: Additional explanation regarding the "NAMUR borders" overflow mode



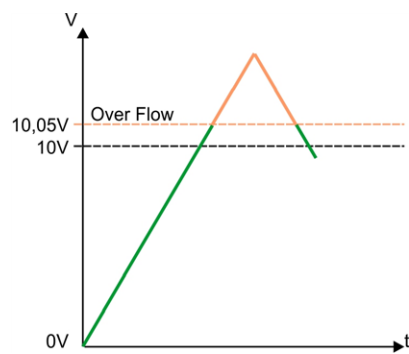
Mode "0-20mA"



Mode "4-20mA"



Mode "0-2V"



Mode "0-10V"

9.2.1.1.1.3 Alarms

Note: In the event of an alarm or a warning, an entry is always created in the alarm list and an immediate transmission is initiated.

The screenshot shows the configuration page for 'rapidM2M C3xx' under the 'Alarms' tab. It features three measurement channels, each with a 'Warning' and 'Alarm' section. The 'Warning' section includes a 'Warning:' label and two input fields for 'Value low' and 'Value high'. The 'Alarm' section includes an 'Alarm:' label and two input fields for 'Value low' and 'Value high', along with a 'Hyst %' field. The 'Hyst %' field is set to '5' for all channels. The interface also includes tabs for 'Basic', 'Configuration', 'Alarms', and 'Trigger'.

"Measurement channels on the DATAEAGLE 701x 2G/3G/4G World " configuration section, "Alarms" tab

Mode "digital"

- | | |
|---|---|
| 1 | A "high" at the universal input triggers a "warning". |
| 2 | A "high" at the universal input triggers an "alarm". |

All other modes

- | | |
|---|---|
| 3 | A warning is triggered, if the measurement value drops to or below this value. |
| 4 | A warning is triggered, if the measurement value meets or exceeds this value. |
| 5 | An alarm is triggered, if the measurement value drops to or below this value. |
| 6 | An alarm is triggered, if the measurement value meets or exceeds this value. |
| 7 | Hysteresis for all-clear in event of alarm/warning (e.g. Hyst=5%, alarm or warning at 100 -> all-clear at 95) |

9.2.1.1.1.4 Trigger

If an universal input is operated in digital mode, there are two different types of triggers:

- Event trigger (RI, XM)

In contrast to the level triggers, the relevant operation (e.g. initiate transmission) is only executed once when the trigger event occurs. With the help of the "Edge" configuration parameter, it is specified whether the rising, falling or both edges initiate the trigger event.

- Level trigger (RA, D1, D2, QX)

A "high" at the universal input initiates the trigger. A "low" at the universal input resets the trigger. The relevant operation (e.g. activate online mode) is executed as long as the trigger is active. The option selected via the "Edge" configuration parameter is not relevant to the level trigger. If it is necessary for the trigger to be initiated by a "low" at the universal input and for it to be reset by a "high", the input signal must then be inverted using the "Invert" configuration parameter located in the "Basis" tab.

These two types of triggers are also differentiated in other universal input modes:

- Event trigger (RI, XM)

The relevant operation (e.g. initiate transmission) is only executed once when the trigger event occurs.

- Level trigger (RA, D1, D2, QX)

The relevant operation (e.g. activate online mode) is executed as long as the trigger is active.

rapidM2M C3xx

Measurement channels Basic Configuration Alarms Trigger

Title 1
Kanal 1 RI XM RA D1 D2 QX Edge 7

Title 2
Kanal 2 RI XM RA D1 D2 QX Level Hyst %

Title 3
Kanal 3 RI XM RA D1 D2 QX Level Hyst %

1 2 3 4 5 6 8 9 10

Output channels

Internal channels Basic Alarms Trigger

"Measurement channels on the DATAEAGLE 701x 2G/3G/4G World " configuration section, "Trigger" tab

Event trigger:

- 1 Execute recording immediately
- 2 Initiate transmission

Level trigger:

- 3 The alternative record interval should be used.
- 4 If this checkbox has been selected, the output of the setpoint on the output channel "RELAY1" of the data logger is only released if the trigger is active. See "Example explaining how to release the setpoint at the output via trigger" on page 88.
- 5 If this checkbox has been selected, the output of the setpoint on the output channel "RELAY2" of the data logger is only released if the trigger is active.
- 6 The alternative transmission cycle should be used.

Mode "digital"

- 7 Event trigger: Selection of the edge at which the trigger should be initiated

Level trigger: not relevant

rising	The rising edge initiates the trigger.
falling	The falling edge initiates the trigger.
both	Both edges initiate the trigger.

All other modes

8	Selection if the corresponding action is to be performed upon exceeding or falling below the value entered in the "level" field	
Greater or equal	Event trigger: The trigger is initiated if the measurement value meets or exceeds this value. Level trigger: The trigger is active as long as the measurement value is higher than the level or equal to the level.	
Less or equal	Event trigger: The trigger is initiated if the measurement value drops to or falls below this value. Level trigger: The trigger is active as long as the measurement value is lower than the level or equal to the level.	
9	Levels for initiating the trigger. The hysteresis is used to determine the level to reset the trigger.	
10	Hysteresis for revoking the trigger (e.g. hyst=5%, level = greater or equal, trigger at 100 -> reset at 95)	

Note: *If one of the "D1" or "D2" checkboxes has been selected on several measurement channels (this also applies to internal measurement channels), the setpoint output for the corresponding output channel is released as soon as the trigger is active on one of the measurement channels, i.e. it is an "or" conjunction.*

9.2.1.1.2 Output channels on the DATAEAGLE 701x 2G/3G/4G World

Configuration section to configure the settings for the 2 relays on the DATAEAGLE 701x 2G/3G/4G World (i.e. on the data logger).

Configuration section "Output channels on the DATAEAGLE 701x 2G/3G/4G World "

1	freely selectable designation for the output channels on the DATAEAGLE 701x 2G/3G/4G World
2	Basic setting for the output channel
off	Output channel deactivated
digital	Digital output

Mode "digital"

3	Inverts the level issued on the device
4	Setpoint (on/off) that should be issued


Note:




Additional explanation on "Digital" mode

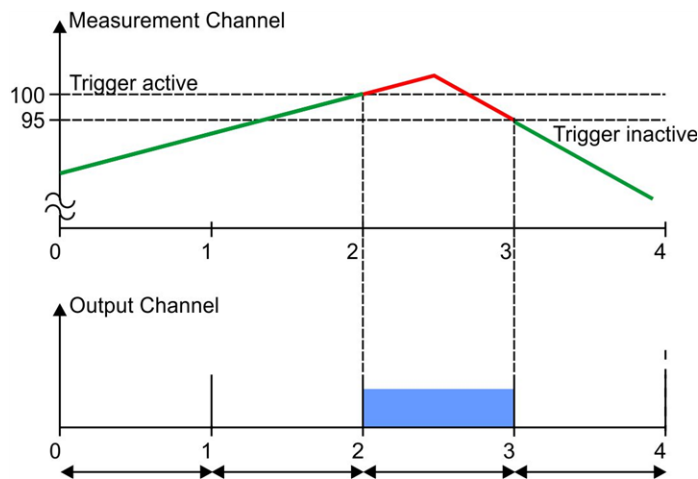
Invert	Setpoint		Output on the device
Off	Off	=	Off (low)
Off	On	=	On (high)
On	Off	=	On (high)
On	On	=	Off (low)

Note:

Example explaining how to release the setpoint at the output via trigger

Basic settings		Measurement cycle	1min.
Measurement channels -> Trigger		D1	Selected
		Threshold	Greater or equal 100
		Hyst %	5
Output channels		Mode	digital
		Invert	off
		Setpoint	on

Trigger not active		green line	
Trigger active		red line	
Output on the device		Sensor supply	



Initial situation: The output channel was initially configured so that the setpoint is issued at the instrument output. Depending on the measurement value, one of the measurement channels should subsequently be used to release the setpoint using the triggers. If one of the checkboxes "D1" (output channel "RELAY1" on the DATAEAGLE 701x 2G/3G/4G World) or "D2" (output channel "RELAY2" on the DATAEAGLE 701x 2G/3G/4G World) in the "Trigger" tab of the "Measurement channels" configuration section (see "Measurement channels on the DATAEAGLE 701x 2G/3G/4G World" on page 75) is selected for one of the measurement channels, the output of the setpoint for the corresponding output channel is blocked at the time of the next measurement as long as the trigger for this measurement channel is not active.

Explanation: The output on the device is inactive up to the time of 2, as the measurement value on the measurement channel is below the trigger level. The trigger is active from the time of 2 which releases the issue of the setpoint at the output. At the time of 3, the setpoint output is ultimately blocked again as the measurement value falls below the "Level - hyst" value (100-5=95).

9.2.1.1.3 Internal channels on the DATAEAGLE 701x 2G/3G/4G World

Configuration section to configure the settings for the internal channels (e.g. mobile network field strength). The designation of the individual channels can be determined via the "Basic" tab. The "Alarms" tab is used to enter the alarm thresholds and the via the "Trigger" tab the trigger thresholds and the actions to be performed if the trigger conditions are met are determined.

9.2.1.1.3.1 Basic

The screenshot shows the configuration interface for 'Internal channels' under the 'Basic' tab. It features a table with two columns: 'Title' and 'Unit'. Two channels are listed: 'GSM' and 'Voltage'. The 'GSM' channel has a unit of 'dBm', and the 'Voltage' channel has a unit of 'V'. Callout '1' points to the 'GSM' title field, and callout '2' points to the 'dBm' unit field.

"Internal channels on the DATAEAGLE 701x 2G/3G/4G World " configuration section, "Basic" tab

1 freely selectable channel designation for:

GSM	the GSM level
voltage	the supply voltage (VIN)

2 String that is used as measurement unit from all display elements of the server

9.2.1.1.3.2 Alarms

Note: In the event of an alarm or a warning, an entry is always created in the alarm list and an immediate transmission is initiated.

The screenshot shows the configuration page for 'rapidM2M C3xx' with the 'Alarms' tab selected. Under 'Internal channels', there are two entries: 'GSM' and 'Voltage'. Each entry has a 'Warning' and an 'Alarm' section. The 'Warning' section has 'Value low' and 'Value high' fields, and the 'Alarm' section has 'Value low' and 'Value high' fields. A 'Hyst %' field is also present for each entry. Numbered callouts 1-5 point to these fields: 1 (Warning low), 2 (Warning high), 3 (Alarm low), 4 (Alarm high), and 5 (Hyst %).

"Internal channels on the DATAEAGLE 701x 2G/3G/4G World " configuration section, "Alarms" tab

1	A warning is triggered, if the measurement value drops to or below this value.
2	A warning is triggered, if the measurement value meets or exceeds this value.
3	An alarm is triggered, if the measurement value drops to or below this value.
4	An alarm is triggered, if the measurement value meets or exceeds this value.
5	Hysteresis for all-clear in event of alarm/warning (e.g. Hyst=5%, alarm or warning at 100 -> all-clear at 95)

9.2.1.1.3.3 Trigger

The following two type of triggers are differentiated::

- Event trigger (RI, XM)
 - The relevant operation (e.g. initiate transmission) is only executed once when the trigger event occurs.
- Level trigger (RA, D1, D2, QX)
 - The relevant operation (e.g. activate online mode) is executed as long as the trigger is active.

▼ rapidM2M C3xx

▶ Measurement channels Basic Configuration Alarms **Trigger**

▶ Output channels

▼ Internal channels Basic Alarms **Trigger**

Title GSM	RI	XM	RA	D1	D2	QX		Level	Hyst %
GSM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	less or equal		5
Title voltage	RI	XM	RA	D1	D2	QX		Level	Hyst %
Voltage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	less or equal		5

Annotations: 1-6 point to checkboxes in the Voltage row; 7 points to the Level dropdown; 8 points to the Level input field; 9 points to the Hyst % input field.

"Internal channels on the DATAEAGLE 701x 2G/3G/4G World " configuration section, "Trigger" tab

Event trigger:	
1	Execute recording immediately
2	Initiate transmission
Level trigger:	
3	The alternative record interval should be used.
4	If this checkbox has been selected, the output of the setpoint on the output channel "RELAY1" of the data logger is only released if the trigger is active. See "Example explaining how to release the setpoint at the output via trigger" on page 88.
5	If this checkbox has been selected, the output of the setpoint on the output channel "RELAY2" of the data logger is only released if the trigger is active.
6	The alternative transmission cycle should be used.
7	Selection if the corresponding action is to be performed upon exceeding or falling below the value entered in the "level" field
greater or equal	Event trigger: The trigger is initiated if the measurement value meets or exceeds this value. Level trigger: The trigger is active as long as the measurement value is higher than the level or equal to the level.
less or equal	Event trigger: The trigger is initiated if the measurement value drops to or falls below this value. Level trigger: The trigger is active as long as the measurement value is lower than the level or equal to the level.
8	Levels for initiating the trigger. The hysteresis is used to determine the level to reset the trigger.
9	Hysteresis for revoking the trigger (e.g. hyst=5%, level = greater or equal, trigger at 100 -> reset at 95)

Note: *If one of the "D1" or "D2" checkboxes has been selected on several measurement channels (this also applies to internal measurement channels), the setpoint output for the corresponding output channel is released as soon as the trigger is active on one of the measurement channels, i.e. it is an "or" conjunction.*

9.2.1.1.4 Measurement channels on the input extension

Configuration section to configure the settings for the 12 universal inputs on the DATAEAGLE 701x Option 12 UI/2 (i.e. on the input extension). The basic settings are configured in the "Basic" tab. The advanced configuration of the measurement channel is done via the "Configuration" tab, whereas the available configuration parameters depend on the "mode" selected in the "Basic" tab. The "Alarms" tab is used to set alarm thresholds and the "Trigger" tab to determine the trigger thresholds as well as the actions to be performed in case the trigger conditions are met.

9.2.1.1.4.1 Basic

▼ C3e 12UI/2Rel

▼ Measurement channels Basic Configuration Alarms Trigger

Title	Mode	Invert	Impulse	Max	Unit	Decimal pl.	Sensor offs.	Unit	Decimal pl.
Title 1 12UI/2Rel Kanal 1	digital	off							
Title 2 12UI/2Rel Kanal 2	cnt.day		0	0		default			
Title 3 12UI/2Rel Kanal 3	cnt.intrvl		0	0		default			
Title 4 12UI/2Rel Kanal 4	0-20mA		0	0	0		0		default
Title 5 12UI/2Rel Kanal 5	4-20mA		0	0	0		0		default
Title 6 12UI/2Rel Kanal 6	0-2V		0	0	0		0		default
Title 7 12UI/2Rel Kanal 7	0-10V		0	0	0		0		default
Title 8 12UI/2Rel Kanal 8	off								
Title 9 12UI/2Rel Kanal 9	off								
Title 10 12UI/2Rel Kanal 10	off								
Title 11 12UI/2Rel Kanal 11	off								
Title 12 12UI/2Rel Kanal 12	off								

► Output channels

"Measurement channels on the input extension" configuration section, "Basic" tab

1	Freely selectable channel title for the universal inputs
2	Basic settings for the measurement channel
off	Measurement channel deactivated
xxx	Analogue and digital modes

Mode "digital"

3	Inverts the input signal
----------	--------------------------

Modes "Cnt.Day 1)" and "Cnt.Intrvl."

4	Metered measurand of a pulse in the "Imp. unit"
5	Defines the upper scale end of the pointer instruments
6	String that is used as a measurement unit by all of the server display elements [0-16 8 characters]
7	Number of decimal places that are used by all of the server display elements

1) The day counter is reset to the time zone selected via the "time zone" parameter in the "basic settings" configuration section (see "Basic settings" on page 107).

