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# Manual

# Datafox Evo 4.6 FleKey

Flexible data collection with method



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## Alternations

### Alternation in this Dokument

Date	Chapter	Discription
14.08.2021	all	New Manual, Version 04.03.17.xx
25.04.2024	all	New Manual, Version 04.03.21.xx

### Alternations of the version

With the device generation IV a new versioning scheme has been introduced. According to this scheme the file name of the device firmware and the setup program (DatafoxStudioIV) is composed as follows:

Product name	XX. Device genera- tion	YY. Compatibility (which versions can be used to- gether)	ZZ. Version number (functional exten- sion)	Build Troubleshooting (with a new version the Build number is reset)
z. B. AE-MasterIV	04.	03.	9.	04

The use of the manual depends on the version of the firmware and the DatafoxStudioIV or the DFComDLL. Gather from the following table which manual matches which version. For different combinations no support can be offered.

### Firmware StudioIV and DLL validity

Firmware: 4.03.21.xx.

Studio and DLL 4.03.21.xx

The DatafoxStudioIV is backward compatible. This means that you can configure a device with a newer DatafoxStudioIV also older firmware, the device only supports the natural functions that are implemented in the older firmware version. I.e., relevant to the functions that are possible, is always the manual state that the firmware associated with the Setup equivalent. It is not possible to provide a centering firmware configured with a stand of DatafoxStudioIV to who is older than the firmware. recommendation:

If possible, use always the current version of DatafoxStudioIV.

What features are supported in which software versions, is from the file:

Datafox MasterIV, SW version xxx.pdf list as shown.

The file is located on the Datafox DVD and for download on the homepage. Please also note the instructions in each chapter in the manual. The updates are available on our website under [www.datafox.de](http://www.datafox.de) download.

## Content

<b>1.</b>	<b>For your Safety</b>	<b>1</b>
<b>2.</b>	<b>Introduction</b>	<b>2</b>
2.1.	Structure of the Documentation .....	2
2.2.	Guarantee Restriction .....	2
2.3.	Typography of the Documentation .....	3
2.4.	Important General Notes .....	3
<b>3.</b>	<b>Intended Use and Environmental Protection</b>	<b>5</b>
3.1.	Regulations and Notices .....	5
3.2.	Power supply .....	5
3.3.	Environmental Influences .....	5
3.4.	Mounting outdoors .....	6
3.4.1.	Degree of protection .....	6
3.5.	Temperature .....	7
3.6.	Repair .....	7
3.7.	Cleaning .....	8
3.8.	Further Notices .....	8
3.9.	Disposal .....	9
<b>4.</b>	<b>System Requirements / Hardware</b>	<b>10</b>
4.1.	System Structure .....	10
4.2.	Installation requirements for Operating Datafox Devices .....	11
4.3.	General Hardware Information .....	12
4.3.1.	Hardware equipment .....	12
4.3.2.	Behavior in case of power failure .....	12
4.3.3.	UPS .....	12
4.4.	Compatibility .....	13
4.4.1.	Firmware File Archive (*.dfz) .....	13
4.4.2.	Datafox Devices and Device Firmware .....	13
4.4.3.	Device Firmware and Device Setup .....	14
4.4.4.	Device Firmware and Communication DLL .....	14
4.4.5.	Communications DLL and DatafoxStudioIV .....	14
4.4.6.	DatafoxStudioIV and Device Setup .....	14
4.4.7.	Update / Downgrade .....	15
<b>5.</b>	<b>Device</b>	<b>16</b>
5.1.	Commissioning .....	16
5.2.	Guideline for Commissioning .....	17
5.2.1.	Set-up of the device .....	17
5.2.2.	Device Installation .....	17
5.2.3.	Troubleshooting during Commissioning .....	17
5.3.	Operation and display elements of the Evo 4.6 Flex-Key' .....	18
5.3.1.	Composition and Operation 4.6 .....	18
5.3.2.	Operation with gesture control for EVO 4.3 .....	19
5.3.2.1.	Display setup and bios of the Evo 4.6 .....	19
5.3.2.2.	Structure display "Normal display" .....	19
5.3.2.3.	Structure Display EVO 4.3 /4.6 in the Bios menu .....	21
5.3.2.4.	activate the Bootloader .....	27
5.3.2.5.	device reboot .....	27
5.3.2.6.	Switch the display design .....	28
5.3.2.7.	Create a new display design .....	29
5.3.2.8.	Keys and the Combinations .....	30
5.3.2.9.	Bios Menu Setting WLAN .....	31
5.3.2.10.	Setting of the Proximity- & ambient Light-Sensor .....	34



5.3.3.	Displaydesigner .....	37
5.3.3.1.	Color Setting for the Display .....	38
5.3.3.2.	Default Setting .....	38
5.3.3.3.	Display function buttons on the EVO 4.3 / 4.6 / 2.8 / 3.5 /5.0 display .....	39
5.3.3.4.	Upload images for function buttons of EVO 4.3 / 4.6 / 2.8 / 3.5 /5.0 .....	39
5.3.3.5.	Transfer additional images.....	40
5.3.3.6.	Picture for the Fingerprint Menu.....	40
5.3.3.7.	Picture for save record message .....	40
5.3.3.8.	Image display in the main menu .....	41
5.3.3.9.	Keyboard graphics a. touch config. for the EVO 4.6 FlexKey and 5.0 Pure.....	42
5.3.3.10.	Show images during inputs.....	43
5.3.3.11.	Design examples in the designer .....	45
5.3.3.12.	Individual Photo gallery for EVO Agera reader.....	46
<b>5.4.</b>	<b>Switch colours of the backlight .....</b>	<b>47</b>
5.4.1.	Switch lighting depending on the result.....	48
<b>5.5.</b>	<b>Installation of the EVO 4.3/4.6 Terminal .....</b>	<b>49</b>
5.5.1.	Mounting height of the Evo 4.3/4.6 .....	49
5.5.2.	All dimensions for the EVO terminal.....	50
<b>5.6.</b>	<b>Connecting of EVO 4.3/4.6 .....</b>	<b>51</b>
5.6.1.	Connecting plugs EVO 4.3/4.6.....	51
5.6.2.	Power supply of the EVO 4.3/4.6 .....	52
5.6.2.1.	Power supply .....	52
5.6.2.2.	Power via POE .....	52
5.6.3.	Modules for devices of hardware V4.....	53
5.6.3.1.	Description of the various extension modules .....	53
5.6.3.2.	Read the optional placement of the device .....	53
5.6.3.3.	Read out important module information from the device .....	55
5.6.3.4.	Connection of the individual modules.....	57
5.6.3.5.	Analog inputs, 4 x analog IN .....	57
5.6.3.6.	2 x digital out .....	58
5.6.3.7.	1 x digital Out 1x digital IN .....	58
5.6.3.8.	4 x digital IN.....	58
5.6.3.9.	4 x digital OUT activ-Low (ground switched).....	59
5.6.3.10.	4 x digital OUT aktive-Hi (plus switched).....	59
5.6.3.11.	RS-485 bus for access control.....	60
<b>5.7.</b>	<b>Communication of Hardware V4 Devices.....</b>	<b>61</b>
5.7.1.	Communication via USB .....	61
5.7.1.1.	Automatic detected connected USB to PC.....	62
5.7.2.	Installing USB driver for Hardware V4 Devices .....	63
5.7.3.	Communication / record transfer via USB-Stick (Host).....	64
5.7.3.1.	Error messages by using USB-Stick (Host).....	65
5.7.4.	Communication via TCP / IP .....	66
5.7.4.1.	Communication TCP / IP via network-cable .....	67
5.7.4.2.	Communication TCP / IP via wLAN / Wifi.....	68
5.7.4.3.	M111_WLAN ESP32-c3 ML01 (wLAN-Modul DF-WL03).....	69
5.7.4.4.	Texas Instruments TI-CC3135 (Generation 2) .....	70
5.7.4.5.	Redpine (Generation 1) .....	71
5.7.4.6.	Connection of the Terminals via TCP/IP DNS / DHCP .....	73
5.7.5.	Communication via Cellular Network (GPRS).....	75
5.7.5.1.	Communication state in the Display .....	76
5.7.6.	Communication via SMS.....	77
5.7.6.1.	Send a SMS .....	77
5.7.6.2.	Receive a SMS.....	78
5.7.7.	Communication via RS485 .....	81
5.7.7.1.	Connecting the terminal via RS485 to PC.....	81
5.7.7.2.	Connecting the Terminal via RS485 with a Comserver Lantronix.....	82

<b>5.8.</b>	<b>Connection and wiring of the access control</b> .....	<b>84</b>
5.8.1.	Configuration and structure of the Access control .....	84
5.8.2.	Description of Tables for Access Control 2 .....	87
5.8.3.	Access-control with Intera 2 .....	90
5.8.3.1.	EVO Intera II, Individual settings .....	93
5.8.3.2.	Functionality of the EVO Intera II .....	93
5.8.3.3.	Global function .....	94
5.8.3.4.	Einstellung der Gerätefunktionen .....	94
5.8.3.5.	Settings for standby .....	95
5.8.3.6.	Setting for standard operation .....	95
5.8.3.7.	Preview of reader behavior .....	96
5.8.3.8.	Transfer to the device .....	96
5.8.4.	Access control with EVO Intera Reader .....	97
5.8.4.1.	Connecting of the EVO Intera reader examples .....	99
5.8.4.2.	Connecting of KYO Oneloc as a door opener with one Intera .....	100
5.8.4.3.	Connecting of KYO Oneloc as a door opener with two Intera .....	103
5.8.4.4.	Wiring of KYO Oneloc as a door opener with two Intera .....	105
5.8.5.	Access control II with PHG-Modules .....	106
5.8.5.1.	Connecting of PHG-reader .....	108
5.8.5.2.	Configuration .....	115
5.8.6.	Access control II with EVO Agera .....	117
5.8.6.1.	Display and operation .....	117
5.8.6.2.	Display for state of access control .....	118
5.8.6.3.	Display the number keypad .....	118
5.8.6.4.	Error message .....	118
5.8.6.5.	Bios-menu .....	119
5.8.6.6.	General configuration .....	119
5.8.6.7.	Display configuration .....	120
5.8.6.8.	Bus configuration .....	120
5.8.6.9.	Setting the bus address of the reader for RS485 bus .....	120
5.8.6.10.	Activate the termination resistor of the bus .....	120
5.8.7.	Instructions for the electrician for installing the access control system .....	121
5.8.7.1.	Star-shaped bus wiring .....	121
5.8.8.	Calculation for the power supply of Access modules .....	123
5.8.9.	Cable length and cable cross section for access wiring .....	124
5.8.10.	Online functions for the access control .....	125
5.8.10.1.	Online via http-protocol .....	125
5.8.10.2.	Online via DLL connection .....	128
5.8.11.	Function extension for access control II .....	129
5.8.11.1.	General description .....	129
5.8.11.2.	Examples .....	130
5.8.11.3.	Description of the table „Action2“ .....	134
5.8.11.4.	Additional functions for Access Control .....	135
5.8.11.5.	List Presence .....	136
5.8.12.	Automatic relay release upon opening of the door .....	137
5.8.12.1.	Supervised doors .....	137
5.8.12.2.	Configuration .....	138
5.8.12.3.	Requirements for the ReaderProps entry .....	138
5.8.12.4.	Logical conditions implemented by the access controller .....	138
5.8.12.5.	Special case: Relays operated by time model .....	139
5.8.12.6.	Configuration sample .....	139
5.8.12.7.	Access control lists .....	139
5.8.12.8.	Additional lists .....	140
<b>5.9.</b>	<b>RFID Reader</b> .....	<b>141</b>
<b>5.10.</b>	<b>Data on Card</b> .....	<b>142</b>
5.10.1.	General Information .....	142

5.10.2.	Settings for using DataOnCard .....	143
5.10.3.	DataOnCard on the access control reader .....	147
5.10.4.	DataOnCard and a access control reader - wiring .....	148
<b>5.11.</b>	<b>Barcode Reader on RS232 port .....</b>	<b>149</b>
<b>5.12.</b>	<b>Fingerscanner optical sensor .....</b>	<b>150</b>
5.12.1.	Menu Page - Check Finger .....	151
5.12.2.	Menu page - "Teach in" fingerprints .....	151
5.12.3.	"Training" menu page .....	152
5.12.4.	Menu page - Delete .....	153
5.12.5.	Menu page - "Exit" .....	153
<b>5.13.</b>	<b>Finger scanner Line Sensor .....</b>	<b>157</b>
5.13.1.	Operation Finger Scanner .....	157
5.13.2.	General infomation .....	158
5.13.3.	Teach-In .....	159
5.13.4.	Procedure .....	160
5.13.5.	Process Variants .....	161
5.13.6.	Technical Data of the Fingerprint Module .....	162
<b>5.14.</b>	<b>Camera for EVO 4.3 and FelxKey .....</b>	<b>162</b>
5.14.1.	Enabling the camera in the device's setup .....	162
5.14.1.1.	Simple picture recording by field function .....	164
5.14.1.2.	Simple or randomized picture recording by field function .....	166
5.14.2.	Setting the storage size for camera images .....	166
5.14.3.	BIOS Menu .....	168
5.14.3.1.	Camera information .....	168
5.14.3.2.	Camera test .....	168
5.14.4.	Transferring images from the device to the PC .....	170
5.14.5.	Restoring camera images .....	171
5.14.6.	Deleting camera images .....	171
5.14.7.	Additional information .....	172
5.14.7.1.	Startup time of the camera module .....	172
5.14.7.2.	Recommendation for placing the field function in the setup .....	172
5.14.7.3.	Availability of camera images .....	172
5.14.7.4.	Status information on the camera .....	173
5.14.8.	Camera frame rates .....	174
<b>5.15.</b>	<b>Signature function (EVO 4.3 only) .....</b>	<b>175</b>
5.15.1.	Configuration using the Datafox Studio IV .....	175
5.15.2.	Integration into the setup process .....	175
<b>5.16.</b>	<b>Fever measurement on the wrist .....</b>	<b>176</b>
5.16.1.	Operating sequence of the measuring process .....	177
5.16.2.	Results off he measurement .....	177
5.16.2.1.	Description of the field function .....	178
5.16.2.2.	Operation on the unit .....	179
5.16.3.	Description of the field function in the Display Designer .....	181
<b>6.</b>	<b>Technical data Evo 4.6 FlexKey Terminal .....</b>	<b>184</b>
6.1.	communication modules .....	185
6.2.	access modules .....	185
6.3.	Module digital in and out .....	185
6.4.	Modules miscellaneous .....	185
<b>7.</b>	<b>FAQ .....</b>	<b>185</b>
<b>8.</b>	<b>Index .....</b>	<b>186</b>

# 1. For your Safety

## Safety Information for Datafox Products



The EVO 4.6 FlexKey must only be operated according to the instructions given in the manual. Do not insert any foreign objects into the openings and ports. The device must not be opened. All maintenance work must only be performed by authorized specialists.



Some devices contain a lithium ion battery or a lithium battery. Do not throw into fire!

Supply voltage: 12 Volt DC  
See respective type label / technical data.  
The device must only be operated with a power-limited power supply according to EN 60950-1. If you do not observe these instructions, the device may be damaged.

### Attention!

The following temperature ranges must be observed

Working area / storage temperature:	-20° C bis +70° C
Mobile communications module:	-20° C bis +55° C



In areas with cellphone ban, GPRS, WLAN and other cellular modems must be turned off.

Persons with heart pacemakers:

When using the device, maintain a distance of at least 20 cm between the heart pacemaker and the device in order to avoid possible interferences. Turn the device off immediately if interferences are assumed.



**Protection class:** Observe the technical data of the respective device. In case of laser devices of class 2, the eye is protected by the blink reflex and/or turning reactions if you briefly and accidentally look into the laser beam. The devices may be used without further protective measures. Nevertheless, avoid looking directly into the laser beam of the laser scanner

**Observe the additional notes in the chapter, "Proper use and environmental protection"**



We declare under our sole responsibility that the product described fulfills the protection requirements of European Directive 89/336 / EEC as amended by 91/236 / EEC, 92/31 / EEC, 93/97 / EEC and 93/68 /. See the manual of the devices for the standards. Evidence is provided by compliance with the following standards:EN 55022 : 2010

- EN 55024 : 2010 + A1 : 2015
- EN 61000 – 6 – 2: 2005
- IEC 61000-3-2 : 2014
- IEC 61000-3-3 : 2013
- IEC EN 60950-1 : 2006 + A11 : 2009 + A1 : 2010

## 2. Introduction

Datafox data terminals have been developed to fulfill the requirements of modern personnel time recording where users have high demands concerning flexible and elegant design. Furthermore, the Datafox Embedded-Concept also covers access control. All relevant data can be recorded with modern technology and be transferred to the analysis software immediately. Billings, calculations or other analyses can be performed in a timely manner; processes can be monitored and controlled actively. This saves time and ensures the data quality and immediacy required.

Datafox data terminals are based on the Datafox Embedded-System which is equipped with modern technology for data collection and of course also data transfer. You make your entries comfortably via keyboard, touch display, RFID or barcode. The device is available with GPS, GSM, GPRS, USB etc. It fulfills all conditions for a flexible usage not only for personnel or order time recording but also for further scopes. This constitutes a real added value. The powerful tools DatafoxStudioIV and DLL facilitate quick and easy integration in any IT solutions. Due to scalability, numerous options are available. You can select according to your company's requirements and only pay what you really need.

### 2.1. Structure of the Documentation

The manual contains a change history as well as a general part with safety information, the introduction and information concerning system requirements and system structure.

The general part is followed by the main part of the manual. It contains the chapter Product Description Device. In this chapter, device-specific components are described as well as the device's functions.

The final part of the manual provides technical data about the device and a glossary whose purpose it is to ensure a consistent understanding between user and manufacturer.

### 2.2. Guarantee Restriction

All installers are responsible for the use of the device and its accessories in accordance with its intended purpose and in compliance with the applicable laws, standards and directives.

All data in this manual has been checked carefully. Nevertheless, errors cannot be excluded. Therefore, we offer no guarantee nor accept any liability for consequences that derive from errors of this manual. Of course we are grateful if you point out errors to us. We reserve the right to make modifications in respect of technical progress. Our general terms and conditions of business apply.

#### Note:



Due to DatafoxStudioIV, Datafox devices offer many functions and combinations of functions not all of which can be tested in the case of updates. This applies especially to setups defined by you as customer. Before updating your device, please ensure by tests that your individual setup works without any errors. If you encounter a problem, please inform us immediately. We will take care of the clarification of the problem on short notice.

## 2.3. Typography of the Documentation

FW .....	Abbreviation for firmware (software in the device)
SW .....	Abbreviation for software
HW .....	Abbreviation for hardware
GV .....	Abbreviation for global variable
<Name;Software Version.pdf> .....	File names



**Note:**

Useful information which helps you avoiding possible mistakes during the installation, configuration and commissioning is given here.



**Caution:**

Here, notes are provided which must be strictly observed. Otherwise, malfunction of the system will occur.

## 2.4. Important General Notes



**Caution:**

Use the devices only according to regulations and follow the installation, commissioning and operating instructions. Installation and commissioning may only be performed by authorized specialists.

### Subject to technical alterations.



**Caution:**

Due to technical development, illustrations, function steps, procedures and technical data may vary slightly.

The Datafox device has been developed for the purpose of creating a flexible and easily integrated terminal for data recording serving for a great variety of applications. The device is robust and easy to use. Due to the PC setup program, the device is quickly and easily configured for its application field so that you save time.

Numerous optional features, such as bar code reader, transponder reader, digital inputs etc., enable you to use the device for:

- PZE - Personnel time recording
- AZE - Order time recording
- BDE - Operating data recording (I/O-processing)
- ZK - Access control
- FZDE - Vehicle data recording / telematics

**This manual describes the creation of setups with the setup program DatafoxStudioIV without covering specific applications. Potential problems and difficulties are pointed out.**

This manual describes the functionality of the EVO 4.6 FlexKey and explains its characteristic features. For example, installation, operation and equipment of the device are described.

In order to define the behavior of the device, a setup must be created. For this purpose, the DatafoxStudioIV has been developed.



With some practice it will be possible to create a complete compilation for the EVO 4.6 FlexKey within half an hour. If you need functions that are not available, please contact us.



**Note:**

If you need support for the compilation of setups, we offer you our services. Due to our extensive experience with the setup, we work very quickly and can make your setup even more efficient through useful advices, so that the input at the device can be performed quickly and securely.



**Note:**

Due to DatafoxStudioIV, Datafox devices offer many functions and combinations of functions not all of which can be tested in the case of updates. This applies especially to setups defined by you as customer. Before updating your device, please ensure by tests that your individual setup works without any errors. If you still encounter problems after thoroughly testing your setup, please inform us immediately. We will fix the error on short notice.

### 3. Intended Use and Environmental Protection

#### 3.1. Regulations and Notices

According to the current state of the art, measures were taken to ensure that the device meets the technical and legal regulations as well as safety standards. Nevertheless, malfunctions due to interferences through other devices can still occur.

Please observe local regulations when using the device.

#### 3.2. Power supply

Only operate the device externally with a limited power source in accordance with EN 60950-1.

Connection voltage of the MasterIV devices: 12 to 24 volts DC

If the devices run with rechargeable batteries, note the instructions in chapter "Rechargeable Battery".



**Caution:**

In the event of non-compliance with these instructions, the device or the battery (if any) can be damaged or destroyed!

In order to ensure maximum battery life, it is recommended to recharge the battery only after complete discharge.

See respective type label of the device EVO 4.6 FlexKey.

#### 3.3. Environmental Influences

Extreme environmental influences may damage or destroy the device and should be avoided. This includes fire, extreme sunlight, water, extreme cold and extreme heat.

See respective type label of the device.

### 3.4. Mounting outdoors

#### 3.4.1. Degree of protection

The terminal EVO 4.3 has IP65 on the front side.

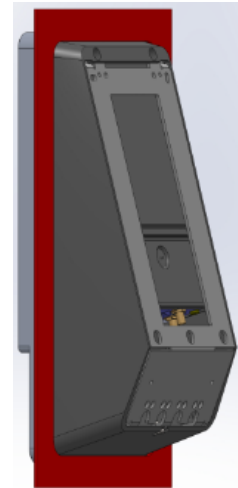
The connection area is set up to the top of the apparatus, so that no water coming from above (e.g., rain) could penetrate. Only jet water from below would be a problem. Should additional conditions beyond the normal weather cause the water to come from below, the terminals can be sealed to the wall when mounting.

For the EVO terminals it is advisable to mount the units on the heel of the front shell.

This would sink the entire back of the device with the connections and in the inaccessible area.

In order to allow such mounting, a mounting surface must be provided by the customer. For example, In boxes with front panel.

In the case of bell systems / mailboxes / barriers, mounting plates are usually already available which can be used for this purpose.



View recessed  
Installation in  
A front plate /  
Mounting plate .

### 3.5. Temperature

The device has an approved temperature range of - 20 ° C to + 60 ° C.

A heater is not necessary for outdoor use.

Due to the inherent heat of the electronics and power supply, the temperatures in the unit are higher even at ambient temperatures below -20 ° C.

Condensation water only occurs when a cold object comes into the heat and would therefore only be an issue for mobile devices.

We recommend, if you use the devices outside, then let it running permanently. Both in terms of temperature as well as condensation, it is recommended to not switch off devices which are used outdoors.

### 3.6. Repair

Except for the battery replacement in mobile devices, Datafox devices are maintenance-free and must only be opened by authorized professionals. In case of defects, please contact your dealer or the Datafox service hotline.

If a definite defect is present, you can also send the device directly to Datafox.

[https://www.datafox.de/reparaturen.de.html?file=files/Datafox\\_Devices/PDF/Support/Datafox%20Reparaturbegleitformular%20V3%2C%20D-GB\\_2020.09.25.pdf](https://www.datafox.de/reparaturen.de.html?file=files/Datafox_Devices/PDF/Support/Datafox%20Reparaturbegleitformular%20V3%2C%20D-GB_2020.09.25.pdf)

### 3.7. Cleaning



Never use scouring milk or caustic cleaning agents to remove dirt. Especially the displays as well as the keyboard and fingerprint modules must be cleaned carefully.

Wet wipes are permitted with:

- Water
- Soapsuds
- Glass cleaner
- Sagrotan
- antifact® N liquid (disinfectant for devices in medical field).



#### CAUTION

Risk of explosion if batteries are replaced improperly.  
Dispose used batteries according to the instructions.

### 3.8. Further Notices

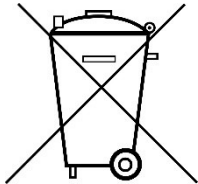
Do not expose the device to strong magnetic fields, especially during operation. Operate the slots and connections of the device only with the appropriate intended equipment. Ensure that the device is secured during transport. For reasons of safety, do not use the device while driving a vehicle. Also ensure that technical equipment of your vehicle is not compromised by the device. In order to prevent SIM card misuse, have your SIM card blocked immediately in cases of loss or theft of the device.

### 3.9. Disposal

Observe local regulations concerning the disposal of packaging material, used batteries and scrapped electrical equipment.

This product complies with the EU Directive No. 2002/95/EC, its appendices and the Council Decision laying down the restrictions of the use of hazardous substances in electrical and electronic equipment.

The device is covered by the European Directive on Waste Electrical and Electronic Equipment which came into force on February 13, 2003 and was translated into the legislation of the Federal Republic of Germany on August 18, 2005.



Do not dispose the device in domestic waste!

As the user, it lies within your responsibility to dispose electrical and electronic equipment via the designated collection facilities. The correct disposal of electrical and electronic equipment protects human life and the environment.

For more information regarding the disposal of electrical and electronic equipment, please contact your local authorities or waste disposal companies.



## 4. System Requirements / Hardware

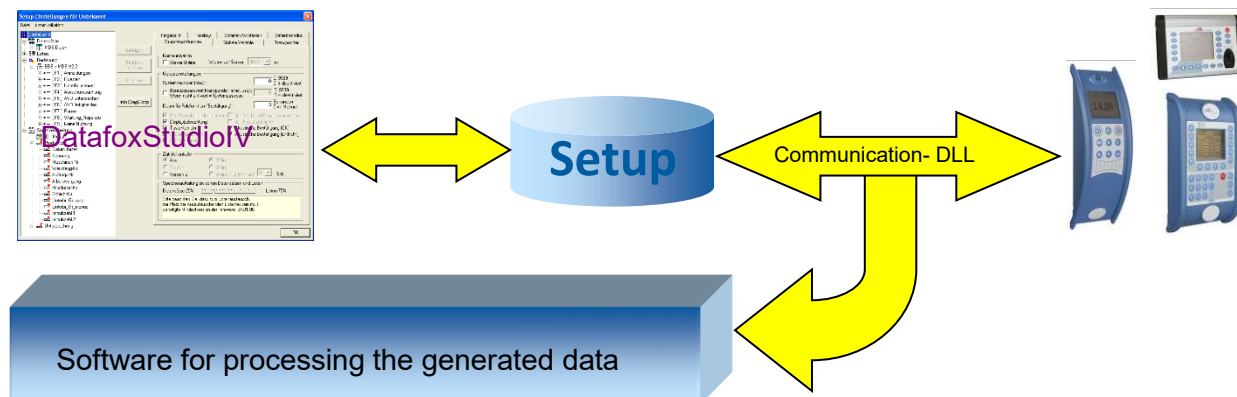
### 4.1. System Structure

The system consists of the Datafox device, the DatafoxStudioIV, the communication DLL and a software for processing the generated data.

Create setup

Save setup

Transfer setup to device



## 4.2. Installation requirements for Operating Datafox Devices

In order to operate the Datafox device, you need a 230 V power connection for the Datafox power supply. Depending on the main communication set, you need a corresponding transfer medium or connection cable.

Main communication:

- USB → one standard USB-A to USB-micro Cable (see the chapter connection USB).
- RS485 → a transmission path in accordance with the EIA-485 standard (see Connection RS485).
- 2G; 4G → a distortion-free mobile connection
- WLAN WiFi → a distortion-free channel to an access point (802.11 b/g/n) within reach (see Connection WLAN).
- at least one standard Ethernet cable, no „cross over“ (see Connection TCP)
- HTTP (internet) via LAN → TCP/IP connection with free internet access. The data are sent to a server.



### Note:

With increasing demands on transfer rate and interference immunity, the demands on the transmission path increase as well with regard to quality (interference immunity).

Ideally, the cables should be provided in a flush-mounted box. Please note this please provide the height information in the assembly instructions.

Assembly instructions on our homepage:

[https://www.datafox.de/d67/unternehmen/downloads/informationsmaterial/informationsmaterial-evo-serie/11500x\\_Datafox\\_EVO\\_4.3\\_4.6\\_7.0\\_Montage\\_und\\_Inbetriebnahme.pdf](https://www.datafox.de/d67/unternehmen/downloads/informationsmaterial/informationsmaterial-evo-serie/11500x_Datafox_EVO_4.3_4.6_7.0_Montage_und_Inbetriebnahme.pdf)

[https://www.datafox.de/d67/unternehmen/downloads/informationsmaterial/evo-3-5-universal/122001\\_Datafox\\_EVO\\_3.5\\_Universal\\_Montage\\_und\\_Inbetriebnahme.pdf](https://www.datafox.de/d67/unternehmen/downloads/informationsmaterial/evo-3-5-universal/122001_Datafox_EVO_3.5_Universal_Montage_und_Inbetriebnahme.pdf)

[https://www.datafox.de/d67/unternehmen/downloads/zubehoer-module/zutrittsleser/12300x\\_Datafox\\_EVO\\_Agera\\_Montage\\_und\\_Inbetriebnahme.pdf](https://www.datafox.de/d67/unternehmen/downloads/zubehoer-module/zutrittsleser/12300x_Datafox_EVO_Agera_Montage_und_Inbetriebnahme.pdf)

[https://www.datafox.de/d67/unternehmen/downloads/informationsmaterial/evo-3-5-pure/1140x1\\_Datafox\\_EVO\\_2.8\\_3.5\\_5.0\\_Pure\\_Montage\\_und\\_Inbetriebnahme.pdf](https://www.datafox.de/d67/unternehmen/downloads/informationsmaterial/evo-3-5-pure/1140x1_Datafox_EVO_2.8_3.5_5.0_Pure_Montage_und_Inbetriebnahme.pdf)

[https://www.datafox.de/d67/unternehmen/downloads/informationsmaterial/kyo-cenloc/124401\\_Datafox\\_KYO\\_Cenloc\\_Rack\\_-\\_TKSS\\_Montageanleitung.pdf](https://www.datafox.de/d67/unternehmen/downloads/informationsmaterial/kyo-cenloc/124401_Datafox_KYO_Cenloc_Rack_-_TKSS_Montageanleitung.pdf)

[https://www.datafox.de/d67/unternehmen/downloads/informationsmaterial/kyo-cenloc/124011\\_Datafox\\_KYO\\_Cenloc\\_Wall\\_Bohrschablone.pdf](https://www.datafox.de/d67/unternehmen/downloads/informationsmaterial/kyo-cenloc/124011_Datafox_KYO_Cenloc_Wall_Bohrschablone.pdf)

[https://www.datafox.de/d67/unternehmen/downloads/informationsmaterial/kyo-inloc/11x402\\_Datafox\\_KYO\\_Inloc\\_HS\\_flach\\_Montageanleitung.pdf](https://www.datafox.de/d67/unternehmen/downloads/informationsmaterial/kyo-inloc/11x402_Datafox_KYO_Inloc_HS_flach_Montageanleitung.pdf)

[https://www.datafox.de/d67/unternehmen/downloads/informationsmaterial/pze-master-iv/105406\\_Datafox\\_PZEMIV\\_Wandhalterung\\_Montageanleitung.pdf](https://www.datafox.de/d67/unternehmen/downloads/informationsmaterial/pze-master-iv/105406_Datafox_PZEMIV_Wandhalterung_Montageanleitung.pdf)

## **4.3. General Hardware Information**

### **4.3.1. Hardware equipment**

The devices with hardware V4 are equipped with a flash memory. Depending on the device type or selected option with 4 or 16 MB.

For the data, the memory is used as a quasi-ring buffer. If the complete ring buffer is written to full without the data being retrieved, the terminal reports "Memory full", please notify the admin". No further data is stored during this time.

Data that has already been read is gradually transferred. The entire memory is always used to minimize the number of accesses per individual memory cell.

An ARM microcontroller with 32-bit technology is used.

Depending on the type of device, the device has a Goldcap capacitor for buffering the time. This ensures that the watch continues to run correctly for up to one week if the power supply is interrupted.

In other devices, such as EVO 4.3 or PZE-Master V4, a buffer battery is installed in addition to the capacitor. With this, the watch retains its value for approx. 4 years.

The exact equipment can be found in the last chapter Technical Data.

### **4.3.2. Behavior in case of power failure**

The device boots automatically when the power supply is switched on again.

All data that was not sent or retrieved by the application software before the power failure is stored on the device.

These are not lost. After booting, this data is available again.

### **4.3.3. UPS**

A corresponding UPS for the V4 hardware is in preparation.

We currently recommend equipping the devices with a POE module if a "UPS" is to be used. Then connect the devices via a POE switch and supply the switch via a standard UPS.

## 4.4. Compatibility

The compatibility must be observed urgently between:

- Datafox devices and the device firmware
- Device firmware and device setup
- Device firmware and communication DLL
- Communication DLL and DatafoxStudioIV
- DatafoxStudioIV and device setup

### 4.4.1. Firmware File Archive (\*.dfz)

#### Description

The Firmware archive combines device specific firmware files into an archive container. This archive uses the file extension DFZ (abbreviation for Datafox Zip). When uploading firmware to a device through DatafoxStudioIV or the DFCom library, simply use this archive.



#### Note:

The firmware archive does not only contain software for the current device generation (HardwareIV), it contains software for previous hardware versions as well. You can update any Datafox device using this archive and upload the current version of the device firmware in this way..

#### Function of the Archive

The transfer routine of the device file selects the right file from the firmware file archive on the basis of the hardware options available in the device. Thus, it is guaranteed that all hardware components available in the device are supported by the corresponding firmware.

### 4.4.2. Datafox Devices and Device Firmware

Each Datafox device has an electronic flat module. The module has specific hardware equipment concerning the options (e.g. mobile radio, WLAN, fingerprint, ...). Due to technical conditions, different options are mutually exclusive. Currently there are conditions where not all hardware options can be supported in one firmware file due to limited program memory. This means that each device with specific hardware options needs a proper firmware to support the hardware options by the software.



#### Caution:

In general, the newest version of DatafoxStudioIV should be used, since this version is capable to support the current device hardware version. Should you opt for using an older version of DatafoxStudioIV, please keep the following minimal version requirements in mind:

- DatafoxStudioIV Version 04.03.00.x or newer is offering support for Hardware Generation IV and III
- DatafoxStudioIV Version 04.02.00.x or newer is offering support for Hardware Generation III

### 4.4.3. Device Firmware and Device Setup

The firmware (operating system) of the device and the device setup (\*.aes data file = application program) form a unit. By the device setup, the runtime behavior of the device (the firmware) is determined. This means the response of the device to input events by the user or the environment (e.g. digital inputs). In principle, only those functions of the device are executed that are supported by the firmware and defined via the setup. Prior to the productive commencement, you should therefore test each setup with the corresponding device or on a device with the same hardware options and firmware.

### 4.4.4. Device Firmware and Communication DLL

A firmware supports certain functions, dependent on the hardware options. The communication DLL is the interface between the firmware and the DatafoxStudioIV or your processing software. Therefore, the firmware must always have the same or a lower version number as the communication DLL.



**Note:**

If your application uses a newer version of the communication DLL than the firmware does, you can only use functions that are supported by the firmware. Otherwise, you will receive an error message (e.g. function not supported) which has to be analyzed.

### 4.4.5. Communications DLL and DatafoxStudioIV



**Note:**

The DatafoxStudioIV and the communication DLL are developed and released as a bundle. Therefore, they have to be used as a bundle. A newer version of DatafoxStudioIV does not work with an older DLL.

### 4.4.6. DatafoxStudioIV and Device Setup

With the DatafoxStudioIV, you create a device setup (application program) for the Datafox device. That means that in the setup only those functions were defined which were available in the DatafoxStudioIV version at the time of the setup creation. The DatafoxStudioIV you use for opening a device setup may thus only be newer but never older than the DatafoxStudioIV version you used to create the device setup.



**Note:**

The updates are always available for download on our homepage [www.datafox.de](http://www.datafox.de).



**Caution:**

When new devices are delivered, the latest firmware is loaded on the devices. If you wish to work with an older firmware version, please perform a downgrade. Please observe the compatibility notes in the release notes of the respective firmware version.

The data file <Device name>, Software version <version number>.pdf shows which functions are supported by which software release.

You will find the file on the product CD. Please also follow the instructions given in the chapters of the manual.

#### 4.4.7. Update / Downgrade

A firmware update or downgrade is a very sensitive process. Possibly, a reset of the main communication to RS232 may occur. In any case, consider the information regarding the compatibility in the software version list.

#### Firmware Update



**Caution:**

Before starting a firmware update, please check on the basis of the software version list whether there are any version dependencies that must be observed.

For example: when changing from Version 04.00.xx to version 04.01.xx, at least version 04.00.23.769 or higher must be present in order to run the update to version 04.01.xx successfully.

#### Firmware Downgrade

A firmware downgrade is not recommended.

We are constantly working towards improving the software/firmware; all functionalities are still included in new versions. New software always offers better functionalities and possible bugs are fixed.



**Caution:**

When performing a firmware downgrade the firmware has to be transmitted to the device twice. This has technical reasons. Errors shown on the display of the device after the first transfer can be ignored.



## 5. Device

**Note:**

It is necessary to ensure suitable protection from direct sunlight as synthetic materials are not 100% UV resistant. Fading is simply an optical defect that does not compromise the functionality of the device.

**Caution:**

Please keep in mind that MasterIV terminals use a flash memory. According to the manufacturer, each memory sector (512 byte) can be written to a maximum of 100,000 times. The firmware of the terminals distributes the access to the memory sectors, this technique is called wear levelling. Bad blocks in case of write or read failures are not used anymore. However, despite this technique, it is not advisable to write the memory too frequently. The application should initialize a new list transfer only after a change of the list data but not cyclically.

Keep in mind the message - FlashService - in the display of the device. It means that the live time of the flash memory according to the manufacturer instruction will be reached soon. Then the device has to be sent to Datafox for service.

### 5.1. Commissioning

On delivery, the device is fully functional and configured with a demo setup so that you can test the input immediately. After establishing the power supply the device will switch on automatically. The EVO 4.6 FlexKey automatically starts booting, recognition of the hardware options and loading the setup. After having finished booting, the device switches to operation. Now itEVO 4.6 FlexKey is ready for use.

**Note:**

On delivery, the main communication is set to TCP/IP and on DHCP. If TCP/IP not on board, then is the main communication set to USB.

**Caution:**

If external modules (e.g. access control, signal processing via the digital inputs) with an external power supply are used, ensure to comply with all limits (max. voltage and current) before commissioning the system.

## 5.2. Guideline for Commissioning

### 5.2.1. Set-up of the device

This section provides a short guideline for commissioning und links to the corresponding chapters in the manual.

- ▶ Connecting device to current supply
- ▶ Setting interface for communication
- ▶ Loading setup of the device                      See manual „[DatafoxStudioIV](#)“

### 5.2.2. Device Installation

- ▶ Installing the device at the intended location
- ▶ Establishing connections for:
  - Power:
  - Communication:
    - [USB](#)
    - [TCP/IP](#)
    - [TCP/IP wLAN /Wi-Fi](#)
    - [GPRS](#)
    - [RS485](#)
  - Digital input
  - Digital output
  - Analog inputs
  - Access-control
- ▶ Finishing installation of the device
- ▶ Setting for man communication

### 5.2.3. Troubleshooting during Commissioning

- ▶ Please see the FAQ on our website: <http://www.datafox.de/faq-de.html>.
- ▶ Tips:
  - Connection to the device cannot be set up via TCP/IP
    - Check IP in the device and the application (studio)
    - Ping on IP
    - Setting "Active Connection" in BIOS?                      → set to NO
    - Setting "HTTP" in BIOS?    → set to NO

### 5.3. Operation and display elements of the Evo 4.6 Flex-Key'

#### 5.3.1. Composition and Operation 4.6

The terminal has a capacitive touch



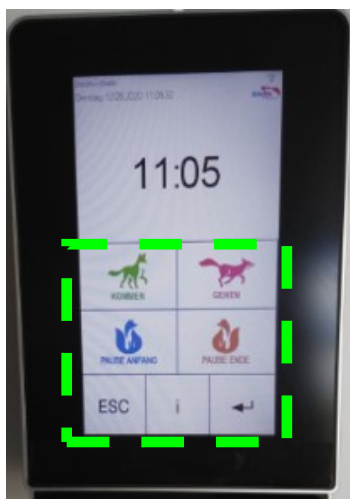
When displaying lists or submenus, this touchpad is selected. Scroll up and down. ▲▼

If arrow keys on the lower part of the touch are stored, these must be used to select in the list.

Touch area. Configuration is device-dependent depending on the order. See next chapter "Configuration Touch Data 4.6"

Reading area of the transponder with background lighting in RGB colors. See chapter "Switching backlighting".

Background lighting in RGB colors for customer logo. See chapter "Switching backlighting".



Touch area. Here is the same Device with other picture in the background and other colors. That's more flexible than with an EVO 4.3.

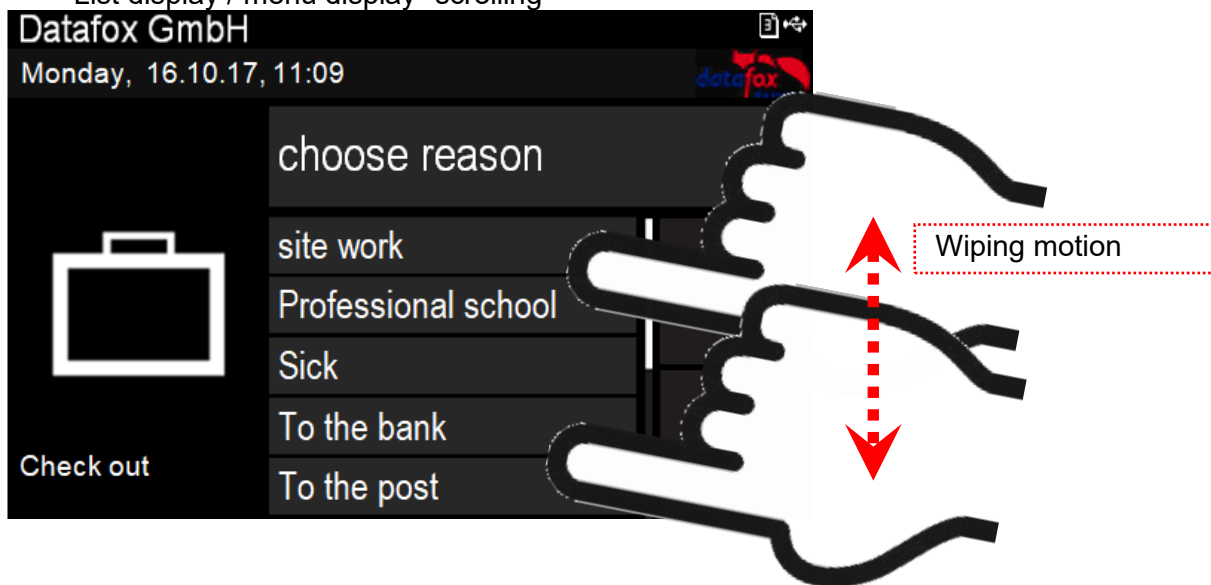
### 5.3.2. Operation with gesture control for EVO 4.3

The world of smartphones and tablets inspire all users of such devices.

This operating convenience has also been introduced at Datafox. Now you can scroll through the display by "Wipe".

This functionality is available here:

- scroll in Bios menu
- List display / menu display "scrolling"



- Turning pages in main menu / submenu

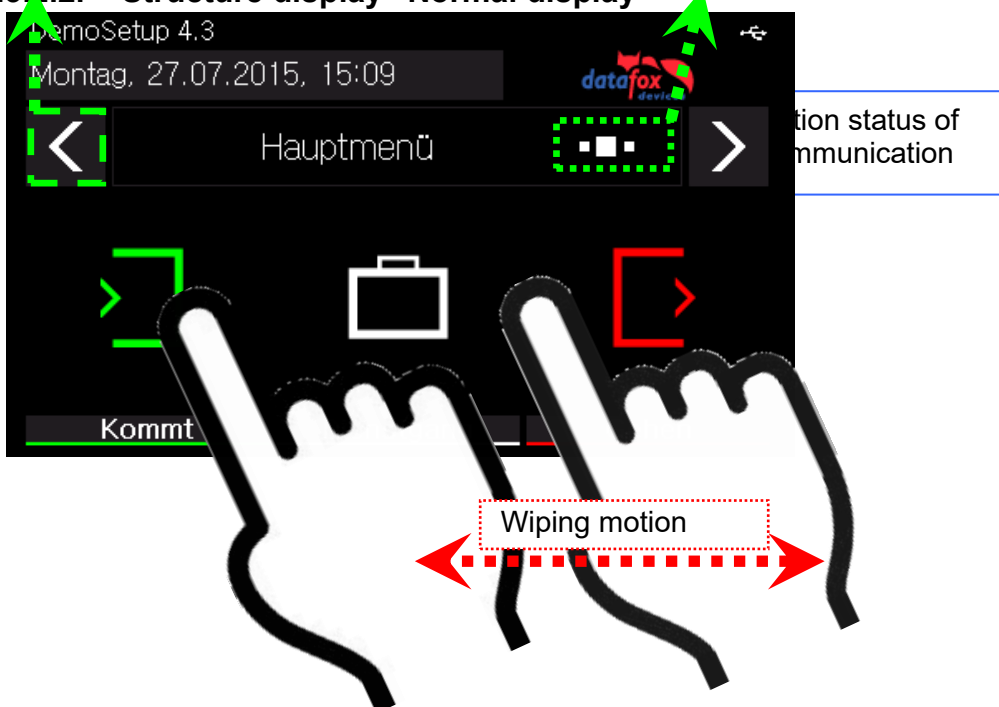
#### 5.3.2.1. Display setup and bios of the Evo 4.6

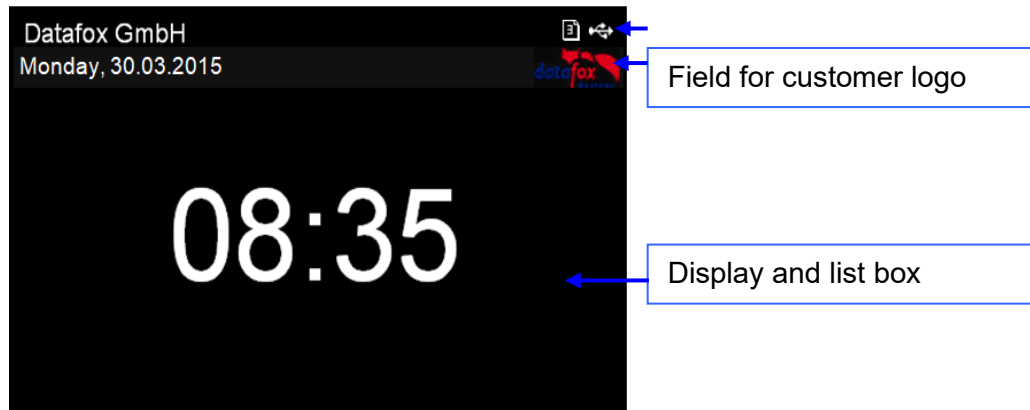
Flip by tapping


























Number of main menus:



#### 5.3.2.2. Structure display "Normal display"



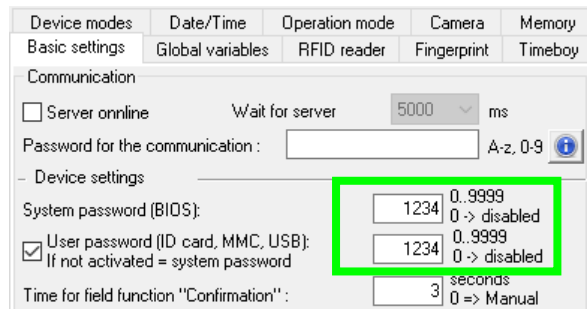


- **Date Time** corresponds to the system time of the device, which is also used for the data records.
-  **Number of records** in memory (display up to 99, then 99+).
- **Communication** field with symbols for:
  -  TCP /IP When this communication is active, this symbol is displayed.  TCP /IP ↑↓.
    -  No link
  - Wlan communication
    -  WLAN as main communication
    -  Wlan connected
    -  Wlan Communication is currently active
    -  signal strength wifi
    -  ! no connection to the access point
    -  ? run dhcp
  -  USB
  -  USB Host (Save the data to USB stick)
  -  RS 485
  - GPRS With status display e.g.[33] See "Status messages on the display".
    -  Mobile modem is off
    -  Mobile modem is switched on, but no connection to the provider.
    -  Mobile modem is switched on, connection to the provider exists.
  - Mobilfunk (BG-96 und EG-95), status display e.g.[33] ] See "Status messages on the display".
    -  Mobile modem is off
    -  Mobile modem is on, but no connection to the provider.
    -  Mobile modem is on, edge connection to the provider.
    -  3G, H, H+, Mobile modem is on, 3G connection to the provider..
    -  LTE, MI, NBI, Mobile modem is on, LTE connection to the provider.
- **Display on the display**
  - The header lines 1 and 2 of the setup are displayed in the main menu.
  - The header lines 3 and 4 stored in the setup are displayed in menus and input chains.
  - During the transmission of a setup or firmware update, the device enters the system stop and displays this symbol  "Systemstop" in this window.
  - Display in the left part of the window:
    -  = Transponder input (Accept value of transponder)
    -  = Check in (coming) - booking
    -  = check out (going) - booking

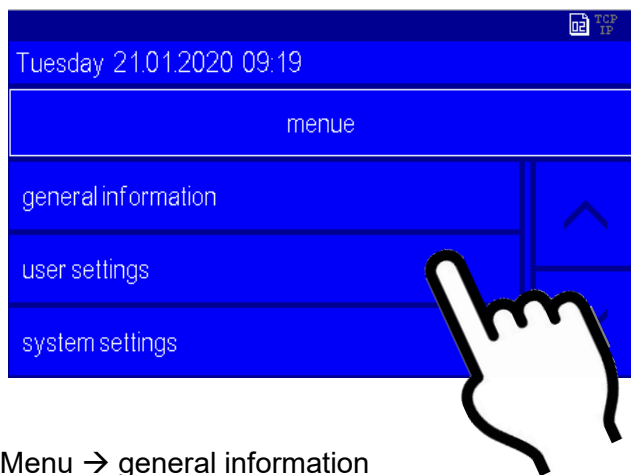
### 5.3.2.3. Structure Display EVO 4.3 /4.6 in the Bios menu

The bios menu is accessed by pressing the buttons at the same time: „ESC“ and „Enter“.

If in the Setup configured a password, you can edit/enter here.



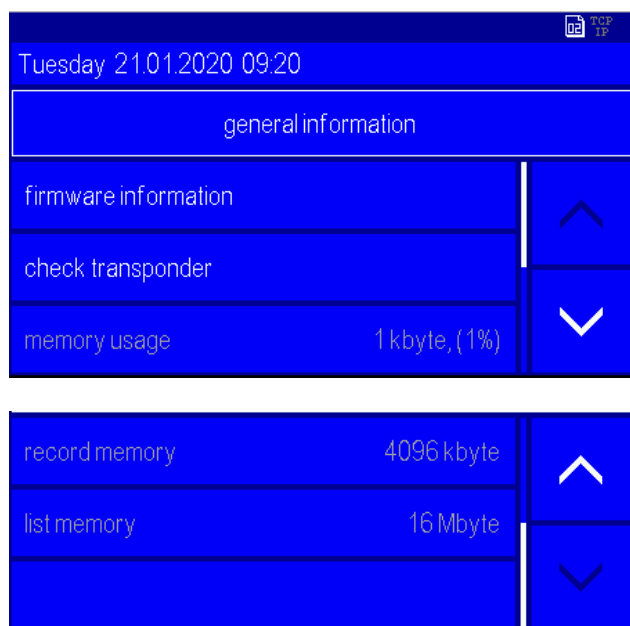
#### 1 display in the bios menu:



To flip the page, use the arrow keys

For selection, just tap.