Modes "0-20mA", "4-20mA", "0-2V" and "0-10V"

8	Start of the measurement range in the measurement unit
9	End of the measurement range in the measurement unit
10	is used to adjust the zero point(see "Additional explanation on the zero point adjustment and installation height of the sensor" on page 78)
11	indicates the mounting height of the sensor
12	String that is used as a measurement unit by all of the server display elements [0-16 8 characters]
13	Number of decimal places that are used by all of the server display elements

9.2.1.1.4.2 Configuration

▼ C3e 12UI/2Rel

▼ Measurement channels Basic Configuration Alarms Trigger

Title	Filter time	Decay	Count	Overflow
Title 1 12UI/2Rel Kanal 1	0	up	1	
Title 2 12UI/2Rel Kanal 2	0			
Title 3 12UI/2Rel Kanal 3	0	min	1	
Title 4 12UI/2Rel Kanal 4	0	min	1	ignore
Title 5 12UI/2Rel Kanal 5	0	min	1	ignore
Title 6 12UI/2Rel Kanal 6	0	min	1	ignore
Title 7 12UI/2Rel Kanal 7	0	min	1	ignore
Title 8 12UI/2Rel Kanal 8				
Title 9 12UI/2Rel Kanal 9				
Title 10 12UI/2Rel Kanal 10				
Title 11 12UI/2Rel Kanal 11				
Title 12 12UI/2Rel Kanal 12				

► Output channels

"Measurement channels on the input extension" configuration section, "Configuration" tab

Mode "digital"

1 Time in [ms] during which the signal must remain constant to initiate a level change. Used to suppress brief faults (debouncing).	
2 Temporal function in the measurement cycle	
off	Decay deactivated
up	At least x consecutive measurement values must be "High" for "High" to be recorded.
down	At least x consecutive measurement values must be "Low" for "Low" to be recorded.
up&down	At least x consecutive measurement values must be "High" for "High" to be recorded. At least x consecutive measurement values must be "Low" for "Low" to be recorded.
3 Number of measurement values taken into consideration during the decay (max. 64). In these modes, a measurement value is created upon expiry of the measurement cycle and when the input signal level is changed. The changes to the inputs are monitored at one second intervals.	

Mode "Cnt.Day"

1 Time in [ms] during which the signal must remain constant to initiate a level change. Used to suppress brief faults (debouncing).
--

Mode "Cnt.Intrvl."

1 Time in [ms] during which the signal must remain constant to initiate a level change. Used to suppress brief faults (debouncing).	
4 Temporal function in the measurement cycle	
off	Decay deactivated
min	The minimum of the last x measurement values is recorded.
max	The maximum of the last x measurement values is recorded.
avg	The arithmetic mean of the last x measurement values is recorded.
med	The median of the last x measurement values is recorded.
rms	The root mean square of the last x measurement values is recorded.
sum	The pulses are added up and are not reset every time a measurement value is generated but only after the measurement value has been recorded. This mode is thus recommended if the record interval is longer than the measurement cycle.
5 Number of measurement values taken into consideration during the decay (max. 64). This configuration parameter is not available if "sum" mode was selected for the decay.	

Modes "0-20mA", "4-20mA", "0-2V" and "0-10V"

1	Time in [ms] during which the analogue signal is averaged for signal smoothing. Used to suppress signal noise (also see "Output channels on the DATAEAGLE 701x 2G/3G/4G World " on page 87).
4	Temporal function in the measurement cycle
off	Decay deactivated
min	The minimum of the last x measurement values is recorded.
max	The maximum of the last x measurement values is recorded.
avg	The arithmetic mean of the last x measurement values is recorded.
med	The median of the last x measurement values is recorded.
rms	The root mean square of the last x measurement values is recorded.
5	Number of measurement values taken into consideration during the decay (max. 64).
6	Procedure in the event of measurement range violations
Ignore	The measurement value is calculated beyond the range limits.
Silent cutoff	The measurement value is truncated at the range limits.
NAMUR borders	<p>Mode "0-20mA":</p> <ul style="list-style-type: none"> • The error value "OF" (overflow) is issued if the measurement value is between 20.1mA and 21mA. • If the measurement value is above 21mA, the error value "SC" (short circuit) is issued. <p>Mode "4-20mA":</p> <ul style="list-style-type: none"> • The error value "OL" (open loop) is issued, if the measurement value is below 3.6mA. • The error value "UF" (underflow) is issued, if the measurement value is between 3.6mA and 3.9mA. • The error value "OF" (overflow) is issued if the measurement value is between 20.1mA and 21mA. • If the measurement value is above 21mA, the error value "SC" (short circuit) is issued. <p>Mode "0-2V":</p> <ul style="list-style-type: none"> • The error value "OF" (overflow) is issued, if the measurement value is above 2.01V. <p>Mode "0-10V":</p> <ul style="list-style-type: none"> • The error value "OF" (overflow) is issued, if the measurement value is above 10.05V.

9.2.1.1.4.3 Alarms

Note: In the event of an alarm or a warning, an entry is always created in the alarm list and an immediate transmission is initiated.

▼ C3e 12UI/2Rel

▼ Measurement channels Basic Configuration **Alarms** Trigger

Title	WA	AL	Value low	Value high	Value low	Value high	Hyst %
Title 1 12UI/2Rel Kanal 1	<input type="checkbox"/>	<input type="checkbox"/>					
Title 2 12UI/2Rel Kanal 2	<input type="checkbox"/>	<input type="checkbox"/>	Warning: <input type="text"/>	<input type="text"/>	Alarm: <input type="text"/>	<input type="text"/>	<input type="text" value="5"/>
Title 3 12UI/2Rel Kanal 3			Value low <input type="text"/>	Value high <input type="text"/>	Value low <input type="text"/>	Value high <input type="text"/>	<input type="text" value="5"/>
Title 4 12UI/2Rel Kanal 4			Value low <input type="text"/>	Value high <input type="text"/>	Value low <input type="text"/>	Value high <input type="text"/>	<input type="text" value="5"/>
Title 5 12UI/2Rel Kanal 5			Value low <input type="text"/>	Value high <input type="text"/>	Value low <input type="text"/>	Value high <input type="text"/>	<input type="text" value="5"/>
Title 6 12UI/2Rel Kanal 6			Value low <input type="text"/>	Value high <input type="text"/>	Value low <input type="text"/>	Value high <input type="text"/>	<input type="text" value="5"/>
Title 7 12UI/2Rel Kanal 7			Value low <input type="text"/>	Value high <input type="text"/>	Value low <input type="text"/>	Value high <input type="text"/>	<input type="text" value="5"/>
Title 8 12UI/2Rel Kanal 8							
Title 9 12UI/2Rel Kanal 9							
Title 10 12UI/2Rel Kanal 10							
Title 11 12UI/2Rel Kanal 11							
Title 12 12UI/2Rel Kanal 12							

► Output channels

"Measurement channels on the input extension" configuration section, "Alarms" tab

Mode "digital"

- 1 A "high" at the universal input triggers a "warning".
- 2 A "high" at the universal input triggers an "alarm".

All other modes

- 3 A warning is triggered, if the measurement value drops to or below this value.
- 4 A warning is triggered, if the measurement value meets or exceeds this value.
- 5 An alarm is triggered, if the measurement value drops to or below this value.
- 6 An alarm is triggered, if the measurement value meets or exceeds this value.
- 7 Hysteresis for all-clear in event of alarm/warning (e.g. Hyst=5%, alarm or warning at 100 -> all-clear at 95)

9.2.1.1.4.4 Trigger

If an universal input is operated in digital mode, there are two different types of triggers:

- Event trigger (RI, XM)

In contrast to the level triggers, the relevant operation (e.g. initiate transmission) is only executed once when the trigger event occurs. With the help of the "Edge" configuration parameter, it is specified whether the rising, falling or both edges initiate the trigger event.

- Level trigger (RA, D1, D2, QX)

A "high" at the universal input initiates the trigger. A "low" at the universal input resets the trigger. The relevant operation (e.g. activate online mode) is executed as long as the trigger is active. The option selected via the "Edge" configuration parameter is not relevant to the level trigger. If it is necessary for the trigger to be initiated by a "low" at the universal input and for it to be reset by a "high", the input signal must then be inverted using the "Invert" configuration parameter located in the "Basis" tab.

These two types of triggers are also differentiated in other universal input modes:

- Event trigger (RI, XM)

The relevant operation (e.g. initiate transmission) is only executed once when the trigger event occurs.

- Level trigger (RA, D1, D2, QX)

The relevant operation (e.g. activate online mode) is executed as long as the trigger is active.

▼ C3e 12UI/2Rel

▼ Measurement channels Basic Configuration Alarms Trigger

Title	RI	XM	RA	QX	Edge	Level	Hyst %
Title 1 12UI/2Rel Kanal 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	falling		5
Title 2 12UI/2Rel Kanal 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	less or equal		5
Title 3 12UI/2Rel Kanal 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	less or equal		5
Title 4 12UI/2Rel Kanal 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	less or equal		5
Title 5 12UI/2Rel Kanal 5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	less or equal		5
Title 6 12UI/2Rel Kanal 6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	less or equal		5
Title 7 12UI/2Rel Kanal 7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	less or equal		5
Title 8 12UI/2Rel Kanal 8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Title 9 12UI/2Rel Kanal 9							
Title 10 12UI/2Rel Kanal 10							
Title 11 12UI/2Rel Kanal 11							
Title 12 12UI/2Rel Kanal 12							

► Output channels

"Measurement channels on the input extension" configuration section, "Trigger" tab

Event trigger:

- 1 Execute recording immediately
- 2 Initiate transmission

Level trigger:

- 3 The alternative record interval should be used.
- 4 The alternative transmission cycle should be used.

Mode "digital"

- 5 Event trigger: Selection of the edge at which the trigger should be initiated

Level trigger: not relevant

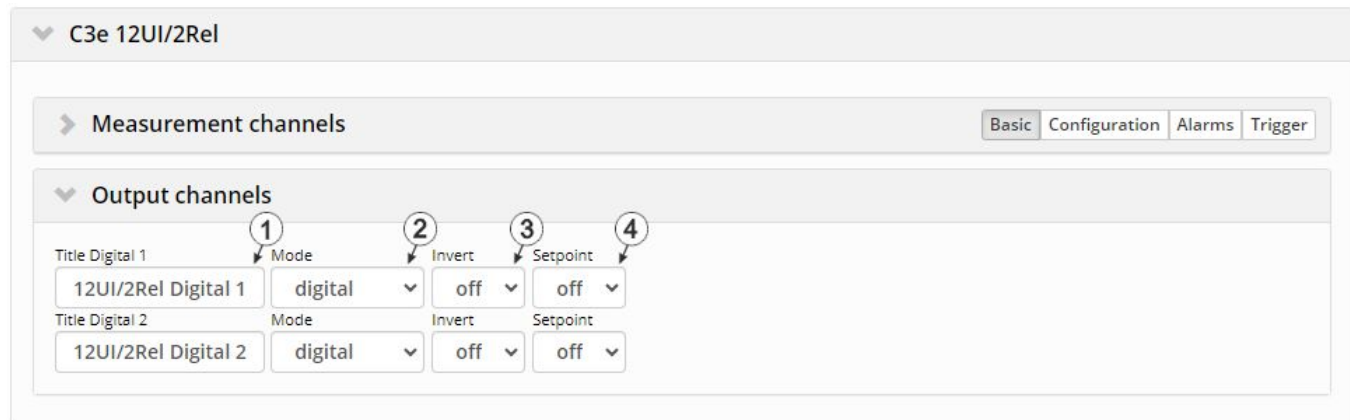
rising	The rising edge initiates the trigger.
falling	The falling edge initiates the trigger.
both	Both edges initiate the trigger.

All other modes

6 Selection if the corresponding action is to be performed upon exceeding or falling below the value entered in the "level" field	
Greater or equal	Event trigger: The trigger is initiated if the measurement value meets or exceeds this value. Level trigger: The trigger is active as long as the measurement value is higher than the level or equal to the level.
Less or equal	Event trigger: The trigger is initiated if the measurement value drops to or falls below this value. Level trigger: The trigger is active as long as the measurement value is lower than the level or equal to the level.
7 Levels for initiating the trigger. The hysteresis is used to determine the level to reset the trigger.	
8 Hysteresis for revoking the trigger (e.g. hyst=5%, level = greater or equal, trigger at 100 -> reset at 95)	

9.2.1.1.5 Output channels on the input extension

Configuration section to configure the settings for the 2 relays on the DATAEAGLE 701x Option 12 UI/2 (i.e. on the input extension).



Configuration section "Output channels on the input extension"

1 freely selectable designation for the output channels on the DATAEAGLE 701x Option 12 UI/2	
2 Basic setting for the output channel	
off	Output channel deactivated
digital	Digital output

Mode "digital"

3 Inverts the level issued on the device
4 Setpoint (on/off) that should be issued

9.2.1.1.6 Analogue output channels on the output extension

Configuration section to configure the settings for the 3 analogue outputs on the DATAEAGLE 701x Option 3mA/6 Rel. (i.e. on the output extension).

Configuration section "Output channels analog" showing three channels (Kanal 1, 2, 3) with settings for Mode, 0%, 100%, Setpoint, Unit, and Decimal pl. The interface includes a section for "Output channels digital" below.

Configuration section "Output channels analogue on the output extension"

1	freely selectable designation for the analogue output channels on the DATAEAGLE 701x Option 3mA/6 Rel.
2	Basic setting for the output channel
off	Output channel deactivated
0-20mA	The mA signal at the output channel varies between 0mA and 20mA.
4-20mA	The mA signal at the output channel varies between 0mA and 20mA.
0-24mA	The mA signal at the output channel varies between 0mA and 20mA.
3	Start of the output range in the measurement unit
4	End of the output range in the measurement unit
5	Output value in the measurement unit
6	String that is used as a measurement unit by all of the server display elements [0-16 8 characters]
7	Number of decimal places that are used by all of the server display elements

9.2.1.1.7 Digital output channels on the output extension

Configuration section to configure the settings for the 6 relays (2 groups for different potentials) on the DATAEAGLE 701x Option 3mA/6 Rel. (i.e. on the output extension).

▼ C3e 3mA/6Rel

► Output channels analog

▼ Output channels digital

Title Digital	Mode	Invert	Setpoint
3mA/6Rel Digital 1	digital	off	off
3mA/6Rel Digital 2	digital	off	off
3mA/6Rel Digital 3	digital	off	off
3mA/6Rel Digital 4	digital	off	off
3mA/6Rel Digital 5	digital	off	off
3mA/6Rel Digital 6	digital	off	off

Configuration section "Output channels digital on the output extension"

1	freely selectable designation for the digital output channels on the DATAEAGLE 701x Option 3mA/6 Rel.
2	Basic setting for the output channel
off	Output channel deactivated
digital	Digital output

Mode "digital"

3	Inverts the level issued on the device
4	Setpoint (on/off) that should be issued

9.2.1.1.8 Alarm settings

Configuration section to determine how to acknowledge alarms and after how much time an "Offline alarm" should be triggered if the device does not report to the server for a longer period of time.

▼ Alarm settings

Acknowledgement: ① → ▼

Offline alarm after: ② → hh:mm

user alarm 1: ③ →

user alarm 2: ④ →

user alarm 3: ⑤ →

"Alarm settings" configuration section

1 Selection of how alarms should be acknowledged	
Standard	The global server setting is used to determine whether alarms must be acknowledged automatically or manually (see "User manual for DATAEAGLE-Portal-Server" - upon request).
automatic	Alarms are acknowledged automatically as soon as all of the messages have been sent. If SMS that have a tariff with a delivery confirmation function have also been sent, acknowledgement is provided after delivery confirmation.
manual	Alarms must be acknowledged by the user.
2 alarm in the event that the device does not report for longer than the set time (00:00 alarm deactivated).	
3 Freely selectable title for user-defined alarm 1. If the user-defined alarm 1 is triggered by a device connected to the site, the server will use this text to signal the alarm. The same applies to user-defined alarm 2 and 3.	
4 Freely selectable title for user-defined alarm 2	
5 Freely selectable title for user-defined alarm 3	

9.2.1.1.9 Calculated channels

In the "Basic" tab, the basic settings are configured and in the "Calculation" tab the advanced configurations are set, whereas the parameters to configure depend on the "mode" selected in the "Basic" tab.

Note: The values of the calculated channels are directly calculated for every data output (display on the server or download from the server). They are not saved in the server database.