Menu → general information



Here you can test to read the badge



## Menu, user Settings:

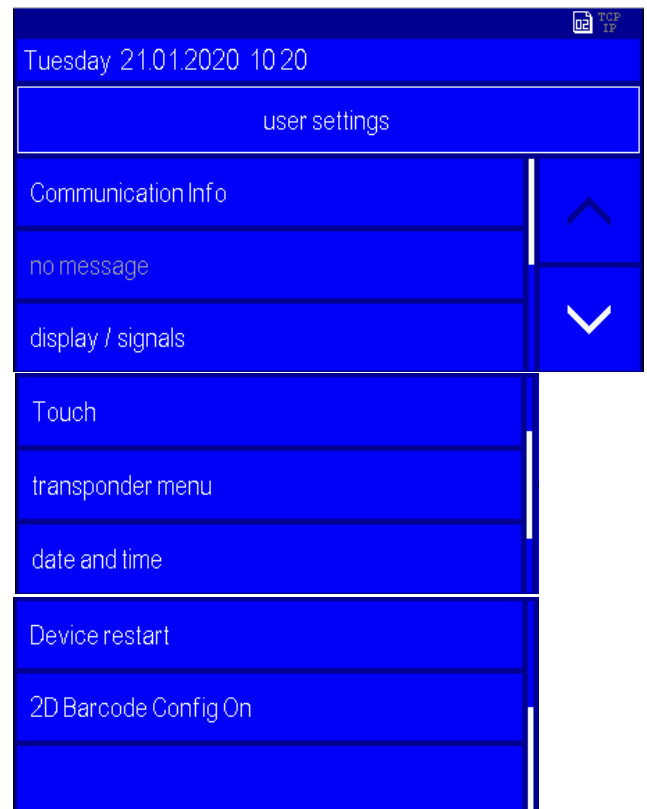
If set the communication on TCP/IP and DHCP see you here the IP address.

Here you get information about the RFID reader and you can programming badges in this menu.

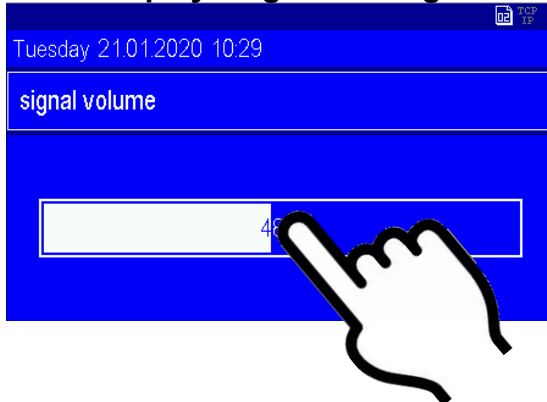
Setting to use a USB Memory stick for data transfer

Setting for date and time

Here you can reboot the device.



## Menu display / signals → signal volume



To adjust the volume, simply tap on the bar in the display.

## Menu Touch:



### Layout:

Here you can see the defined keys on the touchscreen such as numbers or ESC function keys. See the chapter: Touch configuration and display design.

### menu touch Test



#### Testing the touch!

Test environment for the touch. You will see the entire touch area on the right and the x-y coordinates on the left.

You can leave the menu, if you touch with 2 fingers on the same time with 5 cm distance between.



#### Layout:

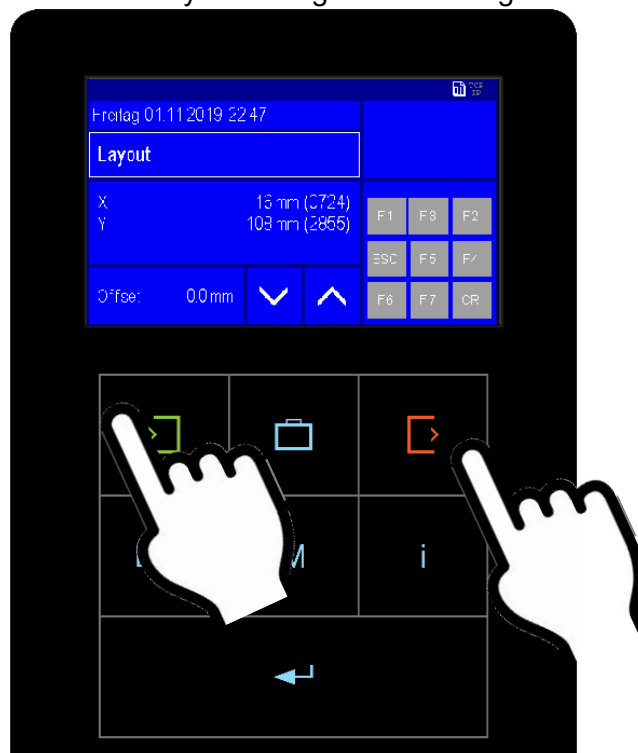
Here you can see the defined keys on the touchscreen such as numbers or ESC function keys.

See the chapter: Touch configuration and display design.

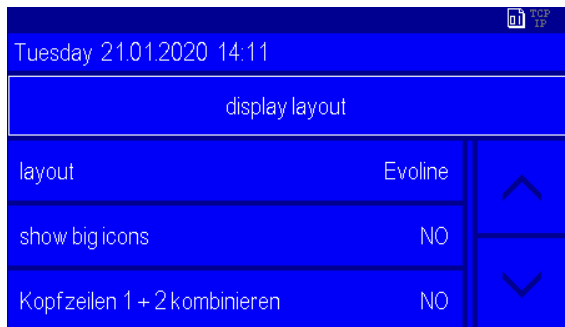
If the layout does not match exactly with the buttons, you can set an offset.

To exit the menu:

Dive with 2 fingers simultaneously on the right and left edge of the touch area for 2 seconds.



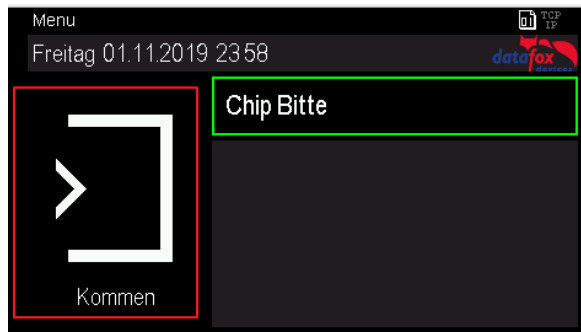
## Menu User-Settings Display-Layout



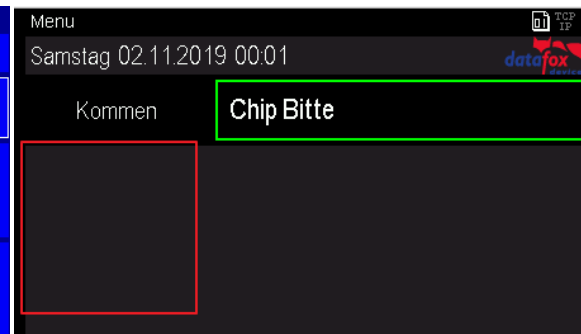
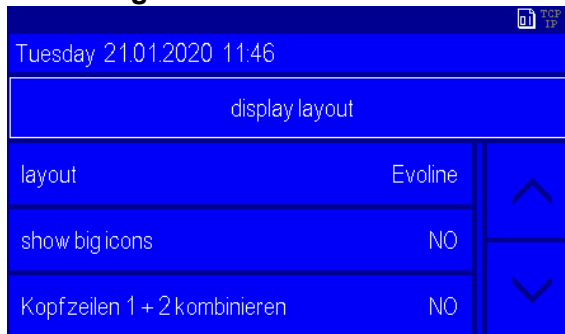
Display-Layout:  
Hier kann das Layout umgestellt werden.  
Große Icons bei Eingaben ein/ausblenden.

Siehe: [Displaybild umschalten](#)

### Show large Icons **yes**



### Show large Icons **no**:



### headline 1 and 2 kombination **no**:



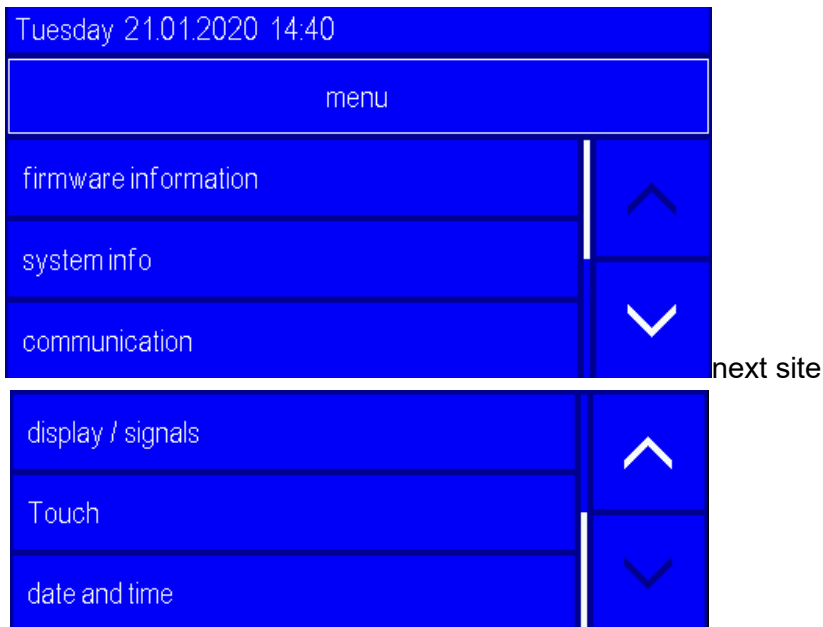
Line 1 of the display (fix):	<input type="text" value="main menu"/>
Text of line 1 on GV (dyn.):	Line 1 of the display (fix) ▾
Line 2 of the display (fix):	<input type="text" value="information line"/>
Text of line 2 on GV (dyn.):	Line 2 of the display (fix) ▾

### headline 1 and 2 kombination **yes**:

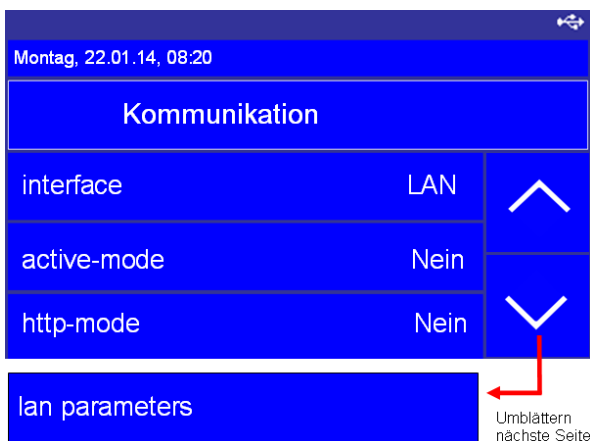


Line 1 of the display (fix):	<input type="text" value="main menu"/>
Text of line 1 on GV (dyn.):	Line 1 of the display (fix) ▾
Line 2 of the display (fix):	<input type="text" value="information line"/>
Text of line 2 on GV (dyn.):	Line 2 of the display (fix) ▾

## Systemsettings:



## menu communication settings



(here see you the current used communication)

(this is only used by active connections. If this setting on "yes", the device is not reachable.)

(With this setting use the device the communication to a web-server. If this setting on "yes", the is the device not reachable.)

(Here can you change the TCP/IP parameters.)  
e.g. IP-address, port and more.

## Setting the LAN parameters TCP/IP (page 1) (DHCP)



lan parameters	
MAC	E4:F7:A1:00:010:10
DHCP	no
IP	192.168.123.123

MAC Address, starts by the Datafox devices ever with E4:F7.

activate DHCP, automatic IP address assignment

Current ip-adress. When you use DHCP then you can not set the IP adress manually.

## Setting the LAN parameters TCP/IP (page 2)



lan parameters	
Netmask	255.255.255.0
Gateway	192.168.123.1
Port	8000

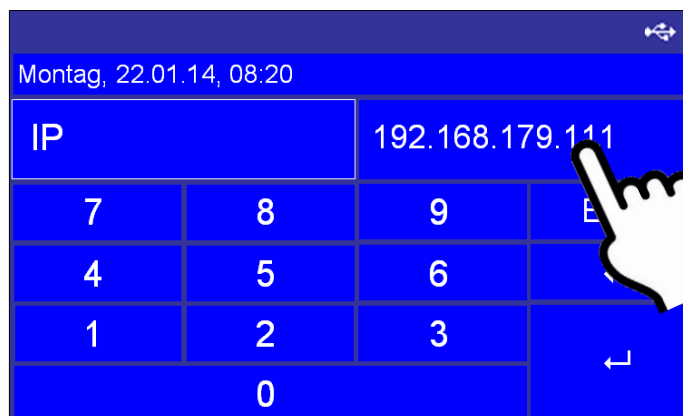
Here you can set the netmask

Gateway – This setting are necessary if send the device data in another network.

IP-Port-setting

## TCP/IP (set IP address)

Tap with the finger on the position were you need the cursor.



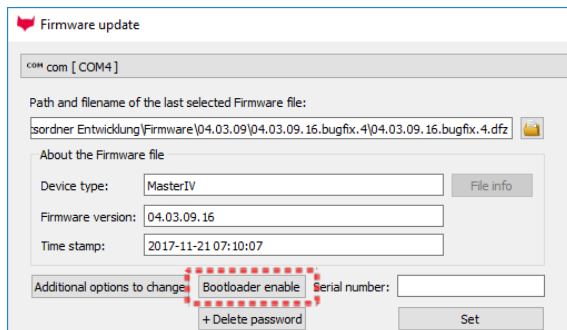
IP		192.168.179.111	
7	8	9	E
4	5	6	.
1	2	3	←
0			

### 5.3.2.4. activate the Bootloader

In the event that you set an unknown IP address and a bios password is set, there is the possibility to activate the bootloader. This allows the device to be reset via USB. With the installation of the firmware and the connection of a setup without bios password, you will have access to the bios of the device.

#### Step 1:

See the dialog with the DatafoStudioIV and press “Bootloader enable”.



#### Step 2:

Connect the device on USB – PC and restart.

#### Step 3:

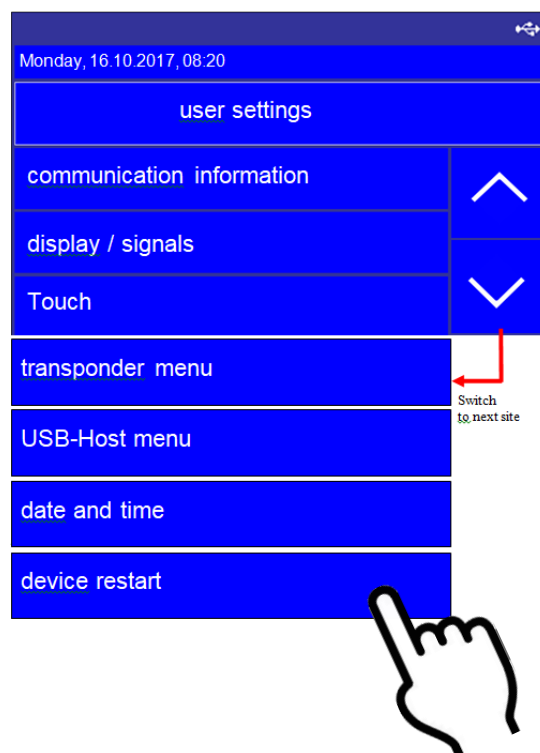
See you the message “Bootloader was successfully activated” then it is possible to transfer a new firmware to the device.

### 5.3.2.5. device reboot

In the menu “User settings” it is possible to restart the device.

Confirm your choosing with a tip (enter) on the display.

All data and settings are kept.



### 5.3.2.6. Switch the display design

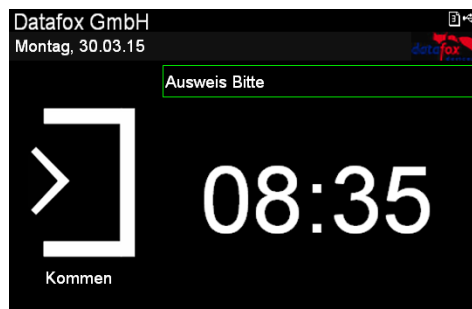
The multifunctional terminal EVO 4.3 has 2 different display options.

#### 1.) Display in the PZE-Master Style,

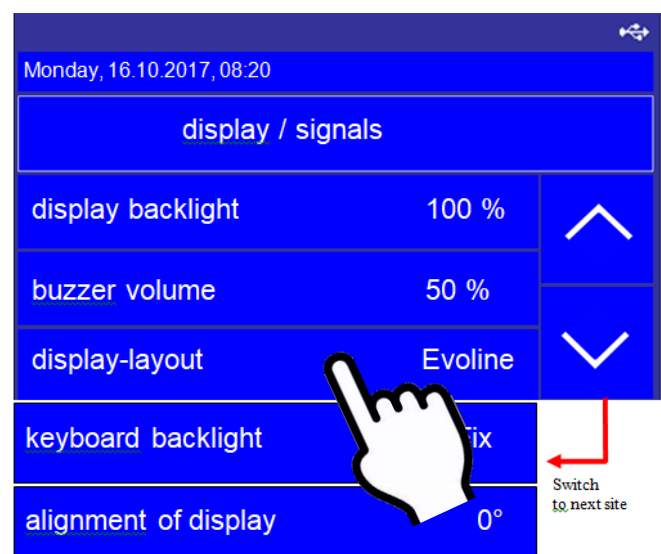


This display layout serves to continue to use the known from the PZE Master IV operating concept. Also if PZE-Master and EVO 4.3 are used in parallel. In this case, the user does not need to get used to another operating concept.

#### 2.) Evolution-Line Style,



You can choose between this two designs in the menu  
 "user settings → display / signals →  
 Display-layout.



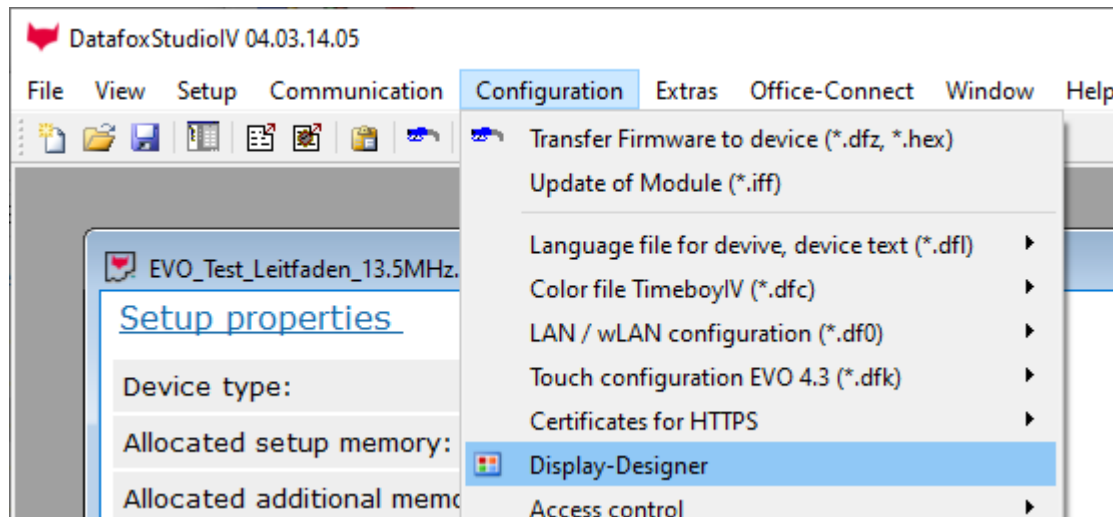
### 5.3.2.7. Create a new display design

Examples for the display design:



To create an individual design, you need the DatafoxStudioIV minimum version: 04.03.06.XX.

You find in the DatafoxStudioIV under  
 "Configuration → Display Designer",  
 the point to create an individual  
 display design.





### 5.3.2.8. Keys and the Combinations

**Note:**

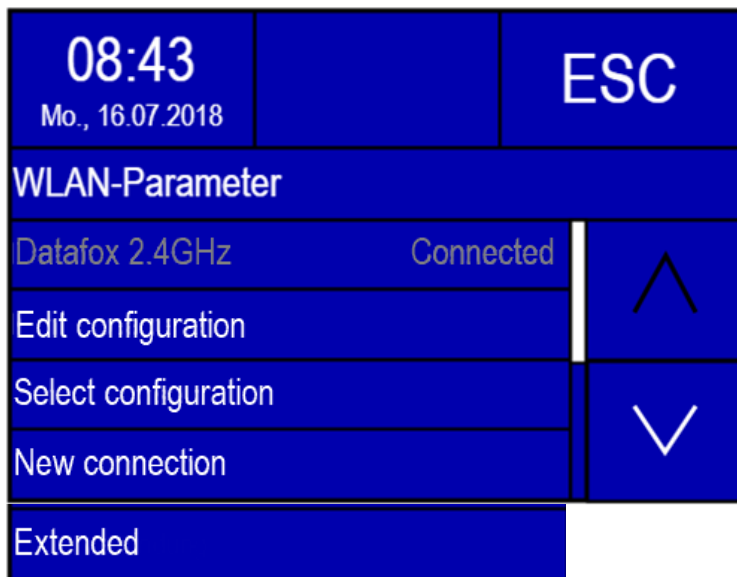
Keep to the given order of the key combinations. Otherwise, you will switch to an input sequence and the desired function will not be available.

- **Activating start options**
  - Press ENTER key during booting.
  
- **Opening device BIOS menu**
  - press ESC + ENTER in sequence and hold
  
- **Navigation in lists**
  - downward arrow or upward arrow „Touch“
  - or slide with the finger over the display
  
- **Assume a chosen list entry**
  - ENTER-button
  
- **Abort an action**
  - ESC-button
  
- **Jump in the main menu**
  - ESC-button

### 5.3.2.9. Bios Menu Setting WLAN

As of firmware 04.03.11, you have the option of changing the settings for the WLAN connection not only with the DatafoxStudioIV, but also directly at the device.

You may edit the individual configurations in the bios menu "WLAN parameters".



Here you can see which configuration the device is currently using to connect.  
Here in the example: „Datafox 2.4GHz“

#### Edit Config:

Next, you can edit the currently loaded configuration in the menu item "Config. Edit". The options that can be set correspond to the network configuration section in the Studio. It is possible to switch between DHCP and static IP address and to adjust the port. In addition, there is the option to define a configuration as the default. This is selected if the automatic selection of the configuration is switched off.

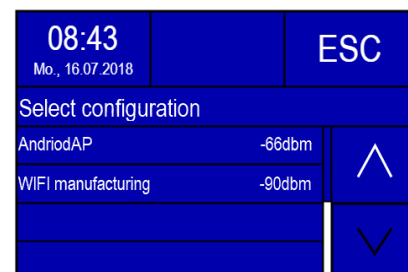
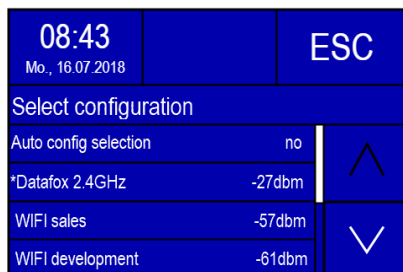
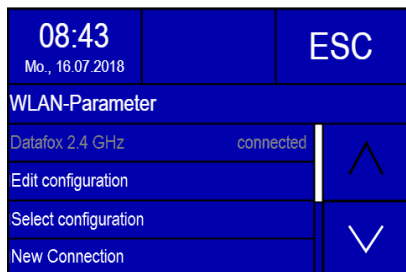
**!** **Attention:**  
This function is only supported on EVO 2.8 Pure, 3.5 Pure, 3.5 Universal and 4.3.

If changes have been made, you will be asked whether they should be saved when you exit the menu. Yes → saves the changes and exits the menu. No → exits the menu without saving the changes. By pressing ESC, you will find yourself back in the change menu and can view the changes you have made again.



### Change Config.

In the menu item "Config. Switch" you can switch between configurations. Furthermore, the automatic selection of the configuration can be set here. If a network is selected here that can also establish a connection to an access point, it is not guaranteed that this network will be selected again when leaving the BIOS menu. If automatic selection of the configuration is activated, the network with the best reception quality is selected. However, if you want to connect to a specific network, this must be set as the default and the automatic configuration selection needs to be switched off.



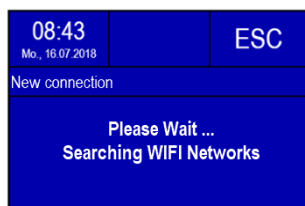
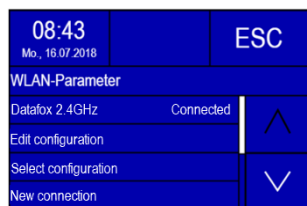
### New Connection

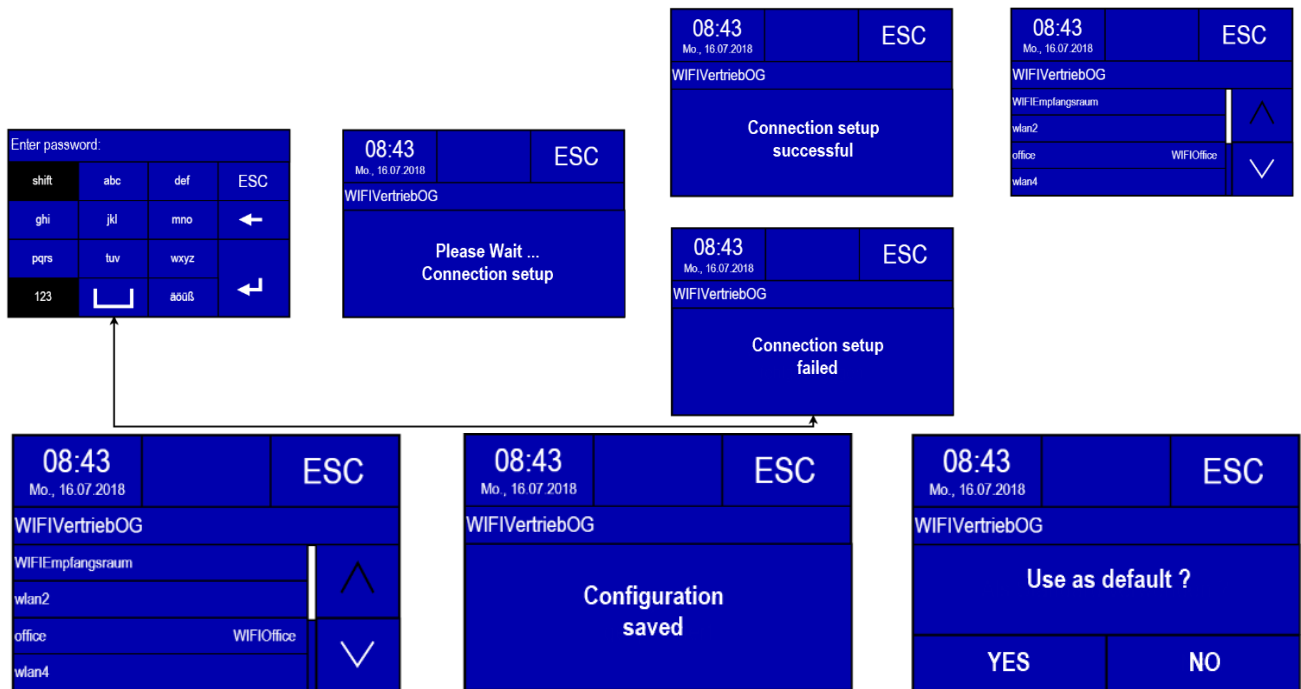
When this menu item is selected, a network scan is carried out. Afterwards, one of the networks can be selected from the list. A key is then entered (Figure 4). An attempt is then made to establish a connection with the network. The result of the connection is displayed on the screen (figure 5). If a connection could be established, a storage location is selected in the next dialogue. The configuration is then saved. If desired, the new configuration can be used directly as the standard (figure 6). In addition, it is possible to enter the SSID manually. In this way, networks that are not within range or do not transmit the SSID can be added.



#### Attention:

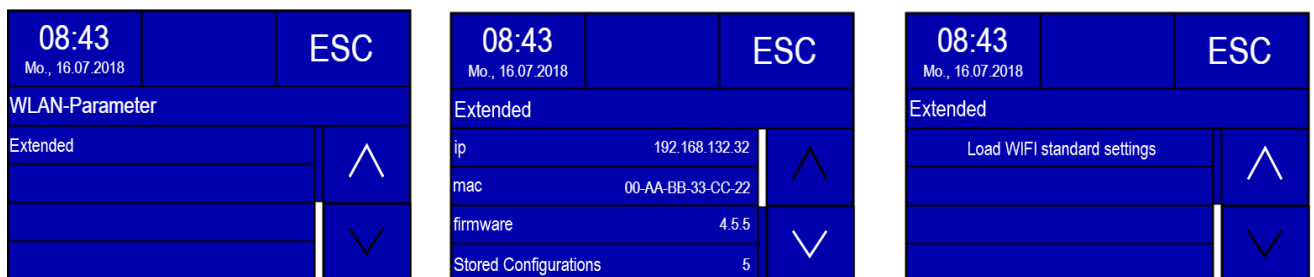
Currently, however, only the connection to WPA2 networks is supported when entering with SSID.



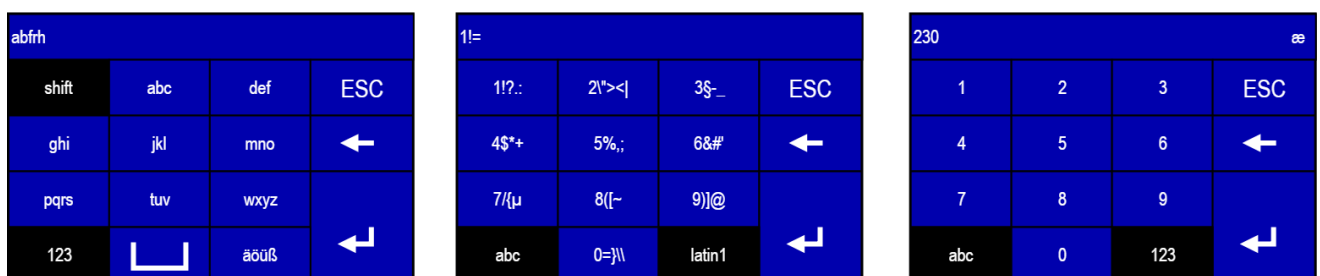


### System Info/Advanced

In the menu item System Info/Advanced, information about the WLAN hardware can be requested. This includes the current IP address, the MAC address of the WLAN chip and the firmware of the WLAN module. The number of configurations currently in use is indicated in Saved networks. By selecting the item Reset configurations, all configurations can be deleted. The configurations then correspond to a new, still unfilled LAN and WLAN configuration. More information on the current communication parameters can be found in the user settings.



### Keyboard Entry



**Note:**

The input of the SSID and the key are limited to 32 characters. Values of the "Latin1" character set are permitted as input, with the exception of the control characters.

### 5.3.2.10. Setting of the Proximity- & ambient Light-Sensor

The following parameters of the proximity and ambient light sensor can be controlled:

- "Proximity sensor" on / off switches;
- "Sensitivity" of the proximity sensor from 0% (~ 0.5 Meter) to 100% (~ 1.2 Meter);
- "display off after" the last detection of the proximity sensor (from 10 to 65534 sec.);
- "ambient light sensor" on / off.

Bios menu:

The menu for the Proximity sensor you find here:

-Bios menu -> usersetting-> display /signals-> Proximity- & ambient Light-Sensor

14:51	ESC
Tu., 15.10.2019	
<b>display / signals</b>	
backlight	100%
signal volume	50%
Proximity- & lighth sensor	
status icons	60 seconds

Is the Sensor activated, have you this display:

13 08	ESC	14 05	ESC
Tu., 15.10.2019		Tu., 15.10.2019	
<b>Proximity- &amp; lighth sensor</b>		<b>Proximity- &amp; lighth sensor</b>	
Proximity sensor	V2.0 ●	Proximity sensor	V2.0 ○
sensitivity	100%	sensitivity	100%
display off after	20 seconds	display off after	20 seconds
Ambient light sensor	On	Ambient light sensor	On

Proximity sensor V2.0 ○ no motion detected!

Näherungssensor V2.0 ● motion detected!

Sensor is deactivated:

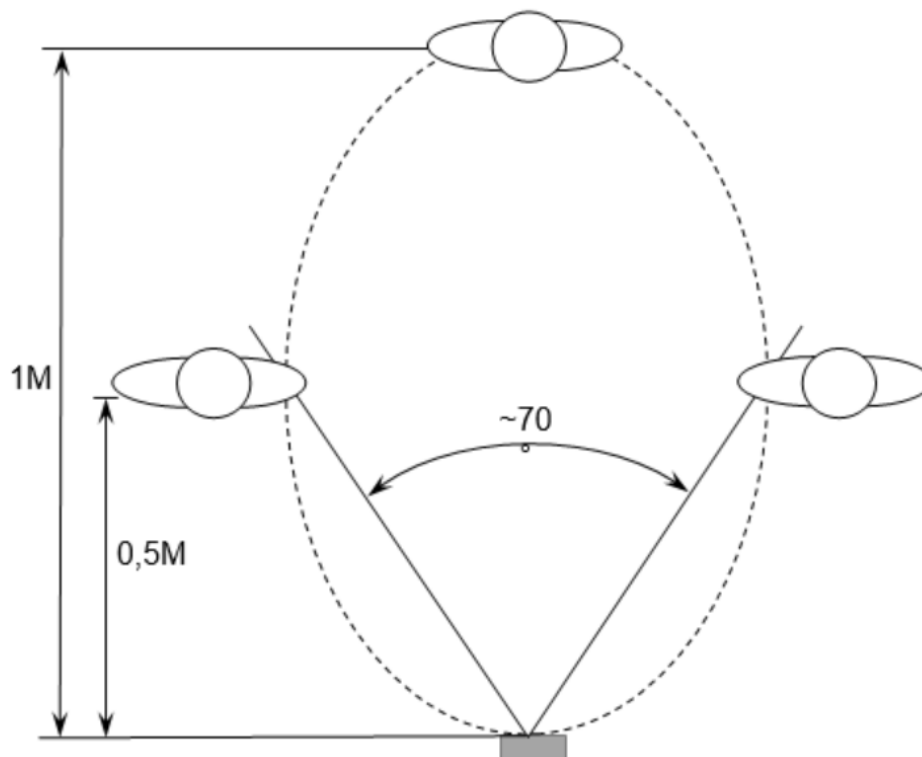
14 07	ESC
Tu., 15.10.2019	
<b>Proximity- &amp; lighth sensor</b>	
Proximity sensor	Off
Ambient light sensor	On

The ambient light sensor set automatically the brightness of the display.

## Information's: Proximity- & ambient Light -Sensor

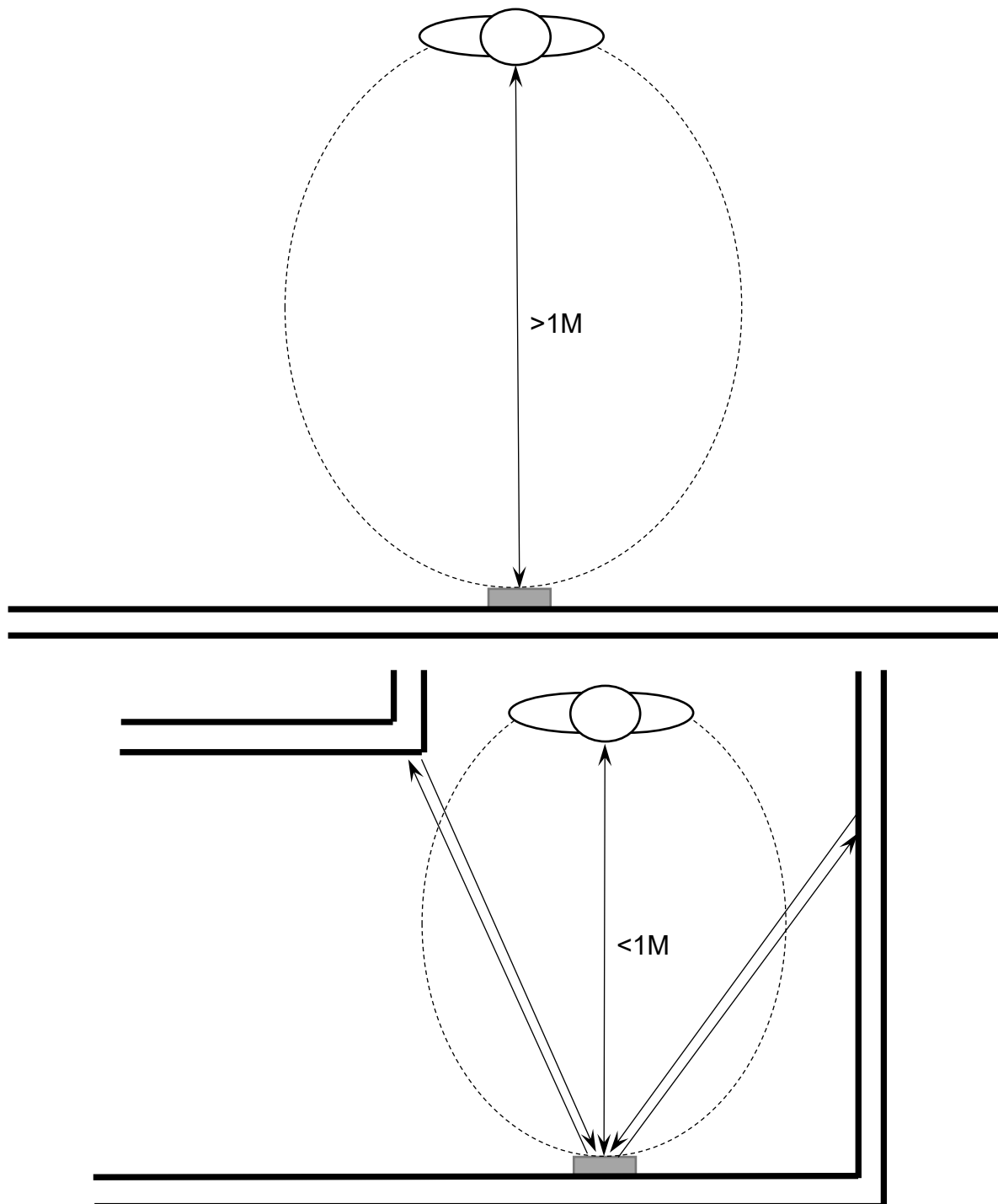
When a Datafox terminal is not in use, it should be in a low power mode. Display and backlights should be off or only slightly active. This is to save energy, in addition, the life of LED or display back lights is also significantly extended.

The Proximity Sensor is a sensor capable of detecting nearby objects without physical contact. A proximity sensor emits an infra-red beam and receives the reflected beam. The reception area looks something like this:



The detection distance (sensitivity) is quite dependent on the area and the re-reflecting properties of the object. That is, the larger the reflective surface, the greater the detection distance. White Fabrice reflect better than dark Fabrice.

Due to the automatic sensitivity settings, the objects in the vicinity of the device, as well as solar radiation and strong electromagnetic interference can reduce the sensitivity.



The ambient light sensor controls the brightness of the display independently of the proximity sensor. In bright ambient light, the backlight is operated at the set brightness. In darker surroundings, the value is automatically reduced to 10%.

### 5.3.3. Displaydesigner

#### scope of application:

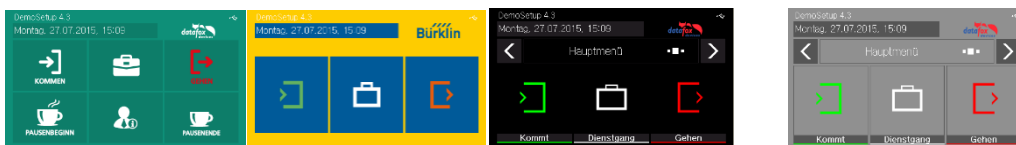
			4.3/4.6	2.8/3.5	5.0	Uni- versal	Agera ZK	Inloc	Mobil Box	IO-Box	Oneloc				EVO- PC
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								

For the devices AE-MasterIV V4, PZE-MasterIV V4 and PZE-MasterIV Basic V4 is the Designer only usable for color display.

With the Display-Designer, Datafox offers the possibility for partners and users to customize the display according to your requirements. But due to the necessary operating sequences, this cannot be a completely free design, but things like headlines, menu structures and footers have to be guaranteed. The aim of the display designer is to enable the feasible settings with minimal effort.

#### *Create an individual Display-Design for your Company:*

Example picture for EVO 4.3 and 4.6 FlexKey



Example picture for EVO 2.8 / 3.5

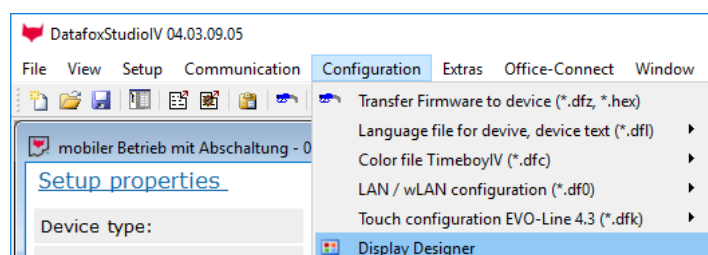


Example picture for PZE-/ AE- Master V4 with color display



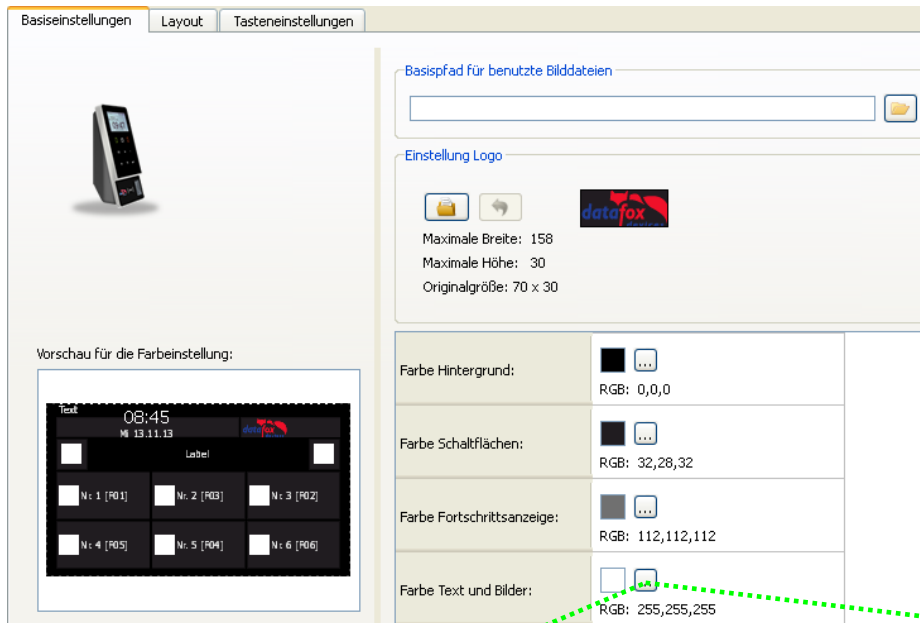
To create an individual ad for your device, you need at least that DatafoxStudioIV 04.03.09.05.

The display designer can be open via the Configuration menu or directly from the setup edit mask.

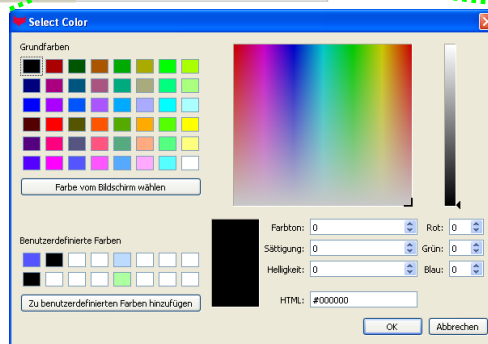
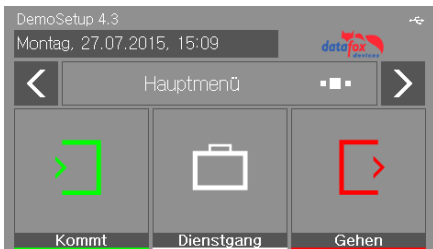




### 5.3.3.1. Color Setting for the Display



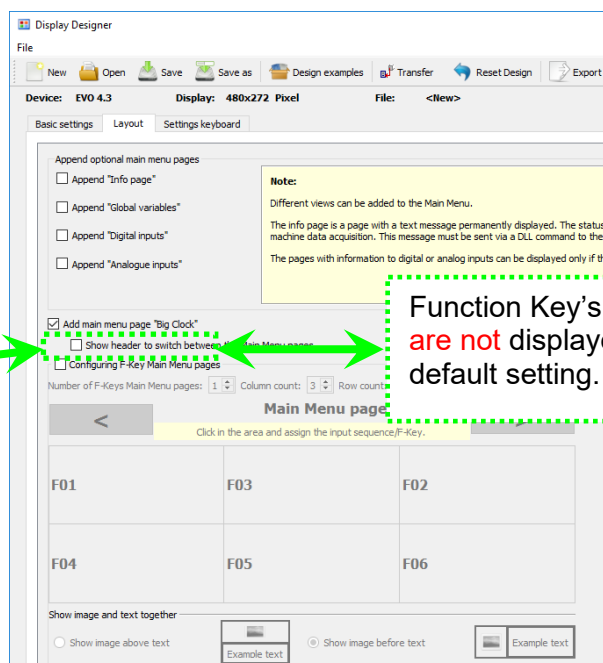
Example Picture:



### 5.3.3.2. Default Setting

The device is delivery in the default „PZE“-design.

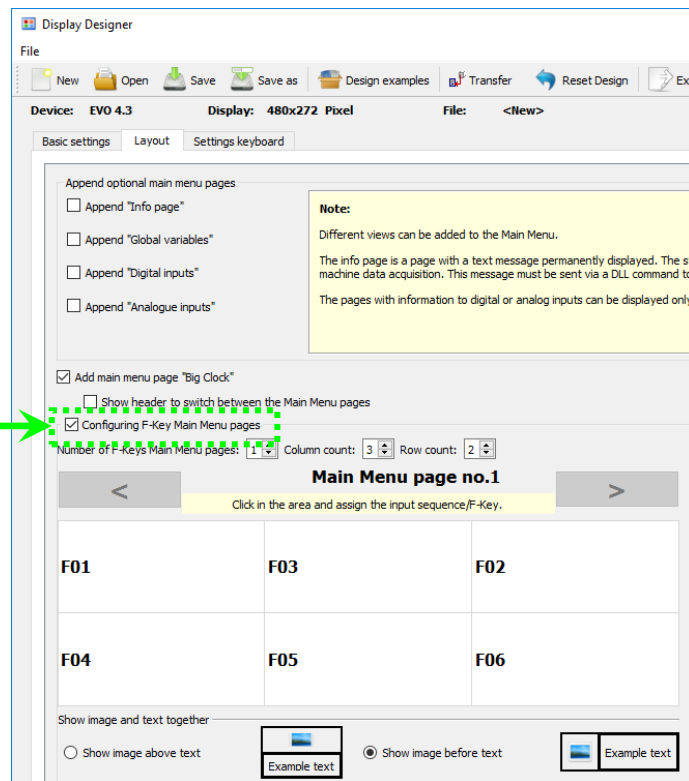
This design is also set as default when you first create a new theme in Display Designer.



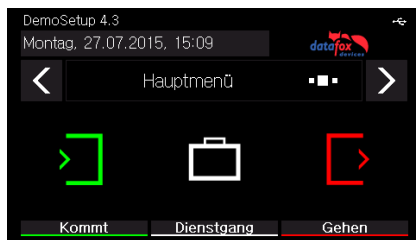
Function Key's are not displayed in the default setting.

### 5.3.3.3. Display function buttons on the EVO 4.3 / 4.6 / 2.8 / 3.5 /5.0 display

By showing the function buttons from the setup, the number of buttons displayed in the display can be adjusted.



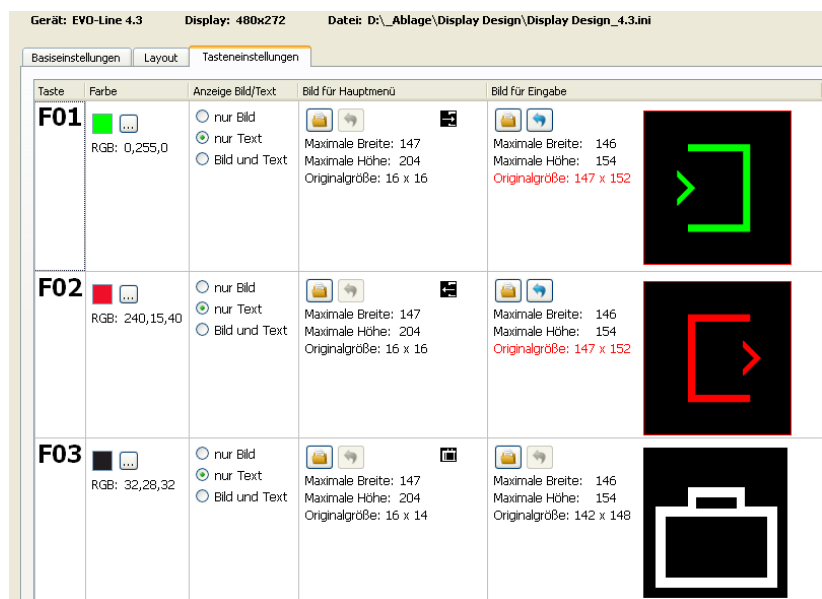
Example:



### 5.3.3.4. Upload images for function buttons of EVO 4.3 / 4.6 / 2.8 / 3.5 /5.0

Under this menu item "Key settings" you can import the image file for each function key.

Sample picture for the key figures:



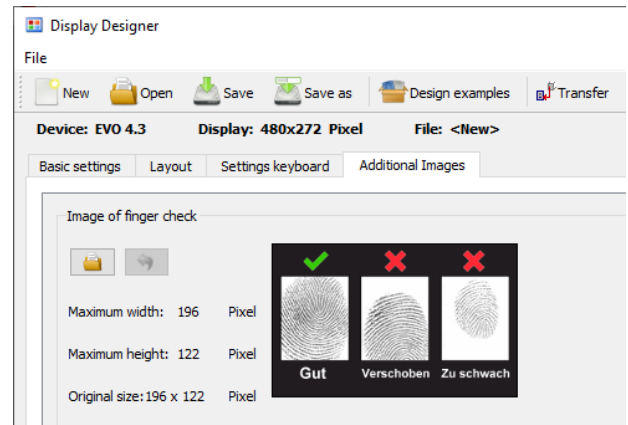
### 5.3.3.5. Transfer additional images

Additional images can also be stored on the terminal. These can either be displayed during data storage, in input fields, as a keyboard layout or in the fingerprint menu. In this way, your terminal can be adapted and individualized even better to your requirements and areas of application.

### 5.3.3.6. Picture for the Fingerprint Menu

Terminals with a fingerprint area sensor have a separate menu for teaching, training and deleting the fingerprint templates. In the menu item "Check" you can put your finger on the sensor and a picture of the fingerprint will be displayed. This allows you to check the position of the finger on the sensor and the contact pressure.

In order to clarify the correct position and the correct pressure again, a picture can be displayed for comparison. This can be selected here if it deviates from the standard.



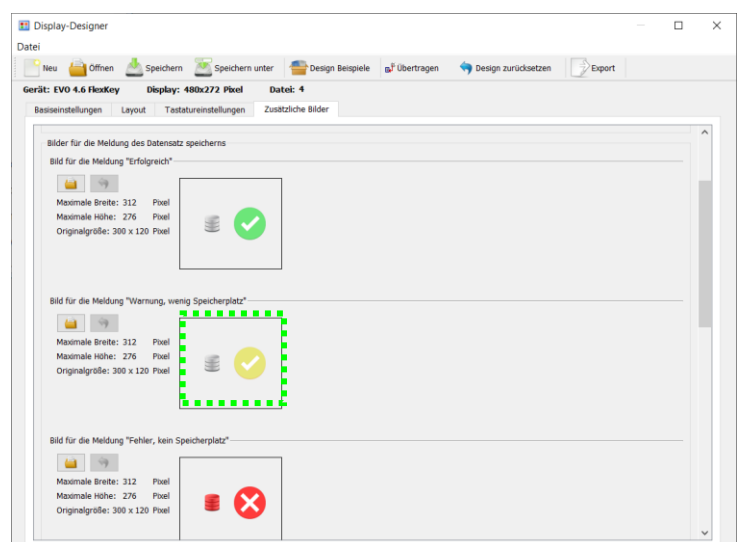
### 5.3.3.7. Picture for save record message

The three confirmation messages after completion and storage of a Record can Now be shown with a Graphic.

The graphics to be seen are standard and are instead of the messages shown on the display of the terminal.

If you want to set your own pictures for these messages, they have to be set and transmitted once.

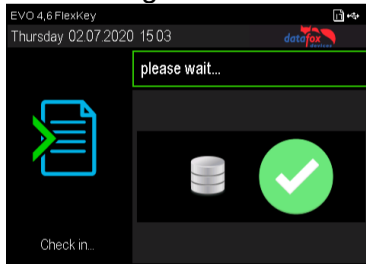
The file names must follow name restrictions as followed:



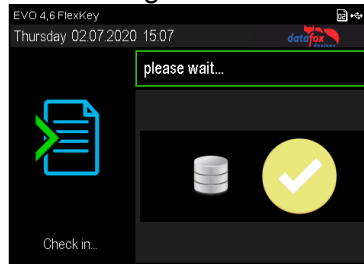
filename - Data storage successful:  
filename - Data storage almost full:  
filename - Data store full! Notify admin:

*save\_ok.bmp*  
*save\_warning.bmp*  
*save\_error.bmp*

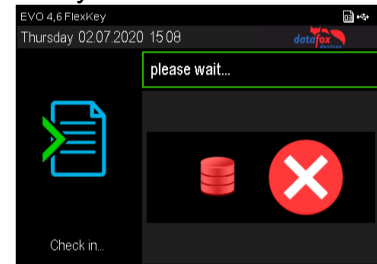
### Data storage successful !



### Data storage almost full



### Data store full! Notify admin !



#### Note:

The graphics do not have to be activated separately, i.e. it is sufficient to transfer them to the device. As soon as one of the graphics is available, it is always displayed instead of the text.

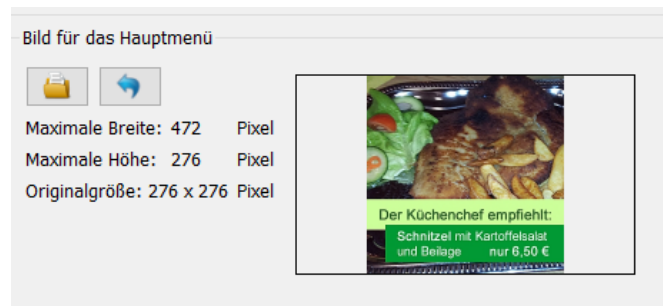
This option is available for all terminals with colour display:

4.3/4.6	2.8/3.5	5.0	Uni-versal	Agera ZK	Inloc	Mobil Box	IO-Box	Oneloc						EVO-PC
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								

### 5.3.3.8. Image display in the main menu

In the main menu of the terminal, you can now choose a graphic instead of the "big clock", global variables, etc. This can include information such as the appointment for the next company party or the current canteen meal plan.

File name: *main.bmp*

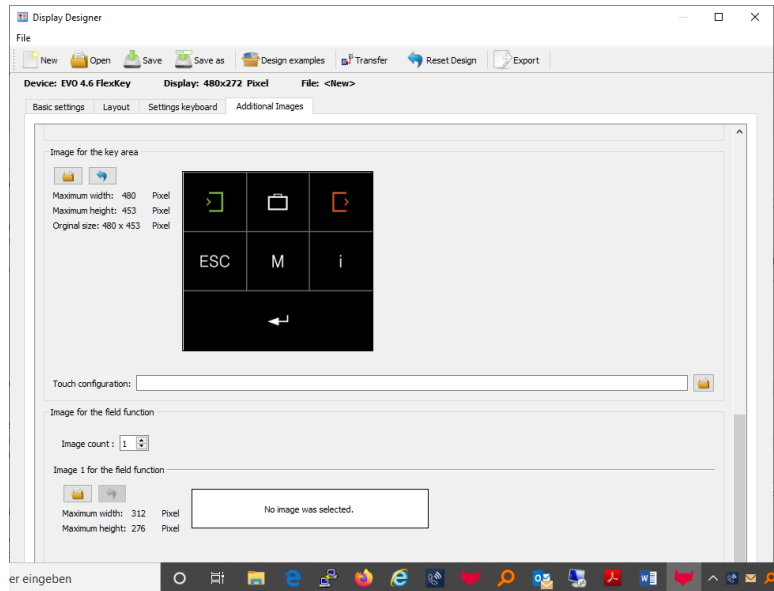


#### Note:

To activate the graphic, it is sufficient to transfer it to the device. I.e. as soon as it is available in the device, it is displayed preferentially when changing to the main menu. The other main menu pages activated in the display designer can still be reached by swiping.

### 5.3.3.9. Keyboard graphics a. touch config. for the EVO 4.6 FlexKey and 5.0 Pure

The representation of the touch buttons (Keyboard area) of the EVO 4.6 unlike the EVO 4.3, not by a printed layout of the glass front, but as a graphic file, which is shown on the display. This is individually changeable and customizable as needed. This keyboard graphic and the associated touch configuration can be edited in the menu "Image for the key area" on the EVO 4.6. The following apply to the graphic restrictions:



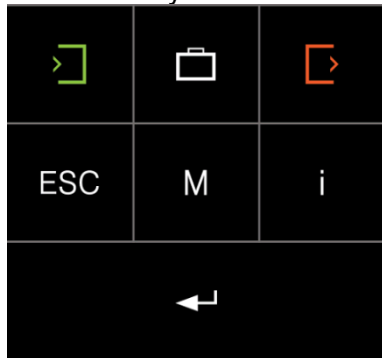
width: up to 480 pixels  
 height: up to 453 pixels  
 filename: *touch\_buttons.bmp*

**Note:** After the graphic has been transferred to the device, it is displayed immediately. This also applies when replacing an existing keyboard graphic.

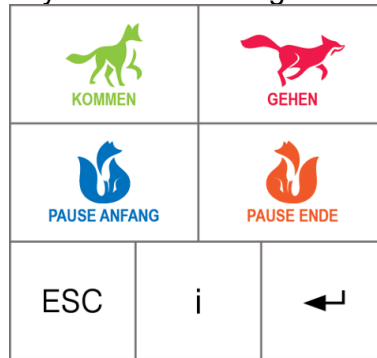
The associated touch file can be created as usual in the DatafoxStudioIV for the respective keyboard layout. See chapter "Configuration of touch data". This can be selected directly for the corresponding keyboard image and transferred together with the display design.

Example picture for the touch:

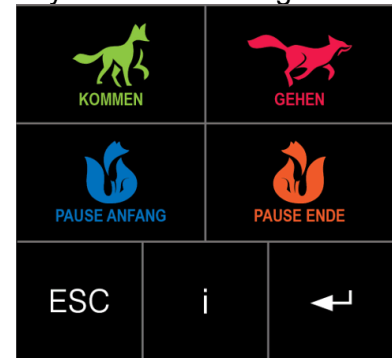
Standard Layout



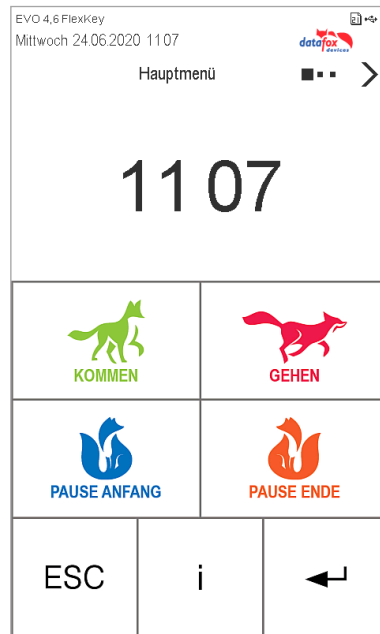
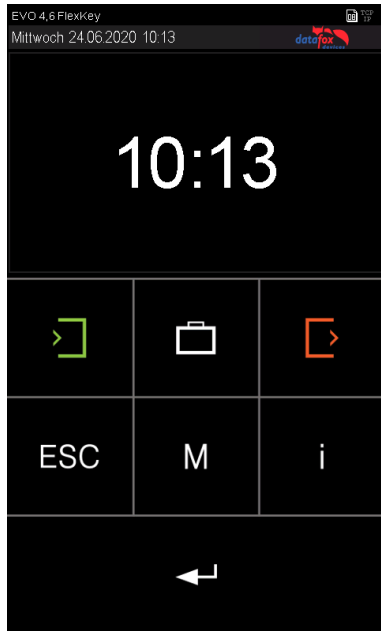
Layout with fox-design white



Layout with fox-design black



You found the Image for the touch in the installation of the DatafoStudioIV:  
 Here the standard installation path:  
 C:\Program Files (x86)\Datafox\data\touch\EVO\_5\_0  
 C:\Program Files (x86)\Datafox\data\touch\EVO\_4\_6



### 5.3.3.10. Show images during inputs

In the input fields "Normal", "Fingerprint", "Confirmation" and "Display or wait message" it is possible to display an image instead of text or the large clock.

The name of the input field defines which stored image is displayed. The image name must be entered in the following form in the name of the field query. *:img: images.bmp*

Input   Advanced   Jumps

A function for field and/or GV execute assignment

Name of the field query:

Text in row 4 of the display:

Here you must replace *images.bmp* with the name of the images. Ex. „*rfid.bmp*“.

#### Caution:



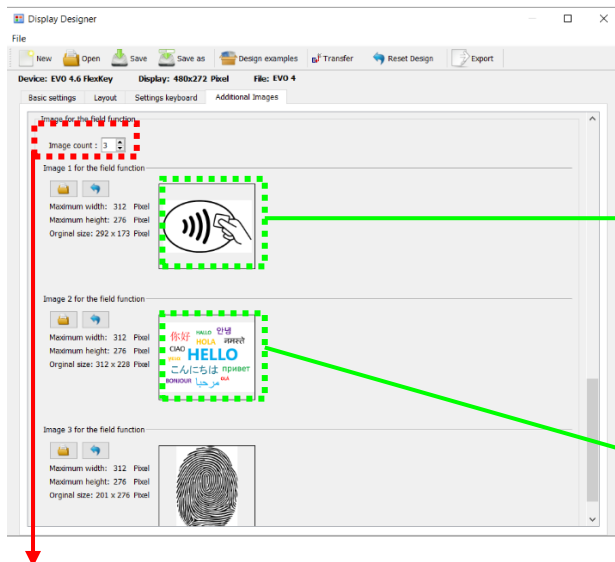
Since a maximum of 16 characters can be entered for the name of the field query and the label for an image must begin with ": img:", the actual image name may consist of a maximum of eleven characters.

#### Caution:



With the PZE and AE MasterIV devices, this function is only available in conjunction with a color display. This feature is not possible for EVO 2.8 Pure, EVO 3.5 Pure and EVO 3.5 Universal, otherwise the F-keys for operation could no longer be displayed.

Example: Field function „Normal“ & „Show message“:



EVO 4,6 FlexKey  
Freitag 03.07.2020 13:38



Check in...

EVO 4,6 FlexKey  
Freitag 03.07.2020 13:38



Check in...

The number of images to be loaded can be individually set. All the pictures linked here are also transferred to the terminal. If these are not referenced in an input field, the images are not displayed either. In this case, note that the available storage space in the terminal is thereby reduced.

### 5.3.3.11. Design examples in the designer

With the installation of the DatafoxStudioIV you get several design examples for the devices. Click on the "Design Examples" button to open them.

Datafox gradually extends the examples.  
If you have any suggestions or wishes, please let us know.

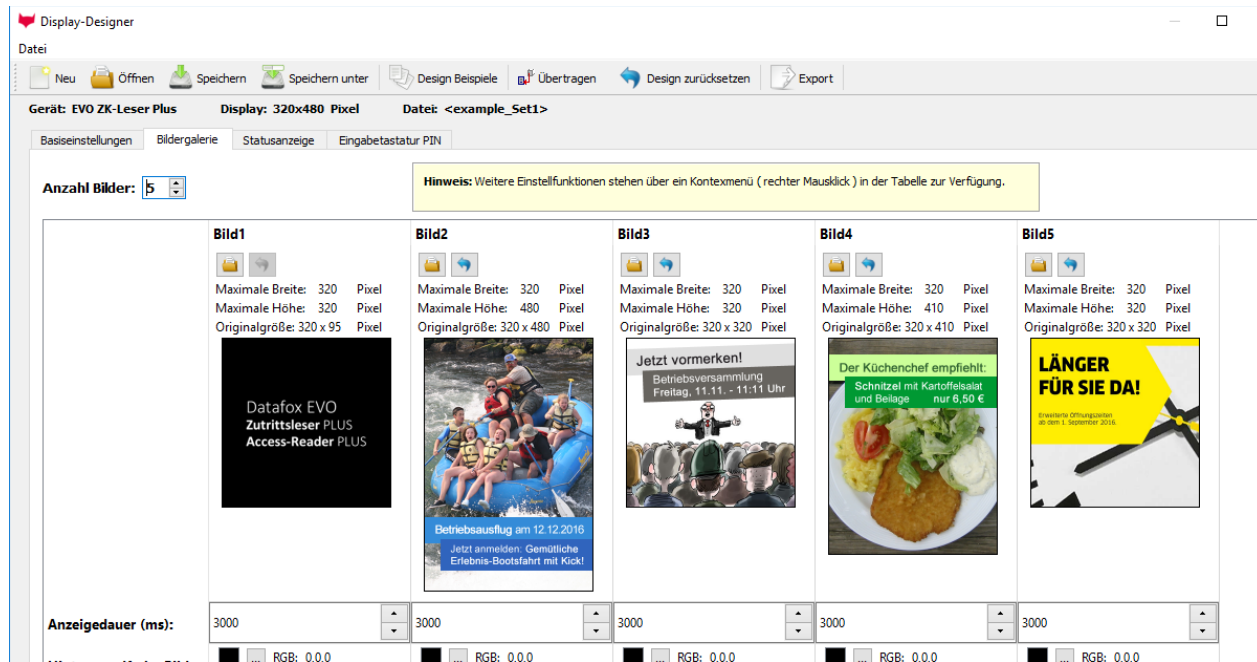




### 5.3.3.12. Individual Photo gallery for EVO Agera reader

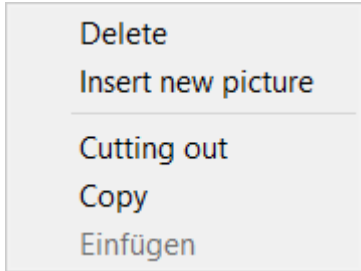
The Datafox EVO Agera is not only in the position to do access control but also to give information by the help of a photo gallery.

This could be e.g. the next company trip, information or just a presentation of your company.



You can set the foreground and background colours and the display time for each image.

Right mouse click over the respective image allows easy changing of the configuration.



## 5.4. Switch colours of the backlight

The follows backlights you can control via terminal setup:

- ▶ Backlight of the keyboard (only in white in in 255 steps)
- ▶ Backlight of the RFID-reader (RGB-colour and white in 255 steps)
- ▶ Backlight of the company symbol (RGB-colour and white in 255 steps)

Possibilities to switch the backlight „Time“:

- **Permanently**, the lighting is switched immediately according to the colour setting or brightness and maintained even after the execution of an input sequence.
- 
- **For a define time**,
- **Up to the next input field**, after the end of the next input field switch the backlight back to the settings before.

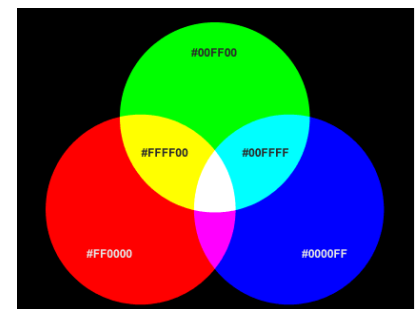


### Note:

The generated colors of the RGB Led's do not always correspond to the color perception of the user. Please adjust the colors to your needs.

Help for the mixed colour:

colour	part of red	part green	part blue	part white
yellow	255	100	0	
turquoise	0	255	255	
orange	255	35	0	
pink	217	0	108	
red	255	0	0	
green	0	255	0	
blue	0	0	255	
white	0	0	0	255



### 5.4.1. Switch lighting depending on the result

With this function you control e.g. the signalling of a valid / invalid transponder.

The distinction between valid or invalid is determined by a selection from a "personnel list".

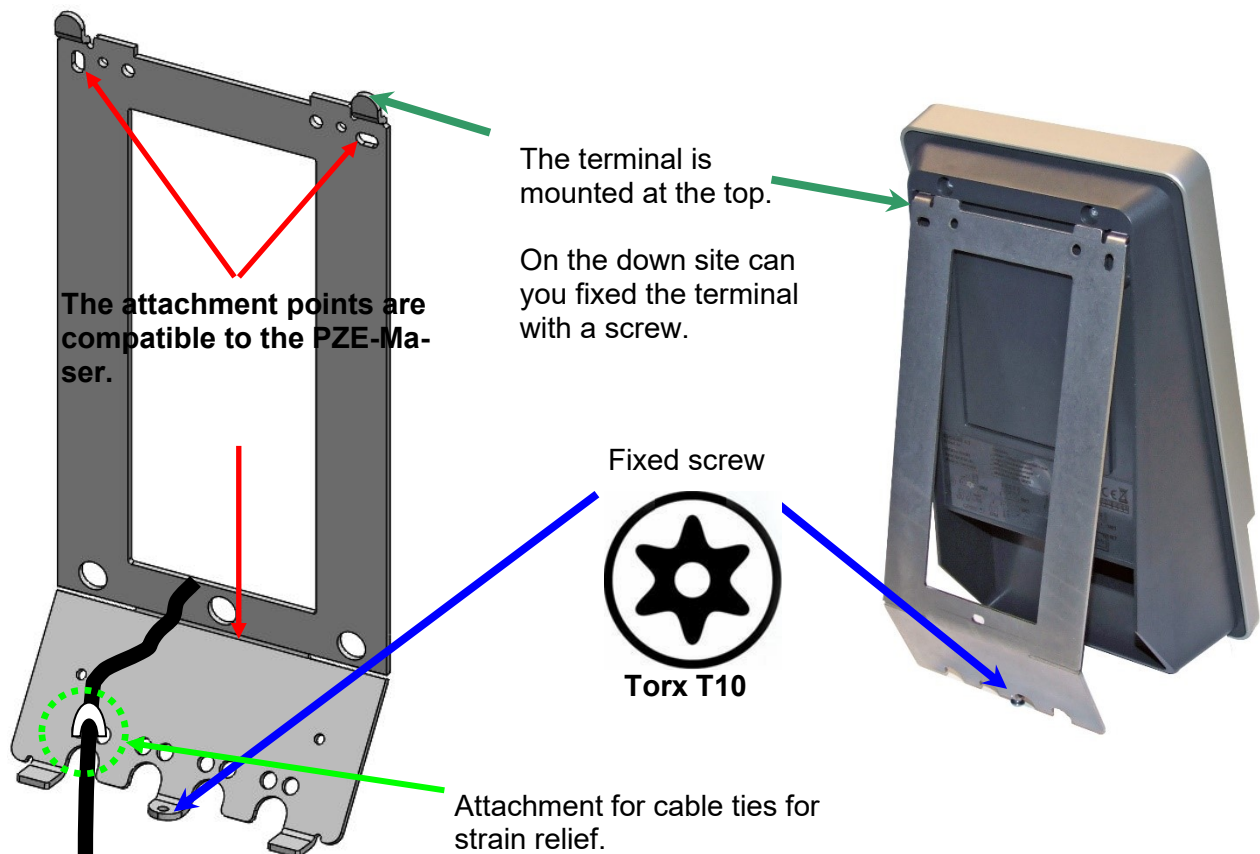
If the number of the ID card is not found in the list, the list box is ended with an "ESC". That the colour of the lighting can be controlled depending on the result.

List selection found no entry, then switch the backlight to: „Result: ESC“

The selection found an entry, then switch the backlight to: „Result: OK“

## 5.5. Installation of the EVO 4.3/4.6 Terminal

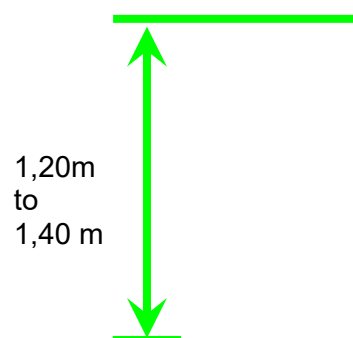
The wall mounting takes place by means of a wall bracket. This is attached to the wall via 4 attachment points.



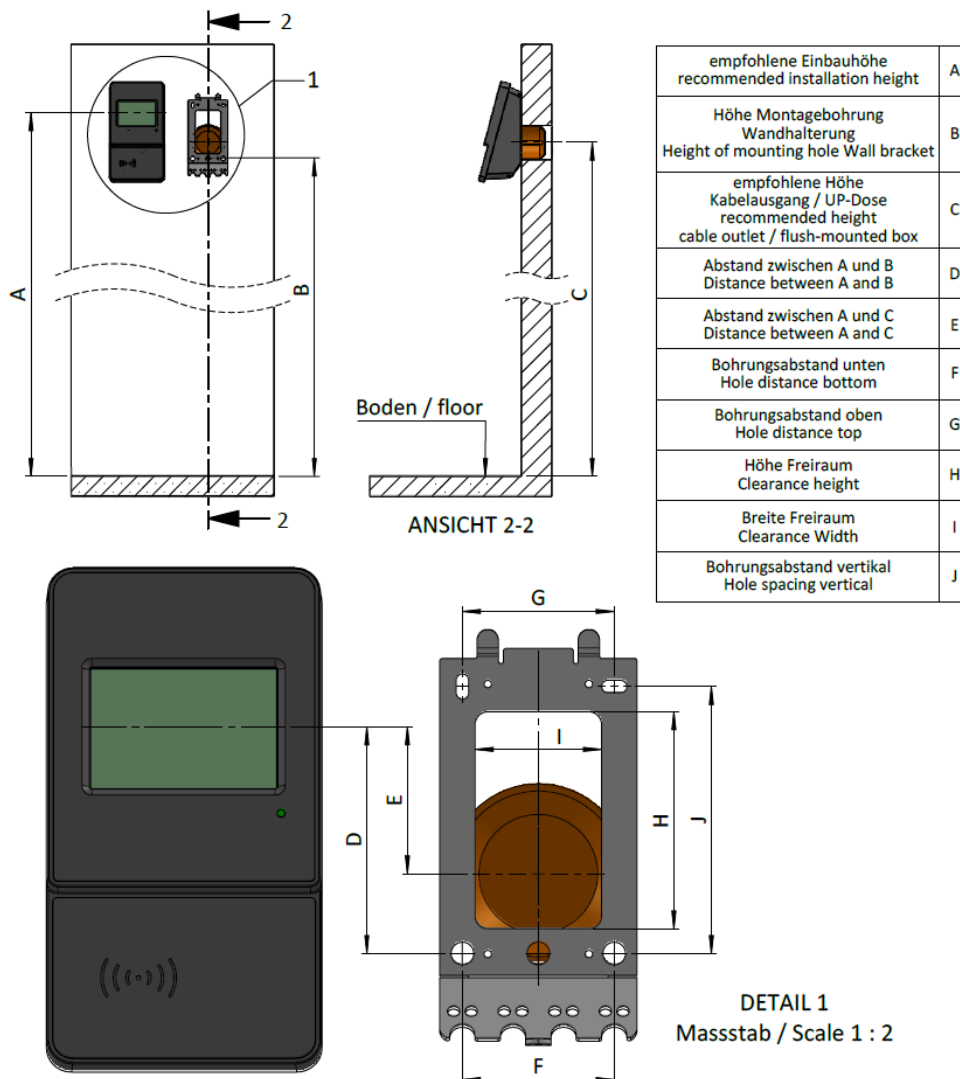
### 5.5.1. Mounting height of the Evo 4.3/4.6

Depending on the size of the person a Installation height from 1.20 to 1.40 m recommended.

If the device is equipped with a finger scanner, you should install the device 5 cm to 10 cm higher.



### 5.5.2. All dimensions for the EVO terminal



Produkt / product	A	B	C	D	E	F	G	H	I	J
EVO 2.8 Pure ohne FP / without FP	1350	1260	1290	90	60	60	60	86	50	106
EVO 2.8 Pure mit FP / with FP	1250	1160	1190							
EVO 3.5 Pure ohne FP / without FP	1350	1260	1290	90	60	60	60	86	50	106
EVO 3.5 Pure mit FP / with FP	1250	1160	1190							
EVO 4.3 ohne FP / without FP	1350	1193	1218	157	132	82	92	150	60	168
EVO 4.3 mit FP / with FP	1250	1093	1118							
EVO 7.0 ohne FP / without FP	1350	1240	1275	110	75	82	92	150	60	168
EVO 7.0 mit FP / with FP	1250	1140	1175							

alle Angaben in mm / all specifications in mm

The suitable drilling template can be found here

[https://www.datafox.de/downloads-evo-line-43.de.html?file=files/Datafox\\_Devices/Downloads\\_Module\\_Zubehoer/230\\_Montage/115001%20EVO%204.3%20Bohrschablone.pdf](https://www.datafox.de/downloads-evo-line-43.de.html?file=files/Datafox_Devices/Downloads_Module_Zubehoer/230_Montage/115001%20EVO%204.3%20Bohrschablone.pdf)

Table stand:

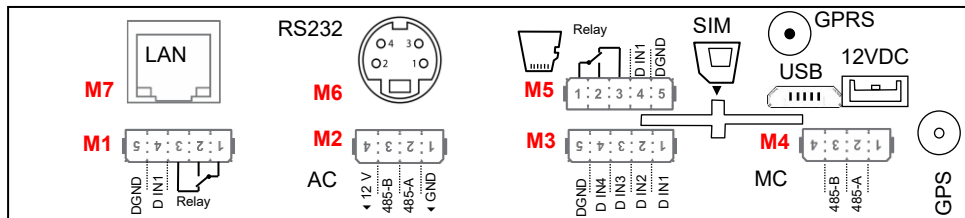
[https://www.datafox.de/downloads-evo-line-43.de.html?file=files/Datafox\\_Devices/Downloads\\_Module\\_Zubehoer/230\\_Montage/11x081%20EVO%20Tischstaender%20BG%20%2B%20Geraete.pdf](https://www.datafox.de/downloads-evo-line-43.de.html?file=files/Datafox_Devices/Downloads_Module_Zubehoer/230_Montage/11x081%20EVO%20Tischstaender%20BG%20%2B%20Geraete.pdf)

## 5.6. Connecting of EVO 4.3/4.6

### 5.6.1. Connecting plugs EVO 4.3/4.6

The Evo 4.3 has 7 intergrated modulplaces. On this places you can order different modules. You can choose the modules on the pricelist.

Here you can see an example with some different modules:



connectors V4.x Evo 4,3"

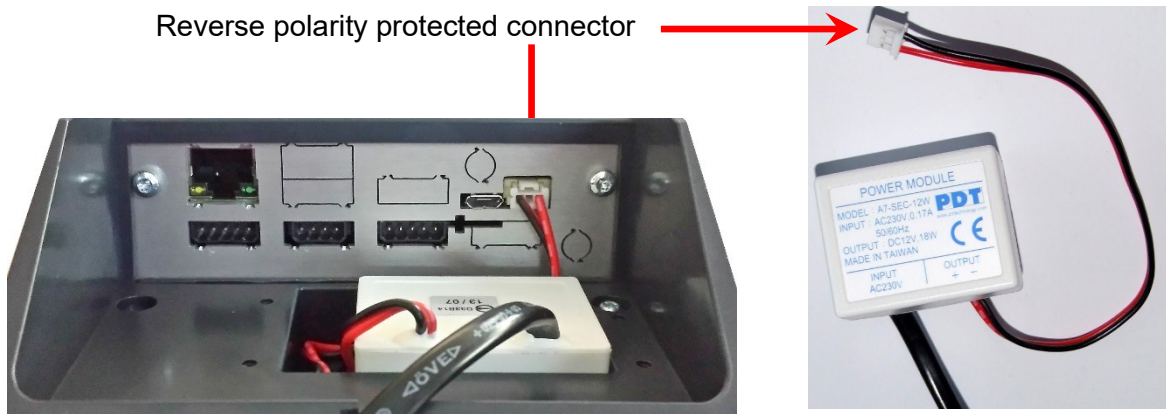
Bezeichnung	Modul	PIN	Beschreibung
digital IO 1x digi. IN 1x digi. OUT	M1	4-5 1-3	1 digital input 1 digital output with normally open and normally close
RS485 for access control	M2	1	ground
		2	A RS 485 for access control
		3	B RS 485 for access control
		4	12 V
Digital IO 4x digi. IN	M3	1	1 digital input
		2	2 digital input
		3	3 digital input
		4	4 digital input
		5	ground
RS485 for main communi- cation. Connecting derectly to an PC	M2	1	ground
		2	A RS 485 for main communication
		3	B RS 485 for main communication
		4	not connected
digital IO 1x digi. IN 1x digi. OUT	M5	4-5 1-3	1 digital input 1 digital output with normally open and normally close
Modulplatz 6 RS 232 Mini-DIN M004	M6	1	TXD
		2	RXD
		3	+ 5 V
		4	Ground / GND
Modulplatz 7	M7		TCP/IP - LAN RJ 45

## 5.6.2. Power supply of the EVO 4.3/4.6

### 5.6.2.1. Power supply

The delivery power supply has 12V DC / 18 W.  
The terminal itself can be supplied with a supply voltage of 24 V DC.

**The power supply:**



### 5.6.2.2. Power via POE

An option for the power is a POE-module (Art. Nr: 115117).  
This POE-module supports 2 standards.

PoE-Standard		power	useable power
PoE	IEEE 802.3af	15,4 Watt	12,95 Watt
PoE+	IEEE 802.3at	25,4 Watt	21,90 Watt

If power is supplied via POE, an external access-reader can also be supplied via the access control plug.

### 5.6.3. Modules for devices of hardware V4

#### 5.6.3.1. Description of the various extension modules

The Datafox devices of the generation V4 are particularly distinguished by the variable configuration of individual modules.

Depending on the device, a certain number of module locations are available.

These can be individually equipped with the individual available modules.

Depending on the size of the module, the individual modules occupy one or two module locations.

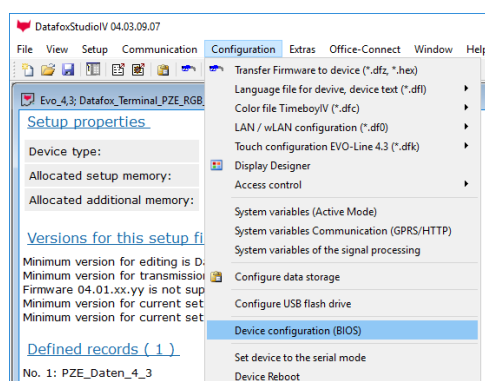
Thus, e.g. the GPRS module (mobile radio) requires 2 module slots and one relay module only needs one module slot.

#### Overview of the different optional modules:

modul description	Required module slots	Description in the BIOS-Menu and Module number.:	Max. possible number of module	items No. for the plug	overprint & Colour
RS 232 - mini DIN Barcode	1	032 Serial port mini DIN	1		
RS 485 access control	1	014 RS485 + 12V Supply	4	A310000 4-01	<b>485</b> ↓ AB ↓
RS 485 main communication	1	035 RS 485 Com Port	1	A310000 4-01	<b>485</b> ↓ AB ↓
GPRS Mobile (Cell phone) network	2	Mobile MC 55i	1		
TCP/ IP	1	011 Ethernet Port	1		
WLAN (Wi-Fi)	1	001 WLAN	1		
4x digital Out	1	051 Digital out activ <b>ground</b>	1	A310000 5-08	<b>Dig-out-4-GND</b> 
4x digital Out	1	051 Digital out activ <b>posi- tiv (Plus)</b>	1	A310000 5-05	<b>Dig-out-4-Plus</b> 
2x digital Out	1	005 Relais Output	8	A310000 5-01	<b>Relay-2</b> 
1x digital In + 1x digital Out	1	012 Digital In-/Output	8		<b>ZK-Opt</b> 
4x digital In	1	006 Digital Input	8	A310000 5-02	<b>Dig-in-4</b> 1 2 3 4 ↓
4x analog In	1	008 Analog Input	8	A310000 5-03	<b>Ana-in-4</b> 1 2 3 4 ↓

How many module places are usable you can see in the device manual in the chapter “Connection of device”.

#### 5.6.3.2. Read the optional placement of the device



Click on:  
„Configuration → Device configuration (Bios)“  
Then click on „Read“.



Display in the Bios-Menu:

Here you can see all modules that are fitted in the device:

You see which module is on which place. You get extended information like MAC address, the number and order of the inputs and outputs.

Device configuration (BIOS)

COM Com\_3\_fest [ COM3 ]

Device

- Status
- BIOS
- LAN MasterIV
- WLAN MasterIV

Description	Value	[P]	[M]	Additional info
Device name	IO-Box V4			
Serial number	4294967295			
Firmware version	04.03.07.71.IOBOX			
Bootloader version	04.03.03.07			
Password key	0000000000000000			
Mainboard	IO-Box Top Hat Rail	0	-	Vers. 1.4b
Default module	006 Digital Input	1	M1	DI 1, DI 2, DI 3, DI 4
Default module	006 Digital Input	2	M2	DI 5, DI 6, DI 7, DI 8
Default module	008 Analog Input	3	M3	AI 1, AI 2, AI 3, AI 4
Default module	008 Analog Input	4	M4	AI 5, AI 6, AI 7, AI 8
Default module	005 Relay Output	5	M5	DO 1, DO 2
Default module	012 Digital In-/Output	6	M6	DI 9, DO 3
Communication	011 Ethernet Port	8	-	Mac: E4-F7-A1-00-0B-5E

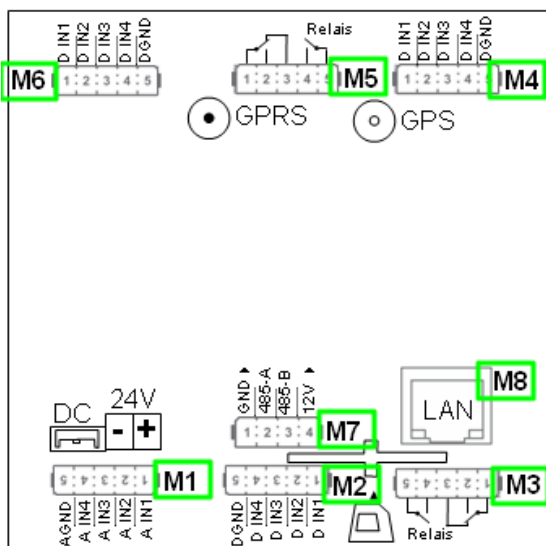
Example 1:

- Module place = M1
- Digital Input 1 to 4
- Module Number: = 006 digital input

Example 2:

- Module slot = M4
- Analog Input 5 to 8
- Module Number: = 008 analog Input

E.g. Type label of an IO-Box V4:

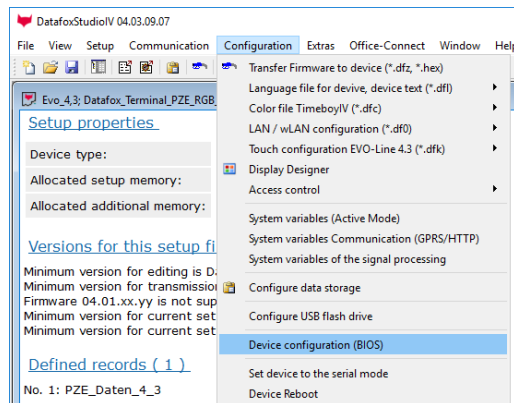


You can see here, in the IO-Box **8** module places are usable. This can be individually fitted.

Exceptions:

- Module place 8, only here TCP is possible.
- RS 485 for access control - maximum 4 Modules can be fitted.

### 5.6.3.3. Read out important module information from the device



Click on:  
 "Configuration → Device Configuration BIOS"  
 Then click on "Status" thereafter  
 Click "Read".

#### Device configuration (BIOS)

Com\_3\_fest [ COM3 ]

Device	
<ul style="list-style-type: none"> <li><span style="border: 1px solid red; padding: 2px;">? Status</span></li> <li>BIOS</li> <li>LAN MasterIV</li> <li>WLAN MasterIV</li> </ul>	<pre> [ SETUP ] Status=Running 1 Name=IO_BOX_AIN_DigIN_2xRel.aes 2 Time=2017-01-30 09:17:44  [ IN ] 3 Status=00000000-  [ CNT ] 4 Values=-  [ OUT ] 5 Status=000  [ ANALOG ] 6 Values=0.01 V, 0.01 V, 0.01 V, 0.01 V, 0.01 V  [ TIMER ] 7 Time to next trigger 1 (2)  [ MEMORY ] Size=4194304  [ RECORDS ] Size=786432 Free=785980 (99%) 8 Used=452 (1%) Count=4  [ LAN ] Mac=E4-F7-A1-00-08-5E Ip=192.168.1.122 Mask=255.255.255.0 Gateway=0.0.0.0           </pre>

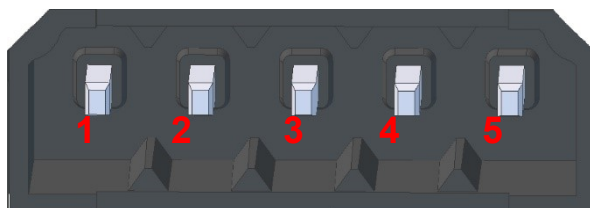
Here you will find a whole series of important information about the terminal.  
Here are some explanations of the individual lines:

- 1) Name of the setup, this is also available when reading out.
- 2) The date when the setup was loaded into the device.
- 3) State of the digital inputs. All inputs which are physically present and defined in the setup are displayed here with their status.
  - a. 00000000 = Digital inputs defined in the setup
  - b. 0 = Input on LOW (logical 0)
  - c. 1 = Input on HIGH (logical 1)
- 4) If digital inputs are defined in the setup as counter, the current count value is displayed here.
- 5) Status of the digital outputs: Output 1 is continuous here from left to right.
- 6) Analog inputs from left to right with respective currently applied voltage.
- 7) Different timers, which are set in the setup, are shown. The figure in brackets is the actual time to the next trigger.
- 8) Number of stored records in the device and memory used.

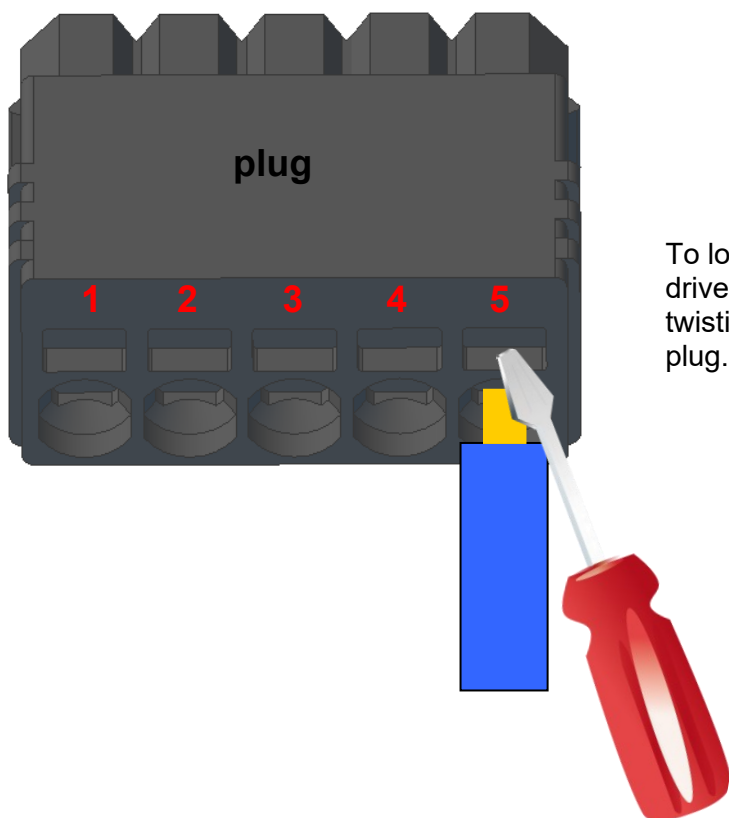
### 5.6.3.4. Connection of the individual modules

The connector / socket for the module always has the following assignment:

Socket on the device:

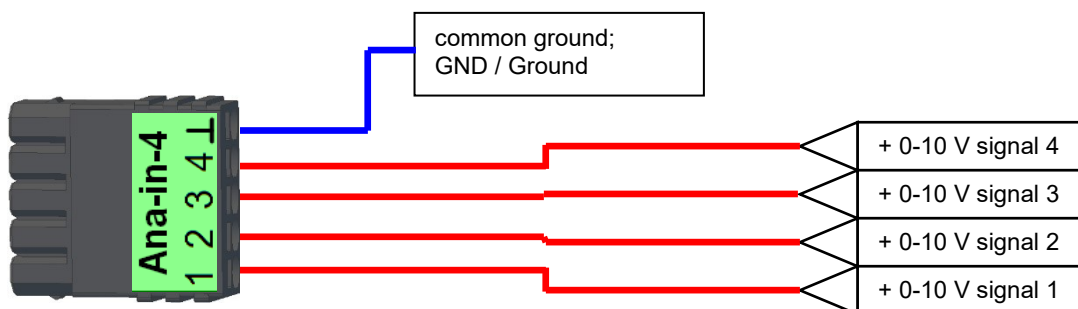


The plug can be inserted only in one direction and is therefore protected against reverse polarity.



To loosen the cable, use a small screwdriver. Solid wires can be loosened by twisting back and forth on the wire and plug.

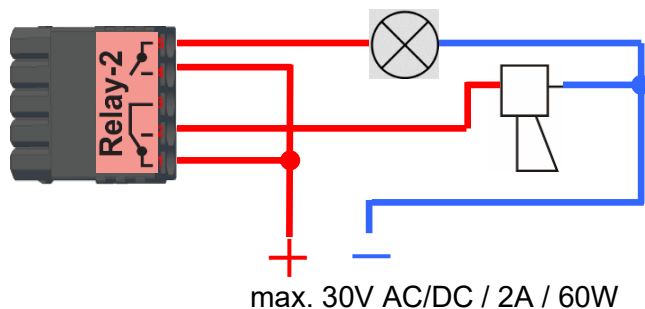
### 5.6.3.5. Analog inputs, 4 x analog IN



### 5.6.3.6. 2 x digital out

#### Connection example:

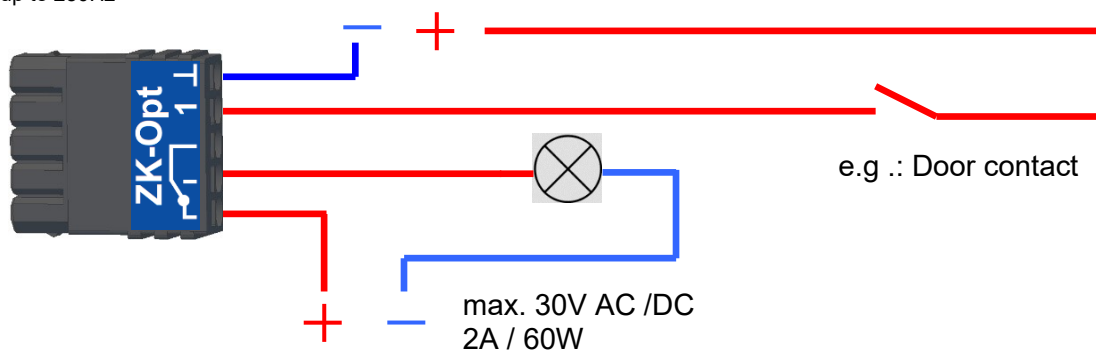
(Connection of a signal light and a signal horn via a potential-free contact):



### 5.6.3.7. 1 x digital Out 1x digital IN

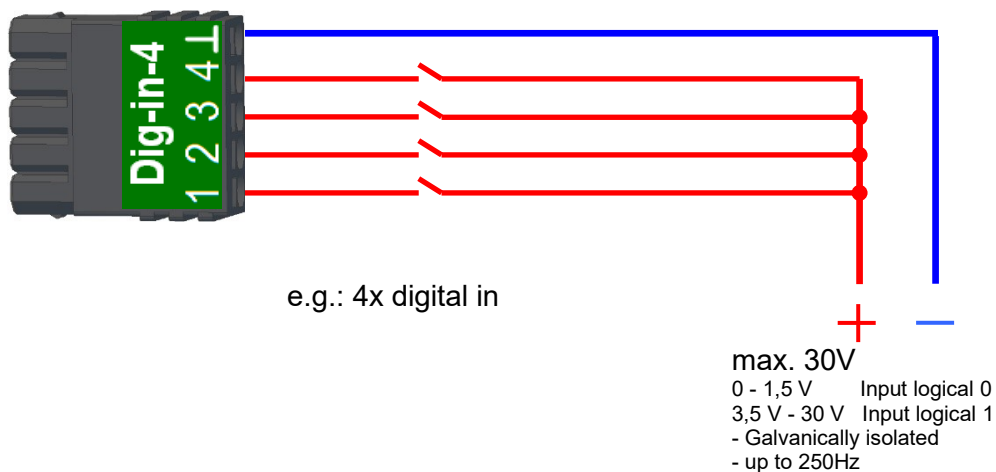
Connection example (Connection of a signal light and a door contact):

- max. 30V
- 0 - 1,5 V Input logical 0
- 3,5 V - 30 V Input logical 1
- Galvanically isolated
- up to 250Hz



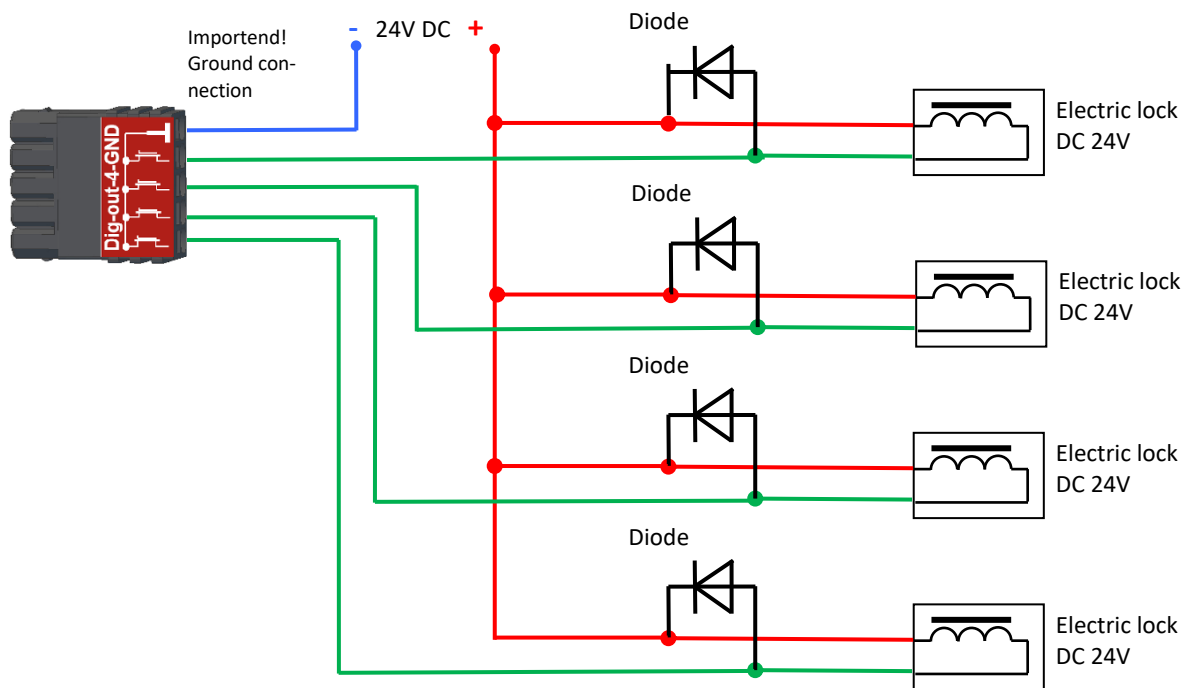
### 5.6.3.8. 4 x digital IN

Connection example (Connection of 4 contacts):



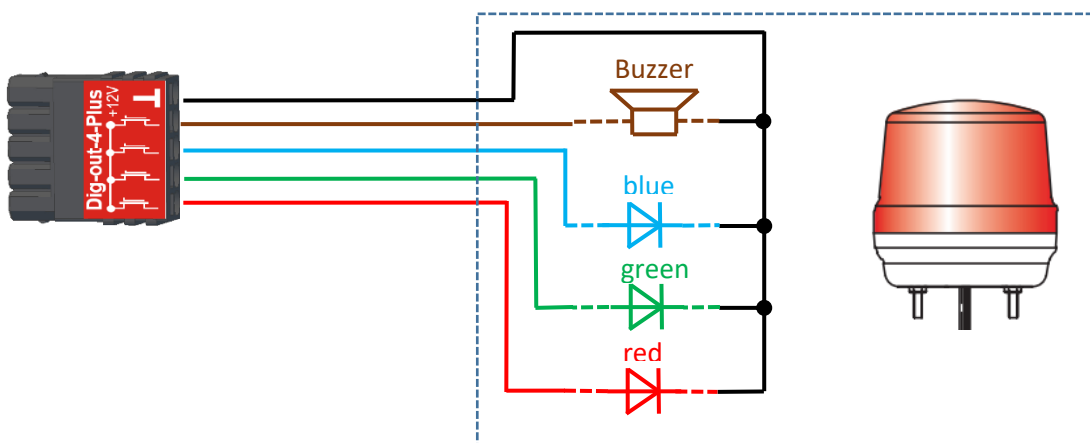
### 5.6.3.9. 4 x digital OUT activ-Low (ground switched)

The digital output modules provide 4 switching outputs on a single module. The module 51 (Art.-Nr. xxx 172) can 12 V DC output, the module 105 (Art.-Nr. xxx 173) switch on ground. (Open Drain). By switching to ground, the module 105 can switch quite large currents, e.g. for lockers or electric door openers.



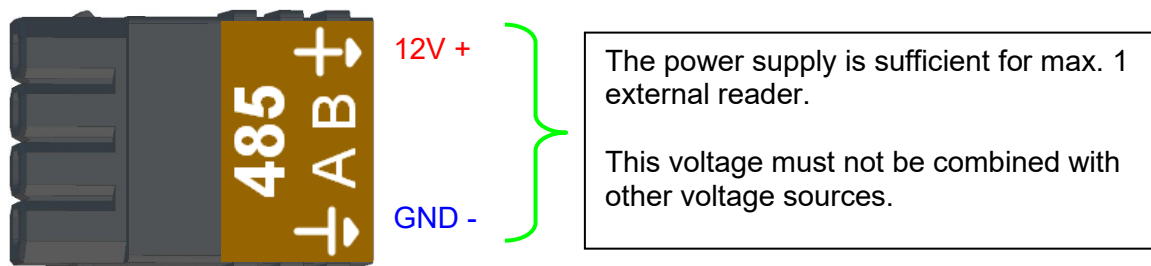
### 5.6.3.10. 4 x digital OUT aktive-Hi (plus switched)


Example connection for indicator lamp, module 51  
In this way, the malfunction indicator lamp can be connected with just a single plug.



### 5.6.3.11. RS-485 bus for access control

The access control option provides the connection for external readers on the device.  
The pin assignment looks as follows:



 **Note:**  
The 12 V are only present when the access control on the device is activated and all access lists have been played on the device.

Furthermore, the connection for a digital input and output is available.  
The pin assignment looks as follows:



How the individual access components are connected or wired, can be found in the chapter "Access control"

## 5.7. Communication of Hardware V4 Devices



### Caution:

The type of communication depends on the device.  
All possible communications are listed in the device.



### Note:

Datafox-devices are able to communicate encrypted.  
Read more in the manual for the „DatafoxStudioIV“.