9.2.1.1.9.1 Basic

"Calculated channels" configuration section, "Basic" tab

1 Freely selectable channel title for the calculated channels [0-16 characters]	
2 Possible calculation modes for the calculated channels	
Off	Calculated channel deactivated
Table	Determines the value for the calculated channel by searching for the row corresponding to the value of a measurement channel in the reference point table. Such a row is made up of the "Measurement channel value" and "Output value for calculated channel" pair of values. Linear interpolation is carried out between the table rows; linear extrapolation is used for values outside the defined table.
Digital	Converts an analogue value into a digital value. The threshold from which an analogue value is interpreted as "high" can be selected via the "High level" parameter in the "Calculation" tab. In addition the determined digital value can be inverted via the "Invert" parameter.
+, -, x, /	Links the values of two measurement channels using a mathematic operation (addition, subtraction, multiplication or division)
Delta	Determines the difference between two measurement values and divides the result by the time difference between the time stamps of the measurement values. The time unit (value/sec., value/min., ...) for the result can be selected via the "Time basis" parameter located in the "Calculation" tab. It is thus possible to convert the counter reading (m ³) of the source in to a flow rate (m ³ /min.) (see "Additional explanation: Delta mode" on page 113).
clone	Creates a clone of a measurement channel. This ensures it is possible to rename channels, to select different ends of the scale for the pointer instruments, to determine a new string as a measurement unit and to adjust the number of decimal places. The measurement values (numerical value without unit) correspond exactly to those of the source.

3	Defines the lower scale end of the pointer instruments
4	Defines the upper scale end of the pointer instruments
5	String that is used as a measurement unit by all of the server display elements [0-16 characters]. It has no direct influence on the values
6	Number of decimal places that are used by all of the server display elements
7	Inverts the input signal (only for calculated channels in "Digital" mode)
8	Buttons to switch between the individual tabs of the configuration section

9.2.1.1.9.2 Calculation

The screenshot shows the 'Calculated channels' configuration section with the 'Calculation' tab selected. It displays five channels, each with a 'Source' dropdown menu and various configuration fields. Numbered callouts (1-7) highlight specific elements: 1 points to the 'Source' dropdown for Title 1; 2 points to the 'High Level' input field for Title 2; 3 points to the 'Source' dropdown for Title 3; 4 points to the 'Offset' input field for Title 3; 5 points to the 'Scale' input field for Title 5; 6 points to the 'Offset' input field for Title 3; and 7 points to the 'Scale' input field for Title 3.

"Calculated channels" configuration section, "Calculation" tab

"Table" calculation mode

1	Selection of the channel from which the input data is used
2	Opens the screen for entering the reference point table (the table rows are interpolated linearly, values outside of the defined table are extrapolated linearly.)

"Digital" calculation mode

1	Selection of the channel from which the input data is used
3	Signal recognition level

Calculation mode "+", "-", "x" or "/"

1	Selection of the channel from which the input data is used
4	Selection of the second channel from which the input data is used
6	Offset that is added following multiplication with the "Factor" parameter.
7	Factor with which the result of the mathematical operation (+, -, x, /) is multiplied. The "Offset" parameter is then added.

"Delta" calculation mode

1	Selection of the channel from which the input data is used
5	Specifies the desired time unit (value/sec., value/min., ...) for the result
6	Offset that is added following multiplication with the "Factor" parameter. The result is converted in to the desired time unit before multiplication with the "Factor" parameter
7	Factor with which the result is multiplied once it has been converted into the desired time unit. The "Offset" parameter is then added.

"Clone" calculation mode

1	Selection of the channel that should be cloned
6	Offset that is added following multiplication with the "Factor" parameter.
7	Factor with which the value of the measurement channel to be cloned is multiplied. The "Offset" parameter is then added.

9.2.1.1.9.3 Alarms

Note: The evaluation of the alarm thresholds for calculated channels can only occur if the device has transferred the measurement data to the DATAEAGLE-Portal server.

Calculated channels configuration section, "Alarms" tab

Title	Alarm low	Alarm high	Hyst %
Title 1 Calculated 1			5
Title 2 Calculated 2			5
Title 3 Calculated 3			5
Title 4 Calculated 4			5
Title 5 Calculated 5			5

"Calculated channels" configuration section, "Alarms" tab

1	An alarm is triggered, if the measurement value drops to or below this value.
2	An alarm is triggered, if the measurement value meets or exceeds this value.
3	Hysteresis for all-clear in event of alarm/warning (e.g. Hyst = 5%, alarm or warning at 100 -> all-clear at 95)

9.2.1.1.10 Basic settings

Basic settings

Connection type: ① → online ▾

Transmission cycle: ② → 24:00 hh:mm

Transmission cycle quick: ③ → 00:15 hh:mm

Transmission time: ④ → off ▾

Record interval: ⑤ → 2 min

Record interval alternative: ⑥ → 0 min

Measurement cycle: ⑦ → 00:00 mm:ss

Supply failure

-) Alarm: ⑧ → off ▾

-) Alarm/Shutdown delay: ⑨ → 20 sec.

Time zone: ⑩ → standard (server: UTC +1:00 (Paris, Frankfurt, Zurich, Vienna)) ▾

Daylight saving time: ⑪ → standard (server: EU) ▾

Default report: ⑫ → off ▾

Position cycle: ⑬ → 24:00 hh:mm

Report template: ⑭ → (not assigned) ▾

Log changes of config-containers: ⑮ → standard (server: made by web api device) ▾

"Basic settings" configuration section

1	Indication of the connection type
online	The device does not disconnect the connection and continuously transmits the measurement data. However, every 7 days, the connection is temporarily interrupted in order to verify the server assignment.
2	Time between transmissions . Upon established online connection, a complete device synchronisation is carried out instead of a connection establishment.
3	Time between the transmissions, if a alternative transmission cycle should be used because of a trigger being initiated. Upon established online connection, a complete device synchronisation is carried out instead of a connection establishment.

4 Selection of whether a connection to the server should be established every day at a firmly defined time	
off	No additional transmissions
on	The adjacent option can be used to determine the time at which the device establishes a connection to the server regardless of the transmission cycle. Upon established online connection, a complete device synchronisation is carried out instead of a connection establishment. If an additional transmission has been initiated, the internal meter of the device, that determines the time of the transmission, is reset. This means that the next transmission is completed exactly after the time specified via the "transmission cycle" parameter.
5 Time between measurement data recordings	
6 Time between measurement data recordings, if an alternative record interval should be used because of a trigger being initiated	
7 Time between measurements (00:00 same as record interval)	
8 Selection of whether an alarm should be triggered in the event of a supply voltage failure	
off	No alarm generated in the event of a supply voltage failure
on	An alarm shall be generated in the event of a supply voltage failure
9 If the offset of a failure report is deactivated: The device is only completely deactivated if the supply voltage has failed for longer than the time configured here. This prevents the device from shutting down in the event of brief supply voltage failures. However, an entry is always added to the device log. If the time is set to 0, the device is immediately completely deactivated every time the supply voltage fails. If setting off a failure report is activated: A relevant alarm is only triggered if the supply voltage has failed for longer than the time configured here. This prevents alarms from being triggered in the event of brief supply voltage failures. However, an entry is always added to the device log. If the time is set to 0, an alarm is generated every time the supply voltage fails.	
13 Regional settings (not relevant for raw measurement data as this is stored in UTC)	
14 Configuration for automatic time adjustment	
Standard	The configuration for the time adjustment is adopted by the global server setting (see "User manual for DATAEAGLE-Portal-Server" - upon request).
Off	Automatic time adjustment deactivated
USA	Predefined setting for the American area
EU	Predefined setting for the European area
15 Selection of the report that is loaded by clicking on the device link in the maps	
Off	The default graphic is loaded.
"Name of a report"	The selected report is loaded.
16 Position update interval (00:00 positioning is completed with every connection)	

17 Selection of whether the default graphic or a report template to display the data is used when clicking on the symbol to display the measurement data located in the site/application list. Only the report templates in which the site/application type of the first wild card is compatible with the site/application that is currently being edited are displayed in the dropdown list.	
(not assigned)	The default graphic is used to display the measurement data.
"Name of a report template"	Name of the report template used to display the measurement data
18 Selection of which changes to the configurations should be logged	
web api	Changes that were implemented via the server interface or REST-API are logged.
web device api	Changes that were implemented via the server interface, by the device itself or the REST-API are logged.

9.2.1.2 Default input screen for configuring the site

9.2.1.2.1 Site

Customer

Specifies to which customer the site is assigned



symbol

Assign site to another customer

Name

Site designation (not relevant for the device or data assignment) [2-50 characters]

Device S/N

Serial number of the device that is linked to the site (device assignment!)

Application

Name of the IoT application based on which the site was created

Application version

Version number of the IoT application that is currently installed on the site. If the version number of the site is not the same as the version number of the device logic installed on the device then the version number of the device logic installed on the device is displayed in addition to the version number of the site.

Tags

List of tags that are already assigned to the site. This assignment can be cancelled by clicking on the cross next to the title of the tag. The input screen for assigning tags can be opened by clicking on the plus symbol.

9.2.1.2.2 Comments

Comments

Free comment field (is also displayed below the device type in the site/application list)

9.2.1.2.3 Alarm settings

Acknowledgement	Standard	The global server setting is used to determine whether alarms must be acknowledged automatically or manually.
	automatic	Alarms are acknowledged automatically as soon as all of the messages have been sent. If SMS that have a tariff with a delivery confirmation function have also been sent, acknowledgement is provided after delivery confirmation.
	manual	Alarms must be acknowledged by the user.
Transfer volume	Standard	The setting for the transfer volume alarm is taken from the global server settings.
	off	The transfer volume alarm is deactivated.
	individual	The level at which the transfer volume alarm should be triggered can be entered in the adjacent field in KiB.
Offline alarm after	alarm in the event that the device does not report for longer than the set time (00:00 alarm deactivated).	
Title user alarm 1	Freely selectable title for user-defined alarm 1. If the user-defined alarm 1 is triggered by a device connected to the site, the server will use this text to signal the alarm. The same applies to user-defined alarm 2 and 3.	
Title user alarm 2	Freely selectable title for user-defined alarm 2	
Title user alarm 3	Freely selectable title for user-defined alarm 3	

9.2.1.2.4 Calculated channels

Note: The values of the calculated channels are directly calculated for every data output (display on the DATAEAGLE-Portal server or download from the DATAEAGLE-Portal server). They are not saved in the server database.

9.2.1.2.4.1 Basic

Title 1-5


Freely selectable channel title for the calculated channels [0-16 characters]

Mode

Possible calculation modes for the calculated channels

<i>Off</i>	<i>---</i>	<i>Calculated channel deactivated</i>
<i>Table</i>	<i>Min</i>	<i>Defines the lower scale end of the pointer instruments</i>
	<i>Max</i>	<i>Defines the upper scale end of the pointer instruments</i>
	<i>Unit</i>	<i>String that is used as a measurement unit by all of the server display elements [0-16 characters]. It has no direct influence on the values</i>
	<i>Decimal places</i>	<i>Number of decimal places that are used by all of the server display elements</i>
<i>Digital</i>	<i>Invert</i>	<i>Inverts the input signal</i>
<i>+, -, x, /</i>	<i>Min</i>	<i>Defines the lower scale end of the pointer instruments</i>
	<i>Max</i>	<i>Defines the upper scale end of the pointer instruments</i>
	<i>Unit</i>	<i>String that is used as a measurement unit by all of the server display elements [0-16 characters]. It has no direct influence on the values</i>
	<i>Decimal places</i>	<i>Number of decimal places that are used by all of the server display elements</i>
<i>Delta</i>	<i>Determines the difference between two measurement values and divides the result by the time difference between the time stamps of the measurement values. The time unit (value/sec., value/min., ...) for the result can be selected via the "Time basis" parameter located in the "Calculation" tab. It is thus possible to convert the counter reading (m³) of the source in to a flow rate (m³/min.) (see "Additional explanation: Delta mode" on page 113).</i>	
	<i>Min</i>	<i>Defines the lower scale end of the pointer instruments</i>
	<i>Max</i>	<i>Defines the upper scale end of the pointer instruments</i>
	<i>Unit</i>	<i>String that is used as a measurement unit by all of the server display elements [0-16 characters]. It has no direct influence on the values</i>
	<i>Decimal places</i>	<i>Number of decimal places that are used by all of the server display elements</i>
<i>Clone</i>	<i>Creates a clone of a measurement channel. This ensures it is possible to rename channels, to select different ends of the scale for the pointer instruments, to determine a new string as a measurement unit and to adjust the number of decimal places. The measurement values (numerical value without unit) correspond exactly to those of the source.</i>	
	<i>Min</i>	<i>Defines the lower scale end of the pointer instruments</i>
	<i>Max</i>	<i>Defines the upper scale end of the pointer instruments</i>
	<i>Unit</i>	<i>String that is used as a measurement unit by all of the server display elements [0-16 characters]. It has no direct influence on the values</i>
	<i>Decimal places</i>	<i>Number of decimal places that are used by all of the server display elements</i>

9.2.1.2.4.2 Calculation

Off	---	Calculated channel deactivated
Table	Source	Selection of the channel from which the input data is used
		Opens the screen for entering the reference point table (the table rows are interpolated linearly, values outside of the defined table are extrapolated linearly.)
Digital	Source	Selection of the channel from which the input data is used
	High level	Signal recognition level
+, -, x, /	Source	Selection of the channel from which the input data is used
	+, -, x, /	
	Source	Selection of the second channel from which the input data is used
	Offset	Offset that is added following multiplication with the "Factor" parameter.
	Factor	Factor with which the result of the mathematical operation (+, -, x, /) is multiplied. The "Offset" parameter is then added.
Delta	Source	Selection of the channel from which the input data is used
	Time basis	Specifies the desired time unit (value/sec., value/min., ...) for the result
	Offset	Offset that is added following multiplication with the "Factor" parameter. The result is converted in to the desired time unit before multiplication with the "Factor" parameter.
	Factor	Factor with which the result is multiplied once it has been converted into the desired time unit. The "Offset" parameter is then added.
Clone	Source	Selection of the channel that should be cloned
	Offset	Offset that is added following multiplication with the "Factor" parameter.
	Factor	Factor with which the value of the measurement channel to be cloned is multiplied. The "Offset" parameter is then added.

Note:

Additional explanation: Delta mode

Assumption: The source channel contains the counter reading of an infinite counter in m^3 . The calculated channel 1 should contain the flow rate in m^3/s and calculated channel 2 should contain the flow rate in l/h .

Required configuration

Parameter	Value channel 1	Value channel 2
Basis -> mode	Delta	Delta
Basis -> unit	m^3/s	l/h
Calculation -> time basis	Seconds	Hours
Calculation -> offset	0	0
Calculation -> factor	1	1000

Source		Calculated channel 1	Calculated channel 2
Date/time	Infinite counter [m^3]	Flow rate [m^3/s]	Flow rate [l/h]
26.03.2013 12:50	900	0 ¹⁾	0 ¹⁾
26.03.2013 12:51	960	1	3,600,000
26.03.2013 12:52	990	0.5	1,800,000
26.03.2013 12:53	1005	0.25	900,000
26.03.2013 12:54	1065	1	3,600,000

¹⁾ Calculation not possible as there is no measurement value before 12:50.

Explanation: No values can be determined for the measurement at 12:50 for the calculated channels as there is no previous value and the difference between the counter readings cannot be determined. For the measurement at 12:51, the difference to the counter reading is $60m^3$ and the time difference is 60sec.

Result = { (value difference / time difference [sec.]) * time basis [sec] * factor } + offset

The result for calculated channel 1 (time basis "Seconds", offset "0" and factor "1") is calculated as follows:

$$\text{Channel 1} = \{ (60m^3 / 60sec.) * 1 * 1 \} + 0 = 1m^3/s$$

The result for calculated channel 2 (time basis "Hours", offset "0" and factor "1000") is calculated as follows:

$$\text{Channel 2} = \{ (60m^3 / 60sec.) * 3600 * 1000 \} + 0 = 3,600,000l/h$$

9.2.1.2.4.3 Alarms

Note: The evaluation of the alarm thresholds for calculated channels can only occur if the device has transferred the measurement data to the DATAEAGLE-Portal server.