The switching of the communication can be done via :

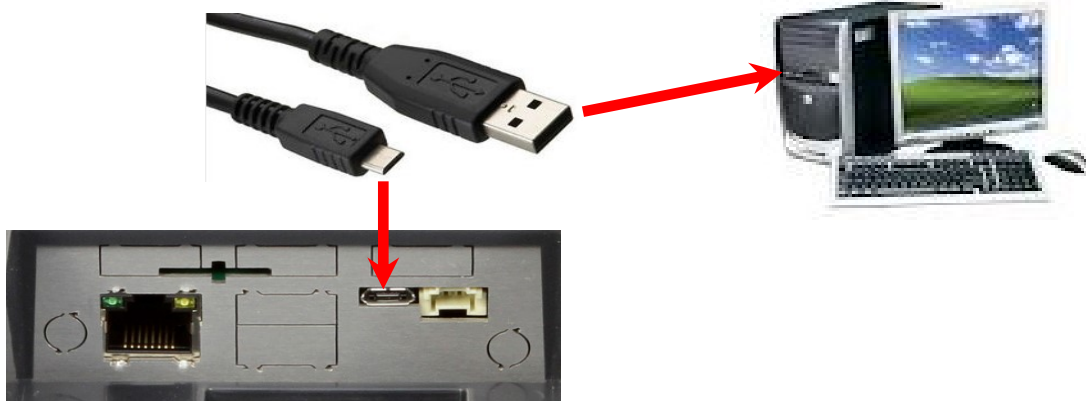
1. the system menu bios on the device
2. with firmware version 04.02.04 and up with the function „Switch communication“.
3. from the Firmware version 04.02.04 upwards with the field function „switch communication“.  
Read more in the manual for the „DatafoxStudioIV“

Possible communication types are:

1. USB (on PC)
2. USB Host, Save data on a USB-stick GPRS connection with mobile cell network.

### 5.7.1. Communication via USB

Every EVO-Line Device is equipped with an USB interface.  
The Micro-USB-B Port can be connected directly to a PC.



### Caution:

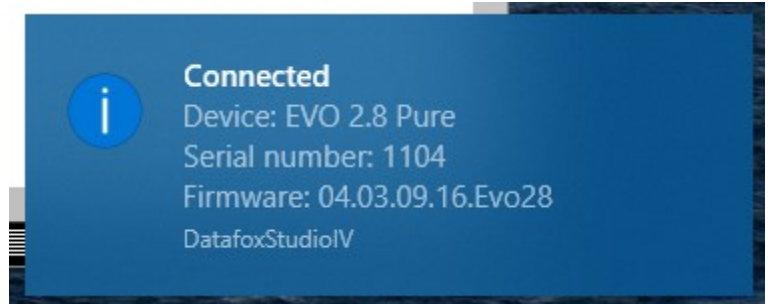
The Terminal works with a USB-B Interface. This means that the device works in slave mode only. So it is not possible for the device to control any other devices via USB.



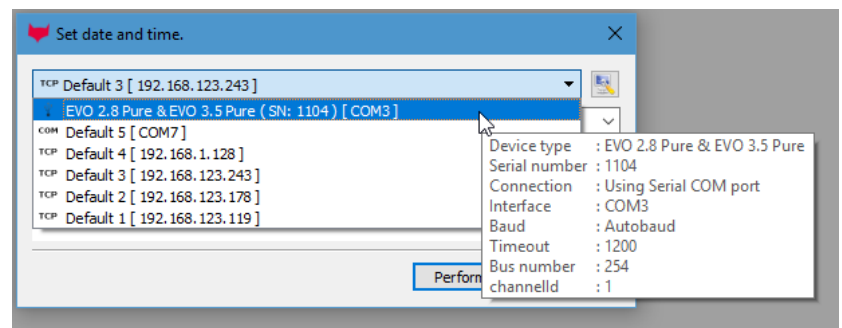
### 5.7.1.1. Automatic detected connected USB to PC

If the terminal is connected to a PC it will recognize the connection and will switch the communication to USB.

DatafoxStudioIV will recognize the device and a notification will pop up.



The studio will generate an entry for the device.



following icon is displayed:



It is not necessary to switch the main communication to USB manually.

**It's especially useful for boxed devices.**

This will save much time in the parameterizing process.



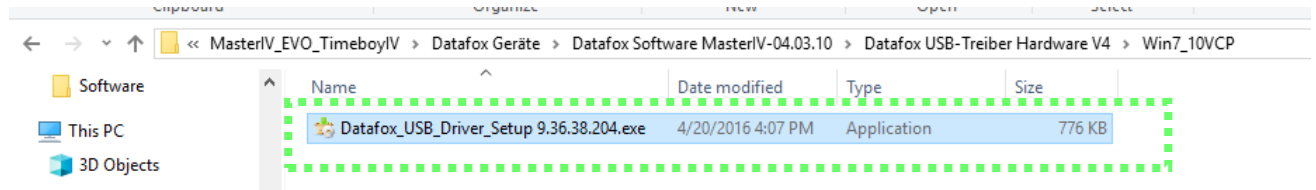
**Note:**

If the device is connected to a PC no other connections (for example Wi-Fi) will happen. If the USB-cable is disconnected, it will automatically switch to the configured main communication.

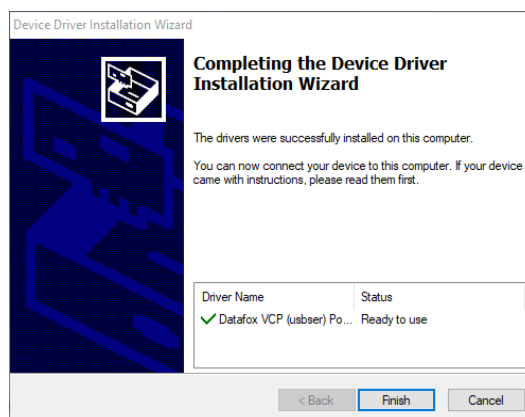
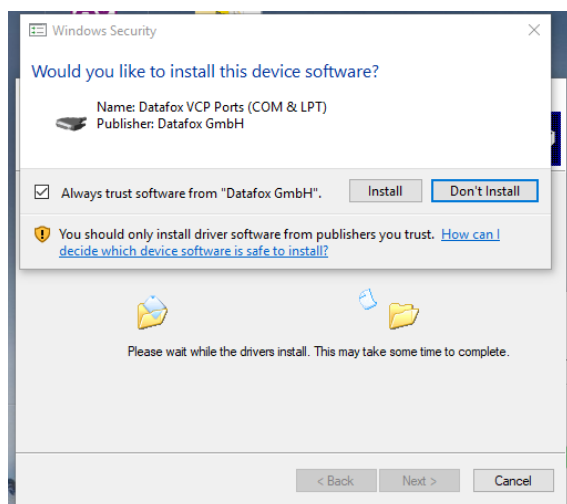
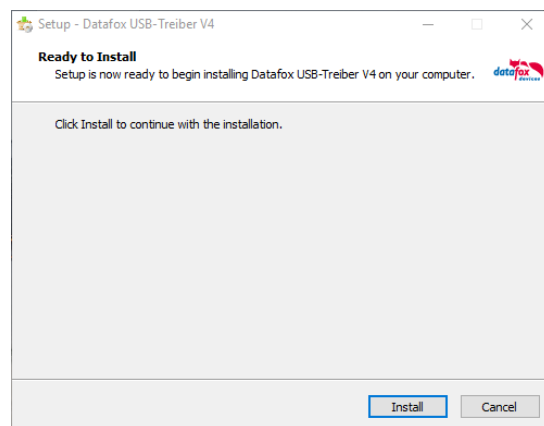
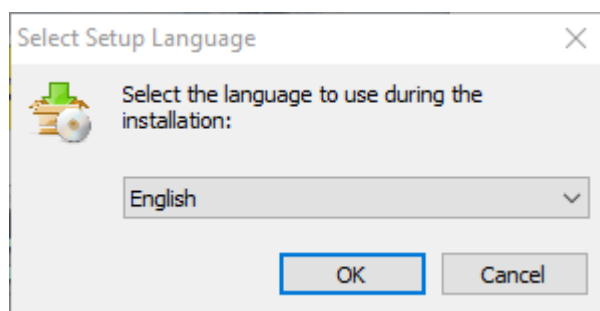
## 5.7.2. Installing USB driver for Hardware V4 Devices

### Installation for Windows 10 and 11

The USB-Driver is a small installer which will do the necessary configuration. Just launch the .exe file.



Follow the instructions on the screen:



**Caution:**  
 Only use the driver which are delivered with the device!

**Note:**  
 If you have DatafoxStudioIV installed, the USB-driver will already be installed on your PC.


### 5.7.3. Communication / record transfer via USB-Stick (Host)

To be able to transfer data from the device to a USB stick, the device must have the option "USB host". You can see this at the neckline.



The USB-Stick must be in **FAT(32)**.



The device detected the stick automatically, when the stick is plugged in. The main communication must be set on "USB-Host". You see the activated main communication by this symbol (Icon) . You can change the main communication in the bios-menu.

#### USB - Stick adjust:

The USB stick is configured with the help of DatafoxStudioIV. You find the configuration menu under the point „Configuration“ → Configure USB flash drive. More description you find in the manual "[DatafoxStudioIV](#)".



#### Note:

We recommend to use a password for the communication with the USB-stick.



#### Caution:

The USB cable to the PC must not be connected if you want to use the stick on the device.



#### Caution:

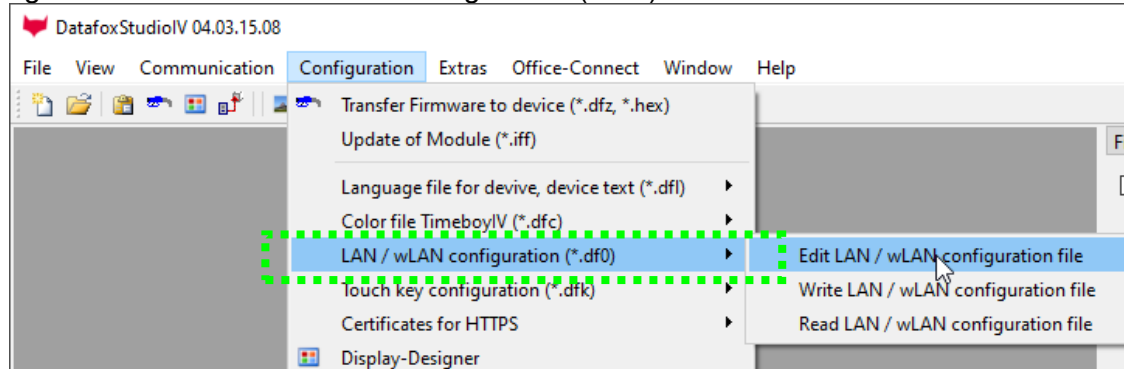
Lists of access control can be transferred individually, operation lists must always be transmitted in complete form. All lists defined in the setup must also exist on the stick in the "List" directory.

### 5.7.3.1. Error messages by using USB-Stick (Host)

Error code	Description
1	<b>Read Error</b>
2	<b>Write Error</b>
3	<b>Error during the communication with the USB host</b>
4	<b>Error during the changing the directory</b>
5	<b>Error by the check of the stick</b>
6	<b>Error by the list directory</b>
7	<b>Error to create a data directory</b>
8	<b>Error handle</b>
9	<b>Error to open a file</b>
10	<b>Error not find the path</b>
11	<b>Error, the file is already open</b>
12	<b>Error to open a file</b>
13	<b>Error by closing the file</b>
14	<b>Error by closing the file, false handle</b>
15	<b>Error by checking the handle</b>
16	<b>Error by checking the handle, the file is not open</b>
17	<b>Error write protect</b>
18	<b>Error by the record structure</b>
19	<b>Error during the firmware update</b>
20	<b>No USB stick</b>
21	<b>Incorrect password</b>
22	<b>No list</b>

## 5.7.4. Communication via TCP / IP

The setting of the LAN / WLAN parameters is done via DatafoxStudioIV under the menu item "Configuration" → "LAN / WLAN – Configuration (\*.df0)".

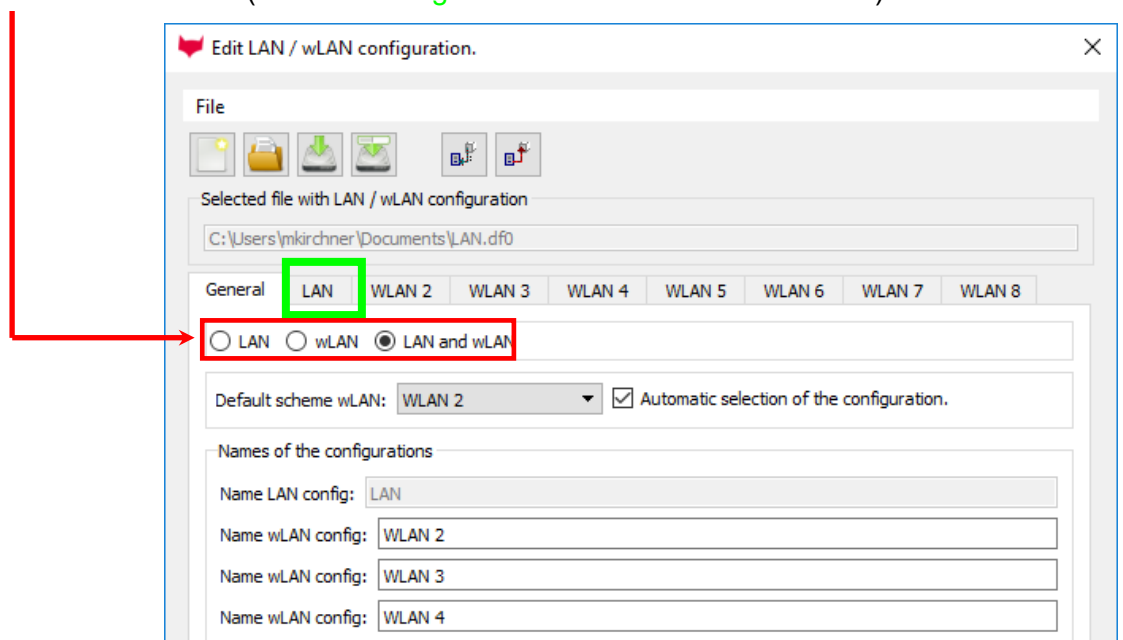


The LAN / WLAN configurations are saved in a file with the filename extension "\*.df0". Here you have the possibility to edit the file, load it into the Datafox device (upload) or read it from the device (download).

When reading the WLAN setting from the device, the currently specified file is overwritten.

In the General tab, first of all, you can set the main communication with which the device is equipped.

- Device with LAN (The first configuration is for LAN connection)
- Device with WLAN
- Device with LAN and WLAN (The first configuration is for the LAN connection)



### Caution:

For TimboylV only this setting (only wLAN) can be used.

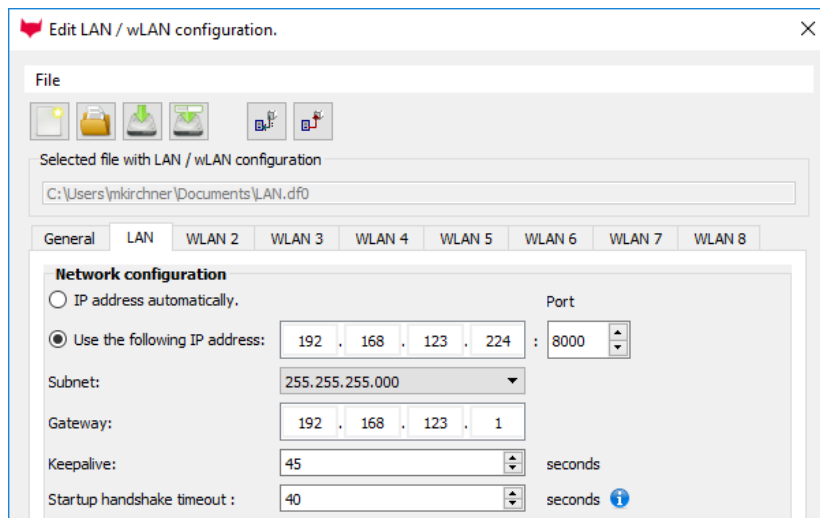


LAN  wLAN  LAN und wLAN

### 5.7.4.1. Communication TCP / IP via network-cable

You can make the IP settings on the "LAN" tab.

Please enter the desired IP address, subnet and if necessary a gateway.



For devices with display, the IP address can also be entered directly on the device. Press ESC and ENTER simultaneously to enter the Bios menu of the device.

More information can be found in the chapter „bios menu“.

### 5.7.4.2. Communication TCP / IP via wLAN / Wifi

General information about the WLAN modules used.

There are 2 different WLAN modules that have been integrated into the Datafox devices.

- 1.) Redpine – installed in the units since 2013.
- 2.) Texas Instruments TI-CC3135 - installed in the devices since 2021.03.

Basically, both modules can be set via the DatafoxStudioIV or on the device itself. The only difference between the modules is that different standards are supported. You can see what each module supports in detail on the following pages.

**You check with the DatafoxStudioIV via Configuration -> Device configuration (Bios):**

Standardmodul	014 RS485 + 12V Supply	1	M1	
Standardmodul	012 Digital In-/Output	2	M2	DI 1, DO 1
Standardmodul	WLAN TI CC3135 ML01	4		
Standardmodul	037 Single Serial Port	6		
Transponderleser	TSR32 Reader 125kHz	1		
Standardmodul	014 RS485 + 12V Supply	7	M7	

oder:

Standardmodul	001 WLAN Redpine RS9110 6	-		Vers. 4.5.5, Mac: 88-DA-1A-7F-E6-65, Ip: 192.
---------------	---------------------------	---	--	---

**You have a delivery note and look at the article number**

- 1.) Redpine: Art.Nr.: xxx112 (generation 1)
- 2.) Texas Instruments CC3135: Art.Nr.: xxx112 A (generation 2)

**You are checking the Bios menu of the unit:**

Under: System Menu-> System Menu  
Bios-> Communication  
Here you have to set the unit to "WLAN"  
as the main communication.  
Under the settings WLAN parameters  
you have an info menu „Modul Infor-  
mationen“.



### 5.7.4.3. M111\_WLAN ESP32-c3 ML01 (wLAN-Modul DF-WL03)

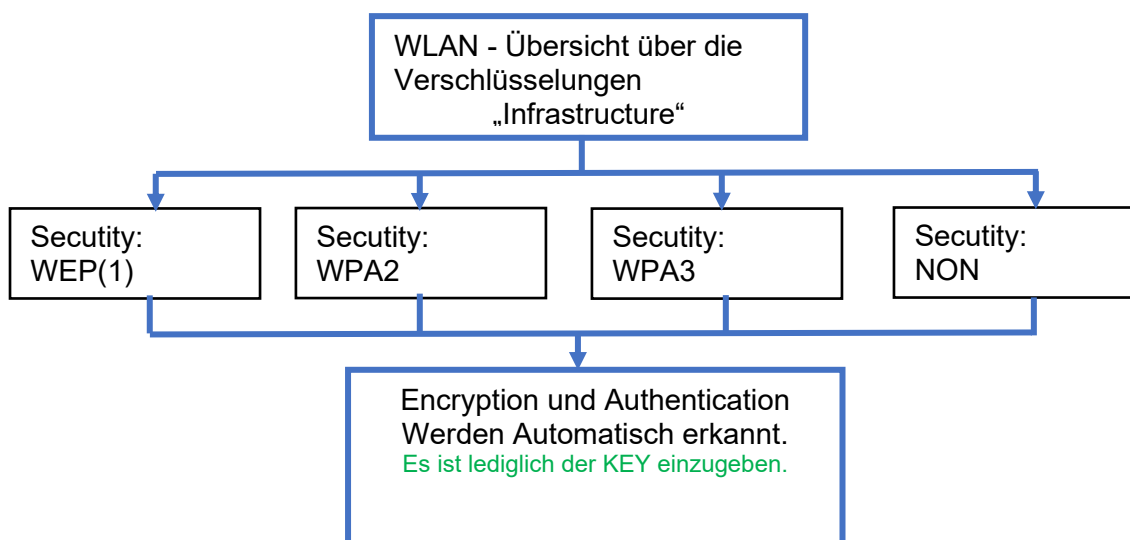
This overview shows you which **WLAN** methods are supported.

The WLAN 3 module automatically detects the encryption of the AP. Therefore, only the Security parameter needs to be set. The other parameters (Encryption and Authentication) are detected automatically.

Routers that operate WPA3/WPA2 in mixed mode can already be used now.

Router die WPA3/WPA2 im Mixed Modus betreiben können bereits jetzt genutzt werden.

Supportet is here only the 2.4Ghz.



#### Achtung:

Wir können nicht jeden auf dem Markt befindlichen Access-Point Testen. Daher ist es uns nicht möglich, einen Verbindungsaufbau zu jedem AP zu garantieren.



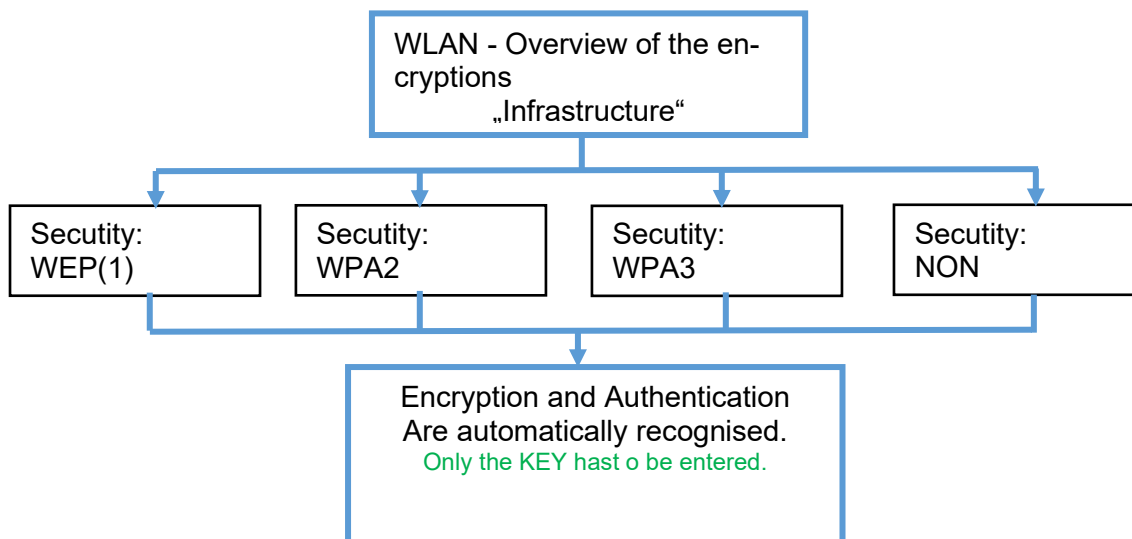
#### 5.7.4.4. Texas Instruments TI-CC3135 (Generation 2)

This overview shows you which **WLAN** methods are supported.

The TI-CC3135 module automatically detects the encryption of the AP. Therefore, only the Security parameter needs to be set. The other parameters (Encryption and Authentication) are detected automatically.

Routers that operate WPA3/WPA2 in mixed mode can already be used now.

If the networks in the 5Ghz and 2.4Ghz bands have the same name, the network with the better reception quality is selected. This is usually the network in the 2.4Ghz band.



#### Attention:

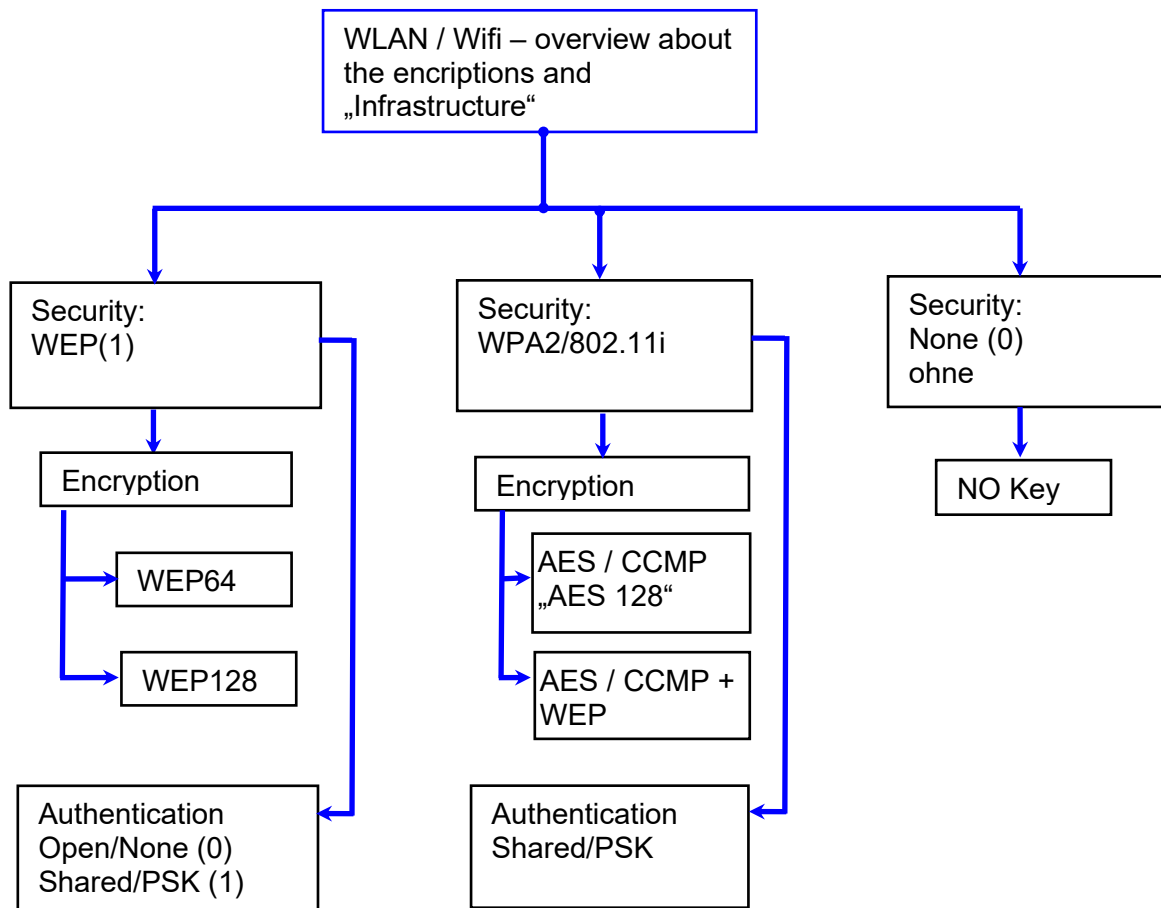
We cannot test every Access point on the market. Therefore, it is not possible for us to guarantee a connection to every AP..

**Support for WPA3 and WPA2 Enterprise is planned.**

### 5.7.4.5. Redpine (Generation 1)

This overview shows you which WLAN methods are supported.

- **Not supported** is WPA (Predecessor of WPA2).
- **Not supported** is multiple-input multiple-output (MIMO)
- **Not supported** 5 GHz connections and no mixed operation 2.4 GHz / 5 GHz
- **Not supported** Authentication via WPA2 Enterprise according to IEEE 802.1x



**Attention:**  
 ! We cannot test every available Access-Point on the market.  
 • Therefore, it is not possible for us to guarantee a connection to any AP.

**Attention:**  
 ! [multiple-input multiple-output](https://en.wikipedia.org/wiki/multiple-input_multiple-output) (MIMO) are not supportet. If you switch the access-Point AP from b/g/n to b/g, use the access-Point only SISO.  
 • [https://en.wikipedia.org/wiki/Single-input\\_single-output\\_system](https://en.wikipedia.org/wiki/Single-input_single-output_system)

When setting the encryption AES or WEP, only one type is used at a time.  
 The setting AES+WEP means for some access points that AES encryption is performed first and then additionally encrypted with WEP.  
 In this case, only set AES.

Select the configuration or location for which you want to set the WLAN parameters.

Enter the IP address for the device here. This must be the same for every location.

All the settings required for an access point can be made here.

If a key is stored, this will be displayed.

If you check this box, the battery life will be significantly increased if the device is operated with a rechargeable battery. **Important for TimeboyIV!**

A scan (search) for access points is only carried out after a disconnection after this set time. Please note the following Attention Box!

### Attention:



A search for a new access point requires a lot of energy and drains the battery. Avoid a continuous search for an access point when the device is operating at the limit by generously selecting the pause between scans for new access points (80-120s). At most access points there is the possibility to set the "Beacon Interval". The higher this is set, the less power the TimeboyIV needs. Recommendation: Beacon interval >300ms.

The entire file with all settings is transferred to the device. If the device has a display, the location can be selected in the Bios menu -> Communication -> WLAN. Each location has its own configuration for the WLAN connection. The user therefore has no insight into the dial-in parameters at the various locations.



### Hint:

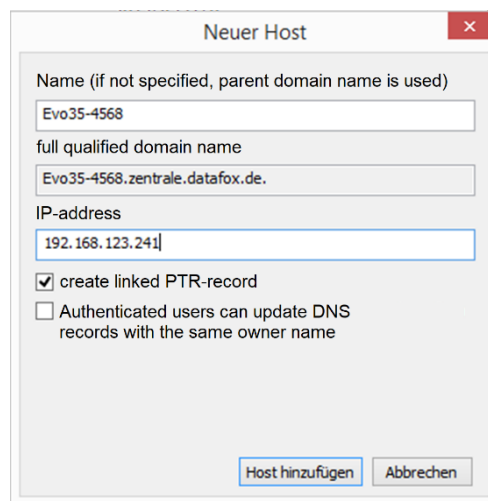
With automatic selection of the configuration / location, the first attempt is always made to establish a connection with the default schema.

### 5.7.4.6. Connection of the Terminals via TCP/IP DNS / DHCP

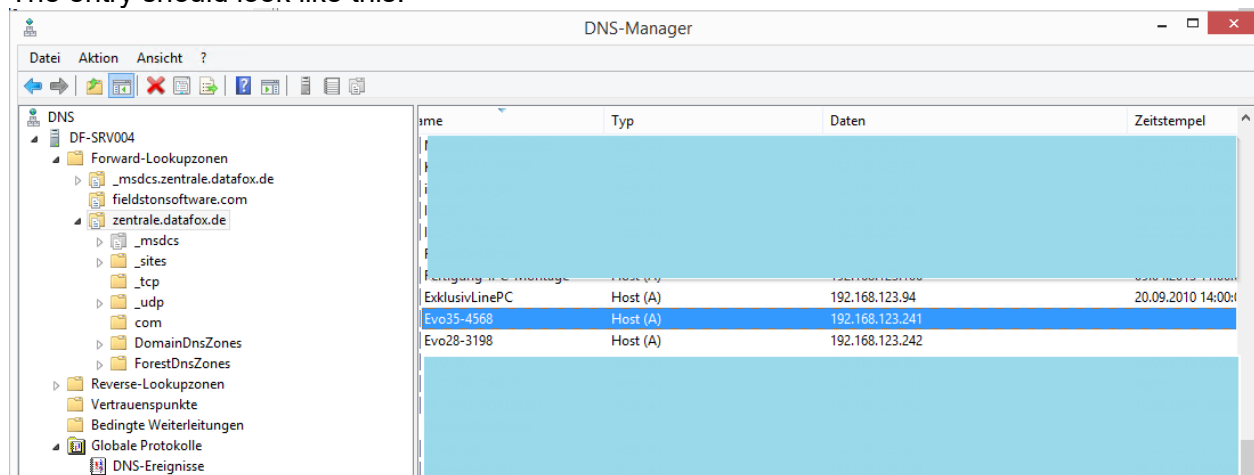
To connect a Datafox EVO-Device with the Hostname it is necessary to set something in the DNS-Server. (In this example Windows-Server 2012)

Create a new Host (A)-value:

Abbreviation	Description
Name	Name of the device Contains the device designation and the serialnumber „deviceXX-serialnumber“ Example: „Evo28-1652“ „EVO43-8552“
full qualified domain name	This is the host name to be entered later.
IP-address	Here you must enter the IP of the device.
Create linked PTR-record	You must create a linked PTR-record. Just put this hook.



The entry should look like this:



Name	Typ	Daten	Zeitstempel
ExklusivLinePC	Host (A)	192.168.123.94	20.09.2010 14:00:00
Evo35-4568	Host (A)	192.168.123.241	
Evo28-3198	Host (A)	192.168.123.242	

## Settings in the DatafoxStudioIV:

Host name

Before entering, this checkbox must be set.

## DHCP- entry for Datafox devices

If a device is set to DHCP, the IP address and the entry in the DHCP server can look like this.

192.168.123.109	Evo43-36100.zentrale.datafox.de	10.07.2017 23:01:31	DHCP	e4f7a100000c	Vollzugriff
192.168.123.223	Evo43-1292.Zentrale.datafox.de	Reservierung (inaktiv)	Keine	e4f7a100072f	Testgeraet Le... Vollzugriff
192.168.123.226	Support_ZK-Box V4	Reservierung (inaktiv)	Keine	e4f7a100073f	Vollzugriff
192.168.123.112	PZE-17358.zentrale.datafox.de	10.07.2017 23:51:21	DHCP	e4f7a1001964	Vollzugriff
192.168.123.125	Evo28-3705.zentrale.datafox.de	10.07.2017 14:05:02	DHCP	e4f7a100370d	Vollzugriff
192.168.123.72	Evo43-5002.zentrale.datafox.de	10.07.2017 22:58:05	DHCP	e4f7a1005070	Vollzugriff

The entry contains the following:

device	serial number	domain	DHCP- entry
EVO 2.5	10245	.zentrale.de	Evo25-10245.zentrale.de
EVO 3.5	10246	.zentrale.de	Evo35-10246.zentrale.de
AE-Master	10247	.zentrale.de	AE-10247.zentrale.de
PZE-Master	10248	.zentrale.de	PZE-10248.zentrale.de
EVO 4.3	10249	.zentrale.de	Evo43-10249.zentrale.de

### 5.7.5. Communication via Cellular Network (GPRS)

The EVO 4.6 FlexKey can be equipped with a cellular network modem. It enables the communication via cellular network. The antenna is located in the connection compartment of the device and can optionally be replaced by an external antenna if reception is bad.

The SIM card is inserted via the connection compartment of the EVO 4.6 FlexKey.

Inserting the SIM-Card at the EVO 2.8 Pure. Inserting the SIM-Card at the EVO 4.3/4.6.



Inserting the SIM-Card.



**Caution:**

For inserting the SIM card a tool in pen or screwdriver form is required. Take care that the SIM card is not damaged.

For removing, the SIM card has to be pushed in a bit. After releasing it, the SIM card protrudes a bit and can be removed.



**Note:**

We recommend to use T-Mobile or Vodafone as provider for mobile networks! Our experience shows that with other providers you have to reckon with more frequent dial-ups and thus delayed data transmission and possibly higher costs.

Information for M2M:

[http://www.t-mobile.de/business/machinetomachine/m2m-im-einsatz/0,23219,26762-\\_,00.html](http://www.t-mobile.de/business/machinetomachine/m2m-im-einsatz/0,23219,26762-_,00.html)

### 5.7.5.1. Communication state in the Display

The state of GPRS-/GSM-connection you can always see in the state bar on the display.

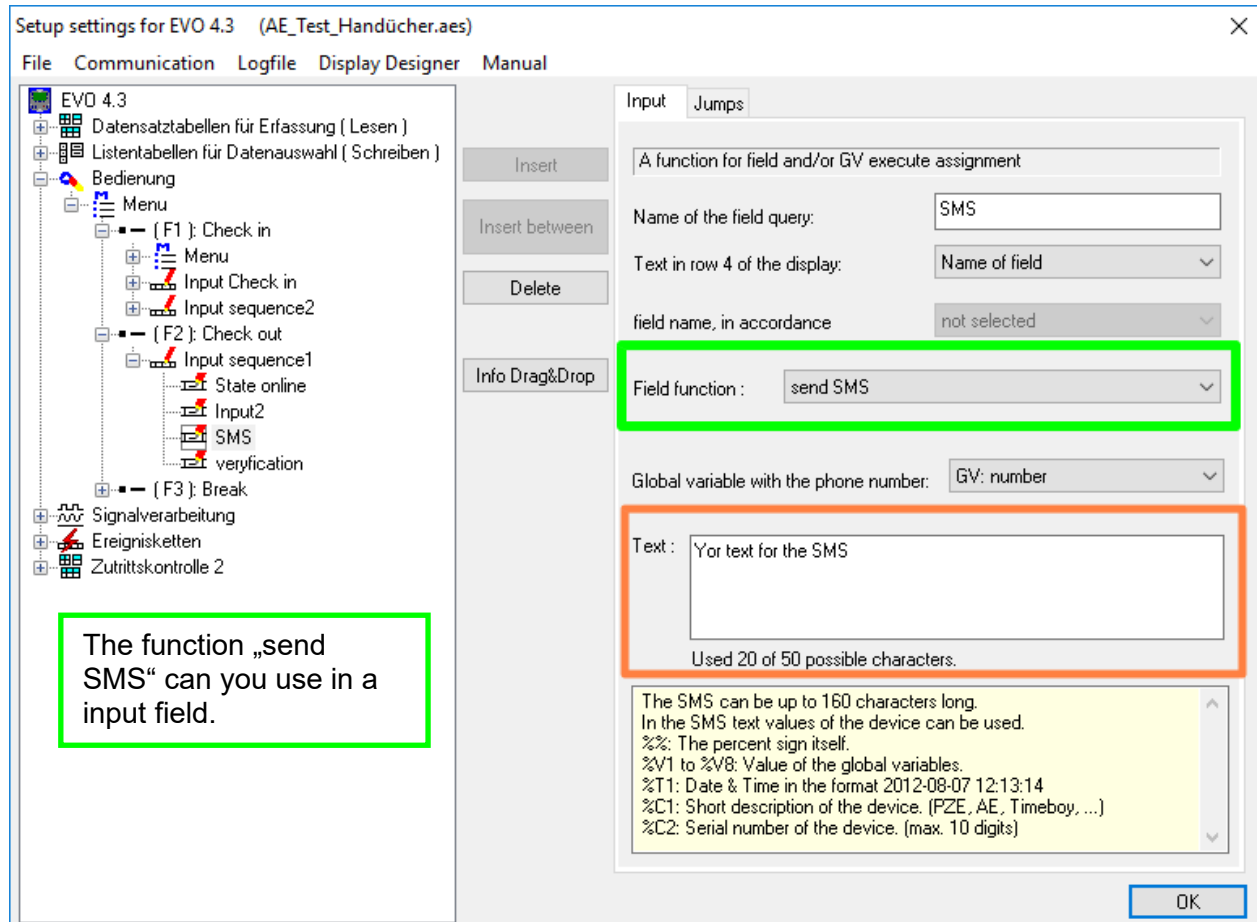
Pin	Bez.
0	Modem is off
1	Initialization of the software
2, 3	Start of the modem
4, 5	Initialization of the modem and SIM-card check
6	if PIN necessary, sending of the PIN
7	if PUK necessary, sending of the PUK
8	dilated initialization of the modem
10	Modem in standby mode
11	Call recognized
12	take calls
14	GSM connection activ
15, 16	GSM connection closed
20	GPRS Standby, Initialization of the GPRS connection after the first records
25	connection to Provider (Attach)
30	GPRS standby (waiting for next data/records)
31	Server (Open)
32	connect to server
33	send data to Server (HTTP)
34	Wait for quitting from server (HTTP)
35	recive data from server (TCP/IP)
36	send data to server (TCP/IP)
37	close connection
38	Braek between tries to connect the server, active mode
40	timeout after failed connection, to 15 minutes
41 <sup>1)</sup>	timeout after failed connection Provider, to 15 minutes.
42 <sup>1)</sup>	count of the connection attempt is end
43	on the Device is the encryption active, but not on the server
44	battery is down, to disable Modem.
45	impossible connect to the provider or Roaming impossible
50	close connection
55	Turn modem off

## 5.7.6. Communication via SMS

### 5.7.6.1. Send a SMS

With the EVO 4.6 FlexKey, it's possible to send a SMS. Condition for this is, an integrated GPRS-Modem (communication via Cellular Network). The main communication must be set on GSM or GPRS/GSM.

To send an SMS you must use the Field Function "send SMS" in the device Setup.



The function „send SMS“ can you use in a input field.

The maximum length of the SMS is 160 characters.

The text can integrated device value:

%%: The percent signs self.

%V1 to %V8: value of global variable.

%T1: date and time 2012-08-07 12:13:14

%C1: Short device description. (PZE, AE, TIMEBOY, ...)

%C2: Serial number of the device. (max. 10 Stellen) %1 für GV 1, %2 für GV2 usw..

The call number if you want send an SMS must be saved in a GV.



#### Caution:

Enter the phone number always with a country code.

Example.: +49161458\*\*\*\*\*

The device can save 128 SMS. Then there is additional as follows to clear the oldest SMS.

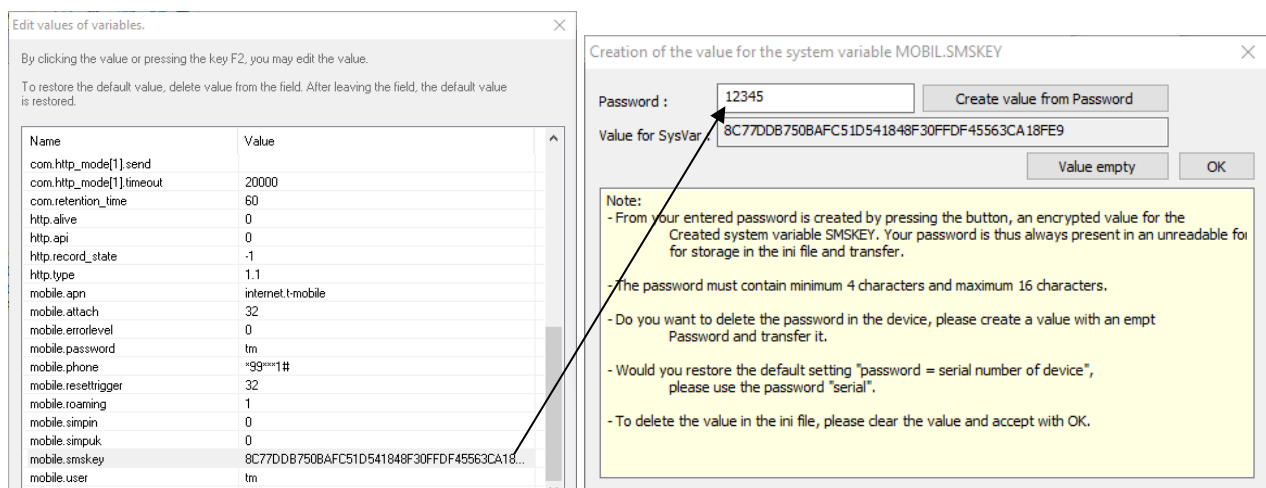


### 5.7.6.2. Receive a SMS

The follows functions are possible:

- ▶ View the SMS on the display. The same action you find in the „DFCComSendMessage“ or the answer via HTTP.
- ▶ to order an service connection (the same how in the HTTP- answer)
- ▶ start in the signal processing an input sequence
- ▶ Output an acoustic signal

**Condition** to receive a SMS is a **KEY** include in the device an in the text from the SMS.  
The Key for the device can set in the GPRS/HTTP .ini file.



### Text message

The keyword must be included in the SMS-text is:

message=text1↵ text line2 ↵ line3 etc.  
&delay=10&key=12345

The **10**, is the time how long to display the message.

After the character ↵ gives a line break (carriage return).

If not a **key** in the device, you can use the serial number as a key (default setting). Save you an empty Key, then receive the device every SMS. The last received SMS can you see in the Bios-Menu under „general information Bios (Menu)“.

### Service-connection (active-mode)

The content of the SMS is similar to that of HTTP-Answer from the WEB-Server.

Actually supported are 3 keywords: **service**, **host** and **port**. The keyword must follow an "=" character with corresponding value. The individual fields are separate with the character "&". With the KEY „**service=1**“, open the device a Service-connection. The connection Parameters (Host, Port) are saved in the “active.ini” file from the device.

An option is, to give the device the Parameters for the connection via SMS (→**host=**, **port=**). Then use the device this parameters from the SMS and not the saved from the “active.ini” (active mode).

“&service=2“

**Coution ! this funktion first supportet with the hardware version V4 GPRS(Mobilfunk) and FW 04.03.06.XX.**

When using parameter 2, the service connection is established immediately.

Beispiele:

- a) **service=X&key=12345**
- b) **service=X&host=www.datafox.de&key=12345**
- c) **service=X&host=123.123.123.123&key=12345**
- d) **service=X&host=www.datafox.de&port=4711&key=12345**

a) Connection to the server with the saved parameters in the „active mode“.

b) and c) Connection on Port 8000 to the server (www.datafox.de/123.123.123.123).

d) Connection to the server “www.datafox.de” and port “4711”.

## Start an input sequence in the device signal processing

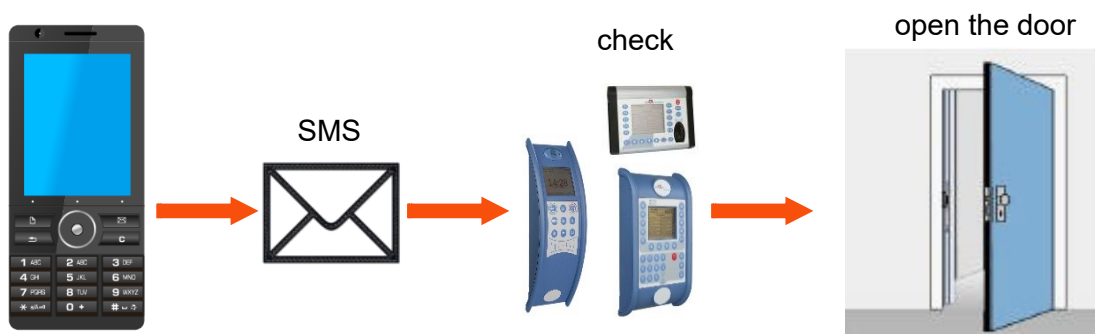
The keyword, if you need in the SMS is:  
**ek=name&key=ja** (the name of the input sequence).

The name of the input sequence must match completely, otherwise it will not run.  
 Recieve the device an SMS with this text, then start the input sequence.

If save a SMS Key, the must include the SMS this Key (**&key=ja**).

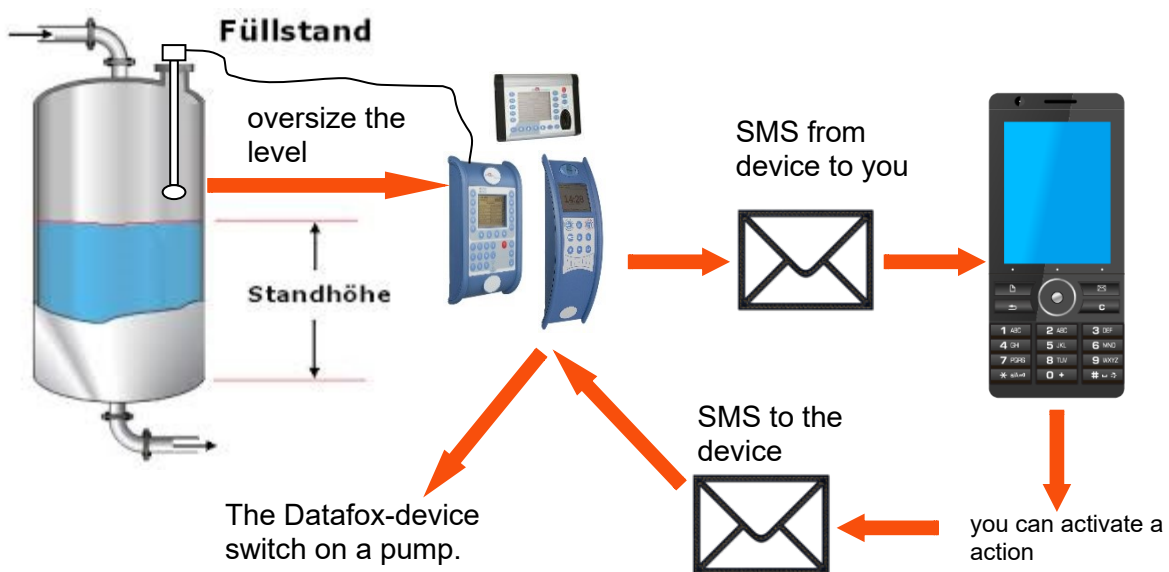
With this are many different variants are possible.  
 Here some example:

### Open a door via SMS.



### Control a technical system and send a SMS in trouble:

If the level of regulation from the system is not correct, then there is a report via SMS.  
 The Datafox MasterIV is not the regulator here. He gives only a report in trouble.  
 If necessary, a procedure also can be done.

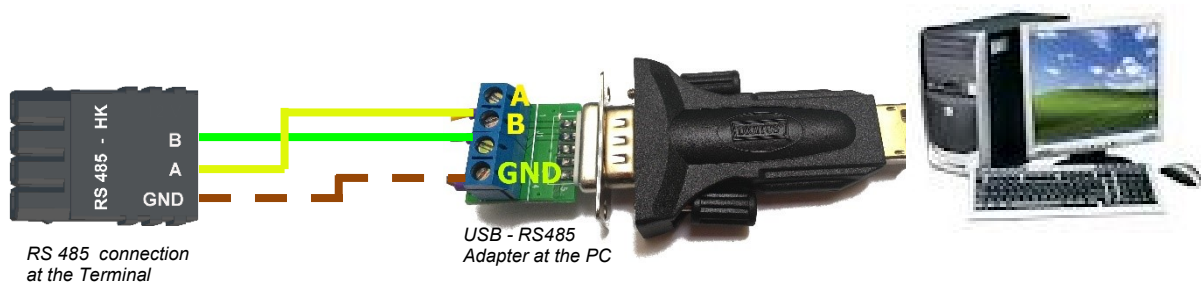
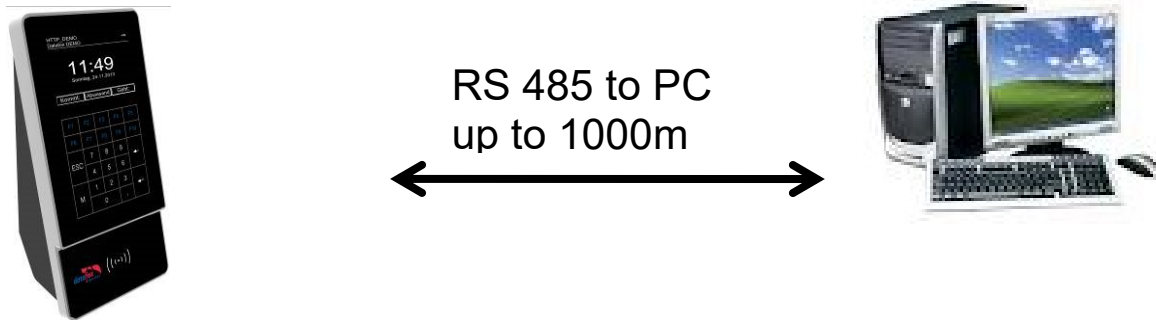


#### **Caution:**

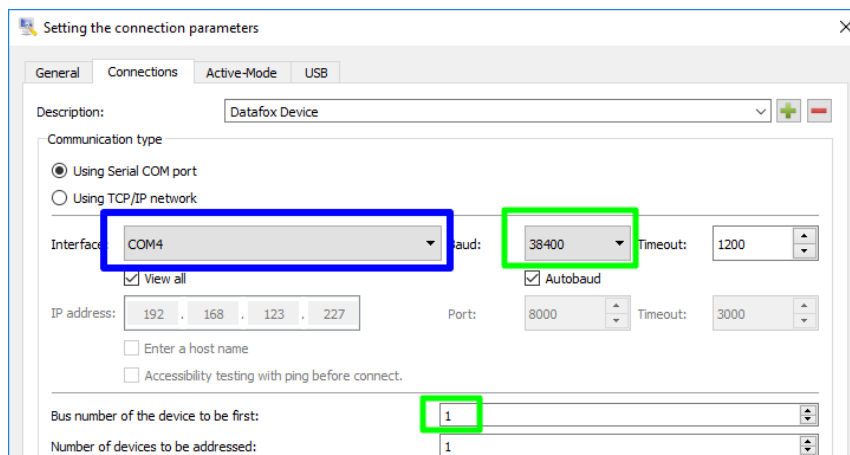
There is no 100% guarantee that a sent text message reaches the receiver. This is only an example which is intended to represent the possibilities.

## 5.7.7. Communication via RS485

### 5.7.7.1. Connecting the terminal via RS485 to PC



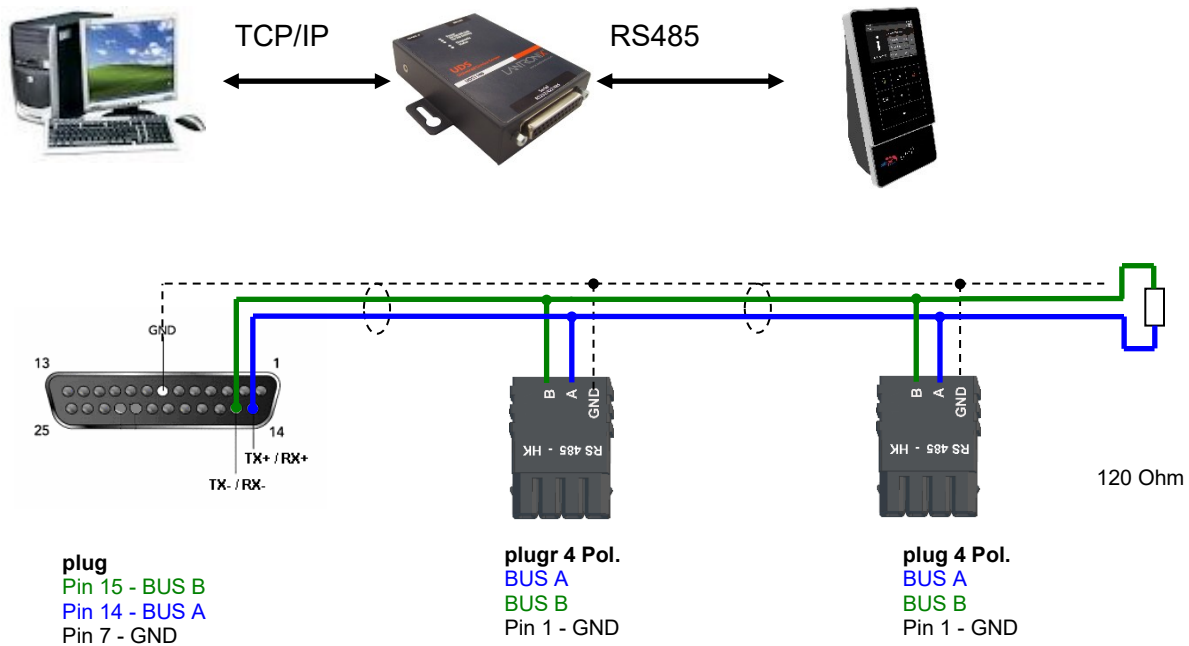
Setting for communication in the DatafoxStudioIV for connection via RS 485:



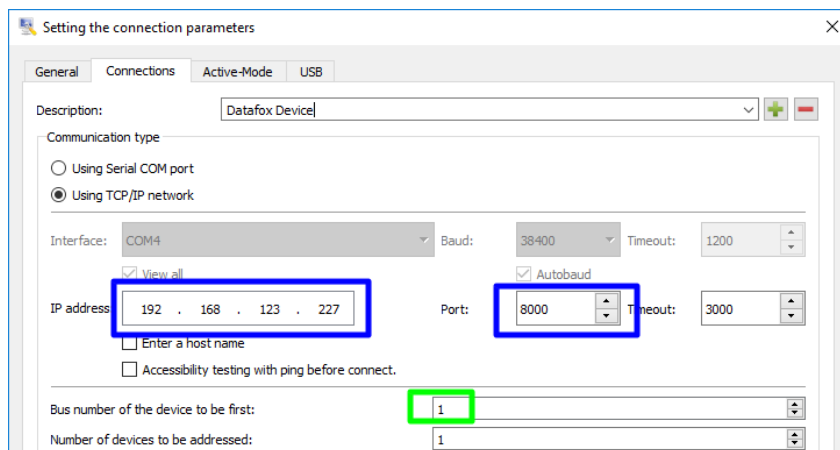
Com-Port  
See in the device manager on your PC

Baud rate 38400 and  
Bus number are to set in  
the device bios menu

### 5.7.7.2. Connecting the Terminal via RS485 with a Comserver Lantronix



Setting for communication in the DatafoxStudioIV for connection via RS 485:



IP and Port must set in the comserver.


Baud rate 38400 and Bus number are to set in the device bios menu

Setting in the Comserver for connection via RS 485:

Port: for example 8000

<b>Endpoint Configuration:</b>	
Local Port: <input type="text" value="8000"/>	<input type="checkbox"/> Auto increment for active connect
Remote Port: <input type="text" value="0"/>	Remote Host: <input type="text" value="0.0.0.0"/>
<b>Common Options:</b>	
Telnet Com Port Cntrl: <input type="text" value="Disable"/>	Connect Response: <input type="text" value="None"/>
Terminal Name: <input type="text"/>	Use Hostlist: <input type="radio"/> Yes <input checked="" type="radio"/> No
	LED: <input type="text" value="Blink"/>

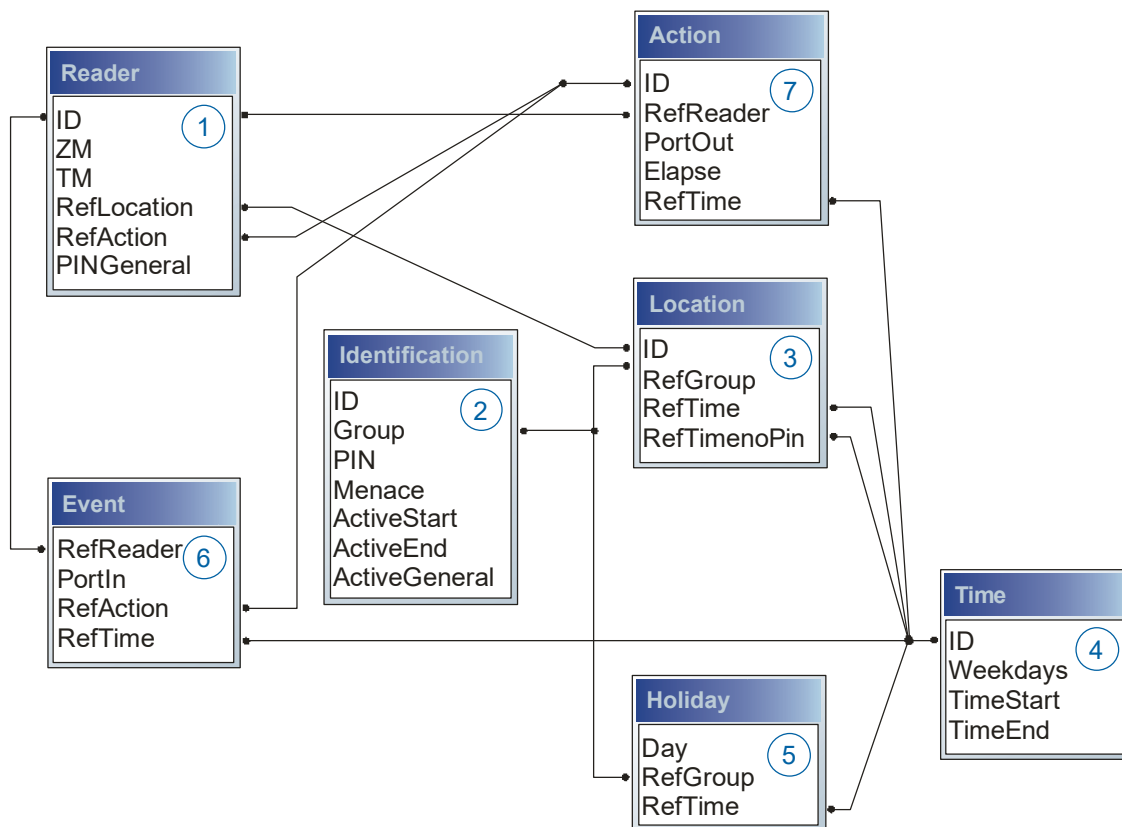
IP: for example 192.168.123.224

<ul style="list-style-type: none"> <li></li> <li><b>Network</b></li> <li>Server</li> <li>Serial Tunnel</li> <li>  Hostlist</li> <li><b>Channel 1</b></li> <li>  Serial Settings</li> <li>  Connection</li> <li>  Apply Settings</li> <li>  Apply Defaults</li> </ul>	<b>Network Settings</b>
	Network Mode: <input type="text" value="Wired Only"/>
	<b>IP Configuration</b>
	<input type="radio"/> Obtain IP address automatically
	Auto Configuration Methods
	BOOTP: <input checked="" type="radio"/> Enable <input type="radio"/> Disable
	DHCP: <input checked="" type="radio"/> Enable <input type="radio"/> Disable
	AutoIP: <input checked="" type="radio"/> Enable <input type="radio"/> Disable
	DHCP Host Name: <input type="text"/>
	<input checked="" type="radio"/> Use the following IP configuration:
IP Address: <input type="text" value="192.168.123.244"/>	
Subnet Mask: <input type="text" value="255.255.255.0"/>	
Default Gateway: <input type="text" value="192.168.123.1"/>	
DNS Server: <input type="text" value="192.168.123.9"/>	

## 5.8. Connection and wiring of the access control

### 5.8.1. Configuration and structure of the Access control

The basis of the access control II are tables. They store all information about the hardware configuration of the access control system, access right of the employees, periods of time (activation, blocking times, holidays,...). The tables are connected as follows:



The tables are created as text files. For an easier administration you can add comments within the files.

When adding comments, you have to notice that in a comment line no field values can be given and that the comment line has to start with a semicolon.

The table Reader.txt might look like this:

ID	ZM	TM	RefLocation	RefAction	PinGeneral
1	1	320	0	1	0
2	1	000	1	2	0
3	1	010	2	3	0

## Holiday Control

It is now possible for ZK-II to consider holidays at switching the relay. In order to achieve compatibility with older versions, the function consider Holidays for the Time Control of Relays has to be activated at the setup page Access Control 2. In the column Group, you specify the **Action ID** of the switched relay output instead of a Group ID. Thus, it is not necessary to alter the table structure of the holiday list. The column RefTime provides the time model applicable that day. A minus sign must be inserted in front of the Action ID in order that the MasterIV terminal can differentiate between Action ID and Group ID. As a result, these Action IDs must be three-digit numbers.

### Example:

Action

ID	RefReader	PortOut	Elapse	RefTime
1	10	1	25	0
2	11	1	25	0
3	12	1	0	0

Holiday

Day	RefGroup „Action-ID“	RefTime
2012-05-01	1	3
2012-05-01	2	4
2012-05-01	-3	5

In the action list above, the door module with the ID 12 was assigned the time model 2 which switches port 1 of the module. If separate holiday control has been activated in the setup, time model 2 is not applied to the relay output at May 1, 2012, but time model 5.

## Extended Parameterization ZK-II

The value range of the parameter 'ActiveGeneral' has been extended by the value 8. Additionally to the general permission (value 9), a PIN request is executed - if defined so for the user and activated for the reader. Furthermore, at both configurations of the ID cards with the ActiveGeneral value 8 and 9, the validity period of the ID card is checked.

For ZK-II the operation modes online, offline or online/offline after time-out are available. In online mode, configuration lists stored in the device are not considered. A data record is read from the server, analyzed and an action triggered. In offline mode, the configuration lists of the terminal are used to grant or deny access to a person. Online / offline after time-out is a combination. If the server is unavailable, the terminal can decide on basis of its lists whether to grant access to a person or not.



## Timing of the Digital Outputs for the MasterIV Device Series:

It is possible to time the digital outputs of the MasterIV device series via tables. Thus, for example turning down the heating system at night, a buzzer control and much more can be realized. Switch Relays via time table:

The following tables must be configured:

- ▶ Action
- ▶ Reader
- ▶ Time

### Description:

Each action that is to be activated must be entered in the table Action. The table Action refers to the tables Reader and Time. In the table Reader the module is provided on which the relay or the Open Collector is to be switched. The reference to the table Time indicates when the switch is to be done. If start and stop time are entered, the relay is switched on when exceeding the start time and switched off when exceeding the stop time. The entry of the duration Elapse in the table Action is ignored. If the relay is only to be activated for a few seconds, e.g. for a buzzer control, the stop time has to be set on "00 : 00". If the start time is exceeded, the respective output will be switched for X seconds (RefTime in Action table). The entry Elapse in the table Action now indicates the on-time.

### Example:

- ▶ A buzzer is to be activated for **3** seconds from Monday to Friday at **10.00** am and 4 pm (**16.00**). The buzzer is controlled by the internal relay of the PZE-MasterIV.
- ▶ The heating system is to be set to the "day mode" at **07.00** am and to the "night mode" at 7 pm (**19.00**) on all weekdays. The corresponding relay is at the door module with the bus number **2**.

### Reader.txt

ID	ZM	TM	RefLocation	RefAction	PinGeneral
1	1	320	0	0	0
2	1	020	0	0	0

### Time.txt

ID	Weekdays	TimeEnd	TimeEnd
3	12345	10:00	00:00
4	12345	16:00	00:00
5	1234567	07:00	19:00

### Action.txt

ID	RefReader	PortOut	Elapse	RefTime
6	1	1	15	3
7	1	1	15	4
8	2	1	0	5

## 5.8.2. Description of Tables for Access Control 2

Table **Reader** (List of all devices installed in the system)

Name	Data type	Length	Description
ID	Number (int)	4	Unique Key (value>0) of the Reader table.
ZM	Number (int)	4	In our example, it has number 1. If there are several PZE-MasterIVs in an access system, they can be depicted in one table connection and it is not necessary to have a separate string for each PZE-MasterIV. If several RS485 bus lines are used on a device, each additional line must be entered with Master ID + 1.
TM	Number (int)	3	Contains two information in one number. Both figures on the left (010) indicate the bus number of the door module, the figure on the right (010) contains information about the type of connection. A 0 means a connection via RS485, a 1 stands for a connection via RS232 or RS485 as stub.
RefLocation	Number (int)	4	Indicates which room is supervised by the reader.
RefAction	Number (int)	4	Indicates which action is worked through after a successful check.
PinGeneral	Number (int)	8	Can contain a numerical sequence by which a person without a card gets access.

Table **Identification** (list of all devices installed in the system - master and door modules)

Name	Data type	Length	Description
ID	Text (ASCII)	20	Contains the ID card no. which is read at the TMR33 device or terminal. An ID card can occur several times (is assigned to several authority groups).
Group	Number (int)	4	Assigns the ID card to an authority group.
Pin	Number (int)	8	Activates a PIN request if not equal 0. Please note that a PIN must not start with zero. 0815 would be invalid.
Menace	Number (int)	4	Activates (if not equal 0) a "menace-PIN" that can be added to the PIN. If entered, the system sends a data record that can be analyzed by software developed for this purpose and sets off the alarm.
ActiveStart	Text (Date)	10	The tag entered here indicates the start date of the validity of the ID card. (for example 2007-07-12 = yyyy-mm-dd)
ActiveEnd	Text (Date)	10	The tag entered here indicates the end date of the validity of the ID card. (for example 2007-07-12 = yyyy-mm-dd)
ActiveGeneral	Number (int)	1	Activates or deactivates this card record. 0 = card blocked 1 = card active 2= virtual card (use only via DLL) 3 = access only by entering the PIN; field ID are now only a PIN for access. 4 = pin = threat code i.e. the threat code is used instead of the Pin entered. 5 = The value for Duress / threat code is not transferred to the PIN adds up to form the threat code (ex: Pin = 1234, Duress = 1 -> threat code = 1235; Pin = 1234, Duress = 6 -> threat code = 1230) 6 = permanent opening for U & Z cylinders 7 = Burglary alarm system, allowed to switch on/off 8 = general authority (with PIN request) 9 = general authority (no PIN request)

**Table Location** (defines which card groups get access to which room at which time)

Identifier	Data type	Length	Description
ID	Number (int)	4	ID of the room. All other tables refer to this data line via this number, if necessary.
RefGroup	Number (int)	4	Reference to the identification table. Labels the access authorized group. All cards of this group have access to this room.
RefTime	Number (int)	4	The time model in which authorized persons get access. (0 = not used)
RefTimeNoPin	Number (int)	4	The time model for which entering an additional PIN is not necessary (at peak times etc.).

**Table Time** (grouping of single time zones (weekday from to) as a time model number)

Name	Data type	Length	Description
ID	Number (int)	4	ID of the time model. All other tables refer to this data line via this number, if necessary.
Weekdays	Number (int)	7	Indicates the weekdays on which the following period of time should be applied (form: 7 digits at most 1-7 e.g. 134567 = Monday, Wednesday till Sunday)
TimeStart	Text (Time)	5	The start point for the period of time. (form: 24h HH:MM)
TimeEnd	Text (Time)	5	The end point for the period of time.

**Table Holiday** (setting blocking days like holidays or company holidays)

Name	Data type	Length	Description
Day	Text (Date)	10	Date of the blocking day. (form: YYYY-MM-DD)
RefGroup	Number (int)	4	Indicates the authorization group to which the blocking day is applied. Zero defines a global validity for all groups.
RefTime	Text (Time)	4	Indicates the assigned time model. (0 = not used) During this time access is granted. Thus, also "half holidays" like New Year's Eve can be realized.

**Table Event** (assigning an action to a signal at the digital input)

Name	Data type	Length	Description
RefReader	Number (int)	4	Module (door module or master) where the digital input is.
PortIn	Number (char)	1	Number of the digital input on the module. Possible values: 1 ... 9 & A ... W corresponds to port 1-32 (digital in)
RefAction	Number (int)	4	Reference to the action that should be carried out (e.g. switch relay).
RefTime	Number (int)	4	The time model which indicates when the digital input is checked. (0 = not used).

Table **Action** (list of all workable actions in the access control system; an action group, i.e. all actions with the same action number, can switch several relays)

Name	Data type	Length	Description
ID	Number (int)	4	Action number, it can occur several times due to several actions that have to be worked through.
RefReader	Number (int)	4	Module (door module or master) on which an output(relay) is switched.
PortOut	Number (char)	1	Indicates the number of the output on the module. Possible values: 1 ... 9 & A ... W corresponds to port 1-32 (digital out)
Elapse	Number (int)	3	The duration of the switching of the relay (0 = permanently). Unit 200 ms
RefTime	Number (int)	4	The time model indicates when the output may be switched. (0 = not used) This is a function to switch relays directly via time (table) <b>Please not mix this function with the normal access actions.</b> <b>!!! By a time-table setting "1234567 00:00-23:59" is the relay permanent on.</b>

### 5.8.3. Access-control with Intera 2

The following hardware is available to set up an access control intera 2 modules. The devices can be combined in different ways according to their hardware requirements.

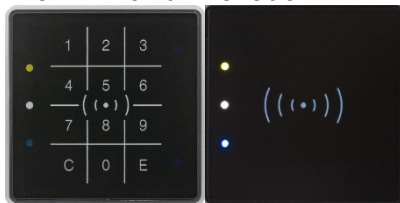
#### EVO 4.6 FlexKey



If the device MasterIV is used for access control, door supervision or remote monitoring, one device can supervise up to 8/16 doors.

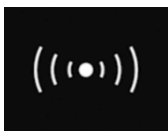
#### EVO Intera

##### with PIN and without PIN

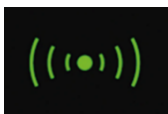


dimensions: 81 x 81 x 19 mm (wxhxd)

The EVO Intera access reader can be used with 125 kHz, Legic or Mifare. It is available for in-wall or on-wall mounting with or without keyboard. Each reader has a sabotage recognition, three lamps for visualizing the state, a buzzer for the acoustic signaling and a proximity sensor.



Backlight signaling:  
Glowing white = reader ready for use  
Flashing white = reader not recognized



Backlight signaling:  
**green** = access allowed



Backlight signaling:  
**red** = Access denied or reader is currently being configured by the master. Or Reader was recognized but not entered in the reader.



LED – **Yellow** RFID-Tac in the field

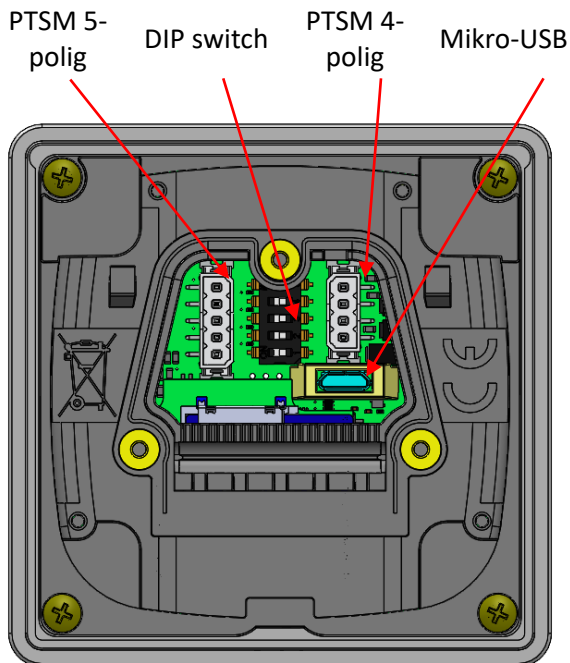
LED – **white** = sleepmode (deactivated via proximity sensor.)

LED – **off** -> ready to read and the background LED is on.

LED – **Blau** (no function)

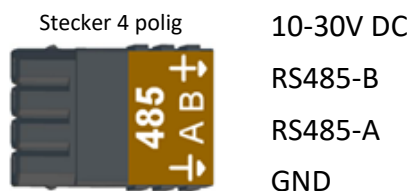
## Anschlussbelegung:

### Anschlussbelegung



#### Anschluss an die PTSM Steckverbinder Connection to the PTSM connector

The EVO Intera II is supplied with the 4-pin or 5-pin mating connector for connecting the reader. These are protected against polarity reversal and are supplied by Datafox with printed assignment.



Stecker 4 polig

10-30V DC

RS485-B

RS485-A

GND



Stecker 5 polig

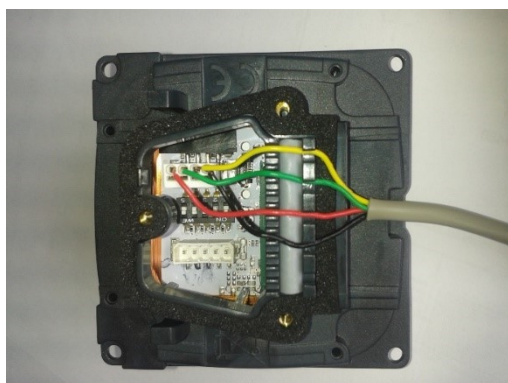
DGND

D IN1

Relais

DIP - Schalter	Off	On
1 – Adresse Bit 0	+ 0	+ 1
2 – Adresse Bit 1	+ 0	+ 2
3 – Adresse Bit 2	+ 0	+ 4
4 – Adresse Bit 3	+ 0	+ 8
5 – end resistor 120R	no-activ	activ

Beispiel	5-4-3-2-1
Adress 2, with active end resistor	1-0-0-1-0
Adress 3, no active end resistor	0-0-0-1-1

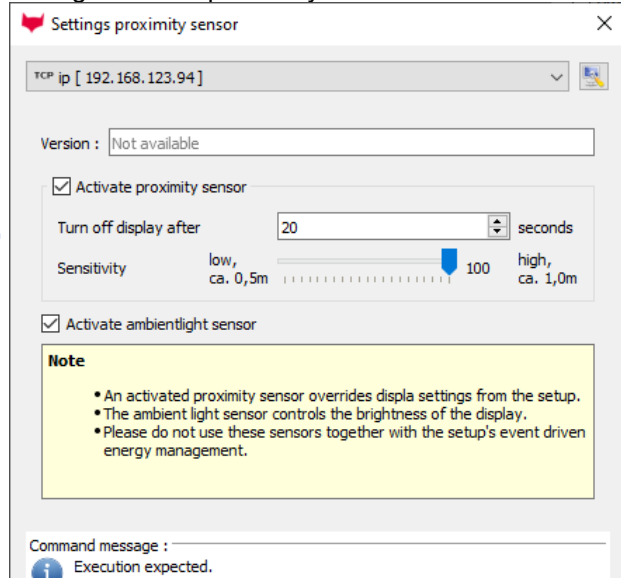
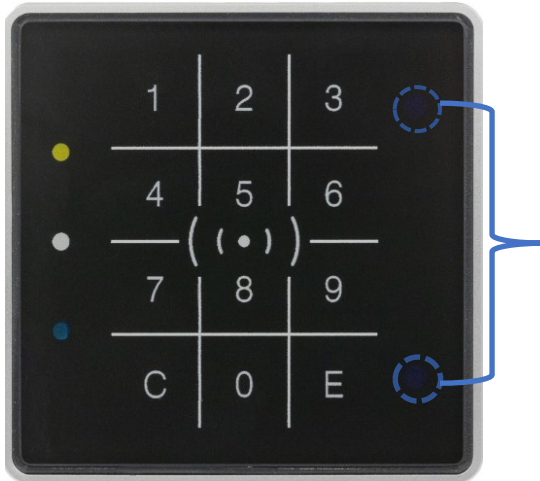


#### wiring

The EVO Intera II has an integrated cable comb to accommodate single wires up to  $d=1.5\text{mm}$  incl. suspension for strain relief. Lay the cores as shown.

### Settings for proximity sensor:

The proximity sensor are on righth side on the reader:  
The settings are include in the SW DatafoxStudioIV Configuration -> proximity-sensor:

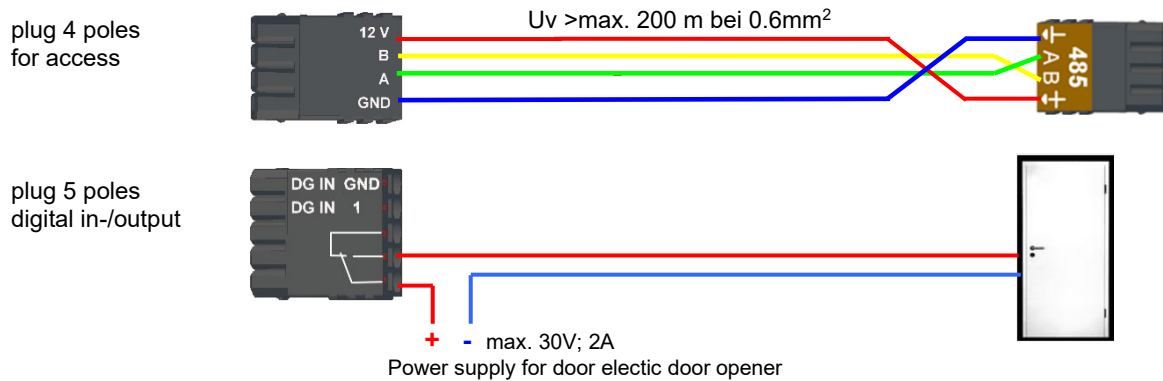


example Reader Table,:

ID	ZM / Bus-ID	TM (Busadresse)	RefLocation	RefAction	PinGeneral	Beschreibungstext
1	1	010	1	1	0	Leser an RS485 Modulplatz 1 = Bus ID 1
4	1	320	0	1	0	ZK-Box V4 (Mastergerät)

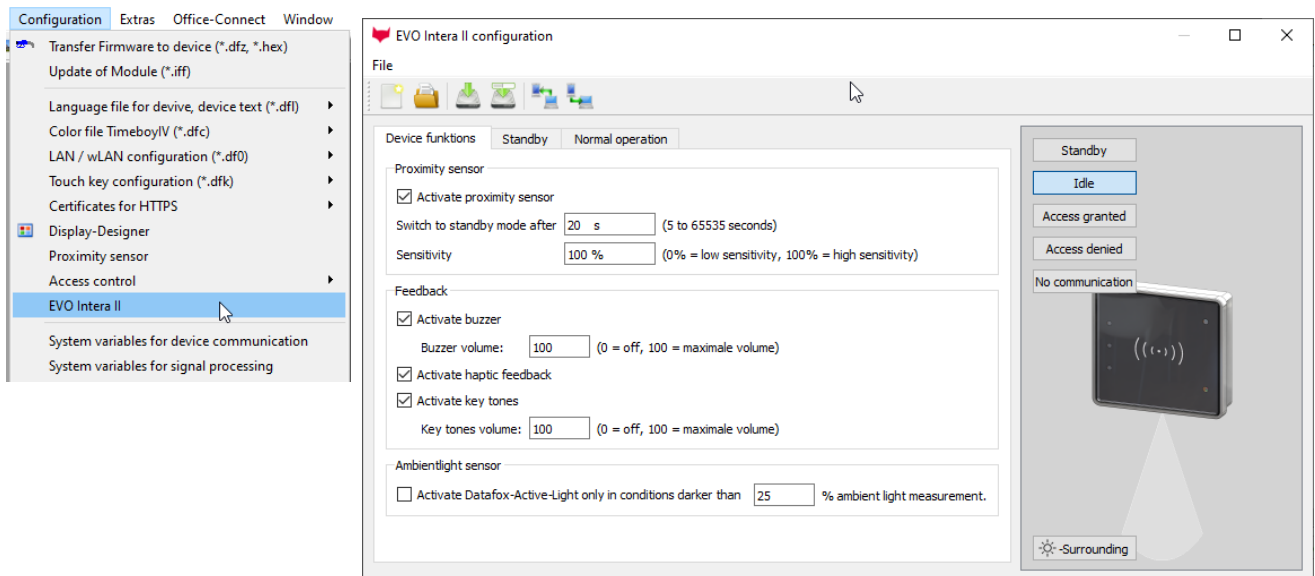
### wire plan for one reader, Intera 2:

Bus Nr. 1  
EVO-ZK-Leser



### 5.8.3.1. EVO Inter II, Individual settings

The mask for setting the EVO Inter II configuration can be accessed in the Datafox Studio via the configuration menu:



The mask allows setting / adapting the behavior of the EVO Inter II. These settings are divided into 3 areas:

- Configuration of the device sensors and actuators (device functions tab))
- Configuration of the standby configuration (sub-configuration of the proximity sensor)
- Configuration of normal operation (Standard Operation tab)

In addition, a preview of the reader signaling is shown based on a selected operating status.

### 5.8.3.2. Functionality of the EVO Inter II

The EVO Inter II is an RFID reader for use in access control. As such, it is designed for operation on an RS485 bus and uses the phg\_crypt communication protocol, which is used as a de facto standard in large parts of the industry.

The reader differs from many competing products in terms of its features:

- It can project indirect lighting
- It has sensors for ambient light and proximity detection.
- It can be used as a pin reader and then generate haptic feedback in addition to the acoustic feedback.

The EVO Inter II also has three programmable LEDs on the left. Functions can be assigned to these LEDs, such as signaling an ID in the field of the RFID reader or a person nearby. There are also other functions such as permanently on / off or switched by the access controller.

The Datafox Studio dialog described in this chapter is used to set up these features. The configuration is transferred via the USB interface of the reader.



### 5.8.3.3. Global function

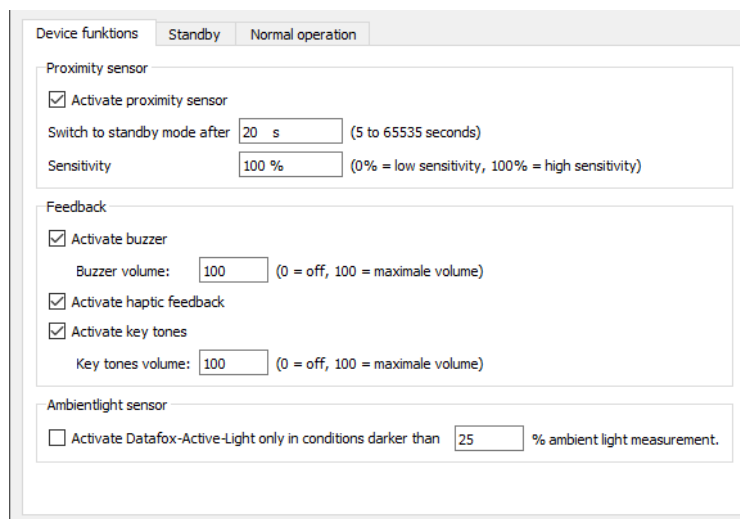


From left to right, the mask offers functions for

- Creation of a new standard configuration
- Reading in a configuration file
- Save the configuration file
- Save the configuration file under a new name
- Transfer of the configuration file to an EVO Intera II
- Reading the configuration file from an EVO Intera II

These actions are also available from the File menu.

### 5.8.3.4. Einstellung der Gerätefunktionen



The EVO Intera II has a proximity sensor - if this is activated, the standby lighting can be set. The standby mode is activated if no person is detected in the vicinity of the reader for an adjustable period of time (20 seconds as standard).

Depending on the structural situation, it may be necessary to limit the sensitivity of the proximity sensor, for example if it is used in narrow aisles and the opposite wall is supposedly recognized as a person nearby.

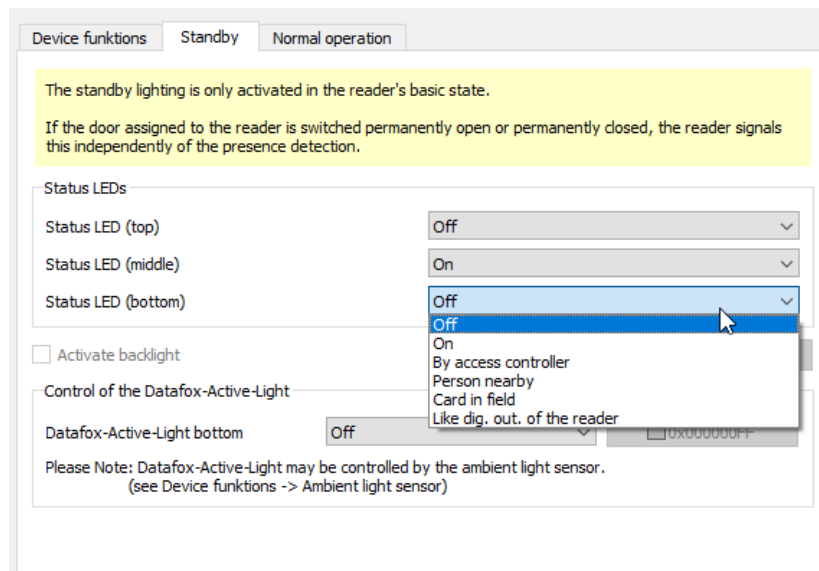
As feedback are next to the

- Buzzer for access events still
- Haptic and sound feedback ready for PIN readers.

You can set the maximum volume for all acoustic feedback so that the reader can also be adapted to quiet office environments.

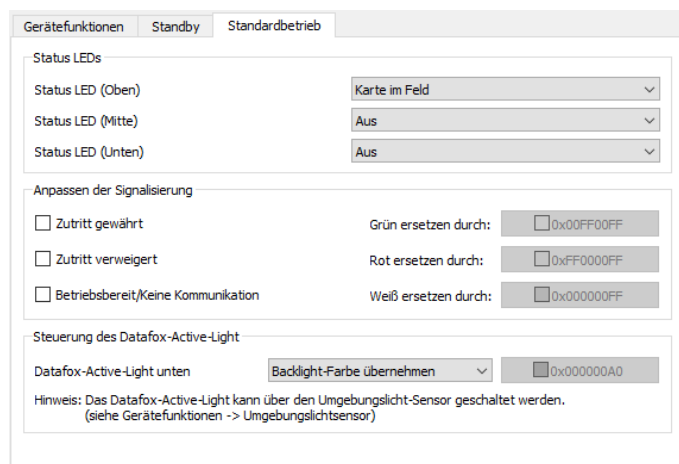
The reader can adjust its brightness - e.g. in order not to shine too brightly at night - to the brightness of the surroundings. If this function is desired, activate the ambient light sensor.

### 5.8.3.5. Settings for standby



The standby mode of the EVO Intera II is activated if the proximity sensor has not detected a person in the vicinity for an adjustable period. In this operating mode, the 3 LEDs can be assigned functions that differ from the normal operating mode. In addition, the Datafox Active Light can be switched if it is built into the reader.

### 5.8.3.6. Setting for standard operation

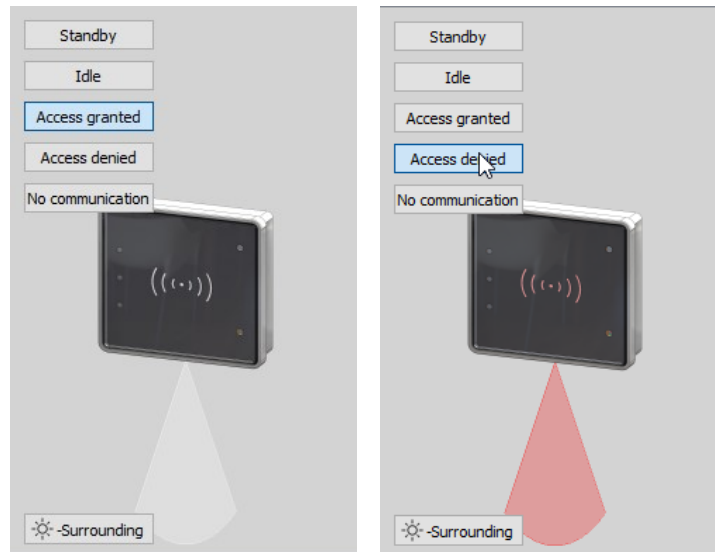


In standard operation, the EVO Intera II fulfills the normal functions of an access reader - the reader is controlled via the access bus by an access controller. In the simplest case, the reader transmits the read RFID data to the access controller and is then switched to access granted ("green") or access denied ("red"). If no access signaling is active, the reader normally lights up white.

In addition to assigning functions to the three programmable LEDs, you can adjust the colors used for green, red and white. You can also - if built into the device - set the color and brightness of the Datafox Active-Light.

### 5.8.3.7. Preview of reader behavior

An EVO Intera II is shown on the right-hand side of the configuration mask. This changes - based on the currently loaded configuration - its appearance. Use one of the five buttons to select the operating status to be displayed.

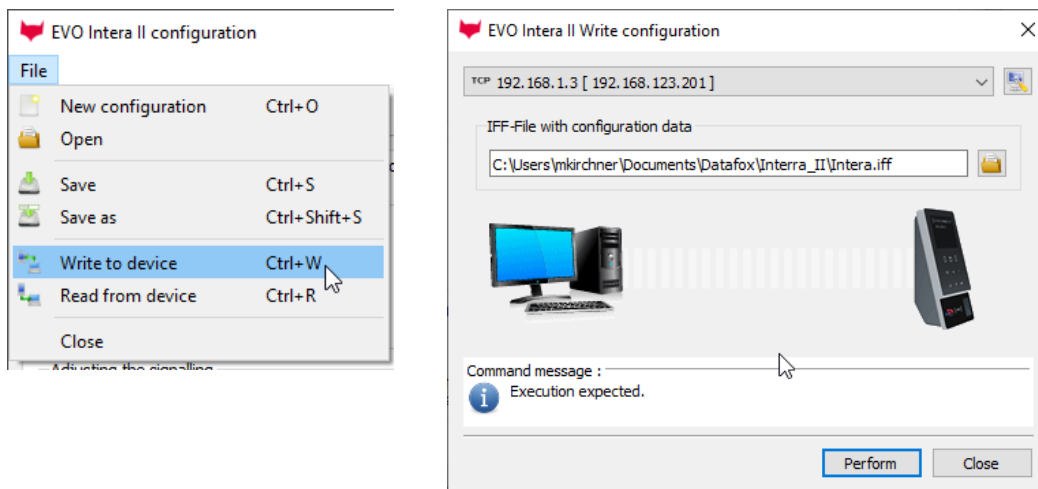


„Zutritt gewährt“ und „Zutritt verweigert“ mit Datafox Active-Light im Modus „Backlight-Farbe übernehmen“

You can use the button at the bottom left in the preview area to explicitly switch the reader to day or night operating mode.

### 5.8.3.8. Transfer to the device

To transfer to or from a reader, please connect it to your PC via USB. After pressing one of the buttons for transfer, you will see the file transfer dialog of the Datafox Studio:



Here you can select the configuration file to be transferred - the version opened in the editor is the standard assignment of the transfer dialog via the transfer button to the device. By pressing the "Execute" button, the configuration file is transmitted to the reader (or read from there).

### 5.8.4. Access control with EVO Intera Reader

The following hardware is available to set up an access control with EVO Intera. The devices can be combined in different ways according to their hardware requirements.

#### EVO 4.6 FlexKey



If the device MasterIV is used for access control, door supervision or remote monitoring, one device can supervise up to 8/16 doors.

#### EVO Intera Reader



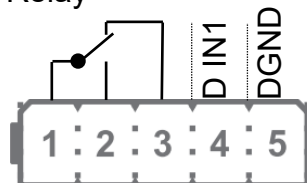
dimensions: 81 x 81 x 19 mm (wxhxd)

The EVO Intera access reader can be used with 125 kHz, Legic or Mifare. It is available for in-wall or on-wall mounting with or without keyboard. Each reader has a sabotage recognition, three lamps for visualizing the state and a buzzer for the acoustic signaling.

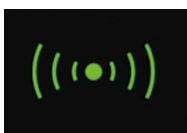
#### IO-modul for EVO Intera reader



#### Relay



Signals from the backlight:  
 white permanent = Reader found an ready  
 white flashing = reader not found and not connection to the master



Signals from the backlight:  
**green** = access accept



Signals from the backlight:  
**red** = access denied or the master configured the reader currently.

Display	Backlit transponder symbol	3-coloured white, green, red	
Individualization	Integrated backlight	Individual printable front glass with backlight 56 x 37mm Colour always like transponder symbol	
power supply	10 - 30V DC, max. 120mA		
Environment values	Ambient temperature, Protection	-20 ° C to +70 ° C, IP65	
Transponder systems	125kHz	Mifare	Legic
	Hitag 1+2+S	Mifare Classic	Legic prime
	Unique EM4102	Mifare Desfire	Legic advant
	Titan EM4450	Mifare Ultralight	

**Connectors of EVO Intera:**



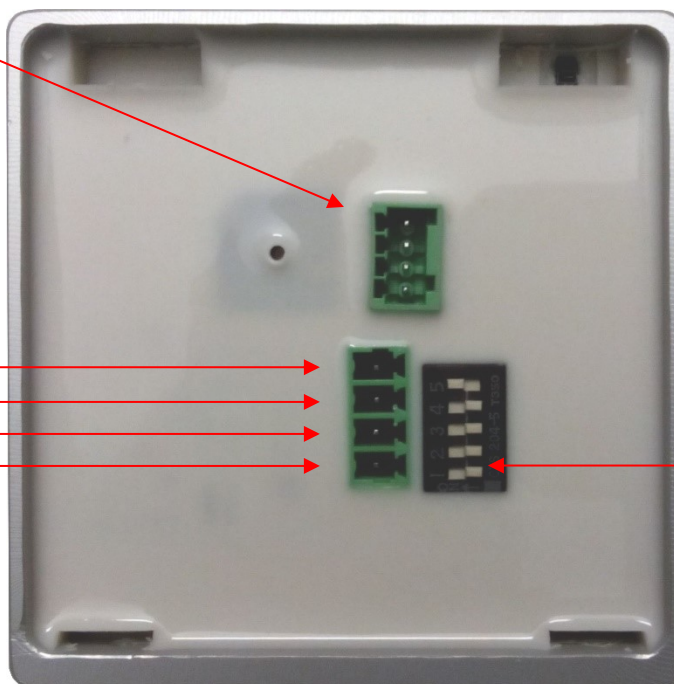
**DIP-switch:**

switch number	Off	On
1 – address Bit 0	+ 0	+ 1
2 – address Bit 1	+ 0	+ 2
3 – address Bit 2	+ 0	+ 4
4 – address Bit 3	+ 0	+ 8
5 – terminate resistor 120 ohm	not activ	activ

example	5-4-3-2-1
address 2, with terminate resistor	1-0-0-1-0
address 3, without terminate resistor	0-0-0-1-1

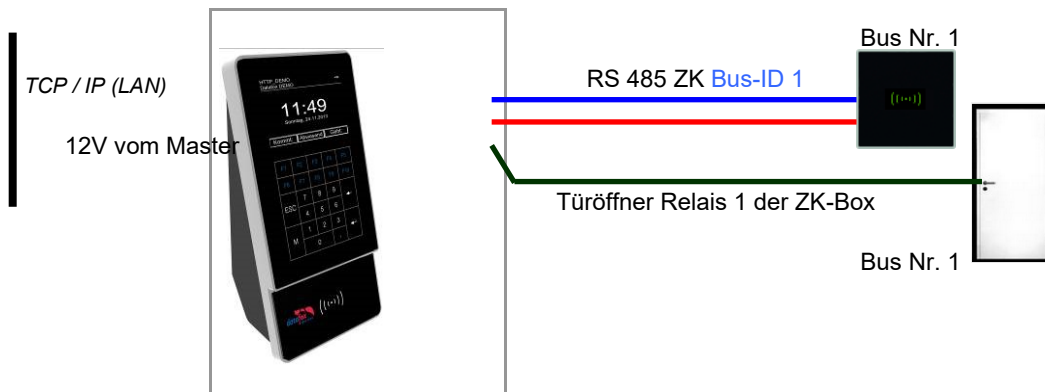
**Connector for IO-  
module**  
Relay + digital in

pin Number.	description
1	+10V bis +30V DC ! new
2	RS 485-Data „B“
3	RS 485-Data „A“
4	GND ground



### 5.8.4.1. Connecting of the EVO Intera reader examples

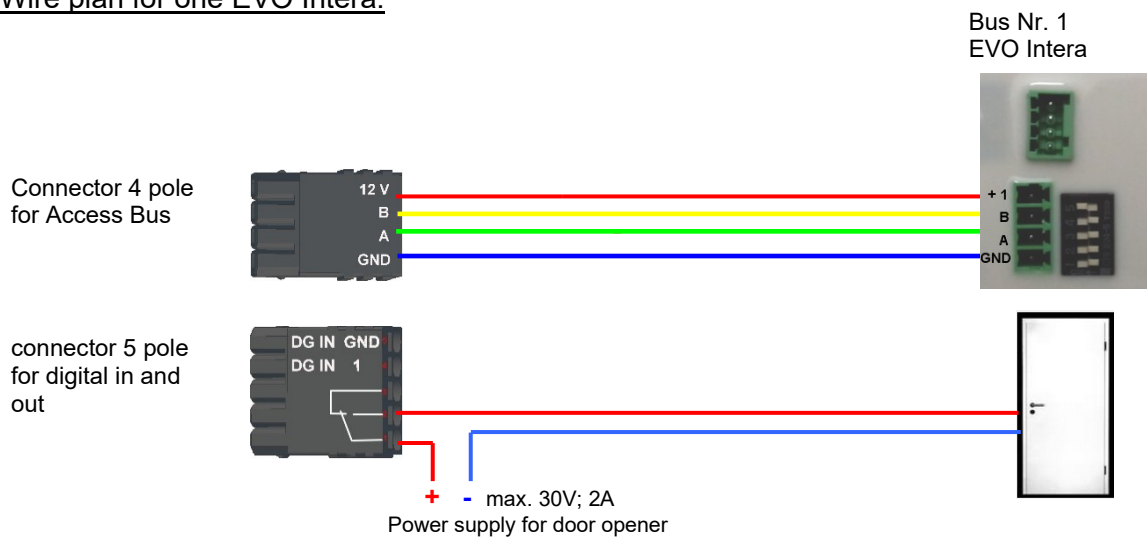
Cable plan for one door, 1 Relay in the EVO 4.6 FlexKey:



*Reader Tabelle, for this example:*

ID	ZM / Bus-ID	TM (Busadresse)	RefLocation	RefAction	PinGeneral	Beschreibungstext
1	1	010	1	1	0	Reader on RS485 Module place 1 = Bus ID 1
4	1	320	0	1	0	access-Box V4 (Masterdevice)

Wire plan for one EVO Intera:

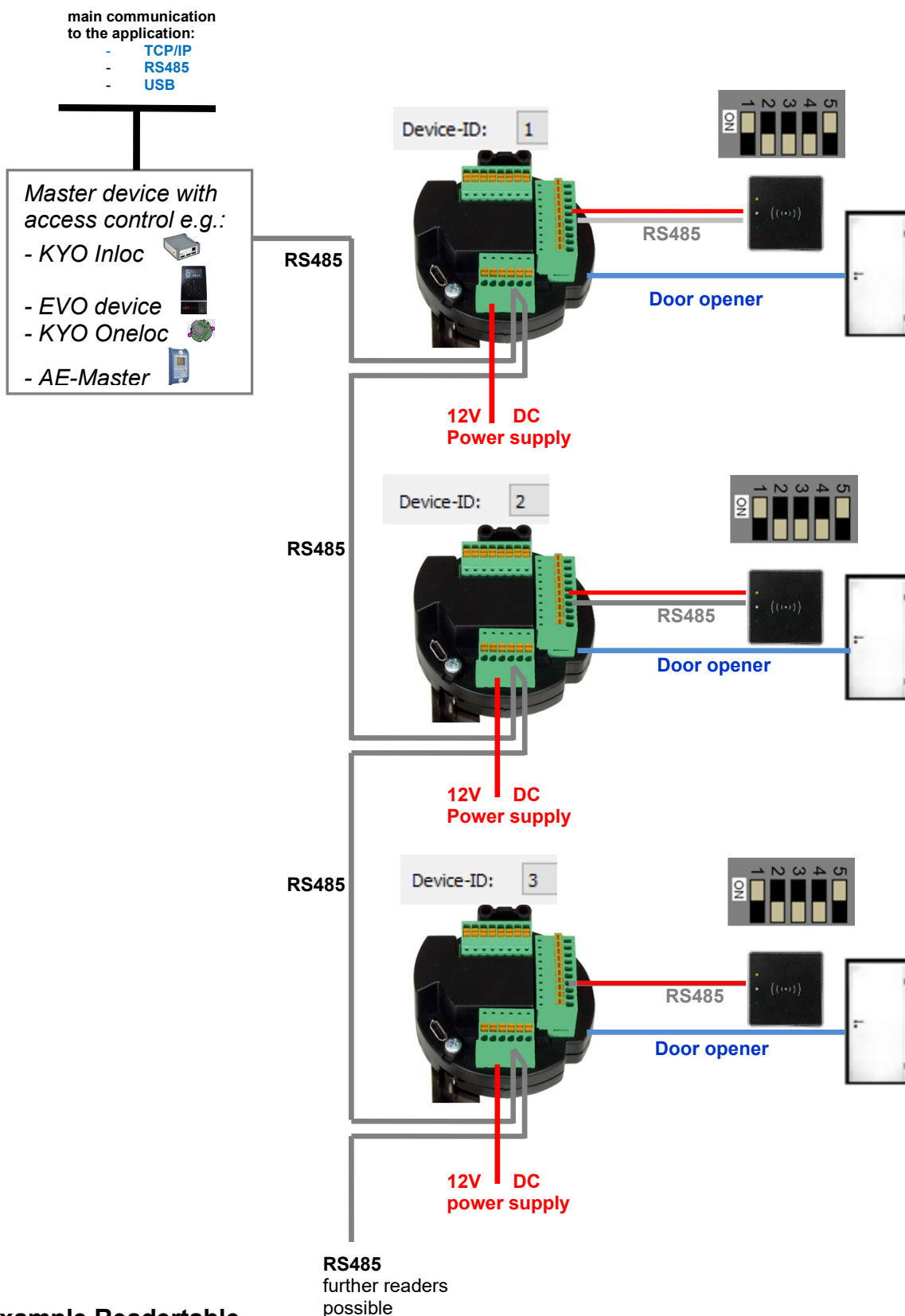


### 5.8.4.2. Connecting of KYO Oneloc as a door opener with one Intera





Attention! The KYO Oneloc must be converted to a door module.