Alarm low	An alarm is triggered, if the measurement value drops to or below this value.
Alarm high	An alarm is triggered, if the measurement value meets or exceeds this value.
Hyst %	Hysteresis for all-clear in event of alarm/warning (e.g. Hyst = 5%, alarm or warning at 100 -> all-clear at 95)

9.2.1.2.5 Basic settings

Time zone	Regional settings (not relevant for raw measurement data as this is stored in UTC)	
Daylight saving time	Configuration for automatic time adjustment	
	Standard	The configuration for the time adjustment is adopted by the global server setting.
	Off	Automatic time adjustment deactivated
	USA	Predefined setting for the American area
	EU	Predefined setting for the European area
Default report	Selection of the report that is loaded by clicking on the device link in the maps	
	Off	No report is loaded.
	"Name of a report"	The selected report is loaded.
Report template	Selection of the report template used to display the data when clicking on the symbol to display the measurement data, which is located in the list of sites/applications. Only the report templates in which the site/application type of the first wild card is compatible with the site/application that is currently being edited are displayed in the dropdown list. The symbol to display the measurement data is only displayed in the list of sites/applications if a report template has been selected.	
	(not assigned)	The symbol to display the measurement data is not displayed in the list of sites/applications.
	"Name of a report template"	Name of the report template used to display the measurement data
Change log configuration	Selection of which changes to the configurations should be logged	
	web api	Changes that were implemented via the server interface or REST-API are logged.
	web device api	Changes that were implemented via the server interface, by the device itself or the REST-API are logged.

9.2.1.2.6 FTP export settings

Note: This configuration section is only visible if the "FTP Agent Extended" licence for the DATAEAGLE-Portal server has been enabled.

FTP export profile	off	FTP export deactivated
	"Name of an FTP export profile"	List with the FTP export profiles that were created on the DATAEAGLE-Portal server (for creating an FTP export profile, see "User manual for DATAEAGLE-Portal-Server " - upon request).
Settings of the selected profile	Shows an overview of the most important parameters of the selected FTP export profile	
FTP directory	Makes overwriting the standard directory of the selected FTP export profile possible [0-100 characters]	
Last export	Time stamp of the last FTP export	

9.2.2 Device configuration

Note: Several of the configuration fields in the following sub chapters may possibly be hidden depending on the respective user level. In this case, contact the DATAEAGLE-Portal server administrator.

You can reach the input screen for configuring the device by clicking on the serial number in the list of sites/applications (see "User manual for DATAEAGLE-Portal-Server " - upon request) or by clicking on the device name in the device name list (see "User manual for DATAEAGLE-Portal-Server " - upon request).

9.2.2.1 Comments

Comments

Free comment field (is also displayed below the site name in the site/application list)

9.2.2.2 Measurement instrument

Customer	Name of the customer to whom the measurement instrument is assigned
Tags	List of the tags that are already assigned to the measurement instrument. This assignment can be cancelled by clicking on the cross next to the title of the tag. The input screen for assigning the tags is opened by clicking on the plus symbol. This enables existing tags to be assigned and new tags to be created.
Serial number	Serial number of the instrument
Instrument class	The instrument class of the site and instrument must match for an instrument to be able to be connected to a site. Once the instrument has been created via the server interface, the instrument class can only be changed up until the first connection of the instrument to the server. If an instrument class, that does not match the actual class of the instrument, is selected when the instrument is created it is automatically corrected during the first connection.
Telephone number	Telephone number of the SIM card. The control SMS messages (e.g. wakeup) are sent to this number. Format: +49123456789
Instrument flags	Additional information regarding the instrument class (for internal use)
Firmware version	Current software version installed on the measurement controller
Last connection	In each case, the last time stamp of the affected operation
Last wakeup	
Last disconnection	
Last transmission error	
Last Aloha connection	
Wakeup SMS count	Number of wakeup SMS sent to this device since the last connection. This counter is reset at/during each successfully established connection.

Device Logic sync	Productive	If the Device Logic installed on the device and saved on the server do not match, the Device Logic saved on the server is loaded in to the device.
	Development (sync)	The Device Logic on the device and server are synchronised. The one with the latest time stamp is transferred to the other one.
	Development (no sync)	The Device Logic on the device and server are not synchronised.
Firmware update	Off	Firmware update is deactivated.
	On	As soon as a new version of the selected firmware type is available, this is installed immediately.
	Even if tag is missing	Firmware is also transferred to the device if the device has not transmitted the current firmware version to the server (NOT RECOMMENDED!).
	Allow downgrade	Facilitates the installation of an older firmware version than the one on the device (NOT RECOMMENDED!)
	Once	Performs a single firmware update. If no new firmware is available or the firmware was installed successfully, the firmware update is automatically switched to "OFF".
	Ignore	The firmware update is deactivated and no information is provided about available firmware updates.
Firmware type	Released	Only firmware versions that have successfully undergone internal and field testing are installed (this practically eliminates malfunctions).
	Release candidate	Only firmware versions that have successfully undergone internal testing are installed (malfunctions cannot be excluded).
	Beta release	Even firmware versions that have not successfully undergone all of the internal tests are installed (malfunctions may occur).
Identification	String specifying the hardware platform implemented in the device and the corresponding hardware version (i.e. the rapidM2M module identification).	
Prod. rev.	Product rev. of the DATAEAGLE 701x 15UI/3mA/10Rel	

9.2.2.3 GPRS

SIM tariff

Selected SIM tariff

Chapter 10 DeviceConfig

10.1 General

The DeviceConfig configuration program can be downloaded free of charge from the following website:

<https://www.schildknecht.com/products/download-2/>

The tool is used for configuration, maintenance, fault analysis and synchronisation purposes. It is compatible with all "Habitat Schildknecht" devices equipped with a USB interface, wireless M-bus interface or Bluetooth Low Energy.

The requirements regarding configuration and maintenance vary depending on the type of device. To ensure simple and intuitive operation, the user interface of the DeviceConfig therefore automatically adjusts to the relevant device that is connected. In addition to the standard functions, the tool also supports device-specific processes (e.g. calibration, zero point adjustment).

The DeviceConfig enables you to complete the following tasks:

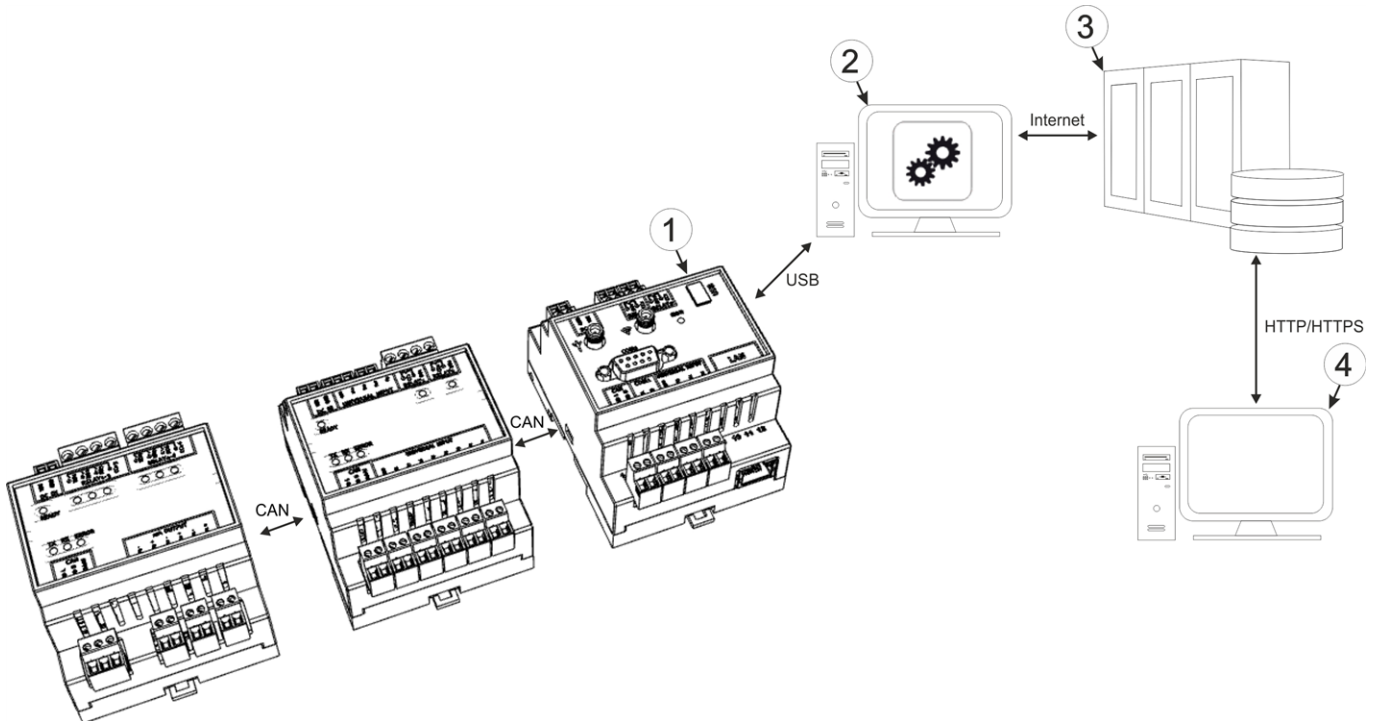
- Synchronisation of measurement data and configuration between device and server (specifically for devices without GSM/GPRS modem)
- Basic configuration of the device (e.g. measurement and transmission cycle)
- Read out and analysis of the device log
- Calibration, trimming and zero point adjustment (special knowledge and password required)
- Update the firmware

10.2 Prerequisites

Interfaces	1 x USB
Operating system	Win XP Windows Vista Windows 7 Windows 8 Windwos 10
Internet connection	Recommended
Required disk space	approx. 50 MB

10.3 Functional principle

The following description specifically refers to the use of the configuration program DeviceConfig in conjunction with the DATAEAGLE 701x 15UI/3mA/10Rel .



Functional principle

1 DATAEAGLE 701x 15UI/3mA/10Rel	3 DATAEAGLE-Portal server
2 PC with the DeviceConfig configuration program installed	4 Client that accesses the interface of the DATAEAGLE-Portal server via the web browser

Important note: The USB interface is a service interface that must be protected from contamination when not in use by the sealing plug included in the package.

The configuration program DeviceConfig communicates directly with the DATAEAGLE 701x 15UI/3mA/10Rel via a USB connection. The functions provided with the DeviceConfig configuration program include:

- Read out and analysis of the device log (see ""Log" tab" on page 125)
- Update the firmware(see ""Firmware" tab" on page 127)

10.4 Installation

The following chapter describes the installation process in Windows 7.

1. Execute the "*InstDeviceConfig.exe*" file to start the installation process.

Note: Only connect the device or USB BLE-Adapter (- upon request) to your PC once the installation process has completed as the required drivers are only installed during this process.



DeviceConfig setup wizard

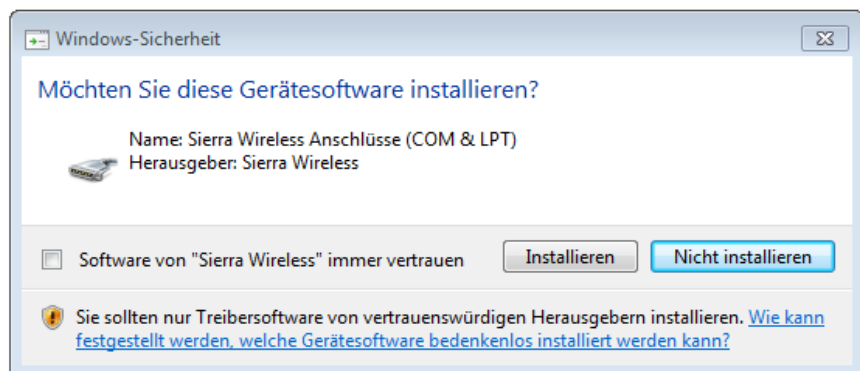
2. Follow the instructions of the setup wizard until the following screen is displayed. The following drivers must be installed to ensure correct operation.



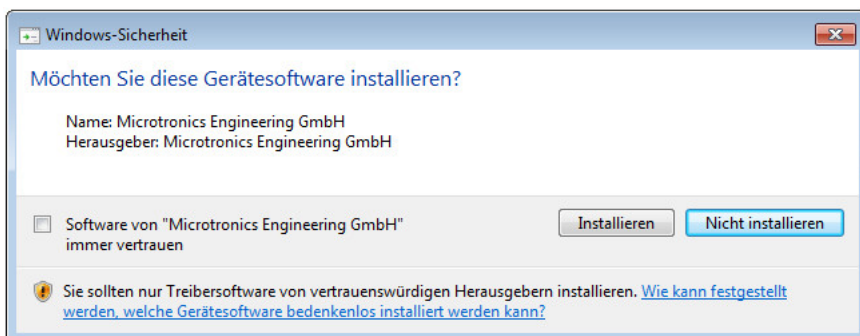
Installation of the USB drivers for the devices



Installation of the drivers for the USB BLE-Adapter

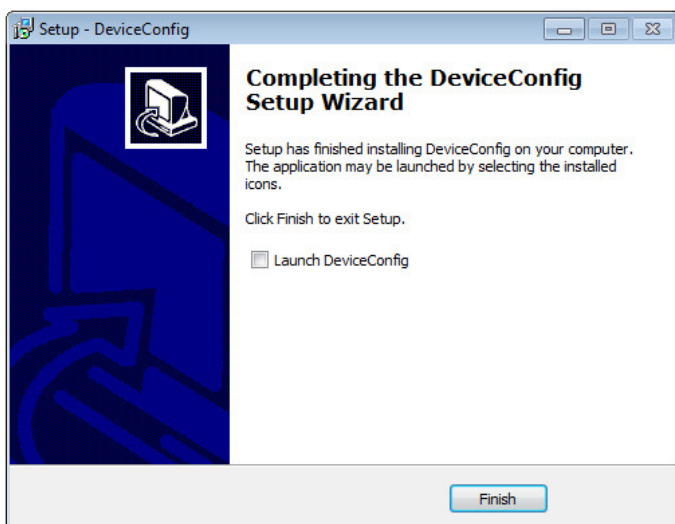


Installation of the USB drivers for the devices on a M1 basis



Installation of the USB drivers for the devices on a M2/M3 basis

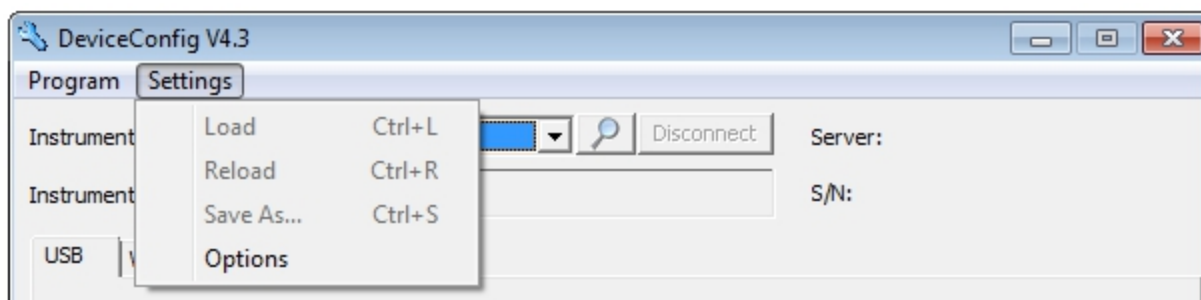
-
3. Once the following screen is displayed, close the installation process by clicking on the "Finish" button.



Complete the setup

10.5 Menu of the DeviceConfig

10.5.1 Settings

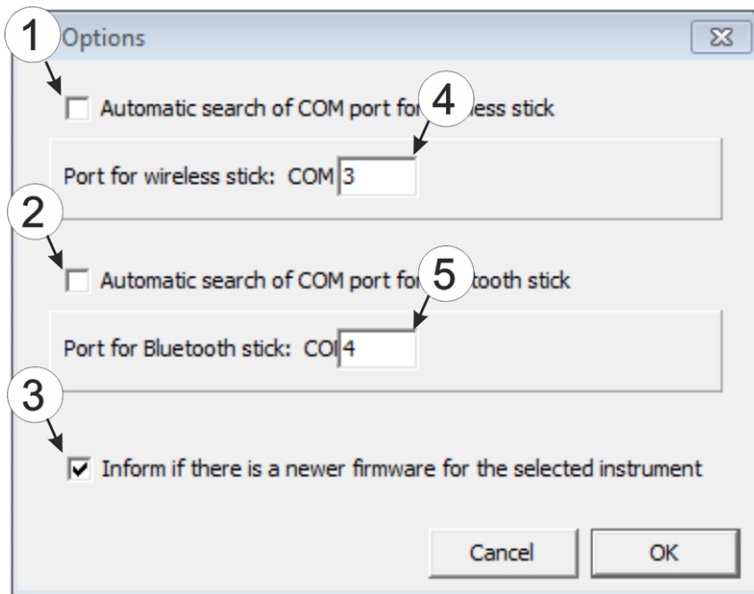


"Settings" menu item

10.5.1.1 Options

The settings for the COM ports to which the USB radio transmitter (- upon request) or the USB BLE-Adapter (- upon request) are connected can be specified and the automatic search for the available firmware versions can be activated or deactivated via the "Settings -> Options" menu item.