See Chapter: [Use as a door module with reader](#)

#### Wiring plan:

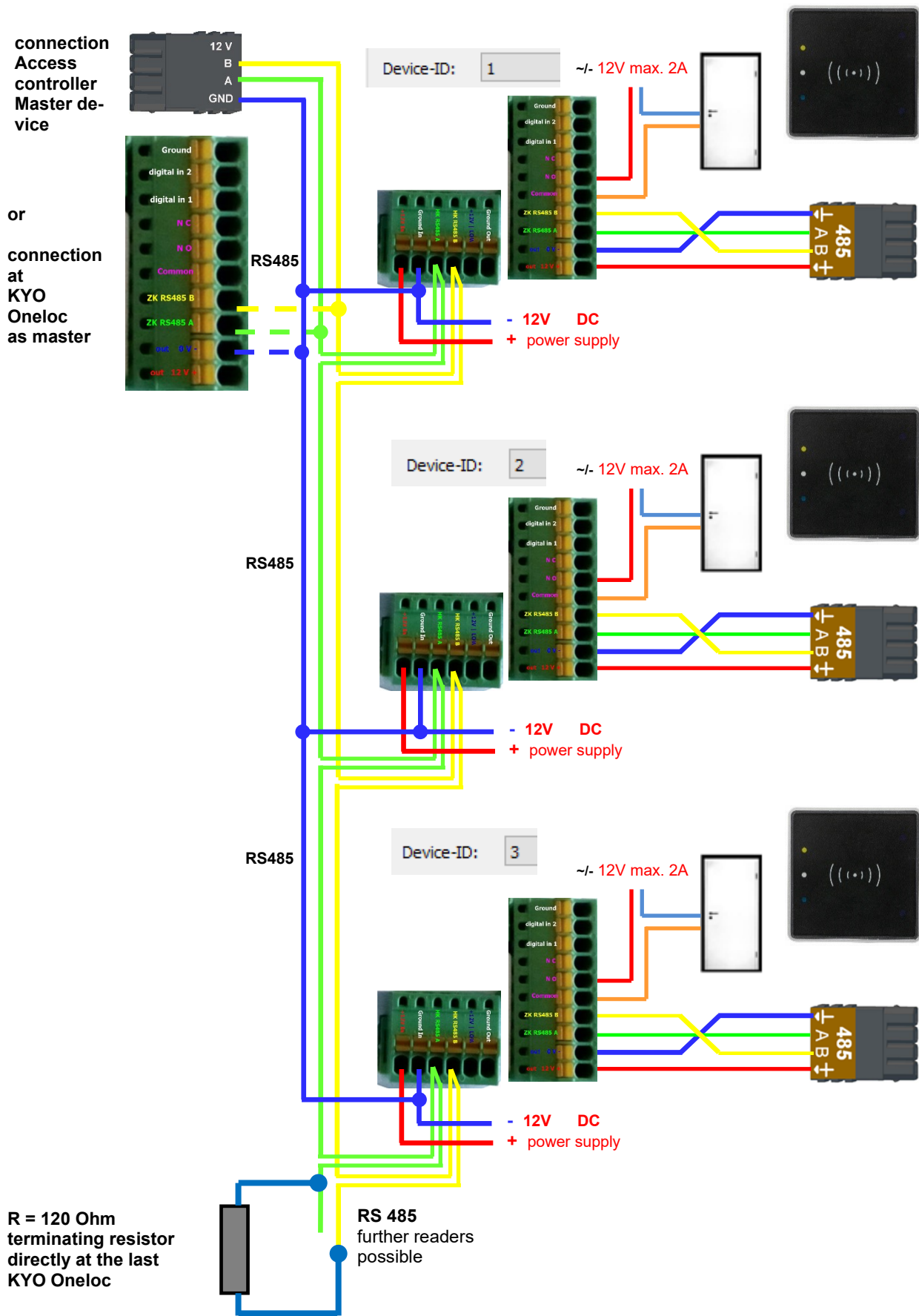


#### Example Readertable

ID	ZM / Bus-ID	TM (Bus-address)	RefLocation	RefAction	PinGeneral	description text
1	1	010	1	1	0	Entry for KYO Oneloc Device-ID: 1
2	1	011	2	2	0	Entry for reader at KYO Oneloc Device-ID: 1 Attention: Dip switch on reader always bus address 1
3	1	020	3	3	0	Entry for KYO Oneloc Device-ID: 2
4	1	021	3	3	0	Entry for reader at KYO Oneloc Device-ID: 2 Attention: Dip switch on reader always bus address 1
5	1	030	3	3	0	Entry for KYO Oneloc Device-ID: 3
6	1	031	3	3	0	Entry for reader at KYO Oneloc Device-ID: 3 Attention: Dip switch on reader always bus address 1
99	1	320	0	0	0	<p><i>Master device with access control e.g.:</i></p> <ul style="list-style-type: none"> <li>- KYO Inloc </li> <li>- EVO device </li> <li>- KYO Oneloc </li> <li>- AE-Master </li> </ul>



Wiring plan:

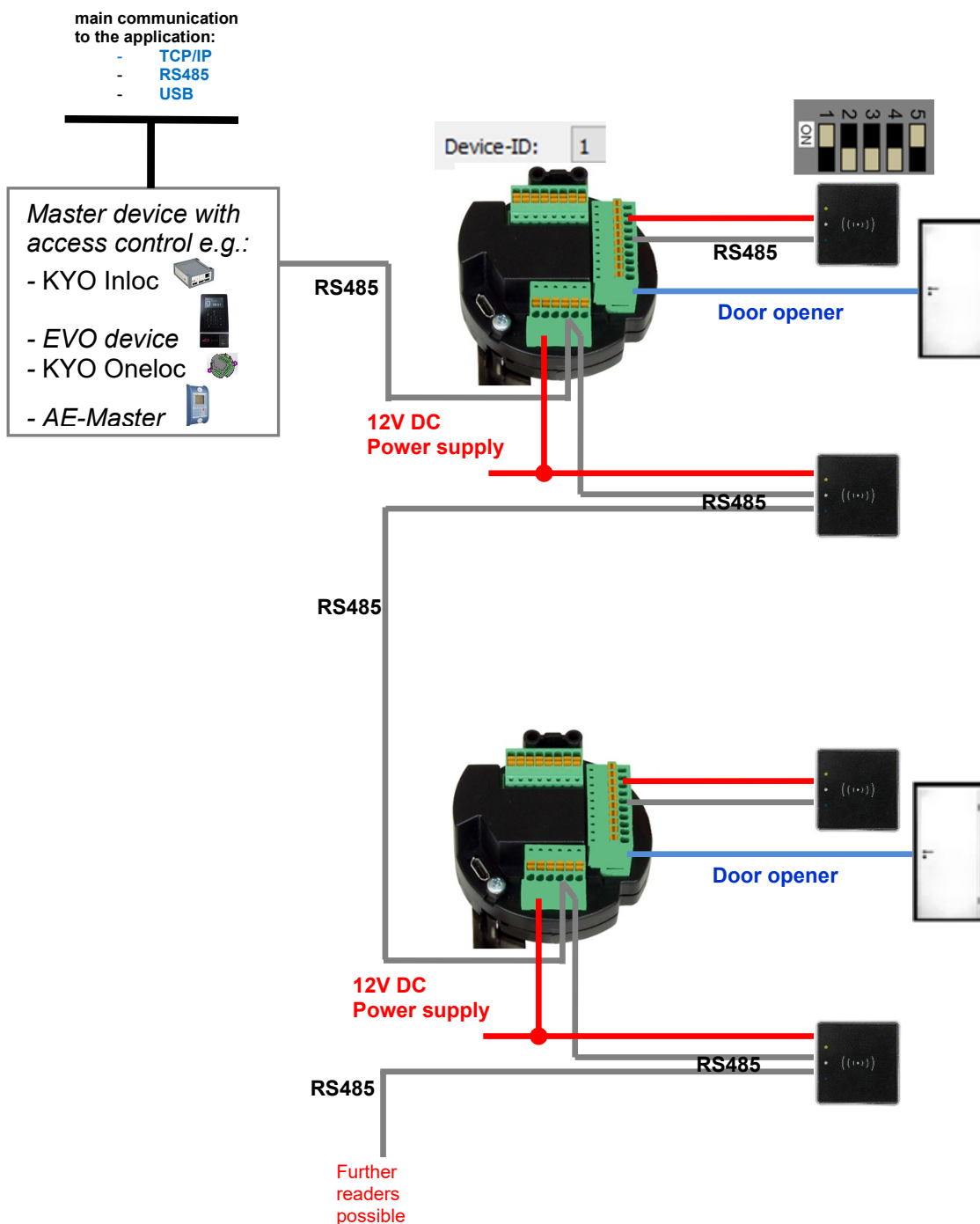


### 5.8.4.3. Connecting of KYO Oneloc as a door opener with two Intera

Security lock function!

Attention! Conversion of KYO Oneloc to door module necessary.

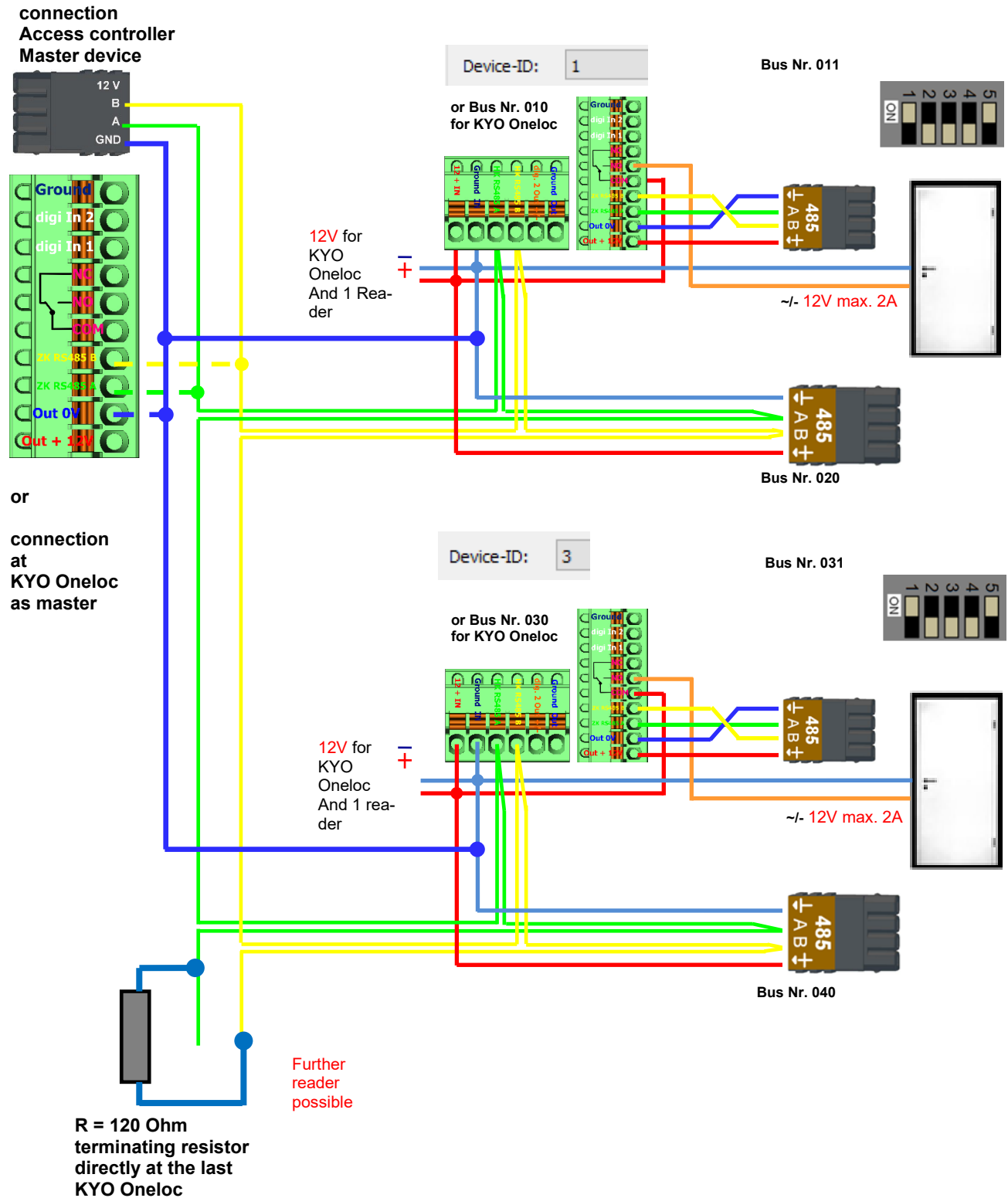
#### Wiring plan:



### Corresponding example reader table for security lock

ID	ZM / Bus-ID	TM (Busadresse)	RefLocation	RefAction	PinGeneral	Beschreibungstext
1	1	010	1	1	0	Entry for KYO Oneloc 1 Device-ID: 1
2	1	011	1	1	0	Entry for reader at KYO Oneloc 1 Device-ID: 1 Attention: Dip switch on reader always bus address 1
3	1	020	1	1	0	Entry 2nd reader Door 1
4	1	030	3	3	0	Entry for KYO Oneloc 2 Device-ID: 3
5	1	031	3	3	0	Entry for reader at KYO Oneloc 2 Device-ID: 3 Attention: Dip switch on reader always bus address 1
6	1	040	3	3	0	Entry 2nd reader Door 2
99	1	320	0	0	0	

### 5.8.4.4. Wiring of KYO Oneloc as a door opener with two Intera



### 5.8.5. Access control II with PHG-Modules

The following hardware is available to set up an access control with PHG modules. The devices can be combined in different ways according to their hardware requirements.

#### EVO 4.6 FlexKey



If the device MasterIV is used for access control, door supervision or remote monitoring, one device can supervise up to 8 doors and control 12 doors at most.

#### VOXIO & (T-Z)



Flush-mounted: 81 x 81 x 11 mm (WxHxD)  
Surface-mounted: 81 x 81 x 40 mm (WxHxD)

The VOXIO can be used with Legic or Mifare. It is available for in-wall or on-wall mounting with or without keyboard. Each reader has a sabotage recognition, three lamps for visualizing the state and a buzzer for the acoustic signaling.

#### Relino & Relino B



50 x 50 x 43 mm (WxHxD)

The RELINO (B) reader can be used with Legic or Mifare. It is available for in-wall mounting. Each reader has three lamps for visualizing the state and a buzzer for acoustic signaling.

#### Siedle



100 x 100 x 20 mm (WxHxD)

The Siedle reader can be used with 125 kHz, Legic bzw. Mifare. It can be mounted in the Siedle Vario 611 housings and is available with and without keyboard. Each reader has three lamps for visualizing the state and a buzzer for the acoustic signalling.

#### IO-Box



51 x 48 x 22 mm (WxHxD)

The I/O box as equipment for the RFID wall reader or RELINO reader has two digital inputs and two digital outputs. The I<sup>2</sup>C bus is used as interface.

From firmware

version of the access reader 69806D of the PHG readers the autologin function for Mifare is supported. Here for 5 of the max. 6 keys can be used in the setup.



#### Attention:

Technical data for the PHG access modules can be found on the Datafox DVD or in our download area. Please note the power consumption of the modules and the voltage

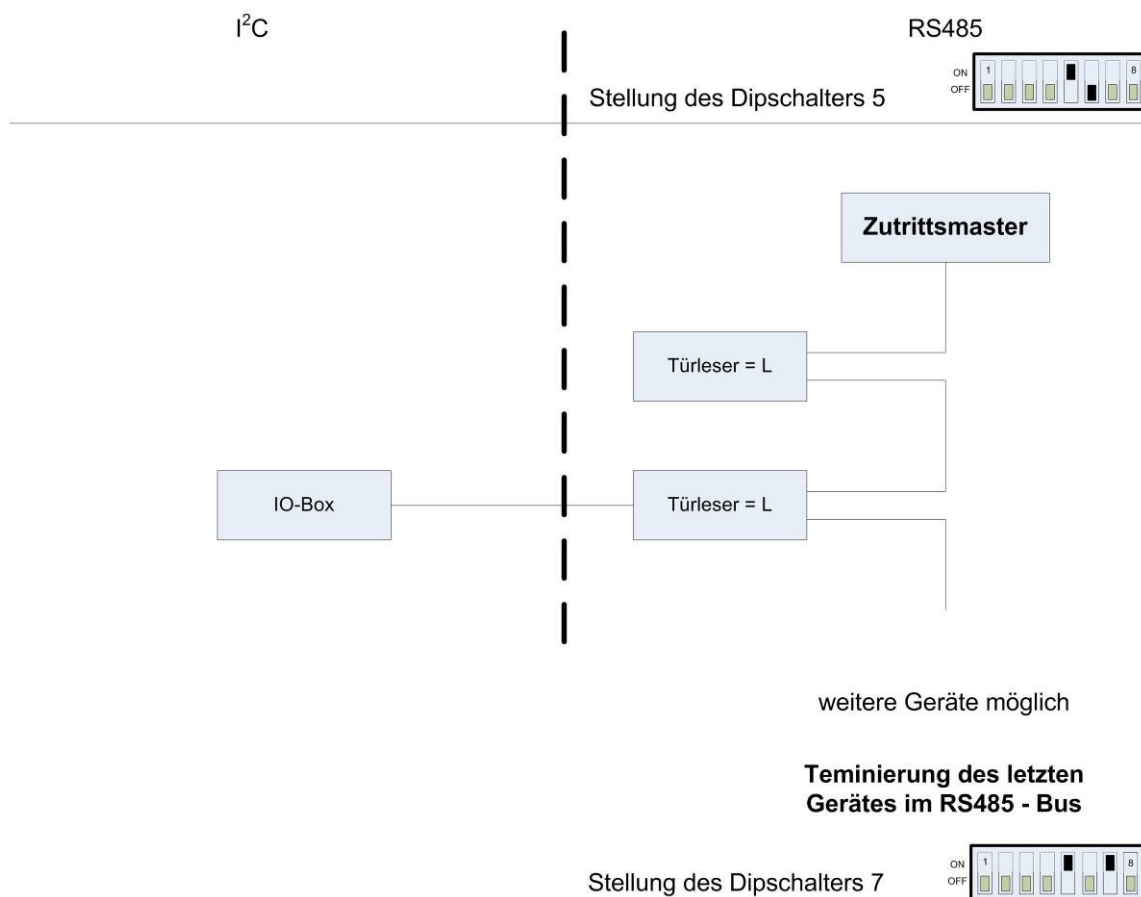
drop at long cable lengths.

The responsibility for calculating the maximum cable lengths lies with the installer.

### 5.8.5.1. Connecting of PHG-reader

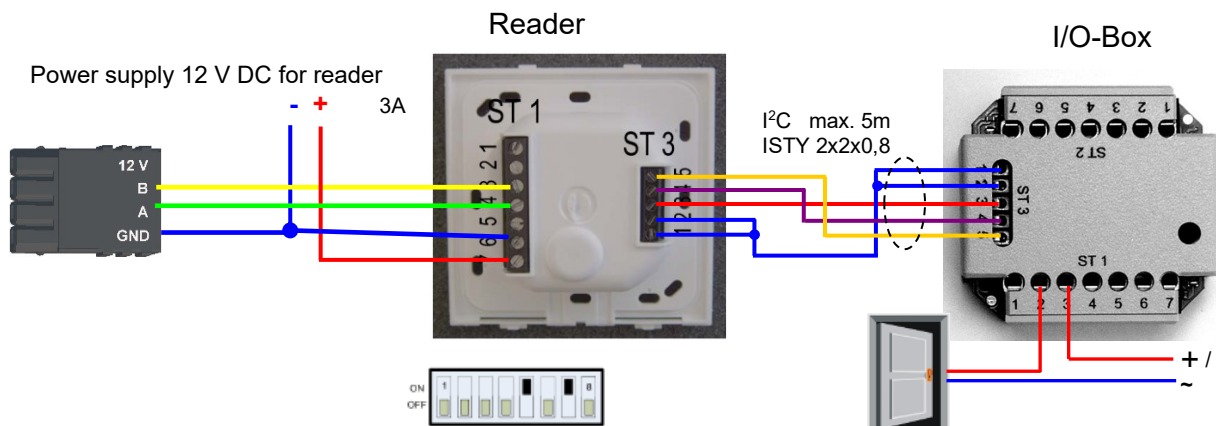
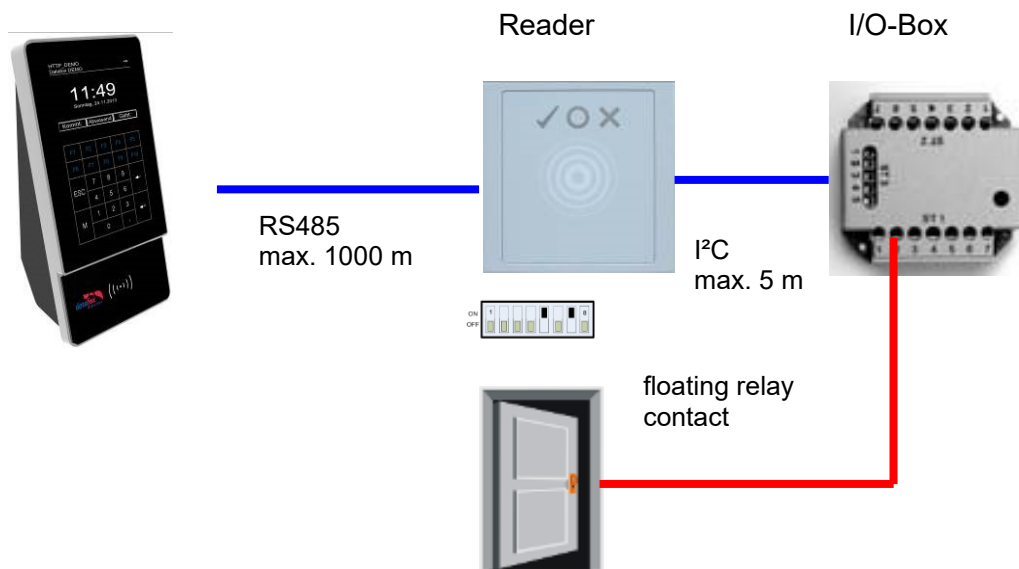
In order to connect the PHG modules, please note the PHG documentation on the Datafox CD:  
 <Datafox-Geräte- Datafox-Zutritt-Module PHG \*.pdf>

In the PHG documents for the single modules, the pin assignment and configuration via the DIP switches are described. In order to carry out an access control with the EVO 4.6 FlexKey the option "access" has to be integrated (Datafox art. no. 105201). The following figure shows the possibilities for connecting the PHG devices to a. The following figure shows the possibilities for connecting the PHG devices to a EVO 4.6 FlexKey for access control.



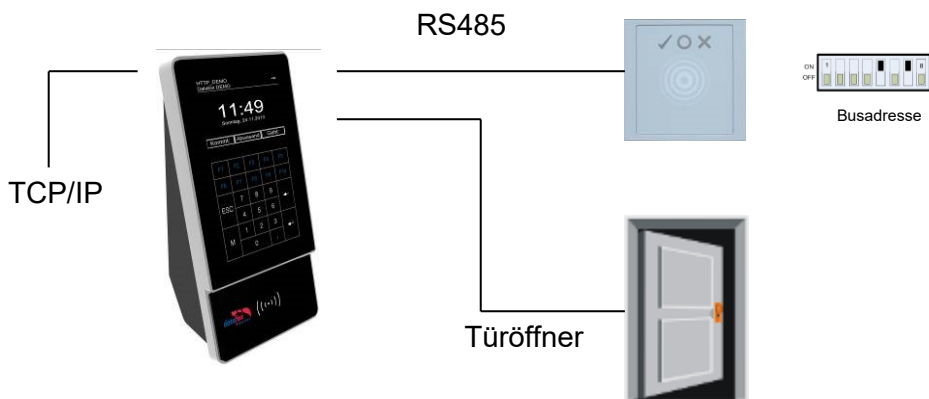
The bus number of the module is set via the DIP switches 1 - 4. The DIP switch 5 always must be set to "ON". The DIP switches 6 and 8 always must be set to "OFF". With the DIP switch 7 = "ON" the RS485 bus is terminated at the last module, otherwise always "OFF".  
 If a door-opener is to be controlled additionally via a relay, the IO-box must be used.  
 With the IO-box two digital outputs as relays are available.

Connection example one door and I/O Box:

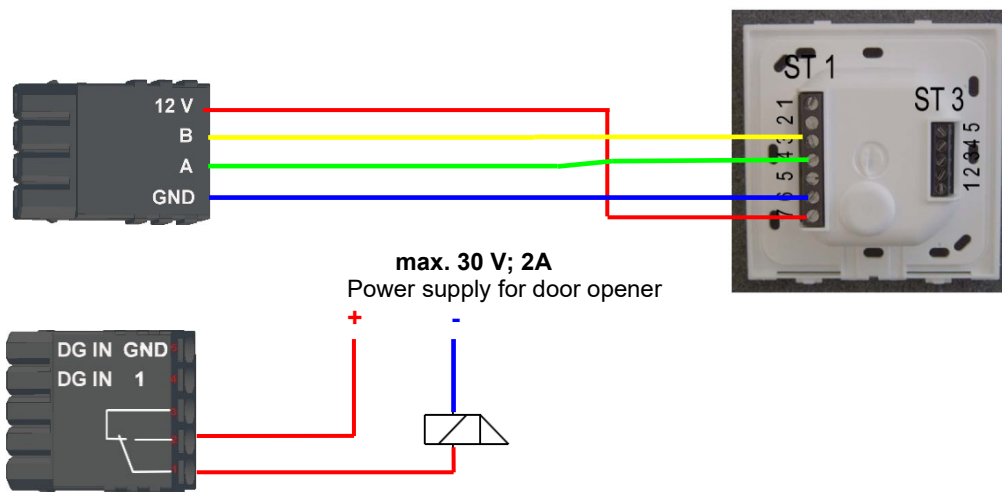




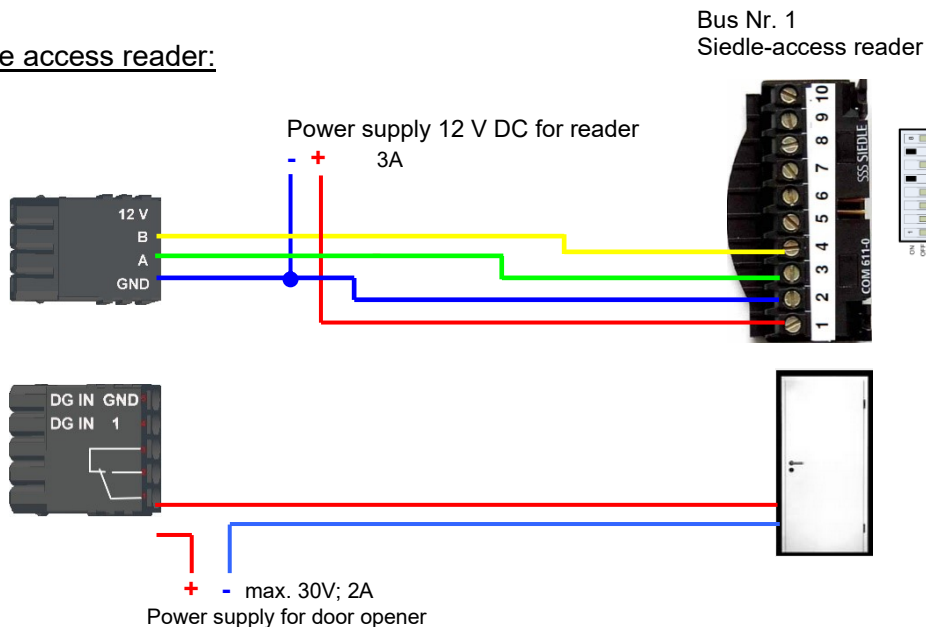
**Connecting example with one door and without I/O-Box:**



**Wire plan:**

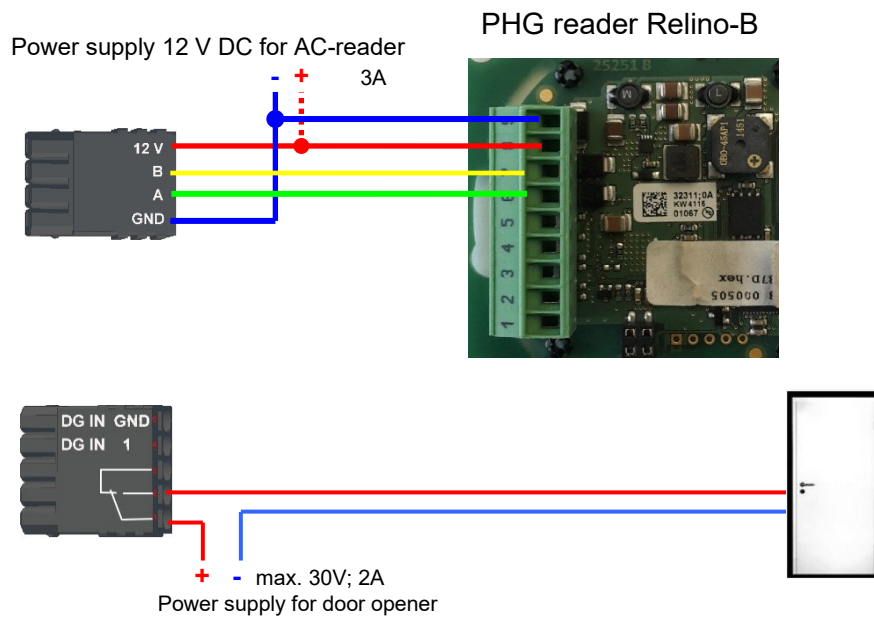


**Wire plan for Siedle access reader:**



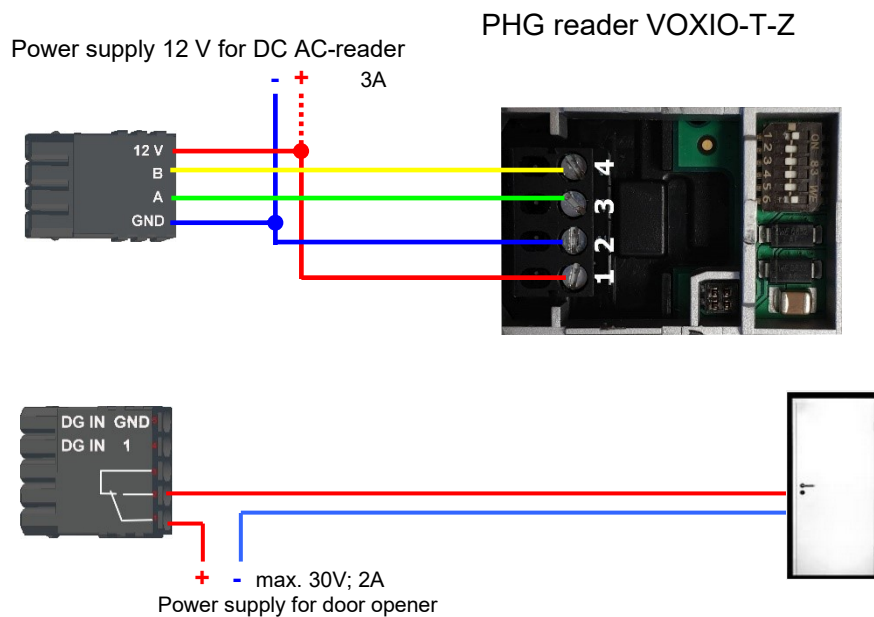
**Wiring plan for a PHG Relino-B-reader:**

! The reader type is supported as of FW 04.03.09.17.

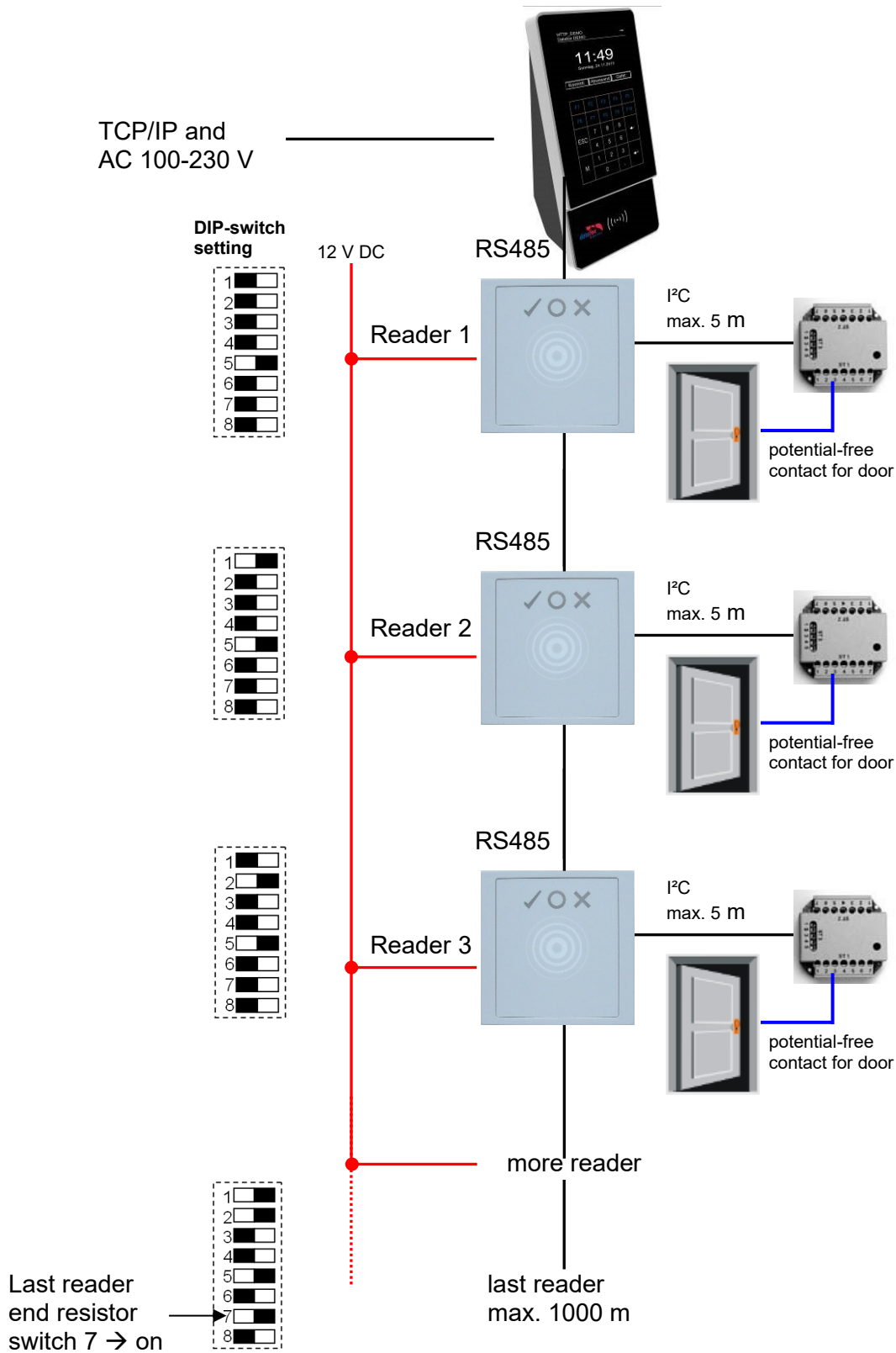


**Wiring plan for a VOXIO-T-Z reader:**

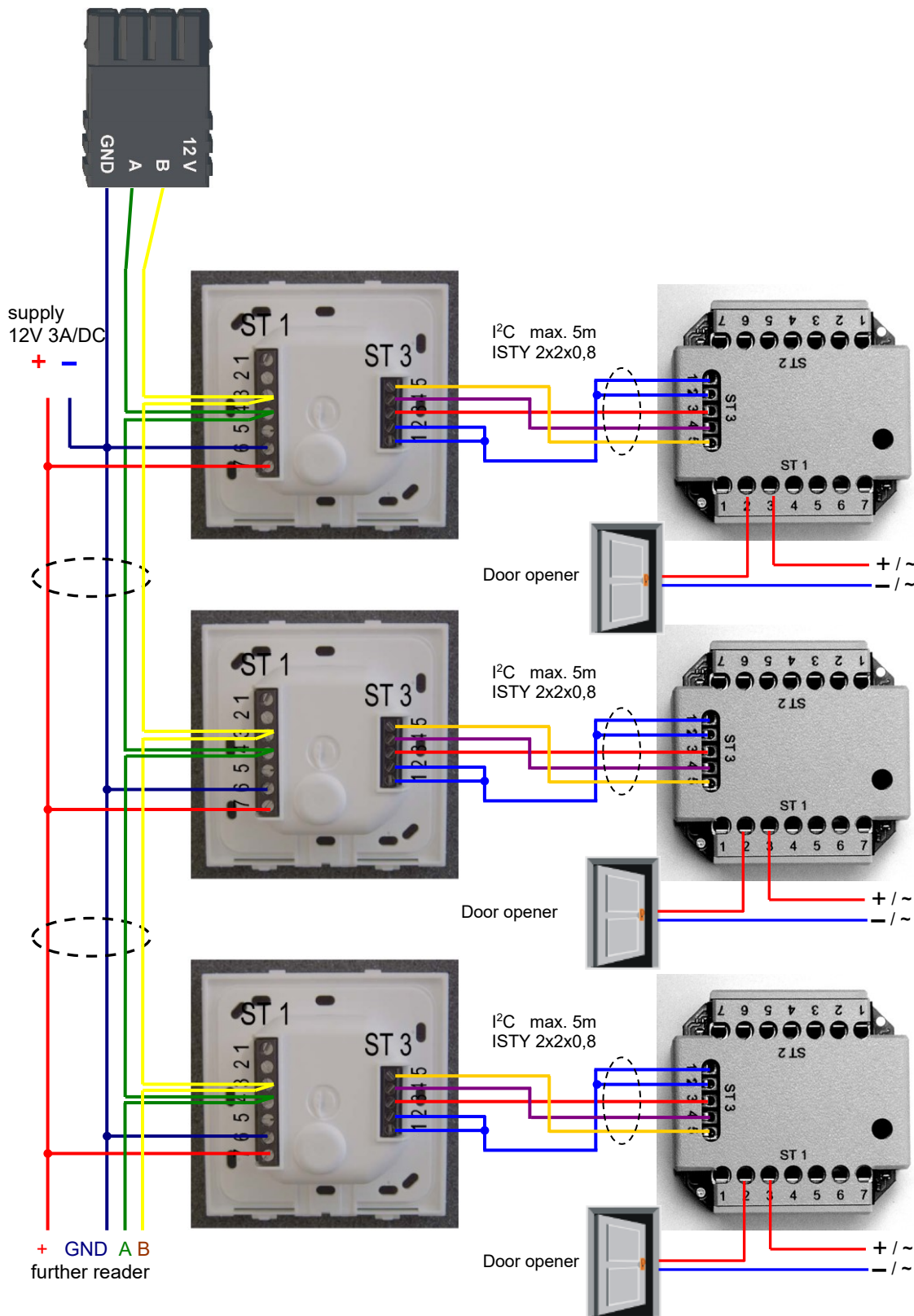
The reader type is supported as of FW 04.03.12.xx



RS485 bus diagram for access control with 3 PHG-modules:



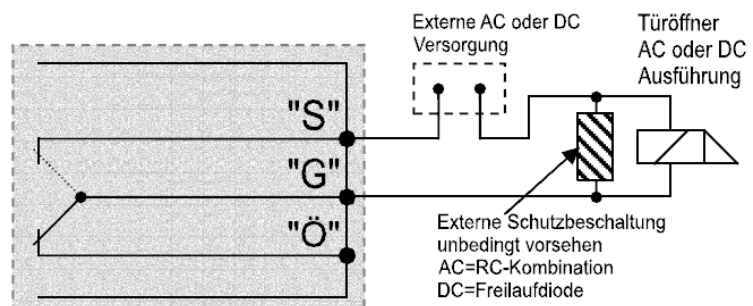
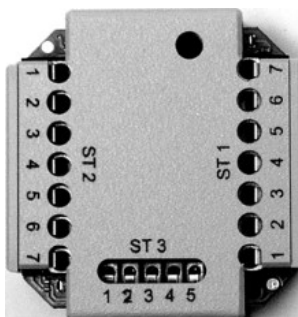
**Wiring plan for several PHG-reader:**



In any case, a protection circuit should be integrated when connecting the door-opener. A freewheeling diode for DC and an RC element for AC.

## Connecting the IO-Box:

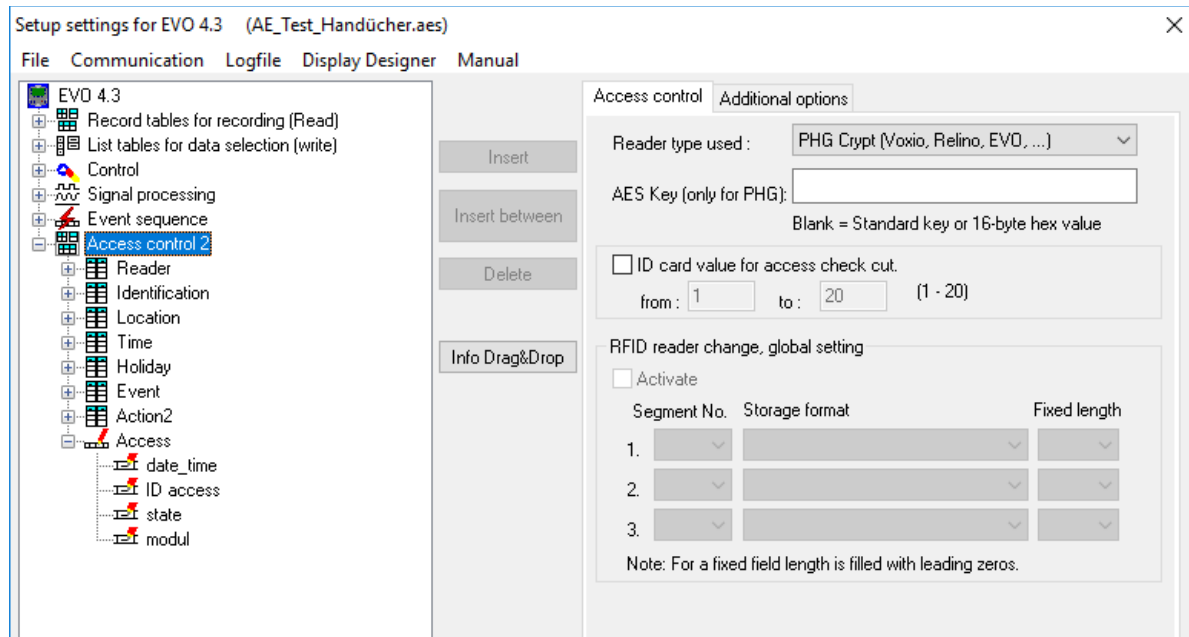
Anschluss (ST1,2,3)	Klemme Nr.	Beschreibung
ST1	1	Relais 1 → normally close
	2	Relais 1 → common
	3	Relais 1 → normally open
	4	free
	5	free
	6	digital in 1 Signal
	7	digital in 1 ground
ST2	1	Relais 2 → normally close
	2	Relais 2 → common
	3	Relais 2 → normally open
	4	free
	5	free
	6	digital in 2 Signal
	7	digital in 2 ground
ST3	1 und 2	ground
	3	U+ 8.....30V
	4	SCL
	5	SDA



ST 1      Circuit diagram  
 3      =      "S" normally open  
 2      =      "G" common  
 1      =      "Ö" normally close

## 5.8.5.2. Configuration

The access modules work with internal encryption. The key is stored in the DatafoxStudioIV but not visible.



If no key is provided under "AES Key" (PHG only), the default key is used.



### Caution:

The key must only be changed at a fully installed access control. If you changed the key and forgot it, the modules must be sent in. Restoring the default key is subject to a charge.

All door modules that are compiled in the reader table have to be available in the RS485 network in order to guarantee that the code can be changed in all modules if a new setup with a different code is loaded. If a door module from the list in the bus is missing, the key is not changed. The old setup with the old key has to be reloaded; otherwise, after rebooting the device, it is not possible to communicate with the door modules until the right key is used again.

If a defective reader is replaced by a new reader that has not been used yet, it is recognized by the firmware automatically at the start and the encryption is set up. The reader can also be replaced during operation, the firmware automatically integrates it.

Contrary to GIS readers, PHG readers always have 2 digital inputs and a sabotage contact. The firmware regards input 1 and input 2 as normal inputs with the number 1 and 2 and the sabotage contact as number 3. The sabotage contact is integrated in the reader. The PHG reader has no analog-switch-input for door monitoring.

Additionally, the PHG reader can be extended by an IO box. The IO box has two digital inputs and two relay outputs. The IO box is accessed via the same address like the reader. The two digital inputs have port number 4 and 5, the digital outputs port number 1 and 2. In case of discontinuity or sabotage, port no. 6 is used.

## PHG modules and firmware:

If you want to use the PHG modules, you have to set it in the Additional Options.

After changing over to the access readers of the PHG series, the firmware must be transferred again.  
The device then selects the respective firmware from the DFZ-file.



All configurations like tables etc. are to be configured in the same way as for the access readers of the TS series.

Only exception:

The IO box is not specified in the reader table. Thus, information regarding the modules which are connected via the I<sup>2</sup>C bus, is omitted.

Corresponding reader table:

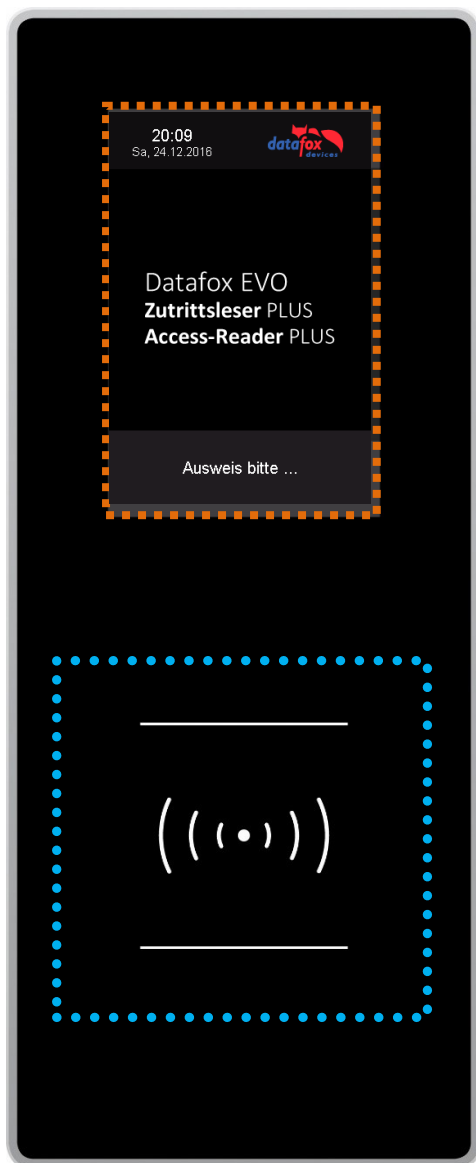
ID	ZM	TM	RefLocation	RefAction	PinGeneral	Description
1	320	1	0	1	0	Master device
2	010	1	1	1	0	Reader at RS485 (PHG)
3	011	1	1	1	0	IO-Box at I <sup>2</sup> C-Bus
4	020	1	2	2	0	Reader at RS485 (LTM)
5	021	1	2	2	0	IO-Box at I <sup>2</sup> C-Bus

## 5.8.6. Access control II with EVO Agera

### 5.8.6.1. Display and operation

The reader has a capacitive touch.

All images displayed by the reader and marked as standard below can be exchanged.



Display:  
The entire display area is backed by a touch screen.

With the DatafoxStudioIV, images can be stored here for a gallery display and for the necessary inputs/outputs.  
See → Configuration → Display Designer.

Reading range of the transponder with backlight in RGB colours.  
The control of the LED is controlled exclusively by the readers firmware.

Access denied = **red** -

Access permitted = **green** -

Bios activated = **blue** -



### 5.8.6.2. Display for state of access control

Currently there are 2 displayed states for:

**granted access:**

**access denied:**



Datafox standard image



Datafox standard image

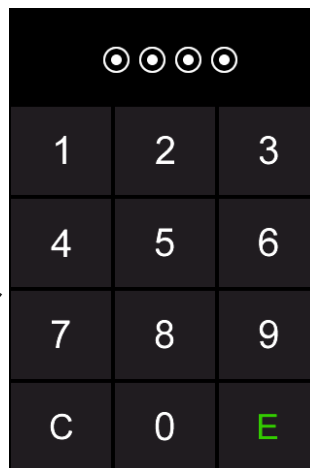
### 5.8.6.3. Display the number keypad

If an additional PIN is requested for access, the keypad will be displayed automatically. For access only by entering a PIN, it is sufficient to briefly touch the display to activate the PIN display.

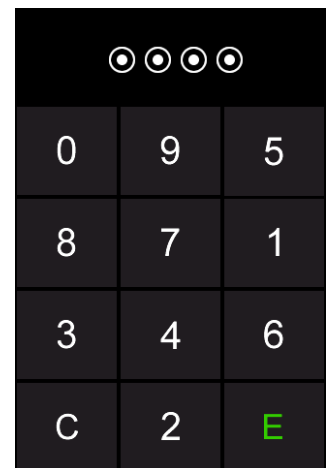


Datafox standard image  
Picture 1 of the gallery

tapping



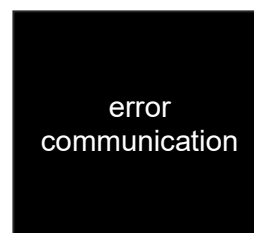
Datafox standard image  
PIN normal



Datafox standard image  
PIN randomization

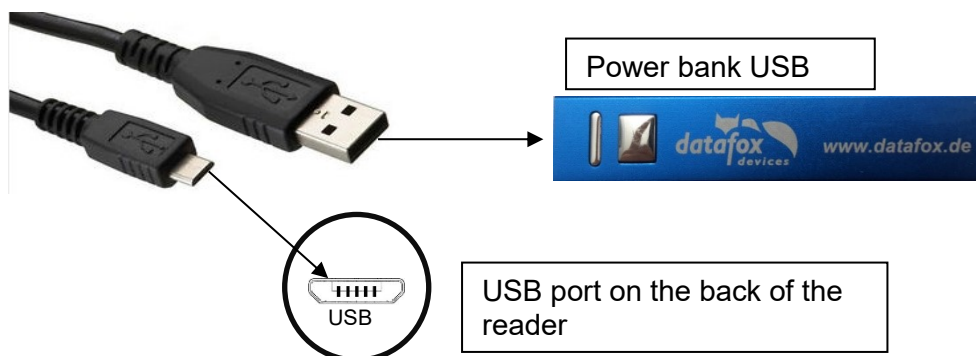
### 5.8.6.4. Error message

The reader is in constant communication with the master. If communication is interrupted, this is indicated by the text "Communication error" on the reader.

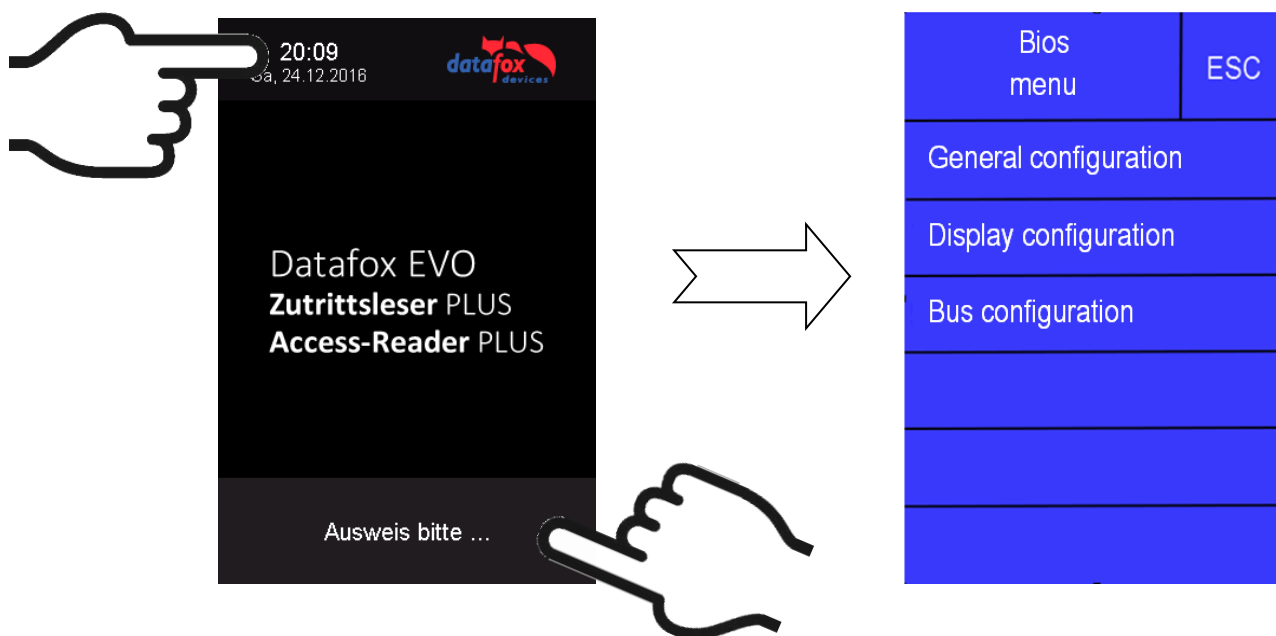


### 5.8.6.5. Bios-menu

Connect the reader to the 12V power supply with the connecting cable.  
 As soon as it is started, connect the reader via USB to a PC or a small battery (power bank).  
**The Bios menu can only be accessed when the USB port is powered.**



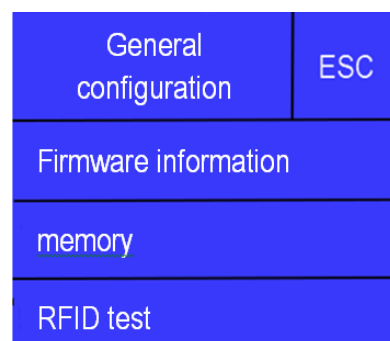
Tap both top left and bottom right at the same time.



### 5.8.6.6. General configuration

The following information can be called up in the general configuration:

- Installed firmware, serial number
- Memory allocation for the image memory
- Transponder test for the transponder configured in the master setup.



### 5.8.6.7. Display configuration

The following parameters can be set in the display configuration:

- The brightness of the device
- Random number keys - arrangement of the pin and keyboard
- The basic activation of the pin - keyboard

Display configuration	ESC
Brightness	100%
Random keyboard	
Display Touch Pin	

### 5.8.6.8. Bus configuration

In the bus configuration, the initial parameters that are used for the setup of the reader must be set.

Bus Configuration	ESC
Bus number	
End resistor	

### 5.8.6.9. Setting the bus address of the reader for RS485 bus

The bus address is defined in the bus configuration under "Bus number".

Note that only bus addresses between 1 and 16 are possible.

The input of the bus number is confirmed with the "Enter" key (bottom right).

With the Escape button (bottom left) the process can be aborted.

Bus Nummer		
0		
1	2	3
4	5	6
7	8	9
ESC	0	↵
	←	

### 5.8.6.10. Activate the termination resistor of the bus

The bus terminating resistor of 120 Ω is switched on or off in the bus configuration under "Terminating resistor".

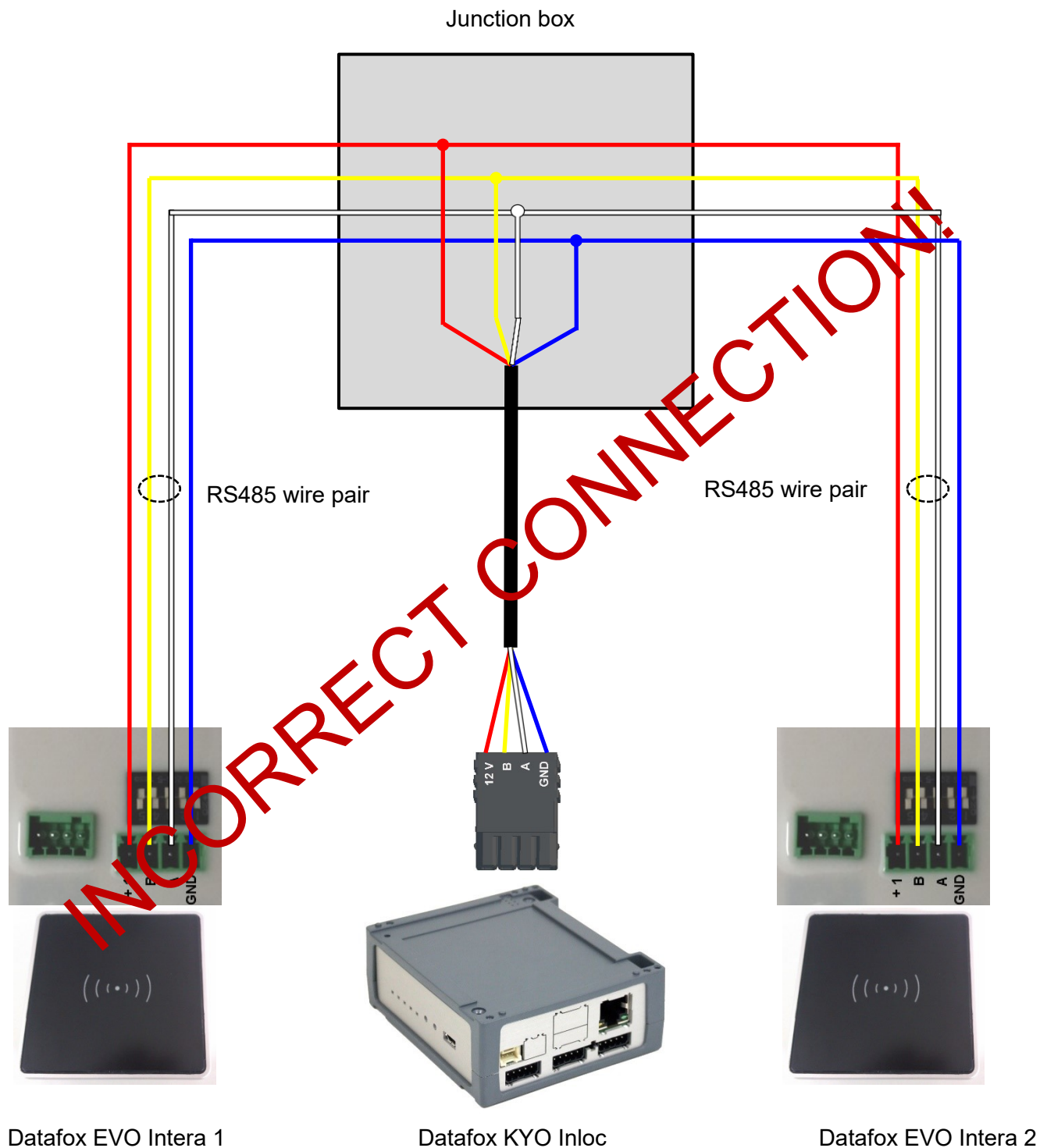
Note: If it is the last or only reader in the RS485 bus, the terminating resistor must be switched on.

End resistor	ESC
On	
Off	

## 5.8.7. Instructions for the electrician for installing the access control system

### 5.8.7.1. Star-shaped bus wiring

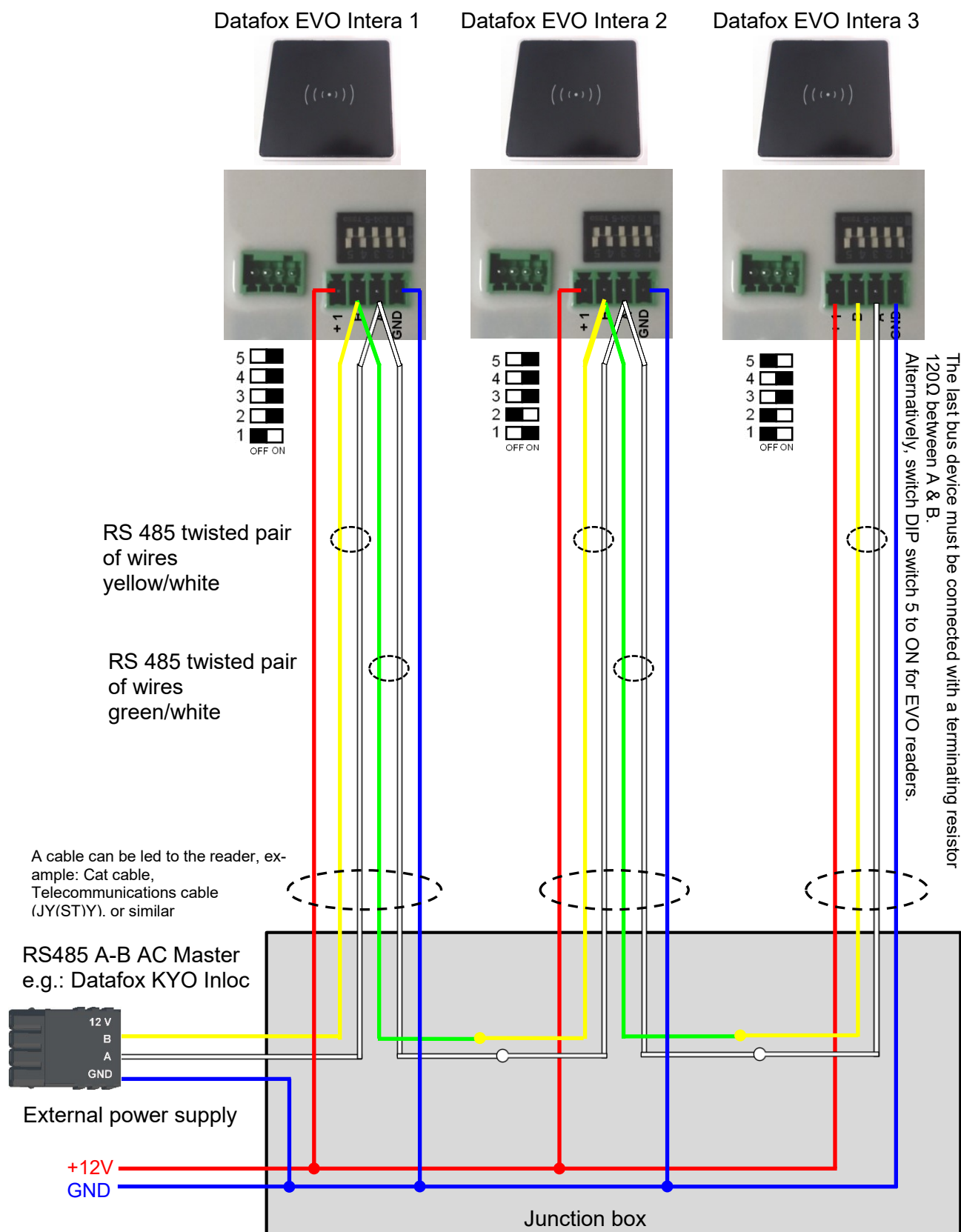
**! Incorrect star connection of the RS485 bus.  
RS485 wire pairs must not be connected in parallel.**



## Correct!

### Correct bus wiring of the access readers with star-shaped cable routing.

The wiring must not be parallel from one point. The wire pairs A and B must each be routed in series directly to the terminal of a reader and from there on to the next bus device in order to ensure smooth operation of the bus communication.



### 5.8.8. Calculation for the power supply of Access modules

When using Datafox access readers or door modules, the necessary cable cross-section has to be calculated before setting up an RS485 network for access control. The voltage drop in the whole bus must not exceed 4 V. Please note that if you use a Datafox device power supply unit as voltage source, 16 modules at most (8 in the RS485 bus and 8 via RS232 stub line) can be fed.

#### Maximum power consumption of the single modules:

TS-TMR33-TR	56,5 mA	16 V max. 8 V min.DC
TS-TMR33-TM	156,0 mA	16 V max. 8 V min.DC
TS-TMR33-TMR	180,0 mA	16 V max. 8 V min.DC
EVO-reader	250,0 mA	24 V max. 9 V min.DC
PHG-reader	250,0 mA	24 V max. 9 V min.DC

The result is a permissible maximum power consumption per Datafox power supply unit of (8 x 180.0 mA + 8 x 56.5 mA) 1.9 A. In order to assure this, you can calculate the necessary cross-section for a given cable length or the permissible maximum cable length for a given cable cross-section.



#### Caution:

Before setting up and commissioning a ZK-network, the calculation has to be done by a person qualified in this field.

The cable cross-section is calculated as follows:

$$Q = \frac{2 \cdot I \cdot l}{k \cdot U_v}$$

Q = wire size in mm<sup>2</sup>

I = current

l = wire length in m

k = Conductivity for copper  $56 \frac{m}{\Omega \cdot mm^2}$

The following applies for 12 V voltage supply:

$U_v$  = voltage drop. 4V at most. **4 V TMR33**

$U_v$  = voltage drop. 4V at most. **3 V PHG** and Reder **EVO-ZK**

$U_v$  is calculated from the supply voltage minus the minimum voltage for the reader.

Thus, the equation for calculating the maximum cable length for a given cable cross-section is:

$$l = \frac{Q \cdot k \cdot U_v}{2 \cdot I}$$

### 5.8.9. Cable length and cable cross section for access wiring

#### Wiring:

Cables with a core diameter of 0.6 or 0.8 mm can be used as bus cables.

The following types of lines are suitable, e.g. as bus line:

- J-Y(ST)Y (telecommunication cable),
- YR (jacketed cable),
- A-2Y(L)2Y (telecommunication cable)

Cat 7 Cable for Network structure!

The maximum total line length BUS RS485 A and B wire is 1000 m. Here are one pair for for the A and B data line in use.

Cable lengths for the voltage supply of the readers.

power supply **1** reader from the box to the power supply **12V**:

- **0,6** mm Cable cross section: **200** m,
- **0,8** mm Cable cross section: **350** m.

power supply **1** reader with separated power supply **12V**:

- **0,6** mm Cable cross section: **250** m,
- **0,8** mm Cable cross section: **400** m.

power supply **2** reader with separated power supply **12V**:

- **0,6** mm Cable cross section: **125** m,
- **0,8** mm Cable cross section: **200** m.

power supply **3** reader with separated power supply **12V**:

- **0,6** mm Cable cross section: **65** m,
- **0,8** mm Cable cross section: **130** m.

power supply **1** reader with separated power supply **24V**:

- **0,6** mm Cable cross section: **500** m,
- **0,8** mm Cable cross section: **800** m.

## 5.8.10. Online functions for the access control

The access control mechanism offers the functionality to control every configuration and action in your software-solution.

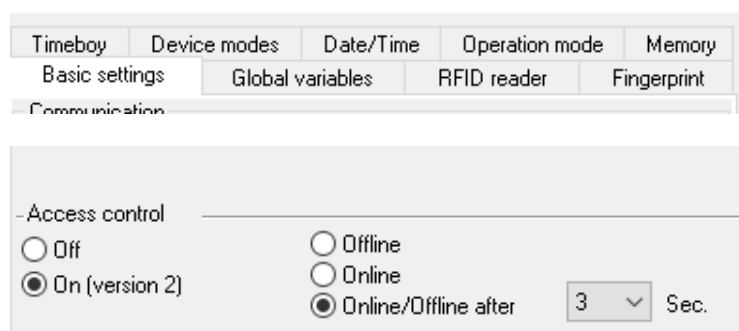
So you can

This allows you to react to all requests from the access control in real time.

Activate the online function in the setup under the basic settings tab.

There are 2 options:

- Offline Mode (the device always waits for the answer from the server)
- In the option **Online/Offline** the terminal waits a defined time before switching to the offline functionality. If this happens the terminal will use the access lists in its memory.



### 5.8.10.1. Online via http-protocol

The communication with http is very quick and easy to set up. Therefore the webserver has an easy job to react to the requests in a very short period of time.

Requirements:

Hardware:

- TCP/IP
- GPRS (1-2 seconds delay)

Software:

- Active Script with a logic for the access control and specially designed to suit the connected hardware (access reader)

With the answer from the server you are able to perform specific actions with the access readers.

The following examples will give you an insight in what is possible with the functions and actions. All parameters correspond the online functions with the dll.



## Example 1:

The following data is going to be received

```
table=access&date_time=2013-07-05_07%3A48%3A11&
Master_ID=1&Modul_ID=010&Chip_Nr=2058&Status=34&checksum=2461
```

Master_ID=1	Master-ID
Modul_ID=010	bus adress of the reader / TM
Ausweis_Nr=2058	ID of the read Chip
Status=34	Online (34)

### Fitting answer to grant access:

```
status=ok&checksum=2461&access=010&mask=8&type=1&duration=1
```

With firmware-version 04.03.04 and up also possible is:

```
status=ok&checksum=2461&master=1&module=010&mask=8&type=1&duration=1
```

<b>access=010</b>	bus adress, on which the action will take place (FW 04.03.03 and lower)
<b>module=010</b>	bus adress on which the action action will take place
<b>master=1</b>	rs485-bus on which the action action will take place
<b>mask=8</b>	relais Nr.1
<b>type=1</b>	turn-on
<b>duration=1</b>	for 1 second

### Fitting anser to deny the access => Red-LED:

```
status=ok&checksum=2482&access=010&mask=5&type=1&duration=2
```

ab der Firmware 04.03.04 ebenfalls möglich ist:

```
status=ok&checksum=2461&master=1&module=010&mask=8&type=1&duration=1
```

<b>access=010</b>	bus adress, on which the action will take place (FW 04.03.03 and lower)
<b>module=010</b>	bus adress on which the action action will take place
<b>master=1</b>	rs485-bus on which the action action will take place
<b>mask=5</b>	red LED + buzzer
<b>type=1</b>	turn-on
<b>duration=2</b>	for 1 second

Several bus strings can be controlled with the new hardware V4. In order to be able to execute actions on the corresponding bus string, the bus string ID must be transferred with the response as well.

For this, the new keywords "module" and "master" were implemented. These must be used together, replacing the keyword "access".



#### Attention:

The order "**access→mask→typ→duration**" or **master→module→mask→typ→duration** must be strictly adhered to.

```
status=ok&checksum=2482&access=010&mask=5&type=1&duration=2
status=ok&checksum=2482&master=1&module=010&mask=5&type=1&duration=2
```

## Overview of the possible parameters for the keywords:

keyword	value / Bit Nr.	description
<b>access=</b> or <b>module=</b> function for 1x Bus RS485	000 010 011 ... 081 usw.	The value of the string must follow the format of the "TM" field of the "Reader" list. He must therefore always include 3 digits.
<b>master =</b>	1-3 1 2	Id for the RS485 bus ZK, represents the ZK- rs485-bus. RS485 Bus ID 1 RS485 Bus ID 2... „ <b>master</b> “ has to be set together with „ <b>module</b> “ and so replaces the function „ <b>access</b> “
<b>mask</b>	1 / 0	this bit will trigger the buzzer.
	2 / 1	this bit will trigger the green LED.
	4 / 2	this bit will trigger the red LED.
	8 / 3	this bit will trigger the first relay.
	16 / 4	this bit will trigger the second relay.
	32 / 5	this bit will trigger the third relay.
	64 / 6	this bit will trigger the fourth relay.
	128 / 7	this bit will trigger the fifth relay.
	256 / 8	this bit will trigger the sixth relay.
	....	unused. always set to 0
<b>type</b>	0	Off
	1	On
	2	change (600ms on, 600ms off)
	3	3 times on for 500ms
<b>duration</b>	Sekunden / 0	Is a period of time and only at =1 active. meaning: 0 = always on, 1 - 40 = seconds on.



### Hint:

You can also perform multiple actions on the access control in one response. However, the total length of the response must not **exceed 254 characters**.

### Attention:

**A automated switch between online and offline mode is not possible in http mode**



- Access control

Off

On (version 2)

Offline

Online

Online/Offline after

3 Sec.

### 5.8.10.2. Online via DLL connection

The dll offers the function to directly access the external access reader. With the function “DFCEntrance2OnlineAction“you are able to trigger the buzzer, the LEDs and the relays.

In the case of an access booking, the access master generates a data record. This must be picked up immediately and forwarded to the application on the server. The application then decides whether access is granted and returns a command to control the relay in the door module or lets the buzzer sound and issues a visual message via the LEDs.

More dll functions are documented in the “Datafox SDK” on our website

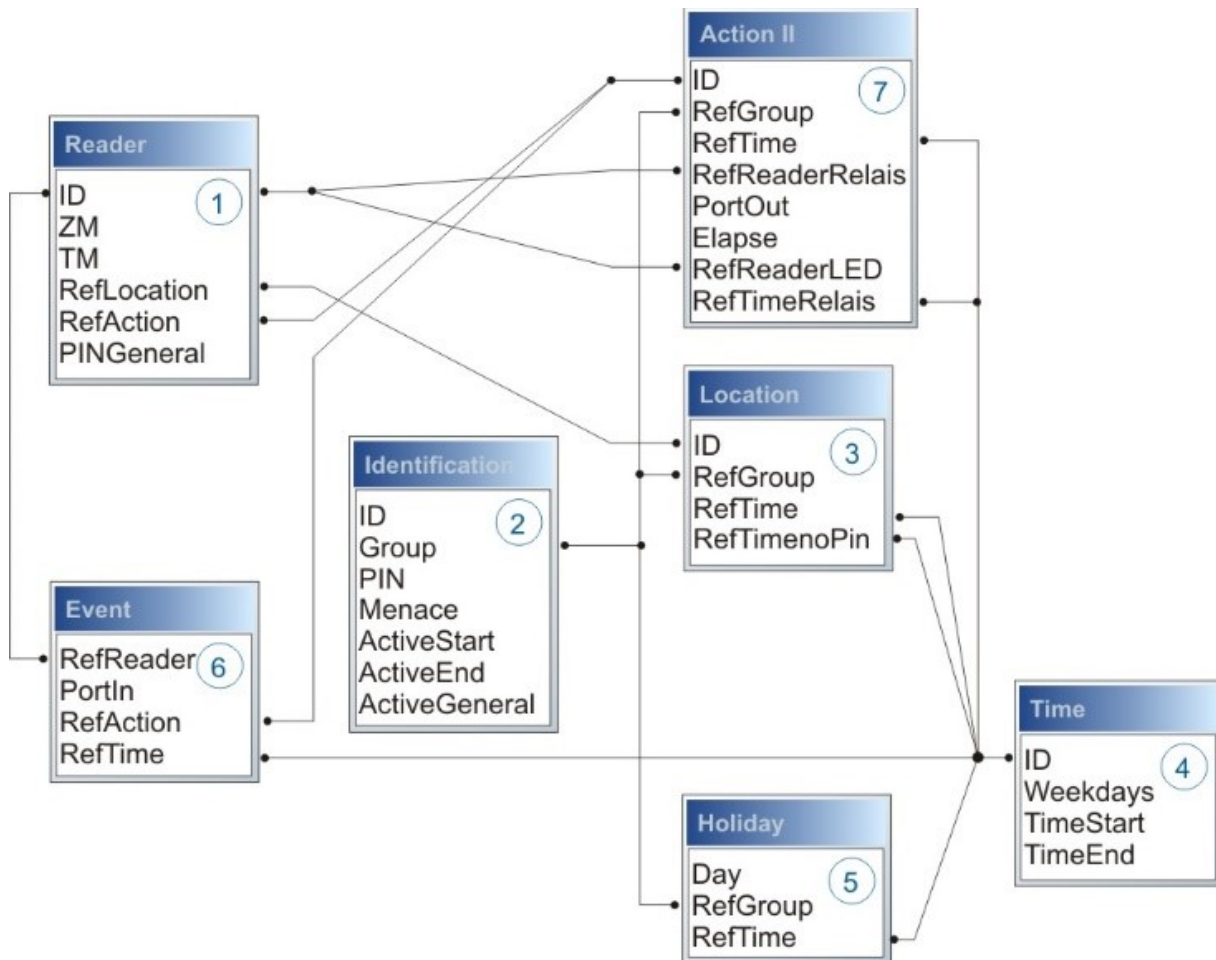
[https://www.datafox.de/downloads-datafox-kyo-inloc.de.html?file=files/Datafox\\_Devices/Downloads\\_Geraete\\_Zubehoer/001\\_MasterIV-Software/Datafox\\_SDK\\_Windows\\_04.03.12.zip](https://www.datafox.de/downloads-datafox-kyo-inloc.de.html?file=files/Datafox_Devices/Downloads_Geraete_Zubehoer/001_MasterIV-Software/Datafox_SDK_Windows_04.03.12.zip)

## 5.8.11. Function extension for access control II

### 5.8.11.1. General description

The access control has been extended to some functionality. To the table "Action 2" was introduced. This table replaces the previously known "Action". On the end of this chapter you find a description for the table „Action2“. Due to a lot of additional references many scenarios are now possible.

The entire logic of the access control lies in the links between the access lists. Here is an overview of the links between the access lists:



The following example gives an overview:

## 5.8.11.2. Examples

### Example - Garage:

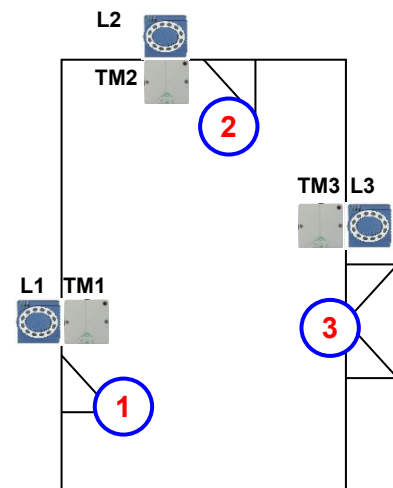
The facility manager comes in the morning at 7.00 o'clock and uses the Entry 1.

- with his RFID-chip he opens the door 1 for 5 seconds.
- with the same action he gives the door 3 free, the opening is now possible with a switch, until 4 o'clock pm.

- entry 2 is now open until 4 o'clock pm for the other person.

the closing is possible with:

- 1 – one RFID-chip registry on group 40
- 2 – double read of a normal RFID-chip
- 3 - Automatic at 4 o'clock pm (define in the time table, see in row 2 „RefTime“)



Construct of Reader-, Location-, Action2- and Identification-table looks maybe at follows

Table Reader

ID	ZM	TM	RefLocation	RefAction	PinGeneral	Description text
1	1	320	0	0	0	Master device
2	1	010	100	0	0	Door-module on RS485 wire (TM1) only relays include Need not a listing in the table „action“
3	1	011	100	1000	0	RFID-reader on RS232 wire (L1) only reader All readings of RFID on this reader make all actions in the table „action“, with the ID 1000.ID 1000.
4	1	020	200	0	0	Door-module on RS485 wire (TM2) only relays include Need not a listing in the table „action“
5	1	021	200	2000	0	RFID-reader on RS232 wire (L2) only reader All readings of RFID on this reader make all actions in the table „action“, with the ID 2000.
6	1	030	300	0	0	Door-module on RS485 wire (TM3) only relays include Need not a listing in the table „action“
7	1	031	300	3000	0	RFID-reader on RS232 wire (L3) only reader All readings of RFID on this reader make all actions in the table „action“, with the ID 3000.

Table Time

ID	Weekdays	TimeStart	TimeEnd	Description text
1	1234567	00:01	23:59	24hours opening possible
2	1234567	07:00	16:00	Time for special action

Table Action2

ID	RefGroup	RefTime	RefReader Relais	PortOut	Elapse	RefReader LED	RefTime Relais	Description
Read an RFID chip on reader 1								
1000	10	0	2	1	5	3	0	Opening normal for 5s. Group (10; 20; 30) have always entrance
1000	20	0	2	1	5	3	0	
1000	30	0	2	1	5	3	0	
1000	30	2	4	1	32400	5	0	door 2 open for 9h (max. 16:00)
1000	30	2	6	1	32400	7	0	door 2 open for 9h (max. 16:00)
1000	40	0	2	1	-1	3	0	command door open, return
1000	40	0	4	1	-1	5	0	command door open, return
Read an RFID chip on reader 2								
2000	10	0	4	1	5	5	0	Opening normal for 5s. Group (10; 20; 30) have always entrance
2000	20	0	4	1	5	5	0	
2000	30	0	4	1	5	5	0	
2000	30	2	4	1	32400	5	0	door 3 open for 9h (max. 16:00)
2000	30	2	6	1	32400	7	0	door 3 open for 9h (max. 16:00)
2000	40	0	4	1	-1	5	0	command door open, return
2000	40	0	6	1	-1	7	0	command door open, return
Read an RFID chip on reader 3								
3000	0	0	6	1	5	0	0	This action is for all Groups are listed in the table "Location".

Table Location

ID	refGroup	refTime	refTimeNoPin	Description
100	10	1	0	Group 10, 20, 30 and 40 have access on this reader.
100	20	1	0	
100	30	1	0	
100	40	1	0	
200	10	1	0	Group 20 can not use this entrance 2.
200	30	1	0	
200	40	1	0	
300	10	1	0	The Master of Garage and the facility manager can open this door.
300	30	1	0	

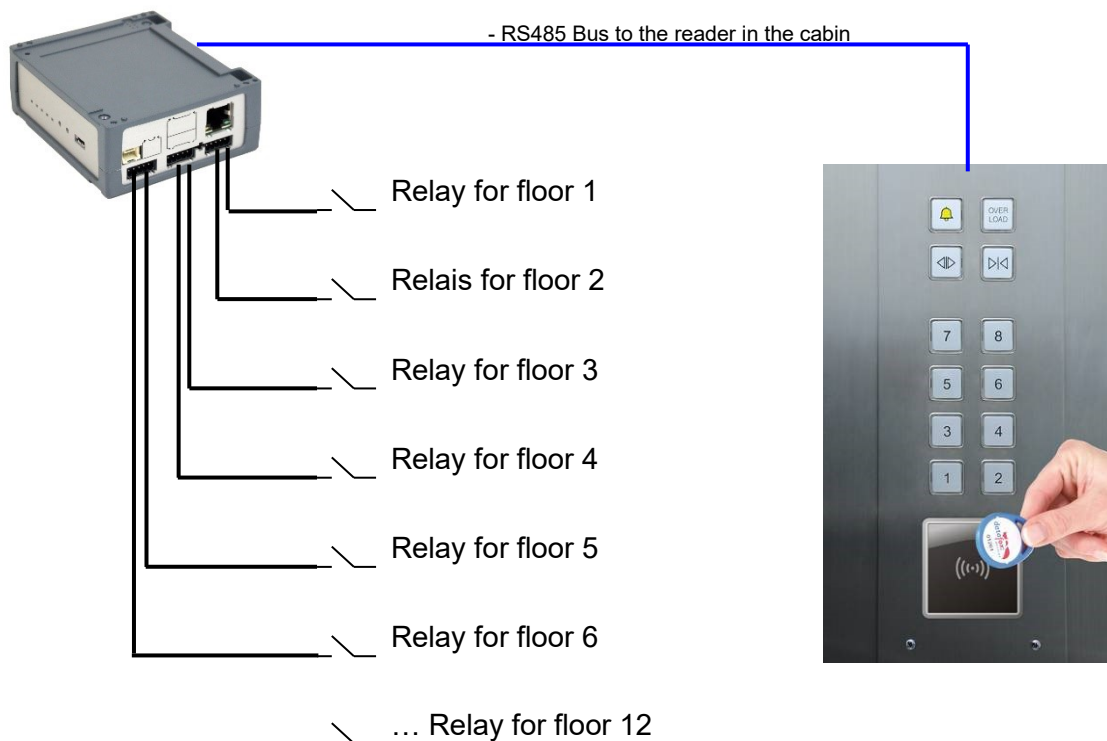
Table Identification

ID	Group	Pin	Menace	ActiveStart	ActiveEnd	Active	Description
1111	10	0	0	2005-01-01	2015-12-31	1	Master of Garage
2222	20	0	0	2005-01-01	2015-12-31	1	Skilled workers
3333	30	0	0	2005-01-01	2015-12-31	1	Facility manager
4444	40	0	0	2005-01-01	2015-12-31	1	Facility manager second RFID-chip, only for closing the door

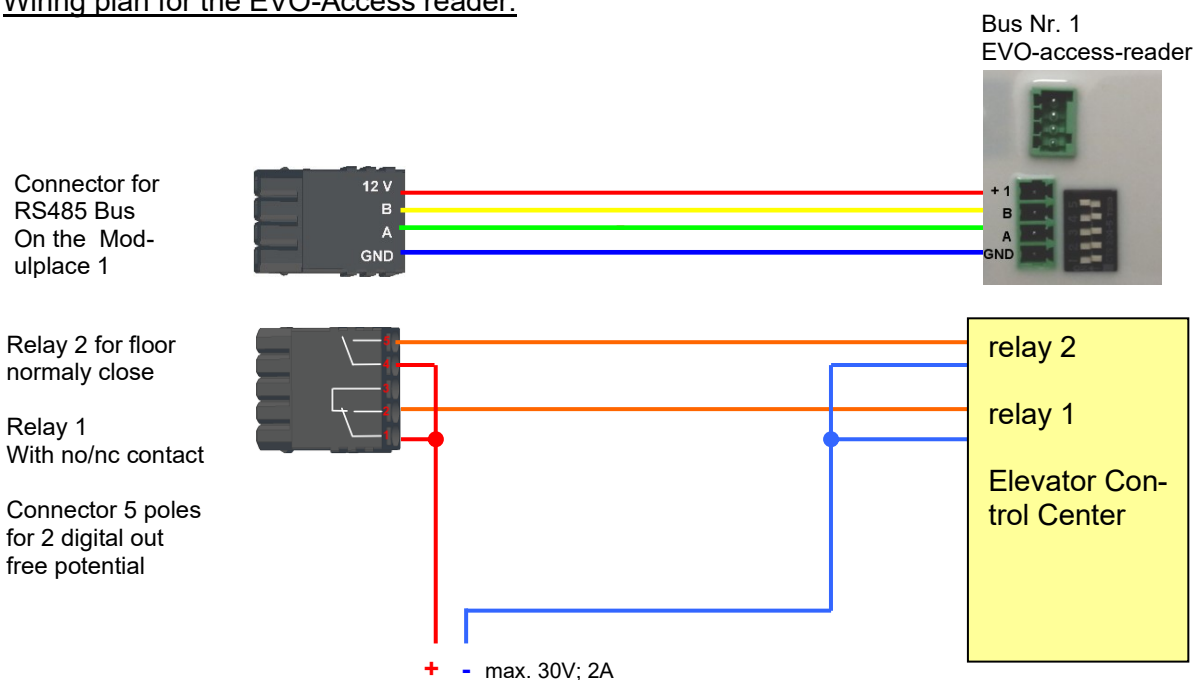
### Example - elevator

The goal is to allow users only to exit at the allowed floor.  
Then tenant uses the transponder to activate only the switch for his floor.

In the cabin of the elevator the RFID-reader is installed. The Datafox-Device is on the top of the cabin.



### Wiring plan for the EVO-Access reader:



The content of Reader-, Location-, Action2- and Identification- might look like follow:

Table Reader

ID	ZM	TM	RefLocation	RefAction	PinGeneral	Description
1	1	320	0	0	0	Master device
2	1	000	100	1000	0	Reader on RS485 wire

Table Action2

ID	RefGroup	RefTime	RefReader Relais	PortOut	Elapse	RefReader LED	RefTime Relais	Description
Buchungen am Leser in der Kabine								
1000	10	0	1	1	20	2	0	Group 10 only for floor 1.
1000	20	0	1	2	20	2	0	Group 20 only for floor 2.
1000	30	0	1	3	20	2	0	Group 30 only for floor 3.
1000	40	0	1	4	20	2	0	Group 40 only for floor 4.
1000	50	0	1	5	20	2	0	Group 50 only for floor 5.
1000	60	0	1	6	20	2	0	Group 60 only for floor 6.
1000	102	0	1	1	20	2	0	Group 102 moving to floor 1 and 2
1000	102	0	1	2	20	2	0	
1000	104	0	1	1	20	2	0	Group moving to floor 1, 2 and 3.
1000	104	0	1	2	20	2	0	
1000	104	0	1	3	20	2	0	

Table Location

ID	refGroup	refTime	refTimeNoPin	Note
100	10	1	0	All Groups 10, 20, 30, 40, 50, 60,102 and 104 must listed in the location for this reader.
100	20	1	0	
100	30	1	0	
100	40	1	0	
100	50	1	0	
100	60	1	0	
100	102	1	0	
100	104	1	0	

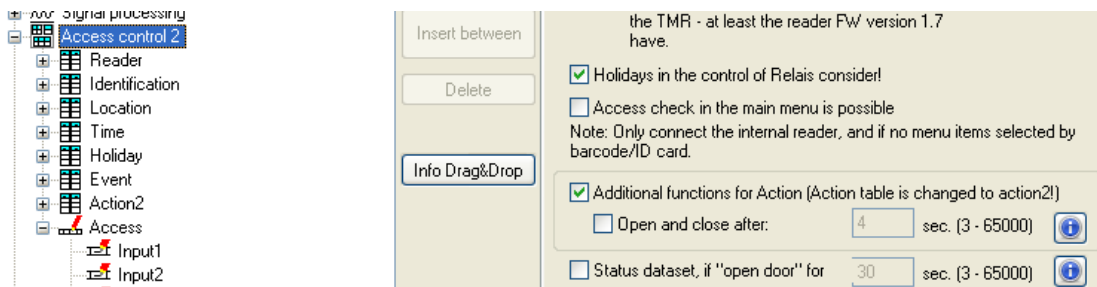
Table Identification

ID	Group	Pin	Menace	ActiveStart	ActiveEnd	Active	Description
1111	10	0	0	2005-01-01	2099-12-31	1	Tenant of an apartment on the floor 1
2222	20	0	0	2005-01-01	2099-12-31	1	Tenant of an apartment on the floor 2
3333	30	0	0	2005-01-01	2099-12-31	1	Tenant of an apartment on the floor 3
4444	40	0	0	2005-01-01	2099-12-31	1	Tenant of an apartment on the floor 4
5555	50	0	0	2005-01-01	2099-12-31	1	Tenant of an apartment on the floor 5
6666	60	0	0	2005-01-01	2099-12-31	1	Tenant of an apartment on the floor 6
1102	102	0	0	2005-01-01	2099-12-31	1	Tenant of an apartment on the floor 1 and 2
1104	104	0	0	2005-01-01	2099-12-31	1	Tenant of an apartment on the floor 1, 2 and 3



### 5.8.11.3. Description of the table „Action2“

The switching from „Action“ to „Action2“ it's a setting in the StudioIV.



Name	Data type	Length	Description
ID	Number (int)	4	Action number, it can occur several times due to several actions that have to be worked through.
RefGroup	Number (int)	4	Only work this action for the listed Group. 0 = for all groups work this action.
RefTime	Number (int)	4	Give a time, and only works this action to this time. (0 = works ever) <b>! Not mixed with times in RefTimeRelais!</b>
RefReader Relais	Number (int)	4	Reference to the list reader, action to switch a relay on this listed reader in table reader.
PortOut	Number (char)	1	Indicates the number of the output on the module. Possible values: 1 ... 9 & A ... W corresponds to port 1-32 (digital out)
Elapse	Number (int)	6	Specifies the period of time a relay is switched <b>! The time is in seconds!</b> When <b>(-1)</b> is specified, the relays are reset directly. With <b>(0)</b> the relays switch for the duration specified for the relay with RefTime. <b>"FRA"</b> activates Free Access <b>"BLA"</b> activates Blocked Access = permanent red signal <b>"STD"</b> returns to Standard mode.= Deactivate from FRA or BLA
RefReaderLED	Number (int)	4	This is a reference to the table Reader to switch the LED on other modules
RefTimeRelais (only for auto-automatic time switch)	Number (int)	4	The time model indicates when the output may be switched. (0 = not used). (Automatic time control) <b>! Action how here work with automatic times, be not mixed with action from the access!</b>

**Caution:**  
By transferring the table "Action 2" to the unit, the table "action" is replaced. Thus, only entries in the table "Action 2" will be considered.

**Caution:**  
If you would like to continue working with the "action" table, the table "Action 2" may not be transferred to the device.  
A table "Action 2" has already been transferred to the device, it must be cleared by loading a new setup.

#### 5.8.11.4. Additional functions for Access Control

All functions described below are only supported in conjunction with the Action 2 table.

Possible functions:

- Logging, in an internal list, in which room each employee is located.
- Hard antipassback
- Soft antipassback (= only the software is informed that an ID card has entered a room 2 times = status message 251)
- BDS
- Type associated to the supervised door unctinality.

The table "ReaderProps" must be created under the table structure of the operation:

Name	Data type	Length	Description
<b>Name</b>	<b>Data type</b>	<b>Length</b>	<b>Description</b>
RefReader	Number (int)	4	Reference to the ID of the Reader whose properties should be specified
Type	Number (int)	2	Type of the Property 1 = anti-passback 2 = BDS-System 3 = BDS 4 = BDS 5 = Type associated to the supervised door unctinality.
Mode	Number (int)	1	Mode for details of the type above 1 - Only protocol the attendance of persons in a room (in list "presence"). 2 - Hard anti-passback (no entry when conflict detected, status code 250) 3 - Soft anti-passback (entry allowed when conflict detected, status code 251).
Duration	Number (int)	10	Access is permitted again after the duration time has elapsed. Value in seconds. 0 = no end time. It is necessary to enter another room necessarily

The table "**ReaderProps**" is created in the setup:

### Protocol - Function

Essentially serves to ensure that when several access managers are used, they know in which room a person is located.

Via your software, this information is distributed between the access managers or can be read out if required.

See the documentation DFComDLL

- DFCTable.....
- DFCPresence....

### Soft antipassback

A status message 251 is issued here if one and the same badge enters the same room more than once. Admission is still permitted!

### Hard antipassback

A reader is always assigned to a room. This room may then only be entered once with the same ID. If the same ID card is used again for access to this room, it will be rejected. Status 250 is output in the data record during access control.

Here you can choose whether the reject is limited in time or whether Hard remains active.

In the case of Hard Active, access is not permitted again until another room ID has been accessed. This corresponds to leaving the previous room.

### 5.8.11.5. List Presence

This list is created by the access controller itself.

This makes it possible to enable the tracking of people and rooms via several access controllers. If the Antipassback function is to be used via several access controllers, this list must always be updated by the software to all access controllers.

#### Example:

A room (example room ID 10) has several doors that are managed by different access control boxes. If a person enters this room, an entry is created in the Presence list of this box that this person is in the room.

The other access control boxes can now also be informed that the person with ID X is in room 10. To do this, an entry in the Presence list must be created in the other boxes via your software (with DLL).

This is done using the method [DFCTableAppendRowData](#) Append Data Row to the table.

The same applies if a person leaves the room, this entry must be deleted in the Other Access Control Boxes.

Name	Data type	Length	Description
ID	Number (int)	20	ID of the person that is stored in the presence list.
RefLocation	Number (int)	4	Reference to the ID of the room, defined in the table "Location", where this person currently stays
TimeStamp	Number (int)	10	Time stamp when the person entered the current room Integer in seconds, starting 01.01.2000.

## 5.8.12. Automatic relay release upon opening of the door

Access control:

The amount of time for which a door is being opened is defined by the “Action” table’s “Elapse” property. The door is opened for the amount of time defined by “Elapse” continuously.

With the enhancements of 04.03.13 firmware release, the relay opening the door can now be deactivated (“release”) as soon as a door-open sensor is trigger. This sensor has to present and connected to the access control system when using this function.

### 5.8.12.1. Supervised doors

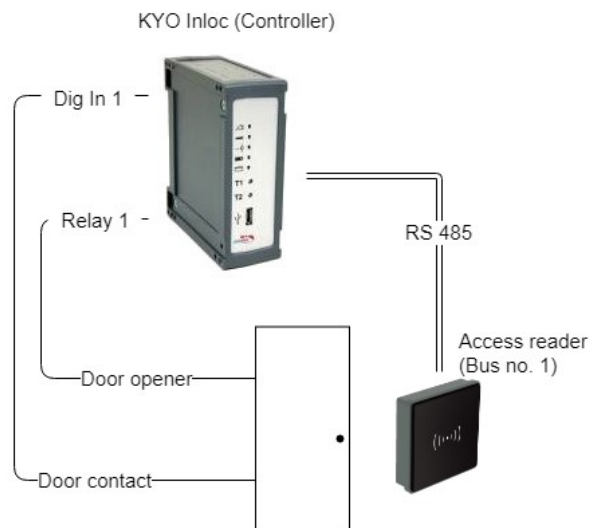


Figure 1 Diagram of a supervised door

A supervised door is a feature of the access controller that allows to lock a door as soon as it has been opened. The supervised door functionality that each door is associated to a digital input that detects if a door is opened. The digital input is assigned using the ReaderProps list.

If the opening of a door is detected, then the associated reader is determined and all realis associated to the reader are deactivated. For this, all actions associated to the reader are checked.



#### Please Note:

The supervised door functionality will only release relays that have been set for a defined time interval. Doors that are opened by a time model or set to free access will remain opened.



#### Caution:

All action entries associated to the reader will be checked and released. A check concerning the group is not implemented.

### 5.8.12.2. Configuration

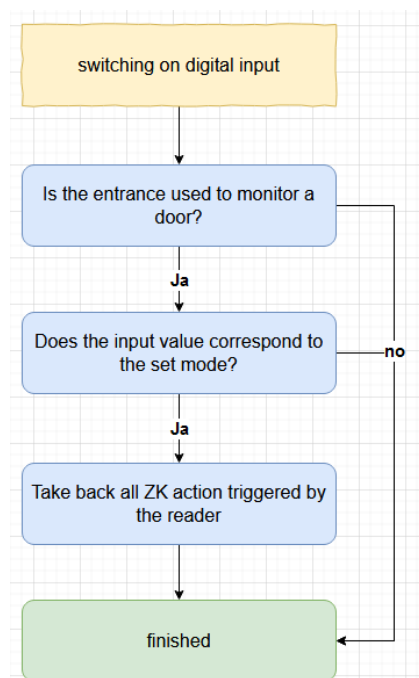
Implementing supervised door using the Datafox Access Control modules requires the setup using the ReaderProps list. This list is required for BDS and anti-passback as well. The following specification of the ReaderProps thus contains minimal field length specifications.

### 5.8.12.3. Requirements for the ReaderProps entry

The ReaderProps list requires at least 5 columns when used for supervised doors.

Name	Type	Length	Description
RefReader	Number	4	Reference number of the reader, where the relay to be released is placed.
Type	Number	2	Type associated to the supervised door (5) functionality.
Mode	Number	1	Mode used for interpreting the digital input 0 (Input low) = The door is opened 1 (Input high) = The door is opened
RefReaderInput	Number	4	Reference to the reader (or door module or access controller) that provides the digital input for the supervised door.
Input	Number	2	Id of the digital input that changes upon opening of the door. 0 = the door is not supervised. 1-32 = Digital input wired to the door contact

### 5.8.12.4. Logical conditions implemented by the access controller

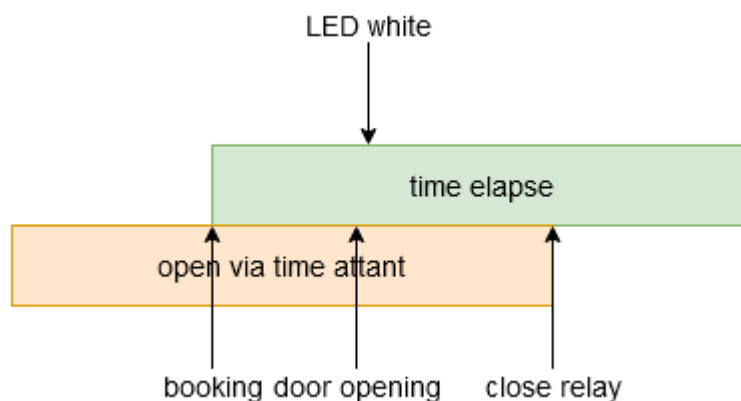


The following conditions are checked by the access controller:

- (1) The check of supervised doors is started upon the change of a digital input.
- (2) Next it is checked, if the digital input (“Input”) and the reader (“RefReaderInput”) are present within the same a supervised door entry of the ReaderProps list.
- (3) If so it is checked, if the input’s state matches the mode (“Mode”). If the Mode is set to 1, the input’s state has to be High (1) has well, for the Mode being 0 the input has to be Low (0). If the Mode matches the input’s state, the state of the relay is checked.
- (4) Next all relays associate to the referenced reader (“RefReader”) that are set for a finite amount of time are being released. If the relay has been set to free access (FRA), blocked access (BLA) or due to a time model associated, it is not released.

### 5.8.12.5. Special case: Relays operated by time model

Despite a time model being active, the RFID reader will detect and read RFID transponders. The Elapse time associated to the action may overlap with the time model's activity period.



A conflict will occur if the door is opened before the time model expires. In this case the reader's LED is set to white. The relay does not toggle there and switches when the time model expires.

**Please Note:** The reader's LED is not set to green if a time model sets the relay. When granting access due to an RFID transponder the LED is set to green only for 3 seconds, not for the elapse time associated to the action. This is the standard behaviour for granting access.

### 5.8.12.6. Configuration sample

The sample configuration explained here is associated to Figure 1. The digital input 1 is used to detect the opening of the door. A low voltage on the digital input indicated that the door is open.

### 5.8.12.7. Access control lists

First the two devices are declared by entries to the Reader list. ID 10 is associated to the RFID reader, which is present next to the door. ID 99 identified the access controller.

Reader.txt

ID	ZM	TM	RefLocation	RefAction	PinGeneral
10	1	010	1	100	0
99	1	320	1	0	0

The list Action2 contains the operations for opening the door. Entry 100 will be evaluated when reader ID 10 identified an RFID transponder that is allowed to open the door. The action sets relay 1 at the access controller for 10 seconds. Simultaneously the green LED is activated at reader ID 10.

Action2.txt

ID	Ref Group	Ref Time	Ref Reader Relais	PortOut	Elapse	Ref Reader Led	Ref Time Relais
100	0	1	99	1	10	10	0

The list Time contains time model 1. This time model is active 24/7.

Time.txt

ID	Weekdays	TimeStart	TimeEnde
1	1234567	00:00	23:59

The Location list must contain an entry. This entry associated the time model, so that access using the reader is possible always.

Location.txt

ID	RefGroup	RefTime	RefTimeNoPin
1	0	1	0

In order to open the door, the Identification list must contain an entry that is allowed to open the door.

Identification.txt

ID	Group	Pin	Menace	ActiveStart	ActiveEnd	ActiveGeneral
2059FB3A	0	0	0	2005-04-01	2020-04-01	1

### 5.8.12.8. Additional lists

As explained earlier, the ReaderProps list is needed in addition to the access control list. If digital input 1 changes to low voltage, all doors being unlocked for a finite time will be locked again. The entry to the ReaderProps list is as follows:

ReaderPorps.txt

RefReader	Type	Mode	RefReaderInput	Input
10	5	0	99	1

## 5.9. RFID Reader

The RFID reader is built-in the EVO 4.6 FlexKey. If this option is available, see the type label and the label on the backside. By DatafoxStudioIV you can enable the RFID reader. For more information see the manual of DatafoxStudioIV.

For reading a transponder you must hold it in front of the device. The reading area is marked with the corresponding icon.

The following transponder readers can be built-in the EVO 4.6 FlexKey :

**EVO 4.6 FlexKey with 125 kHz:** Unique EM4102, Hitag1, Hitag2, HitagS, Hewi EM4450  
LRW 8 cm R/W (**LeseReichWeite** "Read range" with card)

**EVO 4.6 FlexKey with Legic-Prime/Advant:** LRW 4 cm R/W

**EVO 4.6 FlexKey with Mifare-Desfire:** LRW 4 cm R/W für MifarePlus / 7 Byte UID necessary



**Note:**

More information you found in the manual from DatafoxStudioIV chapter „[The RFID Technology](#)“



## 5.10. Data on Card

### 5.10.1. General Information

With the Data on Card - function it is possible to write data with an individual structure on a transponder.

These data are provided in the form of a list of your application.

This list is loaded onto the terminal, and if you're holding the transponder in front of the terminal the data will be written and saved.