The USB radio transmitter (- upon request) is required for "Habitat Schildknecht" devices that are connected to the PC via a wireless M-bus, while the USB BLE-Adapter (- upon request) is required for devices that are connected to the PC via Bluetooth Low Energy. Information on whether your device supports one of these connection methods is provided in the user manual for the respective device.



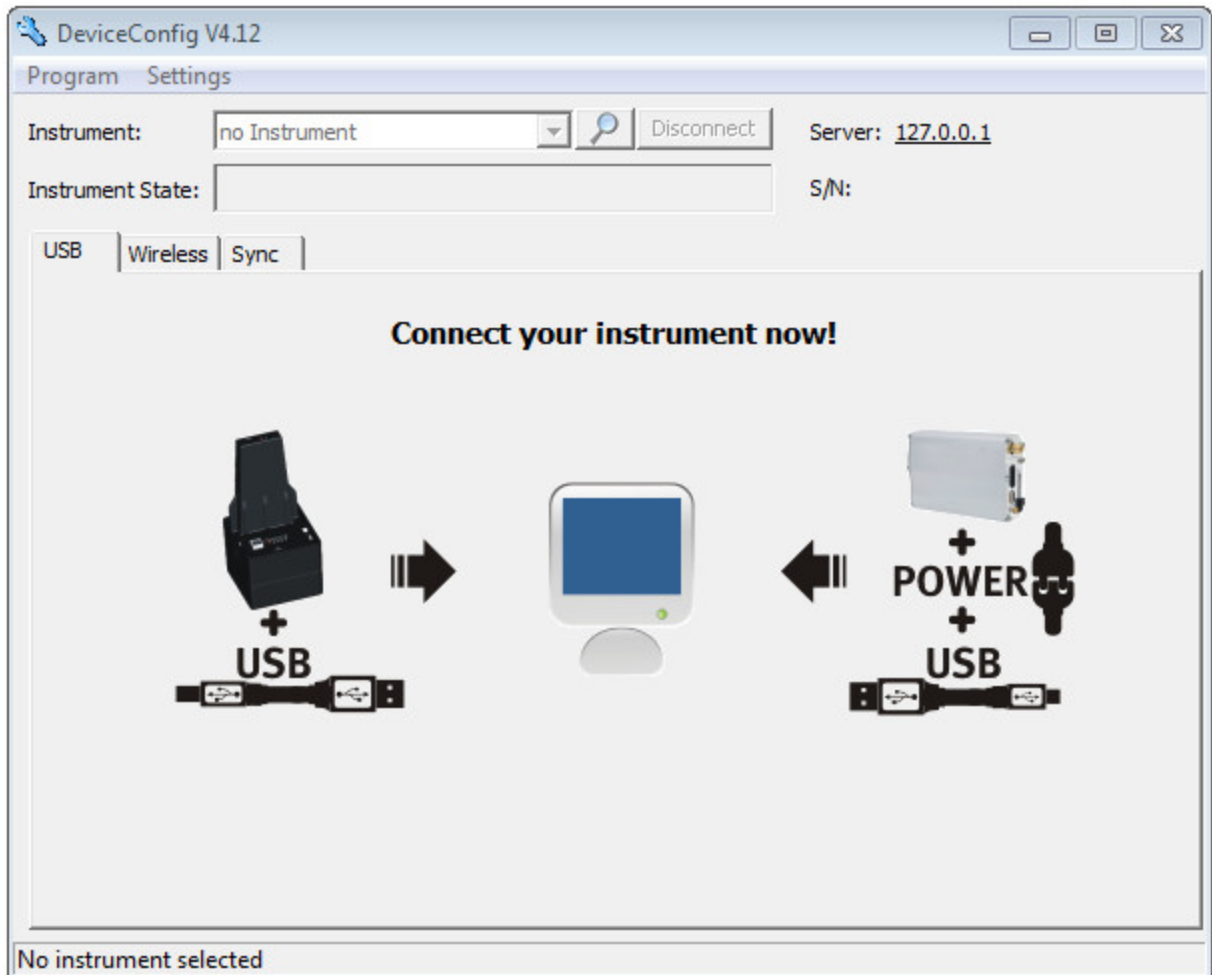
"Settings -> Options" menu item

<p>1 Activates/deactivates the automatic search for the USB radio transmitter (- upon request) on all of the available COM ports</p>	<p>4 COM port that is connected with the USB radio transmitter (- upon request) (only visible when the automatic search is deactivated)</p>
<p>2 Activates/deactivates the automatic search for the USB BLE-Adapter (- upon request) on all of the available COM ports</p>	<p>5 COM port that is connected with the USB BLE-Adapter (- upon request) (only visible when the automatic search is deactivated)</p>
<p>3 Activates/deactivates the automatic search for available firmware versions</p>	

10.6 Connecting a Device via USB

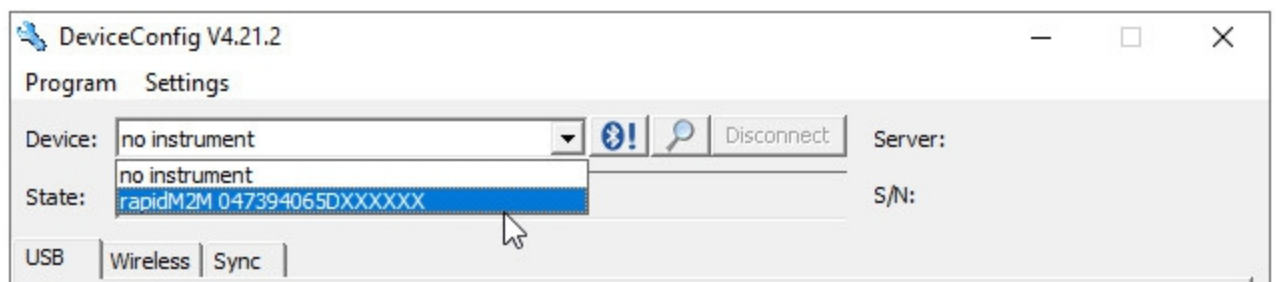
Important note: If you are using a device without an unlocked cellular modem, check the time and date settings (incl. time zone setting) on your PC, as these are used to synchronise the system time of the DATAEAGLE 701x 15UI/3mA/10Rel in this case.

1. Start the DeviceConfig configuration program.



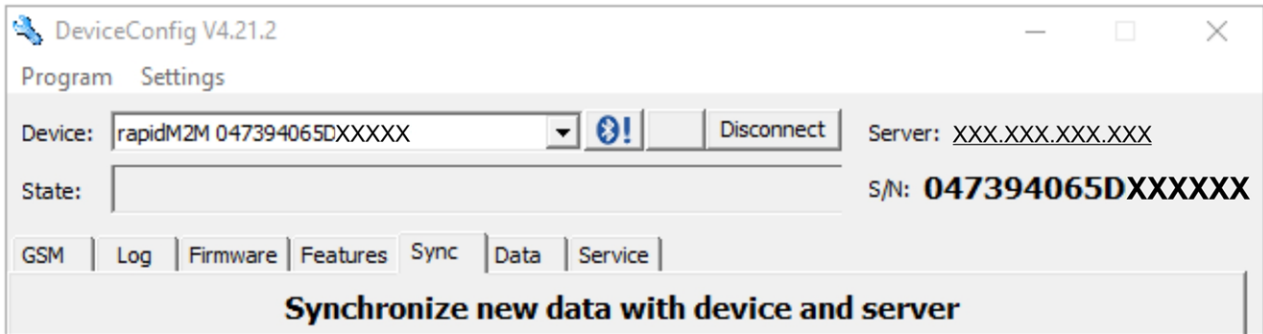
DeviceConfig

2. Connect the DATAEAGLE 701x 15UI/3mA/10Rel to the PC using a USB cable.
3. Select your device based on the serial number from the list of devices found.



List of devices found

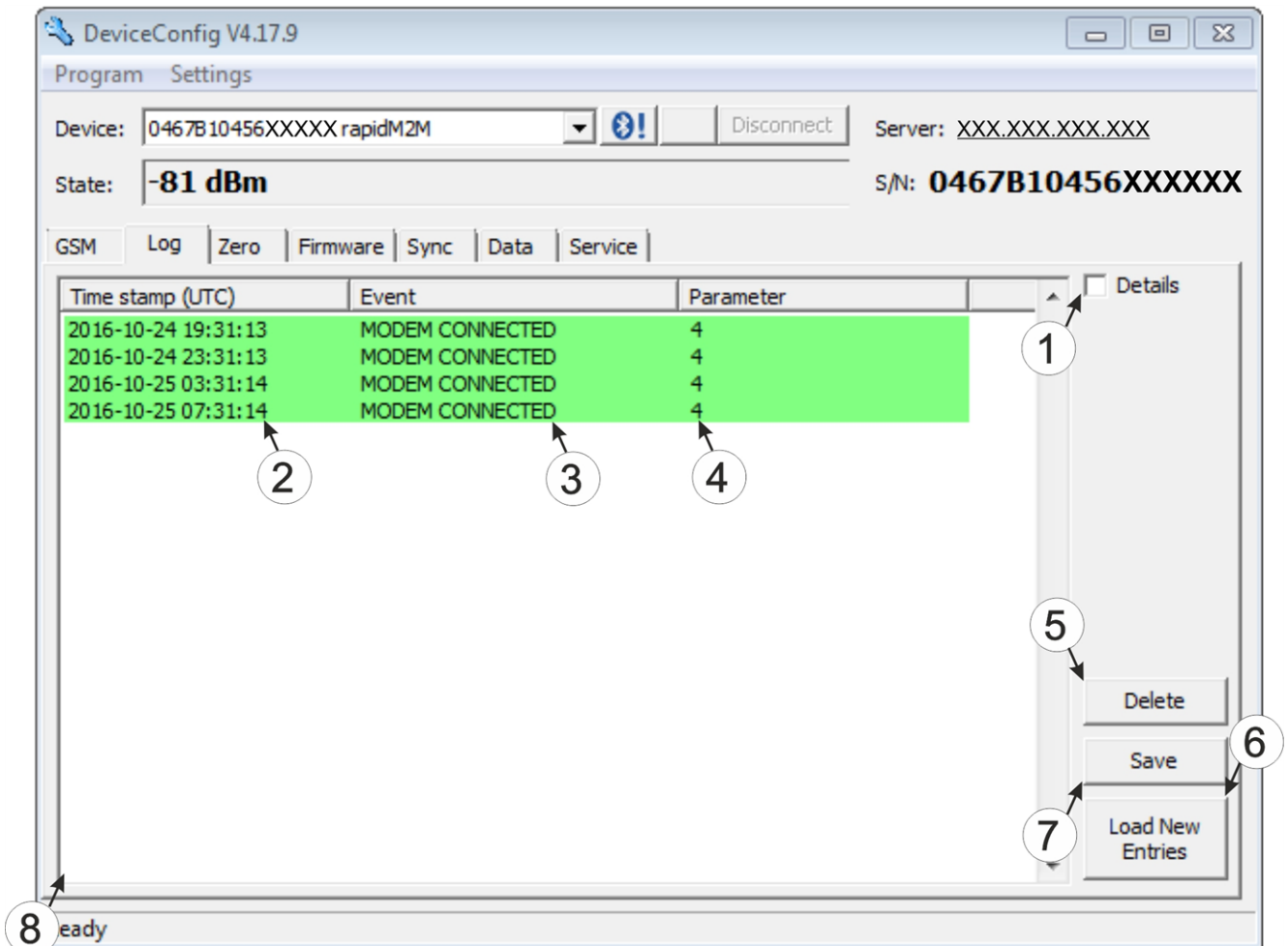
-
4. Wait until the DeviceConfig has received the configuration of the device. Depending on the device, additional tabs may be displayed.



"Sync" tab when actively connected to the DATAEAGLE 701x 15UI/3mA/10Rel

10.7 "Log" tab

This tab is designed to manage log entries. It enables the entries to be loaded from the DATAEAGLE 701x 15UI/3mA/10Rel , to be saved as a *.tsv file and entries to be deleted from the memory of the DATAEAGLE 701x 15UI/3mA/10Rel .

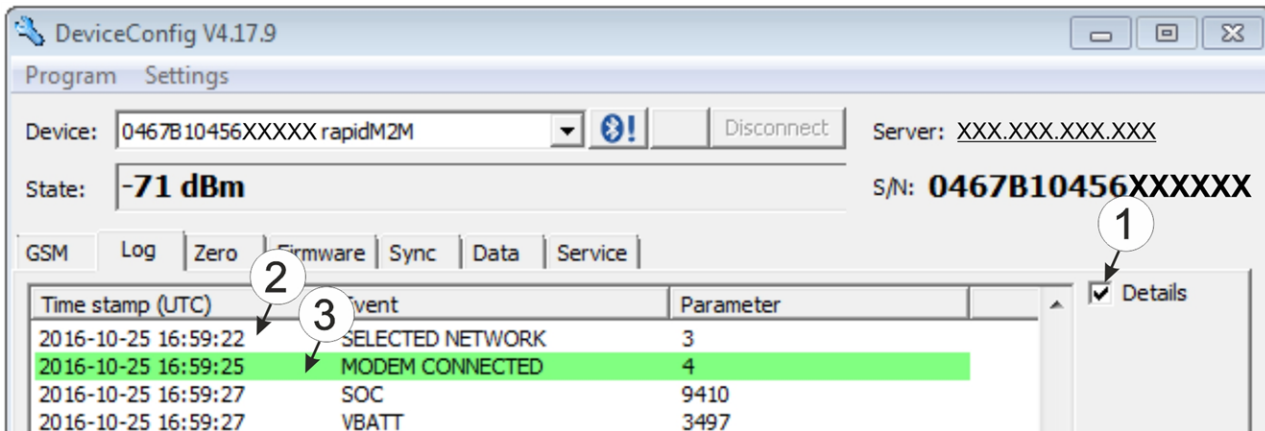


"Log" tab

1 Activates the detailed display of the log entries	5 Deletes the log entries from the memory of the device
2 Time stamp of the log entry	6 Loads the log entries from the device
3 Log entry	7 Saves the loaded log entries as a tsv file
4 Parameter of the log entry	8 Window to display the loaded log entries

The coloured highlighting indicates how crucial the log entry is. The white, informative log entries are only displayed when the detailed display of the log entries is activated (see ""Log" tab with detailed view activated" on page 126).

Colour	Evaluation
White	Information regarding the current operating state
Green	
Light blue	
Blue	
Purple	
Grey	
Yellow	Uncritical error
Red	Critical error



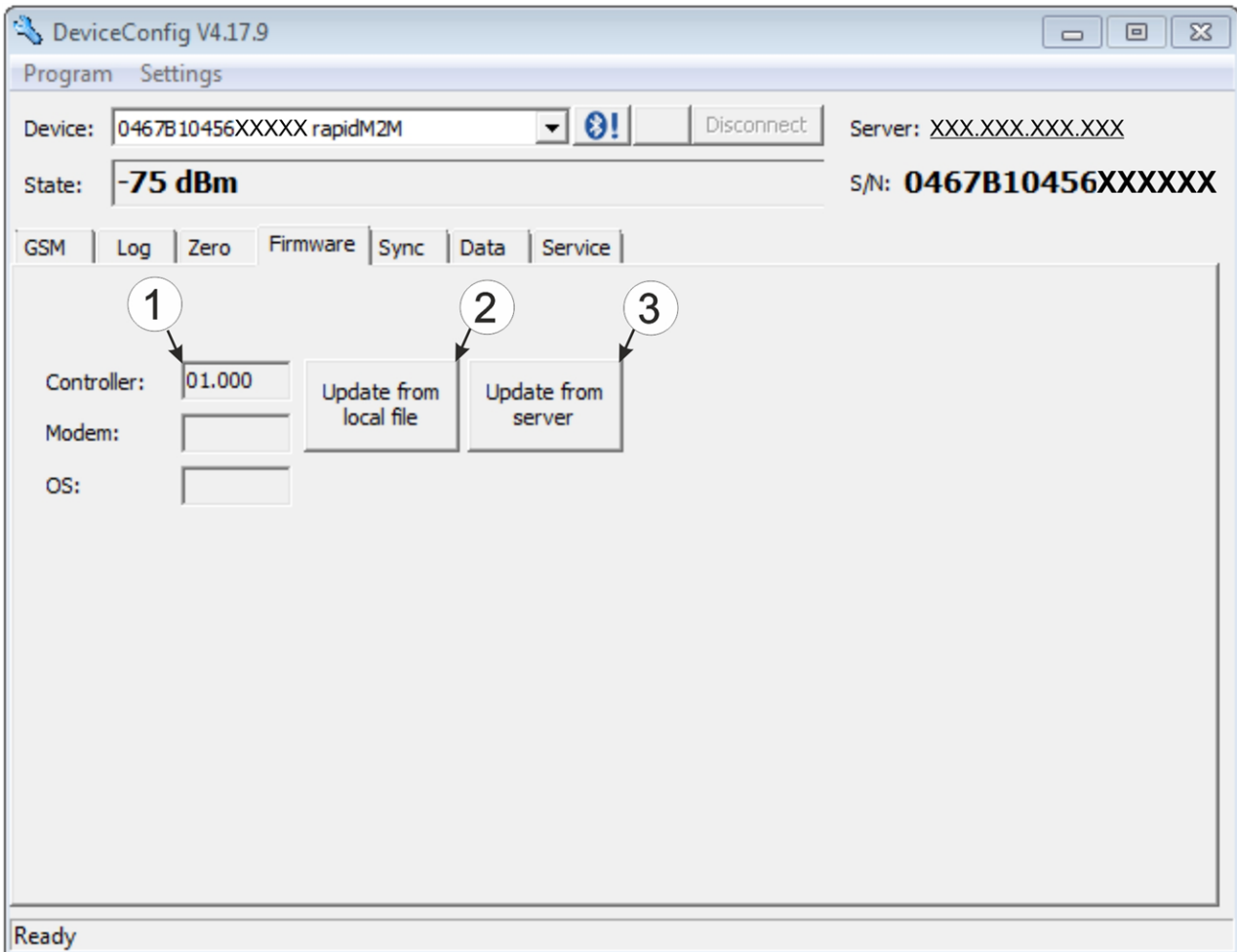
"Log" tab with detailed view activated

1	Activates the detailed display of the log entries	3	Log entry that is always displayed
2	Informative log entry that is only visible if the detailed display is activated		

10.8 "Firmware" tab

This tab enables firmware to be installed directly via the USB interface or the Bluetooth Low Energy interface. There are two available ways to update the firmware:

- Using a previously downloaded firmware package
- By directly loading from the DATAEAGLE-Portal server



"Firmware" tab

1 Currently installed software version	3 The firmware is loaded directly from the server and installed on the device.
2 Button to install a previously downloaded firmware package	

10.9 "Sync" tab

This area is designed to synchronise measurement data and configurations between DATAEAGLE 701x 15UI/3mA/10Rel , DeviceConfig and DATAEAGLE-Portal server. The "Sync" tab is also available if there is no connection (USB, wireless M-bus or Bluetooth) to a device.

10.9.1 Existing connection to the DATAEAGLE 701x 15UI/3mA/10Rel

If there is an existing connection to the DATAEAGLE 701x 15UI/3mA/10Rel, there is an option to only synchronise the measurement data and configurations with the DeviceConfig configuration program for local processing or to transfer them to the DATAEAGLE-Portal server. In the event that your PC is not connected to the Internet when reading out the data, you can initially synchronise the measurement data and configurations of the DATAEAGLE 701x 15UI/3mA/10Rel with the DeviceConfig configuration program. As soon as your PC establishes a connection to the Internet, for example when you return to the office, you can then complete the synchronisations between the DeviceConfig and DATAEAGLE-Portal server (see "No connection to a device" on page 129).



"Sync" tab when connected to the DATAEAGLE 701x 15UI/3mA/10Rel

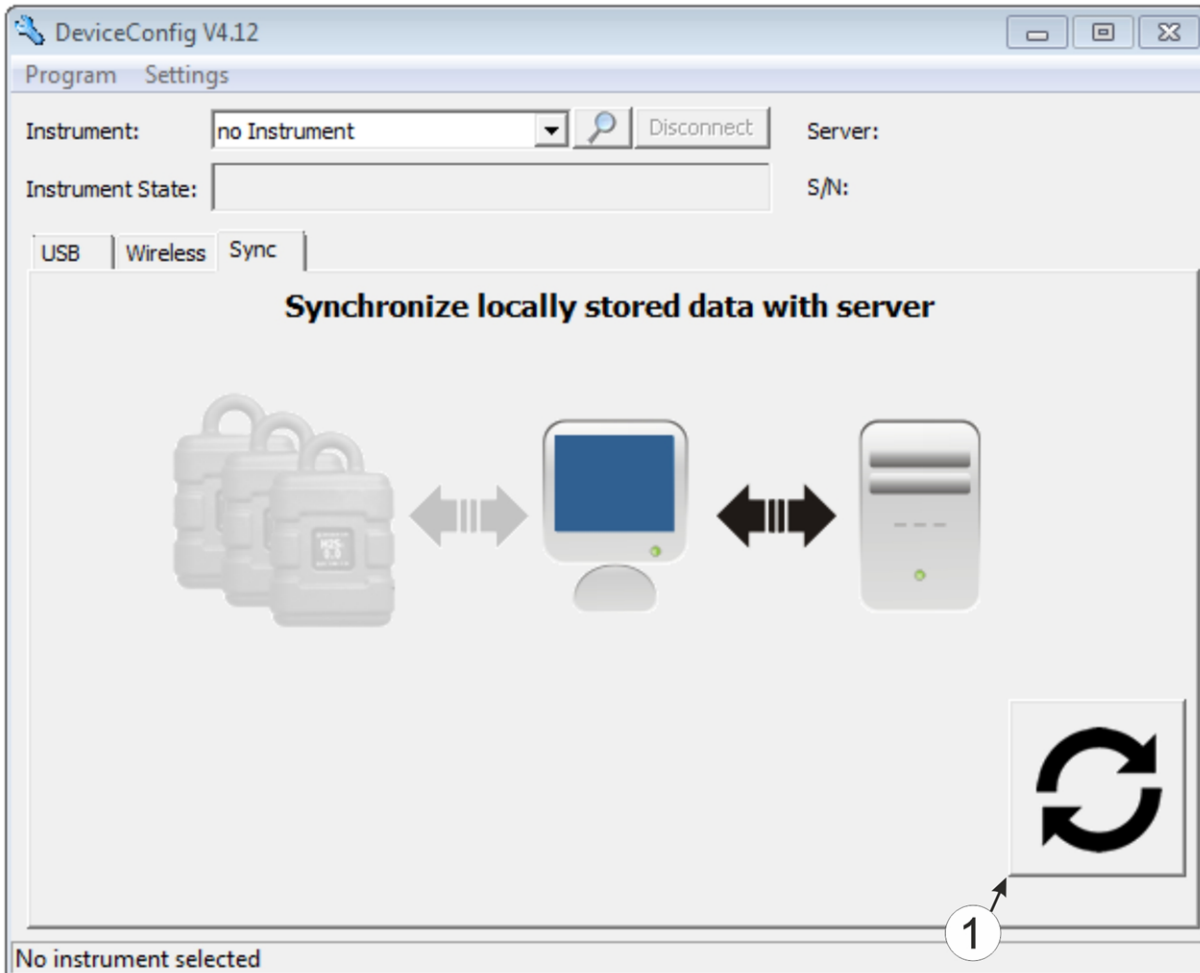
- 1 Checkbox to determine whether the measurement data and configurations should also be synchronised with the server when clicking on the Sync button.

Note: This checkbox is only displayed if your PC is already connected to the Internet.

- 2 Button to trigger synchronisation

10.9.2 No connection to a device

This option can be used to complete the synchronisation retrospectively, if no connection to the Internet was possible while reading out the measurement data and configurations from the DATAEAGLE 701x 15UI/3mA/10Rel .



"Sync" tab without connection to a device

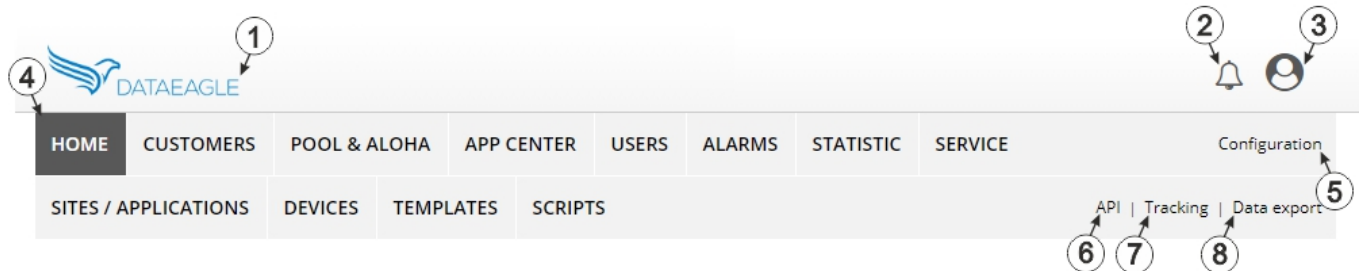
- 1 Button to trigger synchronisation During this process, the measurement data and configurations for all of the devices that the DeviceConfig configuration program has saved locally are synchronised with the DATAEAGLE-Portal server.



Chapter 11 DATAEAGLE-Portalserver

Note: All of the screenshots show version 50v007 of the DATAEAGLE-Portal server using the standard colour scheme. Newer versions may include minor changes to the appearance of the server.

11.1 Overview



Overview of the DATAEAGLE-Portal server

1 Freely selectable logo	5 Opens the screen to input the global settings for the server
2 Opens the window in which the notifications created by the system and intended for the currently logged-in user are summarized	6 Opens the rapidM2M Playground
3 Displays the menu for adjusting the user settings and for logging out the currently active user	7 Switches to the "Data exports" area to configure the data export. This tab is only visible if at least the licence for one export variant is available.
4 Tabs to switch between the individual server areas	8 Opens the input screen to upload a XML file. This tab is only visible if the licence for the XML import is available.

11.1.1 Explanation of the symbols



Adds a new entry to the current list (reports, sites, users, etc.).



Deletes the adjacent element (report, site, user, etc.) from the list.



Calls up the input screen to edit the adjacent element (report, site, user, etc.).

11.2 "Customer" area

Overview of the "Customer" area

1 Area where an image file can be displayed as a "Map" and/or the OpenStreetMaps map can be displayed

The sites can be manually placed on the image file used as a "map".

In the OpenStreetMaps map, the sites are only displayed once GPS coordinates have been assigned to the site.

2 Adds a new customer

<p>3 List of tags that are assigned to at least one of the customers displayed in the list of customers. If the list of customers was limited by the search field or selection of a tag, this is taken into consideration when creating the list of tags. A cross is added to the end of the list of tags as soon as the list of customers is limited by the selection of a tag. Clicking on this cross will reset the selection of all tags and the restriction is cancelled.</p> <p>By clicking on one of the tags with the left mouse button only those customers who have been assigned the corresponding tag are displayed in the list of customers and the selected tag is highlighted in colour.</p> <p>By clicking on one of the tags with the right mouse button all of the customers who have been assigned the corresponding tag are hidden, the selected tag is highlighted in colour and the title of the tag is crossed out.</p> <p>Clicking the same mouse button again will remove the restriction.</p>
<p>4 Opens the input screen for configuring the customer</p>
<p>5 Deletes the customer</p>
<p>6 Comment that can be entered in the configuration of the customer</p>
<p>7 If a default report was defined, the default report is accessed by clicking on the name of the customer. Otherwise the "Sites / Applications" area at customer level is opened by clicking on the name of the customer (see ""Sites / Applications" area at customer level" on page 134 or "Reports" on page 135).</p>
<p>8 Search field to filter the customer list</p>
<p>9 Customer's address that can be entered via the input screen for configuring the customer</p>
<p>10 Symbol via which a OpenStreetMaps map, on which the sites are displayed, can be loaded. (see "Map view" on page 135)</p>
<p>11 Symbol via which an image file can be loaded on to the server as an "Overview map"</p> <p>To remove the "Map" again, open the upload dialogue again and click on "Submit" without selecting an image file beforehand.</p>

11.3 "Sites / Applications" area at customer level

The screenshot displays the 'Sites / Applications' interface. At the top, there is a navigation bar with tabs: SITES / APPLICATIONS, DEVICES & ALOHA, USERS, ALARMS, STATISTIC, SERVICE. Below this, there are sub-tabs: SITES / APPLICATIONS TAGS, DEVICES TAGS, and API | Data export. The main content area is divided into several sections:

- Overview:** A map showing the location of sites in Steinheim an der Murr. A blue pin indicates the location of Site 1. The map is labeled with 'Overview' and has a circled '1' in the top left corner.
- Reports:** A section for viewing reports, currently showing 'Report 1'. It has a search bar and a 'Pages: 1 (Total 1)' indicator. A circled '2' is in the top left corner.
- Channel 1, Channel 2, and Int. Temp:** Three panels displaying sensor data for Site 1. Channel 1 and Channel 2 show a value of -0,3. Int. Temp shows a value of 22,7 °C. A circled '3' is in the top left corner.
- Sites / Applications:** A table listing sites with columns for Filter, Order, and Page Length. The table shows two sites: Site 1 and Site 2, both 4-Channel Data Loggers. A circled '4' is in the top left corner.

Overview of the "Sites / Applications" area at customer level

- 1 Area where an image file can be displayed as a "Map" and/or the OpenStreetMaps map can be displayed
The sites can be manually placed on the image file used as a "map".
In the OpenStreetMaps map, the sites are only displayed once GPS coordinates have been assigned to the site.

2	List of reports (see "Reports" on page 135)
3	List of sites/applications (see "Site" on page 109)
4	Symbol that represents a site on the "Map"
5	Symbol via which a OpenStreetMaps map, on which the sites are displayed, can be loaded. (see "Map view" on page 135)
6	Symbol via which an image file can be loaded on to the server as a "Map" To remove the "Map" again, open the upload dialogue again and click on "Submit" without selecting an image file beforehand.

11.3.1 Reports

The reports provide a variety of options to display graphs of the data on the web interface of the DATAEAGLE-Portalserver or to download the data from the DATAEAGLE-Portalserver. Detailed instructions on creating and handling the reports is provided in User manual for DATAEAGLE-Portal-Server (- upon request).

11.3.2 Map view

The map view provides an overview of the geographic position of the sites. Detailed instructions on operating and configuring map view are provided in User manual for DATAEAGLE-Portal-Server (- upon request).

11.4 Recommended procedure

11.4.1 Creating the site

Note: Some of the fields mentioned in the following chapters may be hidden depending on the respective user level. In this case, please contact the administrator of the DATAEAGLE-Portal server.

Detailed instructions on creating a new site are provided in User manual for DATAEAGLE-Portal-Server (- upon request).

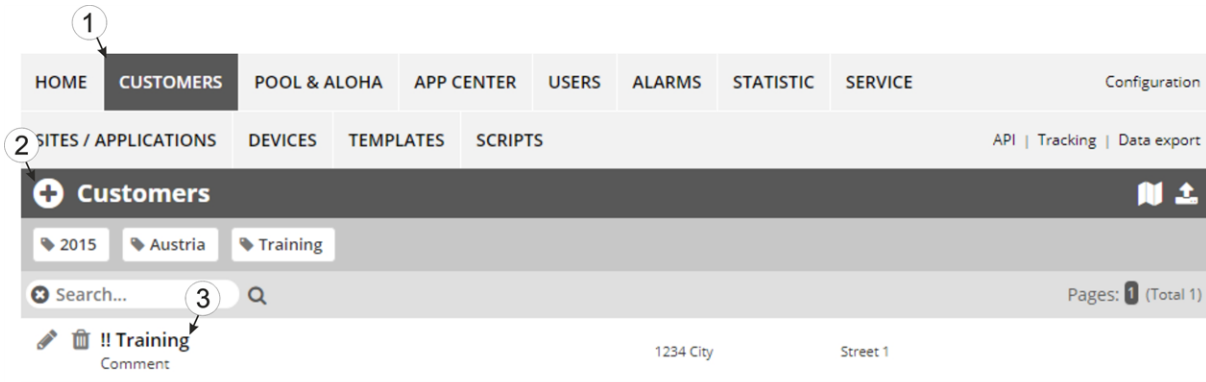
1. Log in via the web interface on the DATAEAGLE-Portal server. You will receive the web address from your responsible sales partner.



user name
password
LOG IN

Login form of the DATAEAGLE-Portal server

- Click on the "Customer" menu item of the DATAEAGLE-Portal server to call up the list of available customers. Select an existing customer or create a new customer.

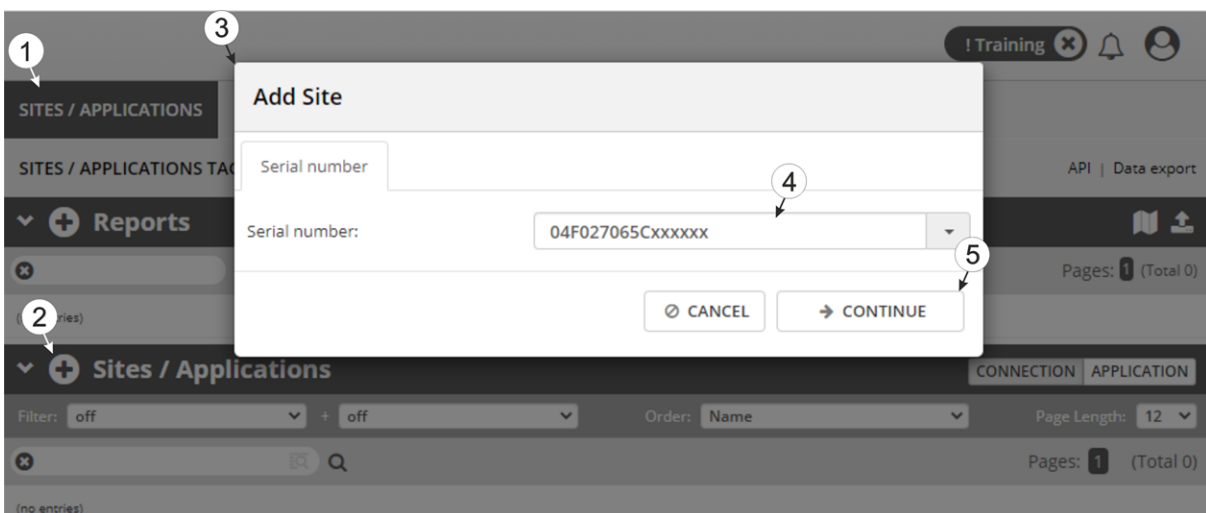


Selecting the customer

1 Menu item to call up the list of customers	3 List of available customers
2 Creating a new customer	

- Click on the "Sites / Applications" menu item of the DATAEAGLE-Portal server to call up the list of existing sites / applications. Open the input window for creating a new site by clicking the "Add new site / application" symbol, enter the serial number of your device in the appropriate field and then click the "Continue" button.

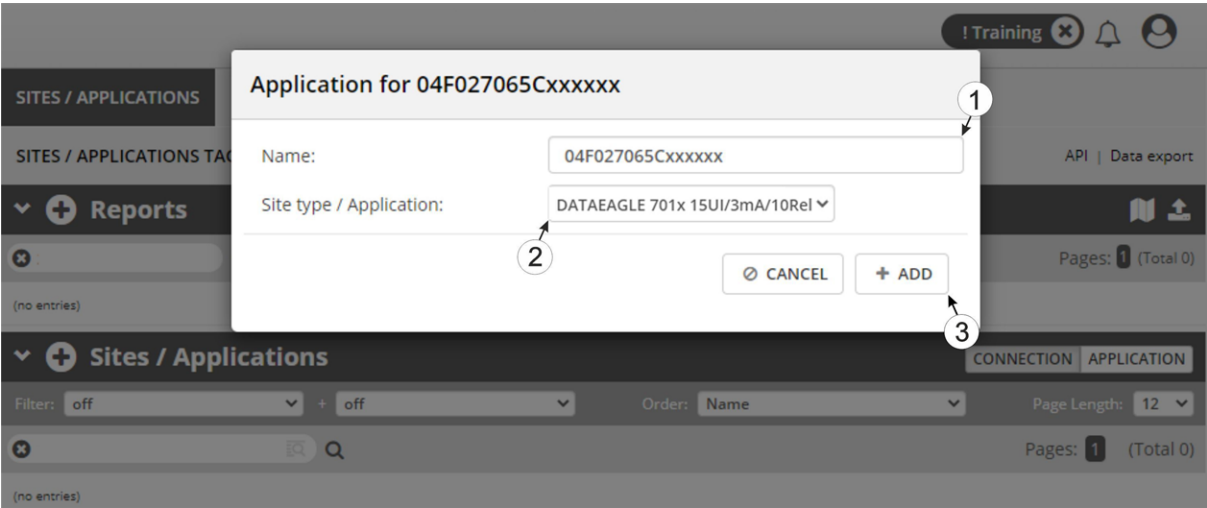
Note: The serial number is on the type plate of the device (see "Device labelling" on page 26)



Creating the site

1 Menu item to call up the list of existing sites / applications	4 Field for entering the serial number
2 "Add new site / application" symbol	5 "Continue" button
3 Input window for creating a new site	

- 4. If necessary, change the suggested name of the site, select the desired site type or the desired application from the drop-down list and then click the "Add" button.



Completing site creation

1 Name of the site (freely selectable)	3 "Add" button
2 Drop-down list of available applications, templates and site types	



Chapter 12 API

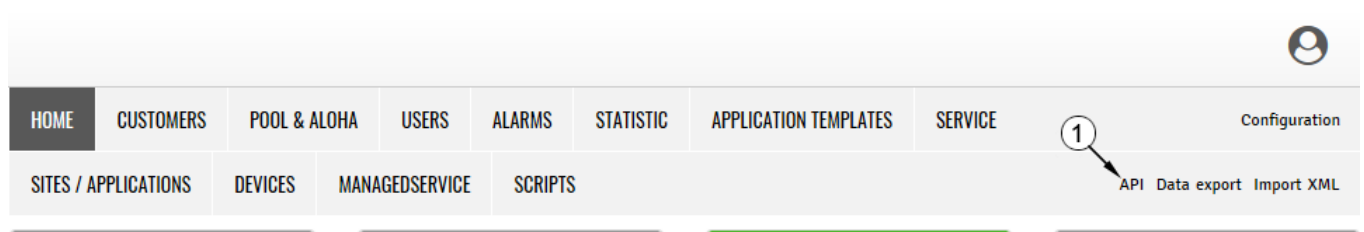
Important note: The relevant licences are required on the DATAEAGLE-Portal server to use the API (Application Programming Interface). For future information contact your responsible sales partner.

12.1 Backend API

The API is provided to export data from and import data to the DATAEAGLE-Portal server. However, this is not just limited to the pure measurement data but includes all of the data provided by DATAEAGLE-Portal server (e.g. configurations). It is therefore possible for the customer to completely dispense with the interface of the DATAEAGLE-Portal server and to create his own user interface. A specially developed PC program or web interface can, for example, be used for this purpose.

12.2 rapidM2M Playground

The rapidM2M Playground enables you to familiarise yourself with the API of the DATAEAGLE-Portalserver and to test the provided functions. One click on the "API" button will take you to rapidM2M Playground .



1 Opens the rapidM2M Playground

12.2.1 Overview

The screenshot shows the 'rapidM2M Playground' interface. On the left is a sidebar menu with 15 numbered callouts (1-15) pointing to various elements. The main area shows a selected HTTP command: 'GET /1/customers/\$CID'. Below this, there is a 'Response Body' window (callout 14) displaying a JSON object. A status bar at the top right shows '200' (callout 11) and '13 ms'. A 'Copy' button (callout 12) is visible next to the JSON response. The top navigation bar includes 'rapidM2M' (callout 6), 'API Quick guide' (callout 7), and other settings icons (callouts 8 and 9).

rapidM2M Playground

1	Input field for the user name
2	Input field for the password
3	List of the available HTTP commands. The HTTP commands are grouped according to their fields of application.
4	Depending on the selected HTTP command, the drop down lists for selecting the customer, user and site that should replace the corresponding wild cards (" \$CID "...customer , "\$UID"...user, "\$SID"...site) in the resource path of the HTTP command are displayed.
5	Button to execute the HTTP command
6	Opens the website "http://rapidm2m.com/" that includes additional information for developers
7	Opens the quick guide for the API
8	Button for displaying the menu that contains the global settings
9	Button to change the colour scheme of the rapidM2M Playground
10	Window displaying the selected HTTP command
11	Response code sent by the DATAEAGLE-Portal server as an answer to the HTTP command
12	Copies the JSON object generated as a response to the HTTP command on to the clipboard
13	Window displaying the documentation for the selected HTTP command. Depending on the selected command, this includes a description of the action being executed, information that must be observed and a description of the request body and response body.
14	Window displaying the JSON object that is generated as a response to the HTTP command
15	Window displaying the last executed HTTP commands

Chapter 13 Maintenance

Important note: *To prevent any damage to the device, the work described in this section of the instructions must only be performed by qualified personnel.*

The device must be deenergised before any maintenance, cleaning and/or repair work.

13.1 General maintenance

- Regularly check the DATAEAGLE 701x 15UI/3mA/10Rel for mechanical damage.
- Check all cables for mechanical damage at regular intervals.
- Clean the DATAEAGLE 701x 15UI/3mA/10Rel with a soft, moist cloth. Use a mild cleaning agent, if necessary.

13.2 Fuse replacement



DANGER:

Risk of fire. An incorrect fuse can cause injuries, damages or emissions. The fuse is located inside the housing. The housing may only be opened by the manufacturer.

If you believe that the fuse of one of the components of the DATAEAGLE 701x 15UI/3mA/10Rel (i.e. of the data logger or one of the extensions) is defective (see "Troubleshooting and repair" on page 145), the relevant component must be sent back in its original packaging to the manufacturer (see "Return" on page 44).



Chapter 14 Removal/disposal

Material separation only by qualified personnel!

- Be careful when disassembling the device, you may injure yourself.
- Take the separated components to the appropriate recycling.

Incorrect disposal can cause environmental hazards.

Dispose of the device components and packaging material in accordance with the locally valid environmental regulations for electronic products (e.g. according to European waste code 16 02 14).

1. Disconnect any charging voltage that has been used.
2. Disconnect any connected cables using a suitable tool.



Logo of the EU WEEE Directive

This symbol indicates that the requirements of Directive 2012/19/EU regarding the scrap disposal of waste from electric and electronic equipment must be observed. Schildknecht AG supports and promotes recycling and environmentally friendly, separate collection/disposal of waste from electric and electronic equipment in order to protect the environment and human health. Observe the local laws and regulations on disposal of electronic waste at all times.

The Schildknecht AG is registered with the EAR, therefore public collection and return points in Germany can be used for disposal.

The device contains a lithium button cell that has been soldered on. It must be removed before disposal or the disposal service must be informed that batteries are still located in the device.

The device includes a battery or rechargeable battery (lithium) that must be disposed of separately.



Chapter 15 Troubleshooting and repair

15.1 General problems

Problem	Cause/solution
The data logger does not respond (status LED always off).	<ul style="list-style-type: none"> • Check the cable connections (see "Connection of the sensors, actuators and the supply" on page 53)
An extension module does not respond (ready LED always off).	<ul style="list-style-type: none"> • Check the cable connections (see "Connection of the sensors, actuators and the supply" on page 53 or "Connection of the extension modules" on page 48)
Communication problems	<ul style="list-style-type: none"> • Load the device log from the DATAEAGLE 701x 15UI/3mA/10Rel using the DeviceConfig (see ""Log" tab" on page 125). A list of all the possible device logic error codes is included in the chapter "Log entries and error codes" (see "Log entries and error codes" on page 147).
Not all or no data is available on the server.	<ul style="list-style-type: none"> • The connection was aborted during the transmission, which is indicated by a timeout entry in the connection list (see "User manual for DATAEAGLE-Portal-Server " - upon request). Solution: Initiate a transmission or wait for the next cyclical transfer. • The assignment of the device and site is not correct (see "Site" on page 109).
Data at universal input is not plausible	<ul style="list-style-type: none"> • Check the cable connections (see "Connection of the sensors, actuators and the supply" on page 53) • Check whether the output signal of the sensor that you are using is compatible with the electrical characteristics of the universal inputs (see "Technical details about the universal inputs" on page 61). • Check the filter setting of the universal input (see "Measurement channels on the DATAEAGLE 701x 2G/3G/4G World " on page 75).
Communication via CAN interface isn't working (error LED blinking or on)	<ul style="list-style-type: none"> • Check the cable connections (see "Connection of the extension modules" on page 48) • The total length of the CAN bus exceeds the maximum permissible limit of 20m . • The terminal resistors for the CAN interface have not been set correctly for the bus participants (see "CAN bus without branch lines" on page 49) • There are other participants on the CAN bus. Only a device of the DATAEAGLE 701x 2G/3G/4G World family and compatible extension modules may be on the CAN bus.
The alarm state of a measurement channel has not been recognised.	<ul style="list-style-type: none"> • Increase measurement interval

Problem	Cause/solution
The alarm state has not been transmitted although the data is available.	<ul style="list-style-type: none"> • Check the alarm settings of the measurement channel • The connection was aborted during the transmission, which is indicated by a timeout entry in the connection list (see "User manual for DATAEAGLE-Portal-Server " - upon request). Solution: Initiate an aloha transmission or wait for the next cyclical transfer.
The alarm notification was not delivered even though the alarm was signalled.	<ul style="list-style-type: none"> • Check the settings of the alarm schedule (see "User manual for DATAEAGLE-Portal-Server " - upon request) • Check the address data of the alarm schedule (see "User manual for DATAEAGLE-Portal-Server " - upon request)
Relay does not respond.	<ul style="list-style-type: none"> • Failure of the voltage that is fed via the relays.
An incorrect current value is output on the analogue output.	<ul style="list-style-type: none"> • Check the cable connections (see "Connection of the sensors, actuators and the supply" on page 53) • The load of the connected device exceeds the permissible value (see "Analogue outputs on output extension (mA OUTPUT)" on page 64).

15.2 Log entries and error codes

Log entry		Parameter		Description
Code	Plain text	Code	Plain text	
1000	POWER ON	0	---	Restart following a power failure
		4	---	Watchdog reset (e.g. because of an exception)
		6	---	Reset was initiated by the device itself (e.g. in event of firmware update)
		##	--	Restart for another reason. There may be a hardware problem if the "POWER ON" log entry with a parameter code that is not equal to 0 or 6 is contained in the device log several times. Contact the manufacturer in this case (see "Contact information" on page 163).
1030	UV LOCKOUT	---	---	The device switches to energy saving mode and terminates all of the operations as the rechargeable battery or battery voltage is too low. Only the charge controller, if present, remains active.
1031	UV RECOVER	---	---	The rechargeable battery or battery voltage once again suffices to guarantee reliable operation. The device resumes normal operation in accordance with the configuration.
1034	CONTROLLER UPDATE	##	---	Controller firmware update was completed successfully This entry is always duplicated in the device log. In the first entry, the parameter specifies the major version number (e.g. 3 for 03v011), while in the second entry it specifies the minor version number (e.g. 11 for 03v011).
1035	EXCEPTION	##	---	An internal system error was detected that caused the device to restart. The parameter specifies the type of system error. Contact the manufacturer if the device log contains this error with the same parameter code several times (see "Contact information" on page 163).
1038	UV MODEM LOCKOUT	---	---	The device deactivates the modem because the rechargeable battery or battery voltage is too low. A connection cannot be established now.
1039	UV MODEM RECOVER	---	---	The rechargeable battery or battery voltage once again suffices to guarantee a stable connection.

Log entry		Parameter		Description
Code	Plain text	Code	Plain text	
1046	CONTROLLER UPDATE ERROR	##	---	Error updating the firmware of the controller
		0	CRC	The CRC of the firmware pack couldn't be verified
		1	SIGNATURE	The signature of the firmware pack couldn't be verified
		2	TLV	The data structure of the firmware pack is invalid
		3	FW INFO	The firmware pack is not suitable for this device
		4	MIN VERSION	The version of the firmware package is below the minimum version stored in the firmware currently installed on the device.
1126	MODEM COPS MODE	---	---	<p>The modem has changed the mode for the operator selection.</p> <p>Contact the manufacturer if the device log includes this error several times (see "Contact information" on page 163).</p>
1161	LOG REFORMATFILE	##	---	<p>Errors in file system have been resolved. This can result in data being lost (data and/or log entries). The parameter contains more information on the problem. Contact the manufacturer if the device log contains this error with the same parameter code several times (see "Contact information" on page 163).</p>
1192	FUTURE TIMESTAMP	##	---	<p>Internal error</p> <p>Contact the manufacturer if the device log includes this error several times (see "Contact information" on page 163).</p>
1200	MODEM ERROR			Modem error (see "Modem error" on page 152)
1201	MODEM NOT FOUND	---		<p>Internal error</p> <p>Contact the manufacturer if the device log includes this error several times (see "Contact information" on page 163).</p>
1202	MODEM CMME ERROR	##	---	The GPRS modem indicates a +CME error. The parameter specifies the type of error.
1203	SELECTED NETWORK	##	---	<p>A new GSM network was selected.</p> <p>The parameter specifies the MCC (Mobile Country Code) and the MNC (Mobile Network Code) of the selected GSM network.</p>

Log entry		Parameter		Description
Code	Plain text	Code	Plain text	
1207	GSM NETWORK REGISTRATION	0	NOT REGISTERED	Not registered, modem is currently not looking for any new operators to register
		1	HOME	Registered, home network
		2	SEARCHING	Not registered, but the modem is currently looking for a new operator with which it can register
		3	DENIED	Registration denied
		4	UNKNOWN	Unknown (e.g. outside the GERAN/UTRAN/E-UTRAN cover)
		5	ROAMING	Registered, roaming
1208	GPRS NETWORK REGISTRATION	0	NOT REGISTERED	Not registered, modem is currently not looking for any new operators to register
		1	HOME	Registered, home network
		2	SEARCHING	Not registered, but the modem is currently looking for a new operator with which it can register
		3	DENIED	Registration denied
		4	UNKNOWN	Unknown (e.g. outside the GERAN/UTRAN/E-UTRAN cover)
		5	ROAMING	Registered, roaming
1212	ERROR MODEM IRREGULAR OFF	##	---	Indicates a faulty connection. The parameter includes a counter that indicates how many consecutive connections have not worked.
1219	LTE NETWORK REGISTRATION	0	NOT REGISTERED	Not registered, modem is currently not looking for any new operators to register
		1	HOME	Registered, home network
		2	SEARCHING	Not registered, but the modem is currently looking for a new operator with which it can register
		3	DENIED	Registration denied
		4	UNKNOWN	Unknown (e.g. outside the GERAN/UTRAN/E-UTRAN cover)
		5	ROAMING	Registered, roaming
1252	MODEM TO CON	##	---	Timeout while a connection is being established. The parameter specifies the reason for the timeout. Contact the manufacturer if the device log contains this error with the same parameter code several times (see "Contact information" on page 163).

Log entry		Parameter		Description
Code	Plain text	Code	Plain text	
1281	ZLIB STREAMPROCESS ERR	##	---	Internal error Contact the manufacturer if the device log includes this error several times (see "Contact information" on page 163).
1282	ZLIB STREAMFINISH ERR	##	---	Internal error Contact the manufacturer if the device log includes this error several times (see "Contact information" on page 163).
1284	BYTE STUFF PENDING	---	---	internal error Contact the manufacturer if the device log includes this error several times (see "Contact information" on page 163).
1300	USB CONNECTED	---	---	USB connection to a PC established.
1310	USB DISCONNECTED	---	---	USB connection was disconnected.
1335	LOG_SHT2X_ STATE	0	SHT2X SENSOR OK	The internal temperature and air humidity sensor is returning valid values again
		1	SHT2X RH ERROR	A communication error occurred when reading the air humidity value from the internal temperature and air humidity sensor.
		2	SHT2X TEMP ERROR	A communication error occurred when reading the temperature value from the internal temperature and air humidity sensor.
		3	SHT2X RH+TEMP ERROR	A communication error occurred when reading the measurement value from the internal temperature and air humidity sensor.
		4	SHT2X PLAUSIBILITY ERROR	The values received from the internal temperature and air humidity sensor are not plausible (rH <0% rH or >100% rH or temperature <-40°C or >125°C)
1336	SHT2X COM ERR	---	---	Communication with the internal temperature and air humidity sensor is not possible (sensor not present or faulty)
1337	SHT2X COM ERR1	---	---	Starting the internal temperature measurement failed
1338	SHT2X COM ERR2	---	---	Starting the internal air humidity measurement failed
1339	SHT2X TEMP RAW	##	---	Temperature raw value (register value from the internal temperature and air humidity sensor) if a plausibility error (SHT2X PLAUSIBILITY ERROR) was detected

Log entry		Parameter		Description
Code	Plain text	Code	Plain text	
1340	SHT2X RH RAW	##	---	Air humidity raw value (register value from the internal temperature and air humidity sensor) if a plausibility error (SHT2X PLAUSIBILITY ERROR) was detected
1601	SIM_STATE	0	NONE	SIM state was changed to "NONE" (initial state).
		1	PRODUCTION	SIM state was changed to "PRODUCTION" (a new device is in stock).
		2	HOT	SIM state was changed to "HOT" (valid contract).
		3	COLD	SIM state was changed to "COLD" (end of contract or fair use policy violated).
		4	DISCARDED	SIM state was changed to "DISCARDED" (device has been decommissioned).
1910	ACCU 0 E2PROM ERROR	0	---	Rechargeable battery not available
		1	---	Invalid length of the data structure in the EEPROM of the rechargeable battery
		2	---	No charging profile available in the EEPROM (only with Li-ion rechargeable batteries)
		3	---	Error when reading the SoC-value
		4	---	Error when writing the SoC-value
		5	---	The charging profiles of the rechargeable batteries inserted do not match (only with devices that support the simultaneous use of multiple rechargeable batteries)
		6	---	<ul style="list-style-type: none"> • Permissible charging time exceeded • When restarting the device, it was recognised that the rechargeable battery currently in use has already exceeded the permissible charging time once. <p>The battery is probably defective and should be checked by the manufacturer.</p>
2000 - 2199	MODULE ERR	##	---	Module-specific critical error (see "Module-specific critical errors" on page 154)
2200 - 2399	MODULE WARNING	##	---	Reserved for extensions

Log entry		Parameter		Description
Code	Plain text	Code	Plain text	
2400 - 2599	MODULE INFO	##	---	Module-specific information about the current operating state (see "Module-specific information regarding the current operating state" on page 154)
2600 - 2799	MODULE DEBUG	##	---	Reserved for extensions
3000 - 3099	SCRIPT ERROR	##	--	Internal system error Contact the manufacturer if the device log contains this error with the same parameter code several times (see "Contact information" on page 163).

15.2.1 Modem error

Log entry		Parameter		Description
Code	Plain text	Code	Plain text	
GPRS error				
1200	BEARER GPRS FAILED	-988	---	GPRS setup error <ul style="list-style-type: none"> • Try to improve the position of the antenna. • Check whether the device is in the coverage area (www.schildknecht.ag).
1200	BAND SEL FAILED	-969	---	A network could not be found on the GSM900/1800 or on the GSM850/1900 band. <ul style="list-style-type: none"> • Try to improve the position of the antenna. • Check whether the device is in the coverage area (www.schildknecht.ag).

Log entry		Parameter		Description
Code	Plain text	Code	Plain text	
1200	NETLOCK ERROR	-966		Error when selecting the network. Check whether the device is in the coverage area. Internal SIM chip: see www.schildknecht.ag
TCP channel error				
1200	CHANNEL ABORTED	-965	---	An attempt is being made to write to/read a TCP client that is no longer available. Try again later
	TCP DNS FAILURE	-958	---	The name could not be resolved in an IP address. Internal error
	CHANNEL REFUSED	-955	---	The TCP connection has been refused by the server. Try again later
	CHANNEL HOST UNREACHABLE	-954	---	No route to the host. Try again later
	CHANNEL NETWORK UNREACHABLE	-953	---	No network available Try again later
	CHANNEL PIPE BROKEN	-952	---	TCP connection interrupted Try again later
	CHANNEL TIMEOUT	-951	---	Timeout (DNS request, TCP connection, ping response, etc.) Try again later
	MODEM POSITION UPDATE ERROR	-943	---	Timeout during determination of the GSM position data
	MODEM NETINFO STALL	-941	---	Error detected during online connection Contact the manufacturer if the device log includes this error several times (see "Contact information" on page 163).
	MODEM RESETLOOP	-940	---	Restart loop on modem detected. Contact the manufacturer if the device log includes this error several times (see "Contact information" on page 163).
	MODEM UNDERVOLTAGE	-939	---	Undervoltage on the modem detected. The power supply should be checked.

Log entry		Parameter		Description
Code	Plain text	Code	Plain text	
	MODEM OVERHEAT	-938	---	Overheating of the modem detected.

15.2.2 Module-specific critical errors

Log entry		Parameter		Description
Code	Plain text	Code	Plain text	
2003	i/o controller not responding	0	---	I/O Controller does not respond. Contact the manufacturer if the device log includes this error several times (see "Contact information" on page 163).
2005	i/o controller updated failed	##	---	Error updating the firmware of the I/O controller
		-1	---	Error not specified in more detail when updating the firmware of the I/O controller
		-2	---	It was attempted to install an older version of the firmware on the I/O controller. A firmware downgrade is not allowed.
		-3	---	The firmware version to be installed is already installed on the I/O controller.

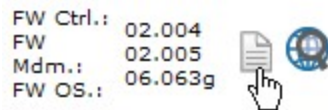
15.2.3 Module-specific information regarding the current operating state

Log entry		Parameter		Description
Code	Plain text	Code	Plain text	
2400	TX forced start	1	---	Additional connection establishment initiated independently of the transmission cycle
2402	operation mode changed to XXX	##	---	Operating mode changed
	operation mode changed to NORMAL	1	---	Normal operating mode. The supply is effected via V IN.
	operation mode changed to PRODUCTION	4	---	Production mode or no site is linked to the device.
	operation mode changed to BACKUP	5	---	The supply was switched to the rechargeable buffer battery..
2406	i/o controller update finished	0	---	Firmware update of the IO controller was successful

15.3 Evaluating the device log

15.3.1 Evaluating the device log on the DATAEAGLE-Portal server

The last 300 log entries on the DATAEAGLE-Portal server can be called up via the button shown below that is located in the measurement device list. As the log entries are sent to the server in the transmission cycle in the same way as the measurement data, only the log entries up to the last server connection are available.



The manual for the server ("User manual for DATAEAGLE-Portal-Server " - upon request) includes a detailed description of the evaluation of the device log on the DATAEAGLE-Portal server.

15.3.2 Evaluating the device log using DeviceConfig

The DeviceConfig program can be used to read all of the stored log entries, including those that have not yet been transferred to the DATAEAGLE-Portal server, directly from the DATAEAGLE 701x 15UI/3mA/10Rel via the USB interface.

A more detailed description about the evaluation of the device log using DeviceConfig is included in chapter ""Log" tab" on page 125.



Chapter 16 Spare parts and accessories

16.1 Suitable data loggers

Description	Quantity	Order number
DATAEAGLE 701x 2G/3G/4G World	1	17013-4G

16.2 Antennas

Description	Quantity	Order number
Extension cable for antenna SMA-M/SMA-F 2,5m	1	17211
Flat antenna Disc SMA-M 2,5m	1	10549
Angle adapter SMA-M/SMA-F	1	- upon request
Rod antenna multi band 2G/3G SMA-M	1	- upon request
Flat antenna Disc Multi Band 2xSMA-M 2m	1	- upon request
Dome antenna multi band SMA-M 3m	1	- upon request

16.3 Extension modules

Description	Quantity	Order number
Input extensions		
DATAEAGLE 701x Option 12 UI/2	1	17015
Output extensions		
DATAEAGLE 701x Option 3mA/6 Rel.	1	- upon request

16.4 Other accessories

Description	Quantity	Order number
myDatamet Tool Pen	1	- upon request



Chapter 17 Document history

Rev.	Date	Changes
01	10.11.2023	First version



Chapter 18 Glossary

App centre

Area of the DATAEAGLE-Portal server for the installation and management of the IoT apps. The app models that serve as a basis for the IoT apps are obtained via the rapidM2M Store. When installing an IoT app on the DATAEAGLE-Portal server the default settings defined when developing the app models are initially applied. These default settings can then be adjusted. Any number of IoT apps can be created based on a single app model by setting the appropriate default settings.

App model

An app model is developed in the rapidM2M Studio and forms the basis for creating IoT apps. It essentially contains the executable program files (device logic, backend logic, portal view, etc.) from which an IoT is created by adding the default settings. Distribution to the individual DATAEAGLE-Portal servers is carried out via the rapidM2M Store. The available app models are displayed in the app centre of the respective DATAEAGLE-Portal server.

Footprint

The manufacturer's devices are equipped with subscriber identity modules (SIM) ex-works for the purpose of mobile data transmission. The footprint describes those countries and regions where a mobile connection is available (see www.schildknecht.ag).

Device logic

The device logic is the intelligence installed on the device that determines the local functionality of the device. The device logic is part of the app model and is created in a C-like scripting language built on "PAWN".

Hardware ID string

Specifies the hardware platform installed in the device and its hardware version (e.g. rapidM2M M2 HW1.4). The part of the hardware ID string, that specifies the hardware version, is only increased if changes relevant to the rapidM2M firmware have been made to the hardware platform. When developing an app model, it can be specified on which hardware platform the app model can be installed and which version of the hardware platform is required as a minimum. The hardware ID string is displayed in the TESTbed of the rapidM2M Studio or in the "Identification" field of the input screen for configuring the device.

IoT app

IoT apps form the basis for creating sites. They consist of an app model and corresponding default settings that are applied as default values for the site when the site is created. The app centre can be used to create any number of IoT apps based on a single app model by setting the appropriate default settings. This makes sense if several use cases need to be covered by a single app model and they each require a different default site configuration (e.g. if a data logger with different external sensors is to be sold as a package).

NaN value

The "Habitat Schildknecht" uses special encoding to display different error statuses in the measurement values, for example. By setting a measurement value to "NaN", it is clearly marked as invalid and is thus not used for any further calculations. In the measurement value graphs, a measurement value that has been set to "NaN" is indicated by an interruption in the graph. When downloading the data, a measurement value set to "NaN" is indicated by an empty data field.

Product revision

Specifies the revision of the product. The revision is increased every time the product is modified (i.e. electronic system, mechanics, etc.) and is marked on the type plate of the product.

rapidM2M Store

Is responsible for distributing the app models to the individual DATAEAGLE-Portal servers. When installing and updating IoT apps the DATAEAGLE-Portal server access the app models provided in the rapidM2M Store . The developer of the respective app model defines which DATAEAGLE-Portal servers are allowed to access an app model via the rapidM2M Studio .

rapidM2M timestamp

Depending on the required accuracy, one of two special encodings can be used for the time stamp in rapidM2M. If the accuracy requirements are moderate, the "stamp32" data type (seconds since 1999-12-31 00:00:00 UTC) can be used. If a higher accuracy is required, the "stamp40" data type (1/256 seconds since 1999-12-31 00:00:00 UTC) can be used. Converting the "stamp32" data type into the UNIX timestamp (seconds since 1970-01-01 00:00:00 UTC) can be achieved by adding 946598400.

Chapter 19 Contact information

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