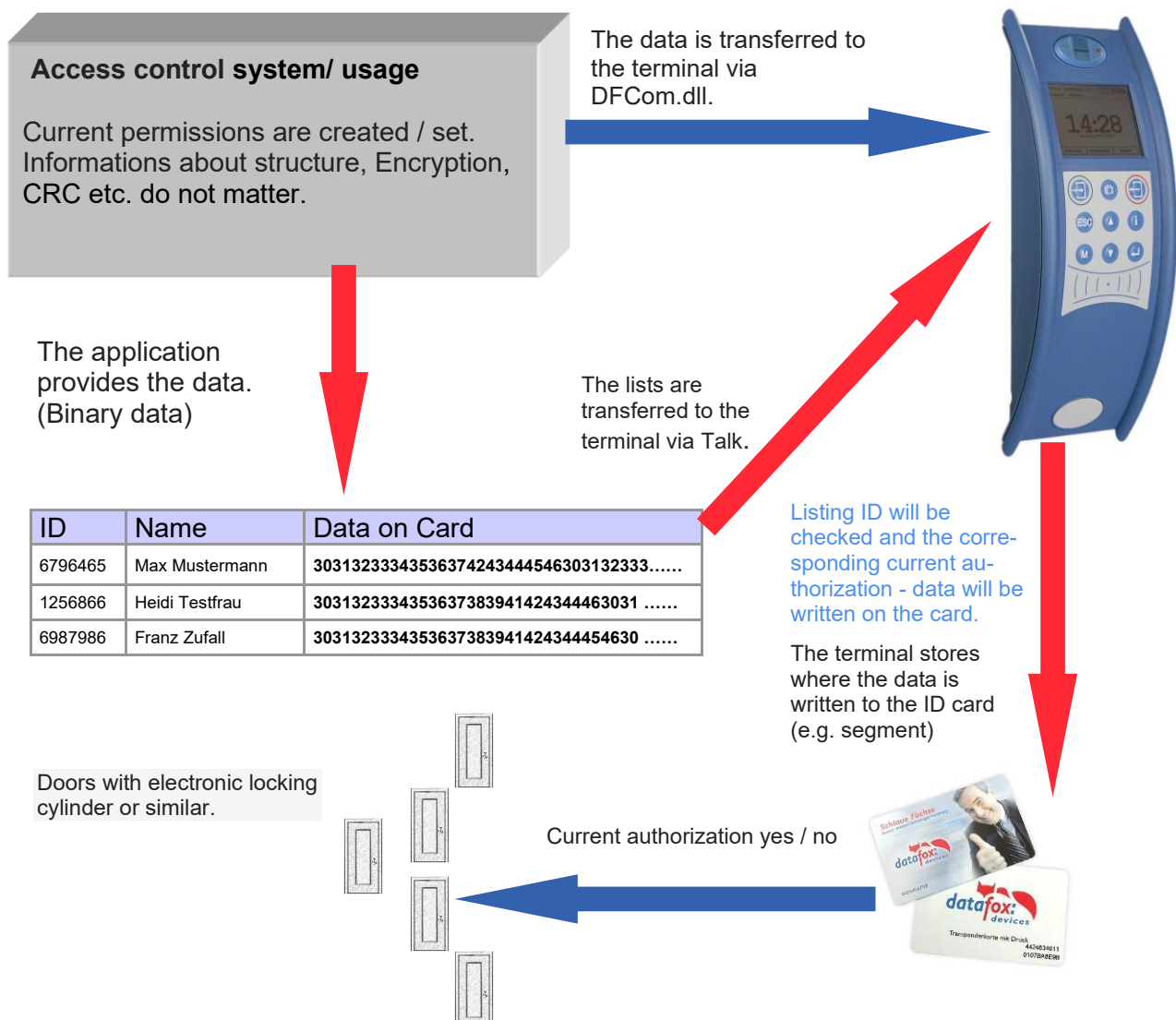
The following transponder-procedures support the Data on Card-function:

- Mifare
- Legic
- iCode
- MyD

#### For instance:

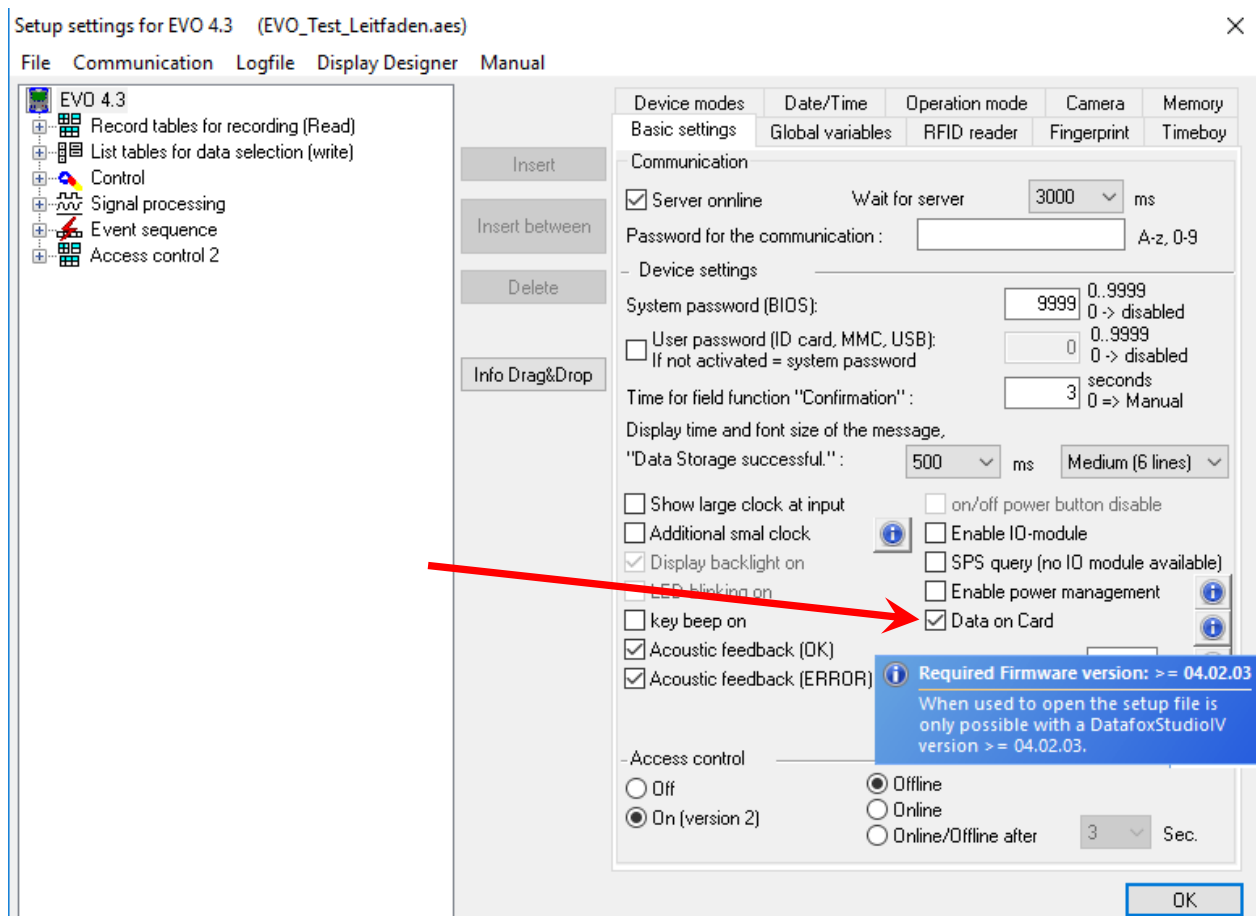
In buildings with an electronic closing cylinder should the actual daily authorization for the access be wrote down on a transponder card.

The Personal ID will be checked and the corresponding current authorization - data will be written on the card. The terminal stores where the data is written to the ID card (e.g. via segment).



## 5.10.2. Settings for using DataOnCard

Data on Card is an option of the device where data can be written to a transponder from a data list. This option needs to be stated and said while you ordered your product. Those devices who don't offer this option, an error message will be displaying when it's executed.



Data on Card works in 3 steps:

- reading a value from the transponder, e.g. Serial number
- the value is used to select a binary field list to read the binary data
- the binary data is written to the transponder

The return value of the Data on Card function for GV or data record field is the value from the first step "Reading a value from the transponder".

For errors like "the value is not found on the list" or the "writing to the ID failed" the function generates an ESC.

The side steps can then be used to decide how the work continues in the input chain.

The binary field data within the file that the DatafoxStudioIV imports and transmits is to be specified as a hex string. When importing via the DLL, the data needs to be passed on as binary data.

Using the DFC GetField, DFC GetField list functions, you are working with strings, while the firmware converts the hexstrings to and from the binary data.

## Settings for Data on Card

Setup settings for EVO 4.3 (EVO\_Test\_Leitfaden.aes)

File Communication Logfile Display Designer Manual

**1.)** Selection value read from ID card  
RFID reader configuration: Default

**2.)** List with data: Personal Data

First Selection field from list "Personal Data": UID

Field with data to be written: Binary

Behavior when there is no entry for the selection.  
 Output error message (generated ESC, see jumps)  
 No error message output (generated ENTER)  
 Branch to: Parent submenu

**3.)** Write ID card value  
RFID reader configuration: Config. 1  
 Big Clock hide and show message for writing.

Behavior at the end of the function  
 Return to the confirmation required  
 or automatically hide after 0 seconds.

OK

### 1.) RFID Configurations for the RFID reader

Setup settings for EVO 4.3 (EVO\_Test\_Leitfaden.aes)

File Communication Logfile Display Designer Manual

Device modes Date/Time Operation mode Camera Memory  
 Basic settings Global variables RFID reader Fingerprint Timeboy

RFID reader type: Legic Advant (also Prime)

Global Default Config 1

Value-to-read Further configuration

Serial number  Advant format at PrimeID card type

Free choice of data  With segment: 1 Length

By search string 00000000000000000000000000000000 Length 13

Search String in hex values. (2 digits correspond to 1 byte length)  
 Legic Prime length of the search string is limited to max. 7 byte.

Start/Offset at: 8 Count: 8

Additional options  
 Without CRC check  8 Bit CRC 1 Address  
 16 Bit CRC

Output format  
 Decimal Fixed length: 8

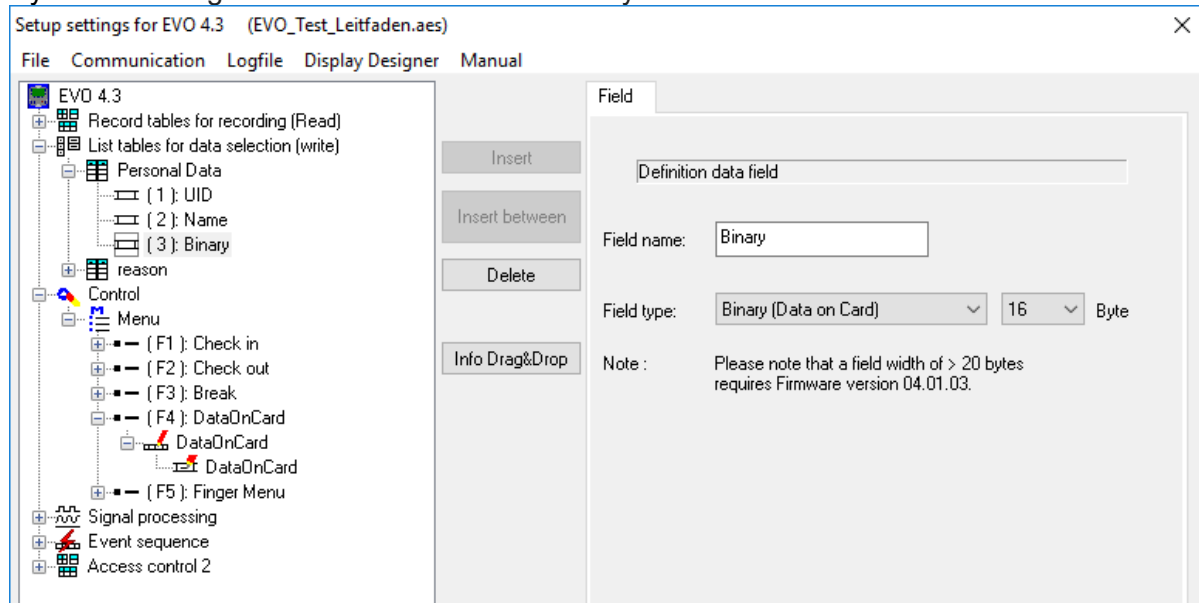
Note: For a fixed field length is filled with leading zeros.

OK

The transponder configuration for the reading can be freely selected. However, firstly it needs to be defined in the basic transponder settings.

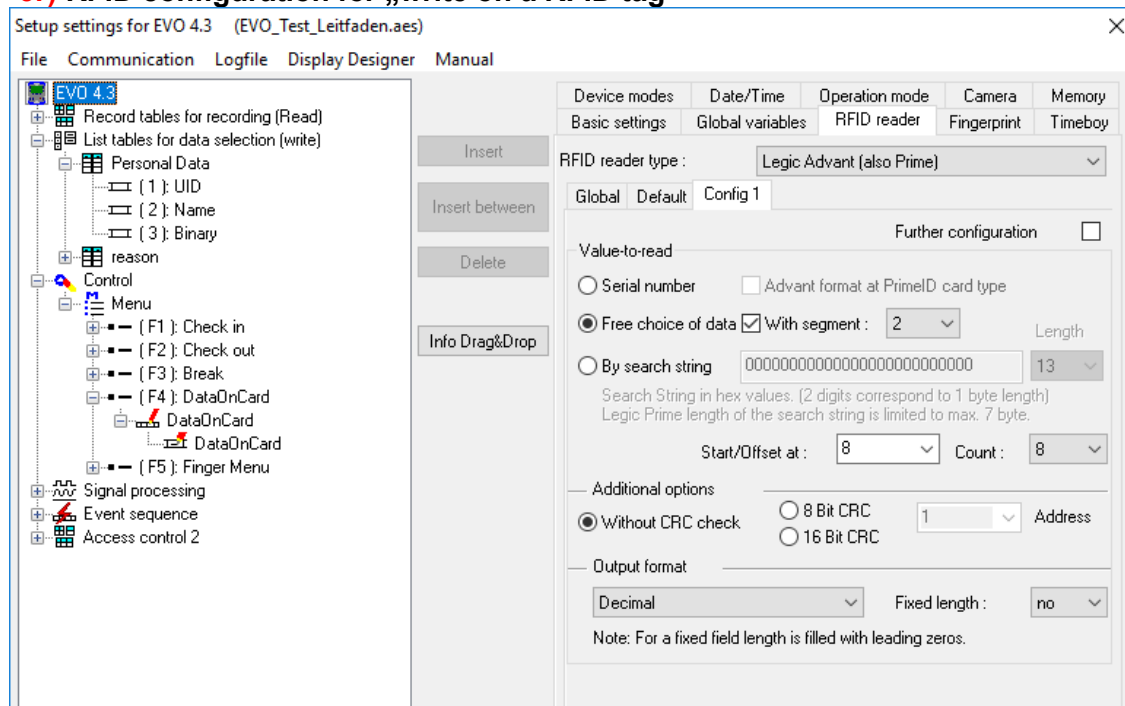
## 2.) List / binary file structure

By the list configuration the list who has a binary field will be selected.



In this example, the value of the transponder reading, who is wanted in the list in the ID field. The data that needs to be written is binary on the Data on Card field. The maximum field size is not allowed to exceed more than 220 bytes. After this, the further procedure can be set for list errors.

## 3.) RFID configuration for „write on a RFID tag”



The transponder configuration for the reading can be freely selected. However, firstly it needs to be defined in the basic transponder settings.



### Please note:

First, complete the transponder configuration, then create the list with the binary field and finally parameterize the field function Data on Card.

Example for Data on Card:

ID with serial number: **1848989745**

List entry for **1848989745** in the file before transferring to the device

Field ID Field Data (binary field) here as hex bytes

1848989745 30313233343536373839414243444546303132333435363738394142434445463031323334353637383941 .....

Data after conversion or within the device

Field ID Field Data (binary field) is binary here

1848989745 0123456789ABCDEF0123456789ABCDEF0123456789A .....

The following data will be written on the ID card:

0123456789ABCDEF0123456789ABCDEF0123456789A .....

Binary the data looks like this:

0x30, 0x31, 0x32, 0x33, 0x34 .....



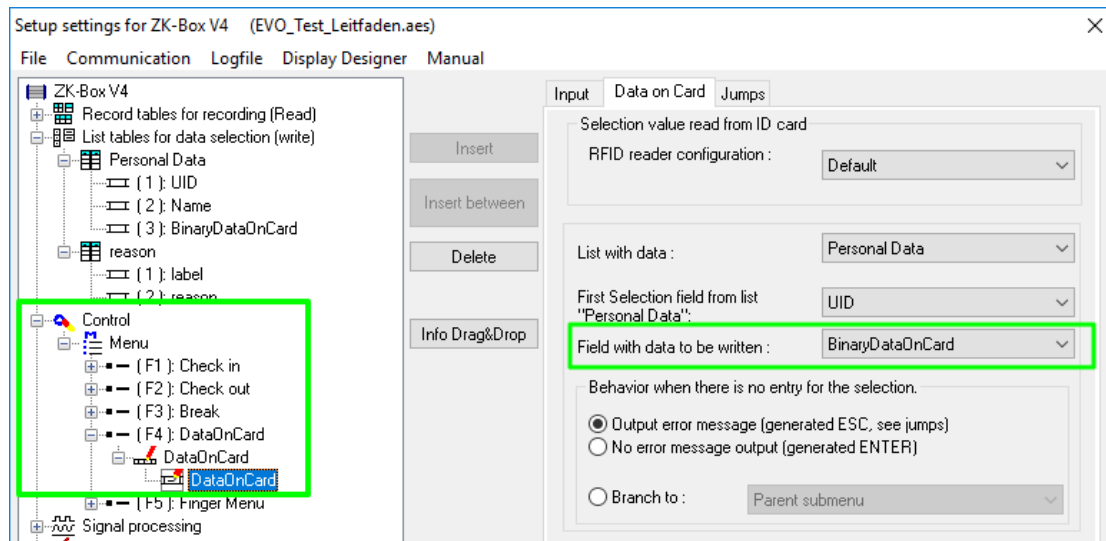
**Please note:**

When a 3-tone sequence is signaled, the Data-On-Card option is not available on this device. The option has to be purchased afterwards.

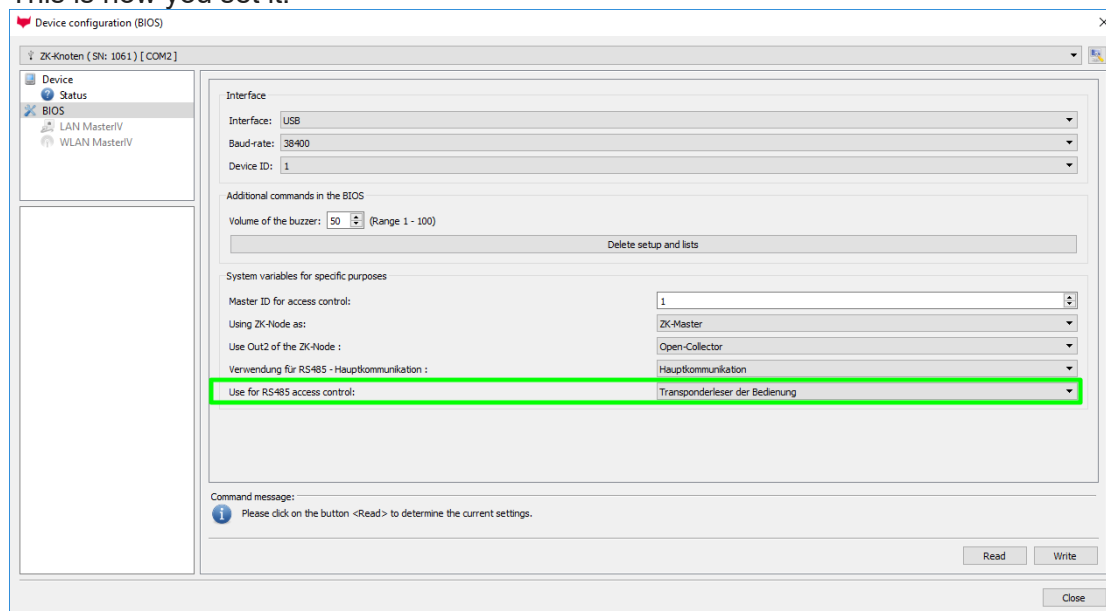
### 5.10.3. DataOnCard on the access control reader

In order to be able to use on a standard ZK reader of the EVO or the PHG series, the following settings must be made.

The functions for DataOnCard described in the previous chapters can only be set in the setup under Control menu.



Now it is necessary to be able to access the *access control reader* under the control. This is how you set it:



The reader on the *access control reader* (ZK) bus (RS485) is now activated via the Control menu (Operation transponder reader)



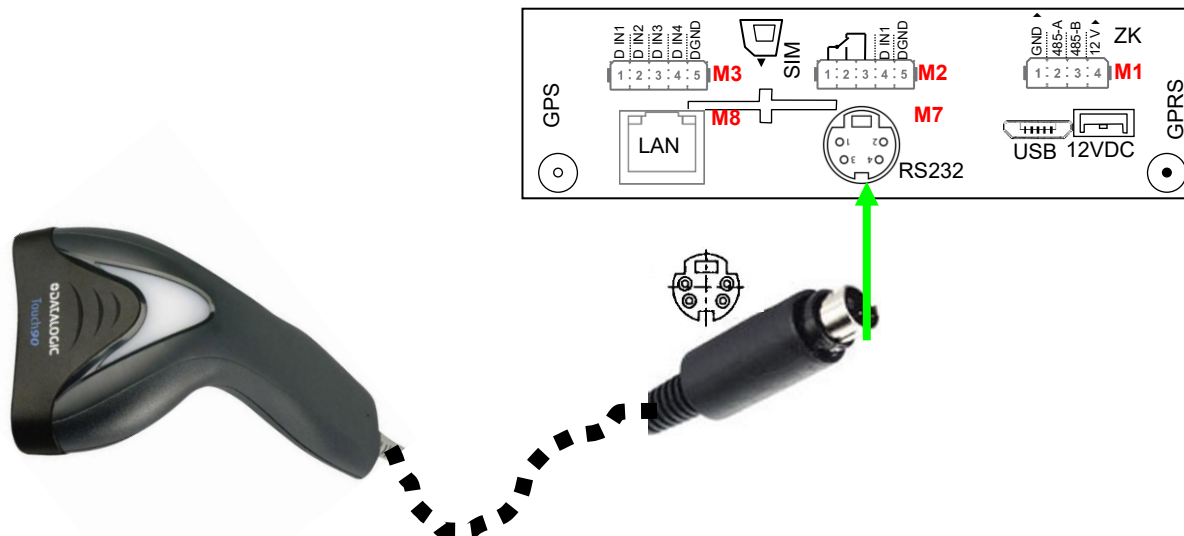
**Please note:**

Only one *access control reader* (ZK) can be connected to the bus at any time. Dip switch 1 and the termination of the bus must be set to "ON" (Bus address 1).

#### 5.10.4. DataOnCard and a access control reader - wiring

## 5.11. Barcode Reader on RS232 port

You can use an internal barcode reader 2d or 3d and you can connect any barcode reader with a RS232 port to the EVO 4.6 FlexKey. Observe the following pin assignment of the RS232 interface.



Description	Modulplace	PIN	Function
RS 232 Mini-DIN M004	Here an example on <b>M7</b>	1	TXD
		2	RXD
		3	+ 5 V
		4	Ground / GND

Barcodes that are read in can be up to 255 characters long. This is supported by the field function "Normal (value transfer from ID card, etc ...)".

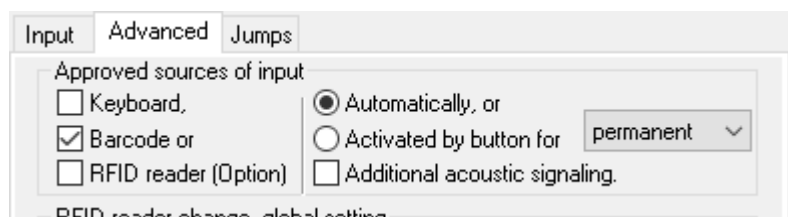
From this 255 characters can you copy maximum 60 in a global variable.

The RS232 take information in this format:

- 9600 Baud
- 1 Stop-bit, no parity
- And need CR LF on the end

More information about cut a value find you in the manual DatafoxStudioIV in the chapter "Normal (value transfer from ID card, etc ...)".

### Setting in the DatafoxStudioIV:





## 5.12. Fingerscanner optical sensor

In response to many customer requests, we have added a new finger sensor to our product range. This is an optical surface sensor.

**RGB LED**  
The LED is controlled by the setup of the device.  
See field function  
"Switch the backlight."

Optical area sensor.

**Advice:**  
The background LED illumination is only on when a finger is placed on the sensor.



With the sensor, a new menu navigation was also introduced for teaching in and deleting the fingers. The menu is called up automatically when the Administration field function is called up in the setup (device configuration).

The menu contains 6 pages: **Check fingers, teach fingers, train fingers; delete individual fingers and delete all fingers. In addition, Finger Writing on Card can be active.**

Input Jumps

A function for field and/or GV execute assignment

Name of the field query: Finger Menu

Text in row 4 of the display: Name of field

field name, in accordance: not selected

Field function: Fingerprint: fingerprint administration

Global variable with PID: GV: PNR

Show / hide pages:ht eingeblendet

- Check fingers
- Teach-in finger
- Training fingers
- Deleting individual fingers
- Delete all fingers of a person
- Writer Finger templates onto card

**You can select the individual menu items!**

You can also watch the handling of the new finger sensor in our video.

<https://www.datafox.de/video-verwendung-und-einlernen-einer-fingerprintloesung-mit-optischen-flaechensensor.de.html>


### 5.12.1. Menu Page - Check Finger

This page is used to find out which finger provides the best scan result and how the finger should best be placed on it. To do this, place your finger as straight as possible with light pressure on the sensor. The most important area is the middle of the foremost finger link.

Take your time to select the fingers that provide the best possible image. Please observe the pictures and [instructions](#) below.

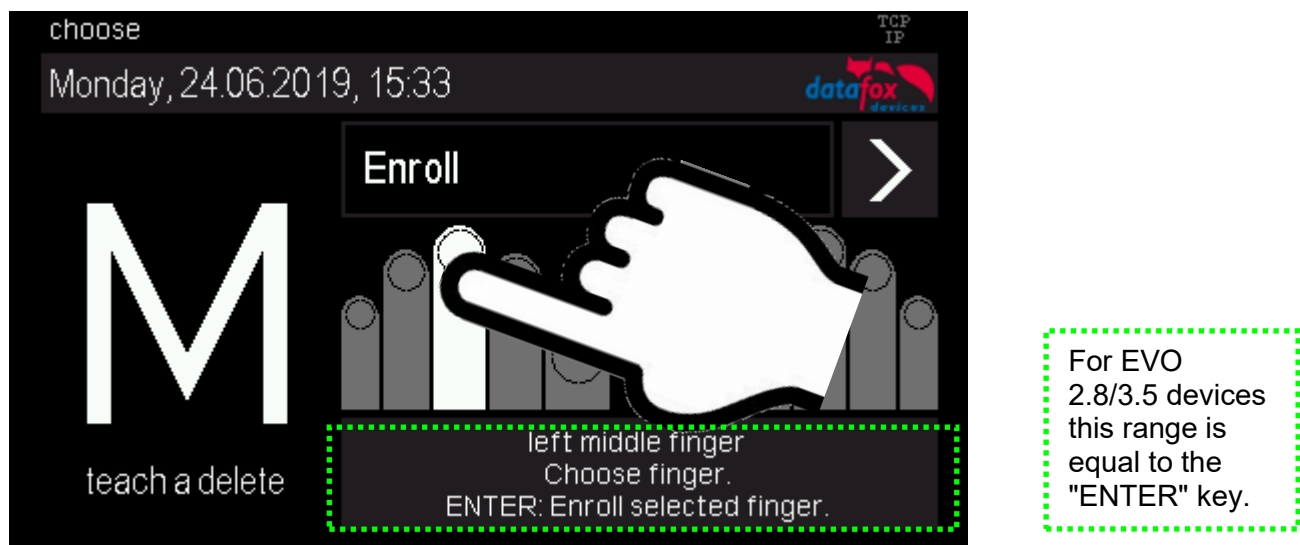
If the overall picture is too pale, this could be due to the dryness of the finger. Slight rubbing or breathing on the fingertip improves this considerably, see also the example pictures below.



Once you have selected the appropriate fingers, press the arrow , to move to the next page.

### 5.12.2. Menu page - "Teach in" fingerprints

Select the finger you want to teach in by simply tapping on the corresponding finger shown in the display! The dark grey fields symbolize the two hands, the thumbs are in the middle.



Follow the instructions on the display.

The finger must be scanned 3 times. After each beep, briefly lift your finger off the scanner and replace it.

The successful teach-in is indicated by a green field which also contains a quality value. With a quality value of 85 and more, the teach-in was very successful.

If the values are lower, the teach-in can be repeated directly in order to achieve a better result. Teaching-in should be completed with the highest possible quality value, as this is the basis for later recognition.

Of course, there are fingers that can only reach lower values. In this case, however, other fingers of this person should also be tested.

We recommend to teach in at least two fingers for each user if a finger is not recognizable due to injury.

If you select a different finger symbol, you can then learn additional fingers directly.

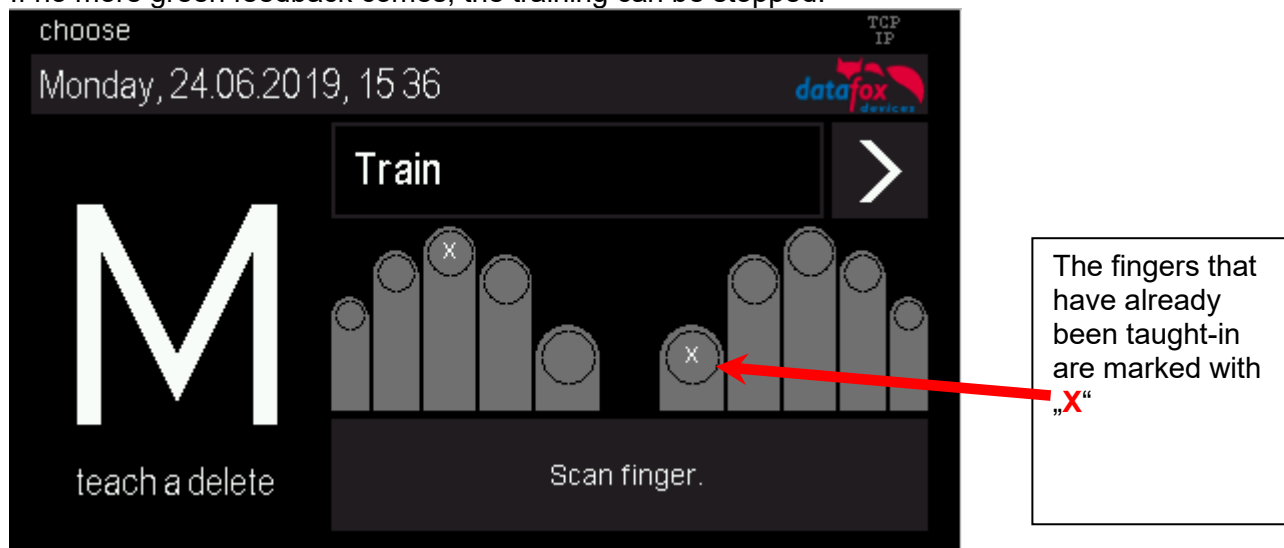
### 5.12.3. "Training" menu page

This step fulfils two tasks, on the one hand a functional check that the taught-in fingers are actually recognized, on the other hand the system can be further optimized, i.e. trained.

To optimize, the fingers should now be deliberately moved or twisted a little.

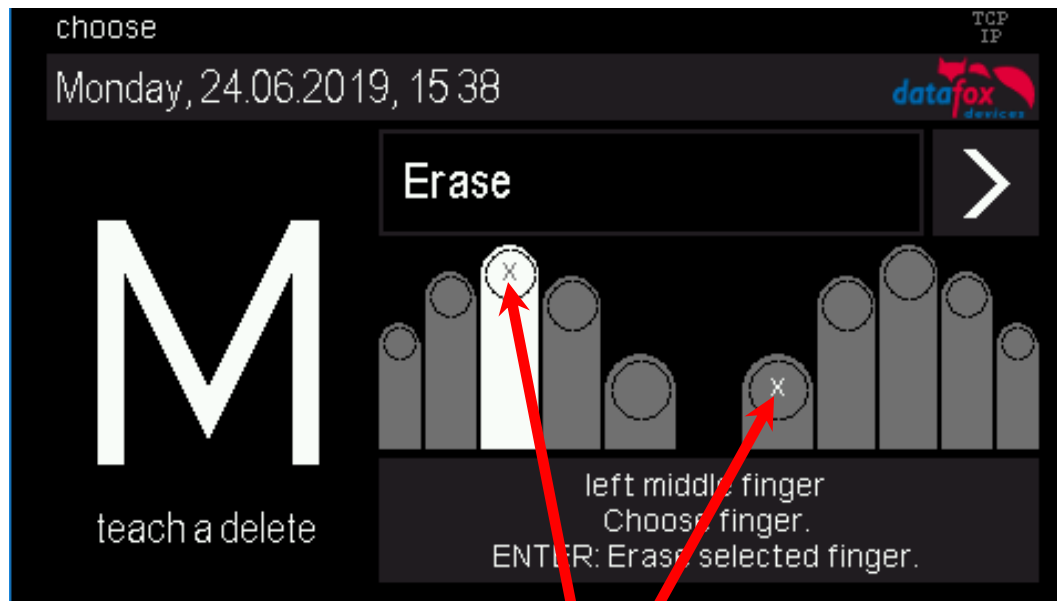
This way a larger area of the finger will be recognized bit by bit and the saved template will be optimized. An optimization is indicated by the green bar. Good for the system is, if several such optimizations can take place to a finger.

If no more green feedback comes, the training can be stopped.



#### 5.12.4. Menu page - Delete

Delete individual fingers:



The taught-in fingers are marked with "X".  
Tap on the finger you want to **delete** and confirm with "Enter".

#### Delete all fingers of a person:

On the next menu page "Delete all fingers of a person", all taught-in fingers of the person are highlighted. When you confirm with Enter, all the person's fingers are removed from the fingerprint sensor.

#### 5.12.5. Menu page - "Exit

Menu page - "Exit

For EVO 2.8 and 3.5 there is a separate page for exiting the finger administration menu. Simply click on the center of the screen and exit the menu.

With the EVO 4.3 you can exit the administration menu by pressing the "ESC" key.

## Hinweise zur Verwendung des Fingerprint-Flächensensors Hints for using the fingerprint area sensor

Dieser Abschnitt zeigt anhand von Fingerprint Bildern, wie sie auch beim „Finger check“ angezeigt werden, wie ein Bild aussehen sollte und welche Auswirkungen durch schlechte Position, falschen Druck oder ungünstige Finger erkennbar sind.

This chapter shows with images, as they are also shown in the function “Finger check” how a good image should look like and how they could look with respect to bad positions, bad pressure or difficult fingers.

- Der Finger muss mit leichtem Druck auf den Sensor gelegt werden.  
The finger must be put onto the sensor with light pressure.
- Der wichtigste Bereich ist die Mitte des vordersten Fingerglieds, da dort die meisten Eigenschaften vorhanden sind.  
The most important area is the middle of the front finger link, because there are the most characteristics.
- 

### Gutes Bild / good image



### Schlechte Positionen / Bad positions

Zu weit unten  
Too far down



Zu weit oben  
Too far up



Zu weit links  
Too far left



Zu weit rechts  
Too far right





Schlechter Andruck / **Bad pressure on the sensor**

Zu wenig Druck  
**Too little pressure**



Zu viel Druck  
**Too much pressure**



Finger verdreht / **Finger twisted**

Zu steil, nur Finger-  
spitze  
**Too steep, only finger-  
tip**



Nach links verdreht  
**Twisted to left**



Nach rechts verdreht  
**Twisted to right**



Schräg rechts /  
**Diagonally right**



Trockene Finger / **dry fingers**

Finger sehr trocken  
**Finger very dry**



Trockenen Finger kurz  
gerieben  
**Dry finger shortly  
rubbed**



Trockenen Finger an-  
gehaucht  
**Dry finger breathed on**



Trockenen Finger ein-  
gecremt  
**Dry finger with cream**



## Schwierige Finger / Difficult fingers

Falten /  
Wrinkels



Unterbrechungen /  
Interruptions



Falten, unscharf  
Wrinkels, diffuse



Unscharf /  
Diffuse



## Schwierige Finger / Difficult fingers

Generell Undeutlich /  
Generally unclear



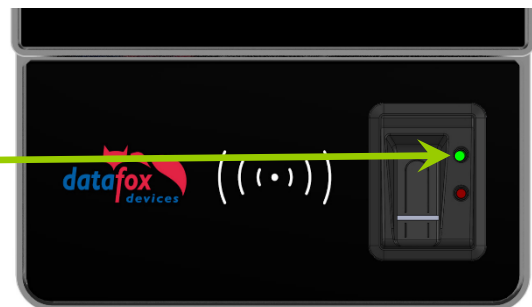
### Fingerprint Flächensensor Saturn01

Templates	5000 Templates à 640 Byte, ISO19794-4; ANSI-378	In the module 5000 fingers can be managed, a template has 640 Bytes.
Resolution	500 dpi	The sensor-resolution is 500 dpi.
Active area	14 x 18mm	The active area of the sensor is 14 x 18 mm.

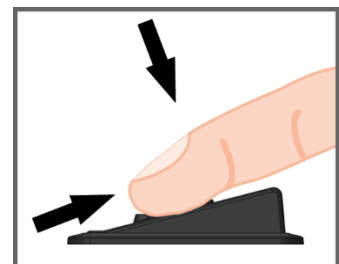
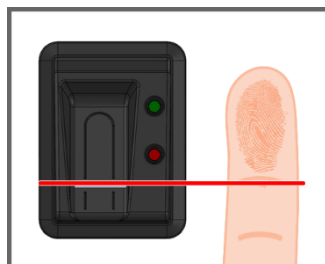
## 5.13. Finger scanner Line Sensor

### 5.13.1. Operation Finger Scanner

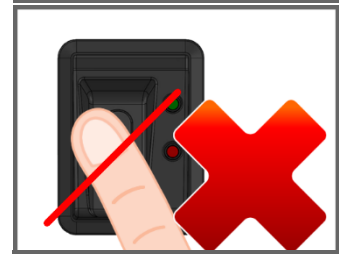
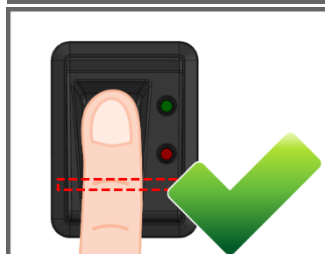
The fingerprint reader's readiness to scan is indicated by the flashing green LED.



1.) Place the finger with the area of the first finger segment.



2.) Lay the finger flat. Caution, do not place your fingers on the edge, otherwise only a part can be detected.

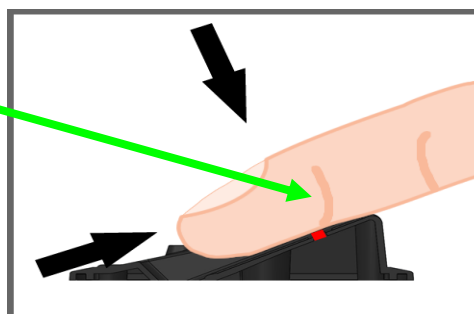


3.) Pull the finger over the scanner with a little pressure on the scanner. In order to allow a good detection of the finger, the fingers must be clean!



#### Attention!

This small strip, shown here red, is the actual line scanner. Pull the finger over the sensor with light pressure. The contact from the finger to the scanner must not be interrupted.



Section view

#### How to scan correctly - video

<http://www.datafox.de/videothek.html>

**guide:**



All terminals should be mounted in such a way that the finger sensor is at the same height so that the handling can be carried out identically.



In no case may be components on the finger, which have an abrasive effect. These use the protective layer of the line sensor and thus significantly reduce the service life.



### 5.13.2. General information

Biometrics offers the possibility of identification and verification by the body's characteristics. Datafox supports finger detection with the fingerprint module. ID cards and PINs are no longer necessary and thus cannot be forgotten. Reading the fingerprint replaces reading the ID card. Of course, all functions which are available when reading an ID card are also supported for fingerprints. This data sheet is an addition to the respective product sheet.

#### Basically, you have to differentiate between the following information:

The "PID" is the person identification number, also called employee number. 10 finger templates can be assigned to one PID at most. The PID should be a decimal number; when using transponders the corresponding format (decimal n digits) must be selected.



#### Caution:

The PID must not exceed the decimal value of 4294967295 ( $2^{32} - 1$ ). We recommend working with a 9-place PID.

The "finger template" consists of the PID and the finger characteristics of a person. The finger characteristics are the feature points (minutiae) which are determined from the image after scanning a finger.

The "security level" (false acceptance rate / false rejection rate) defines when a read finger is accepted or rejected. 60 means that 60% of the minutiae of the scanned template must match 60% of the reference template, in order to declare the detection as valid. We recommend setting the value not lower than 55 and not higher than 75. It is best to use 60.

Image quality is the number of usable finger lines in relation to the number of available finger lines. We recommend setting the value not higher than 40.

The "count of minutiae" defines how many minutiae must be determined from the image so that a template for a matching can be created or declared as valid. We recommend setting the value not lower than 7, better set to 10.



#### Caution:

For image quality the recommended value is 40. For older models with Biokey 3000 with a firmware version 04.12, the recommended value is 70. Biokey 3000 with firmware 61.00, the image quality must necessarily be less than 70. The recommended value of 40 offers an optimum for learning the fingers.



#### Note:

Recommended settings:

**Security level 60%, quality: 40% minimum of minutiae: 15**

Difficult fingers can be detected by decreasing the parameters, but this can lead to false detection. The behavior must be checked in each individual case, since it is very dependent on the group of people.

In such cases, one should switch to another finger, because not every human finger is suitable for the Minutiae method.

### 5.13.3. Teach-In

In order to use fingerprint, the persons must be taught-in at the terminal at first.

**4 steps to teach-in the Finger**

**Step 1**  
Read the PID

Chip number                      or                      choosing on a list                      → PID



personnel data  
 ( 1 ): ID Number  
 ( 2 ): Name

ID-number	Name
00799611485215	M. Mustermann
05597861113494	M. Musterfrau

**Step 2**  
Scan finger  
 Fingerprint: scanning.

**Step 3**  
PID and finger characteristics to combine

Field funktion:

PID    +    finger characteristics    =    Template

**Step 4**  
Save Template



#### 5.13.4. Procedure

##### Identification

The finger characteristics are recorded via the fingerprint module. Then, the data pool is checked for matches. If a match is found, the PID of the person is returned, otherwise an error. The matching threshold is determined by the security level.

##### Verification

An employee identifies himself via a transponder. The PID (employee number) is read from the ID card. Then the employee has to swipe his finger across the scanner of the fingerprint module. In the data pool of the fingerprint module, all primary keys (combination of PID and template) with this PID are determined (up to ten assignments are possible) and checked for matches with the scanned finger characteristics.

Advantage: faster detection, higher security

Disadvantage: further detection medium needed, e.g. transponder

##### Identification with Data Storage of Finger Templates in the Fingerprint Module

The terminal polls the fingerprint regularly whether someone has read their finger. If so, the fingerprint transfers to the terminal, who has read their finger and whether the finger was valid. PID and validity are transferred. The task in the terminal for the fingerprint triggers an input sequence and access control - if defined in the setup. If no person is detected, the fingerprint returns a PID = 0.

##### Verification with Data Storage of Finger Templates in the Fingerprint Module

The terminal polls a transponder reader regularly whether a transponder was detected. If so, the serial number or a memory block of the transponder is transferred to the fingerprint module. The fingerprint module waits for the reading of the finger. After reading, it is checked whether the finger stored in the fingerprint module with the serial number or the transponder data matches the read finger. The fingerprint module transfers PID and validity to the terminal. The task in the terminal for the fingerprint triggers an input sequence and access control - if defined in the setup.

##### Verification with Data Storage of Finger Templates at a Transponder

The terminal polls a transponder reader regularly whether a transponder was detected. If so, the serial number or a memory block of the transponder and the finger data stored in the transponder are transferred to the fingerprint module. The fingerprint module waits for the reading (scanning) of the finger. After reading (scanning), it is checked whether the finger transferred by the ID card matches the read (scanned) finger. The fingerprint module transfers PID and validity to the terminal. The task in the terminal for the fingerprint triggers an input sequence and access control - if defined in the setup.

### 5.13.5. Process Variants

#### **Teach-in for identification/verification with data storage in the fingerprint module**

- 1.) Determine PID (read from ID card or via list selection)
- 2.) Scan finger (determine finger characteristics)
- 3.) Teach-in (amalgamate PID and finger characteristics and save in fingerprint module)

or

- 1.) Scan finger
- 2.) Determine PID
- 3.) Teach-in fingerprint module

#### **Teach-in for verification with data storage on a Mifare card**

- 1.) Determine PID (read from ID card or via list selection)
- 2.) Scan finger (determine finger characteristics)
- 3.) Teach-in (amalgamate PID and finger characteristics and save on Mifare card)

or

- 1.) Scan finger
- 2.) Determine PID
- 3.) Teach-in and save on Mifare card

#### **Identification via fingerprint module**

- 1.) Scan finger
- 2.) Identification via fingerprint module

#### **Verification via BIO key**

- 1.) Determine PID (read from ID card)
- 2.) Scan finger
- 3.) Verification via fingerprint module or
- 1.) Scan finger
- 2.) Determine PID (read from ID card)
- 3.) Verification via fingerprint module

#### **Verification via Mifare card**

- 1.) Read template from Mifare card
- 2.) Determine PID (read from ID card)
- 3.) Scan finger
- 4.) Verification by fingerprint module

or

- 1.) Scan finger
- 2.) Read template from Mifare card
- 3.) Determine PID (read from ID card)
- 4.) Verification by fingerprint module

#### **Deleting a template from a fingerprint module by identification**

- 1.) Scan finger
- 2.) Delete template from fingerprint module or
- 1.) Determine PID (read from ID card or via list selection)
- 2.) Delete template from fingerprint module

### **Deleting a template from a fingerprint module by verification**

- 1.) Determine PID (read from ID card or via list selection)
- 2.) Scan finger
- 3.) Delete template from fingerprint module or
- 1.) Scan finger
- 2.) Determine PID (read from ID card or via list selection)
- 3.) Delete template from fingerprint module

### **Deleting a template from a Mifare card**

- 1.) Read Mifare card
- 2.) Delete template from Mifare card



#### **Note:**

For more information on possible settings see the manual DatafoxStudioIV, chapter "Functions in the Setup → Fingerprint".

## **5.13.6. Technical Data of the Fingerprint Module**

- ATMEL FingerChip
- ATMEL ARM9 Controller
- Storage capacity of 2000 fingers
- Power consumption ca. 120 mA at 3.3 volts, sleep 1  $\mu$ A
- Temperature -20 to + 85 °C (-4 to +185 °F)
- Template: Idencom compact format 216 Byte
- Teach-in time 1.2 seconds + processing time terminal
- Matching time: 0.014 seconds
- False Rejection Rate (FRR):  $1,4 \times 10^{-2}$
- False Acceptance Rate (FAR)  $1,0 \times 10^{-4}$
- From 100 fingerprints onwards, we recommend verification only. Combination with PIN via keyboard or ID card.
- Experience shows that not for all employees the fingers can be recorded in sufficient quality.
- Depends on the state of the fingers. For those persons the ID card or PIN has to be recorded.

## **5.14. Camera for EVO 4.3 and FelxKey**

The camera is designed to record the person that is operating the terminal. The camera is not intended to record a video or image sequence, it is meant to create simple snapshots.

With sample images the person operating the terminal and having been identified by the terminal can be correlated. In this way, datasets recorded may be checked and fraud can be detected as long as the image is available.

This chapter explains the steps necessary to use the camera function in your projects.

### **5.14.1. Enabling the camera in the device's setup**

In order to use the camera it has to be active first (see). A default setup does not activate the camera automatically – you have to do it explicitly.

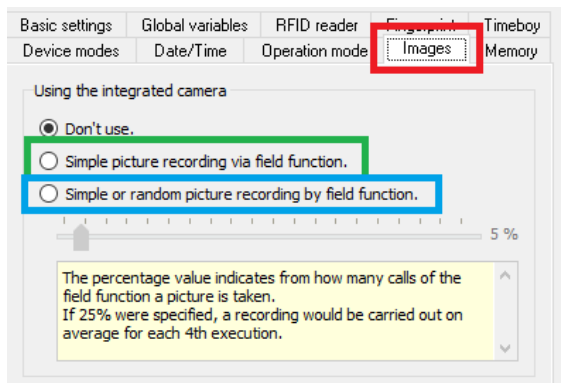


Figure 2 Images / Setup

When using the camera, two modes of operation are possible. These modes are described in the following sub sections.

**Attention:**

!

If the camera is not triggered by a setup function but invoked from a call to the DLL, it has to be activated in the device's setup as well. You will require the activation of the camera in order to use the camera test from the BIOS menu as well.

### 5.14.1.1. Simple picture recording by field function

Using this option (see the green box at **Fehler! Verweisquelle konnte nicht gefunden werden.**) picture can be taken using a field function. The field function is named “Take a picture with the camera” (red marker in **Fehler! Verweisquelle konnte nicht gefunden werden.**).

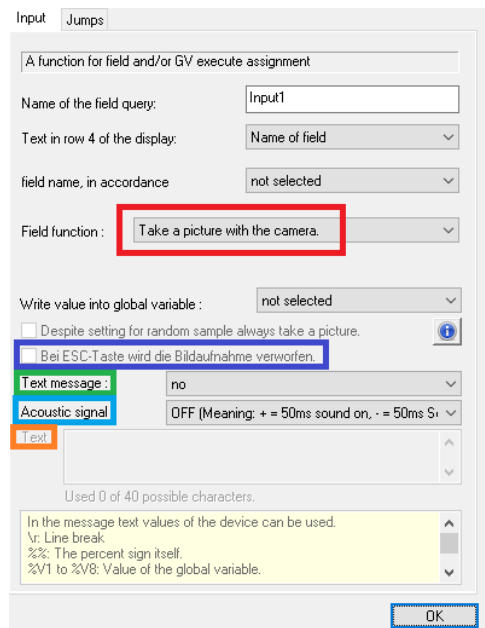


Figure 3 Camera field function in mode “simple picture recording”

The field function provides the name of the image created. Storing this image name inside a data record enables you to link the data record to the image just taken. The image name may be stored within a global variable and / or in a data record field. The data record field will have to accommodate 39 alphanumeric characters (see **Fehler! Verweisquelle konnte nicht gefunden werden.**)

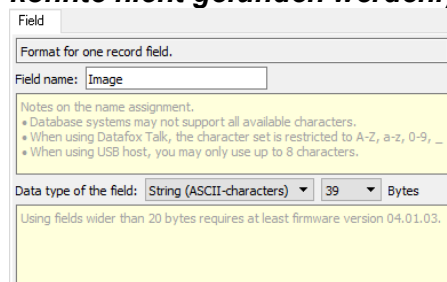


Figure 4 Field size for storing an image name

The image name is build according to the schema

**Device Type Id\_Serial number\_Date\_Time\_Camera Id\_Sequence Number.Image Format**

Example: An **EVO4.3** with **Serial number 123** is taking a picture on **January 21<sup>st</sup>, 2016** at **10:53:44 AM** using **Camera Id 1**. The sequence number counter for this image is **372** and image format is set to **PNG**.

**11\_0000000123\_20160121\_105344\_1\_372.png**

Using this schema to create image file names results in every picture taken having a unique name. In addition to taking pictures you may show a text message on the display when the device has just acquired the image. The duration for showing the text message may be set explicitly (see green box in **Fehler! Verweisquelle konnte nicht gefunden werden.**).

Displaying a message while processing the image not activated by default. A text to be displayed is entered into the orange area in **Fehler! Verweisquelle konnte nicht gefunden werden..** You may incorporate information on the device into the text, please check the info box just below. A text message is displayed until it expires or is being confirmed by “ENTER” or “ESC”, then the image is saved. You may activate “Discard picture on ESC” (see **Fehler! Verweisquelle konnte nicht gefunden werden.** highlighted in purple) to prevent recording the image when pressing ESC. This setting will result in a picture being stored only when a data record is being generated.

**Attention:**  
! The recorded picture will only be discarded, if the ESC key is pressed while the text message is shown. After pressing ENTER, if the message is not configured or when the message expired automatically before you pressed ESC the picture is being saved.

Using the settings on the “Jumps” page (red marker in **Fehler! Verweisquelle konnte nicht gefunden werden.**) you can configure the behaviour upon pressing ESC. By default ESC skips to the next input field (green marker in **Fehler! Verweisquelle konnte nicht gefunden werden.**) – consequently a data record is being generated.

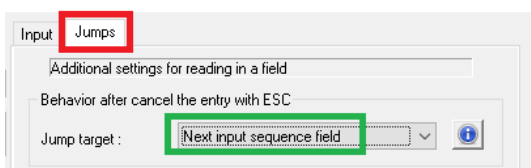


Figure 5 Jump configuration for the camera field function

**Attention:**  
! Saving images and data records are independent processes. An image will be saved even if the record store for data records is full.

Additionally an acoustic signal may be generated when running the field function. The acoustic signal may be selected from the drop down list (see blue section in **Fehler! Verweisquelle konnte nicht gefunden werden.**). The acoustic signal is deactivated by default.



### 5.14.1.2. Simple or randomized picture recording by field function

Using this option (see blue marker in **Fehler! Verweisquelle konnte nicht gefunden werden.**) you may record images as with previous option. In addition to **Fehler! Verweisquelle konnte nicht gefunden werden.**, you may randomize taking a picture using a percentage of images to be taken – in order to collect only a sample set of images. The percentage value corresponds to the ratio of images taken to images not taken when triggering the field function. The percentage may be chosen between 1% and 99% - the default is 5%.

**Example:** A value of 25% results in roughly every fourth image being taken.

By activating the check box “Despite setting for random sample always take a picture” (see red marker in **Fehler! Verweisquelle konnte nicht gefunden werden.**), the randomization may be deactivated, so that an image is taken always.

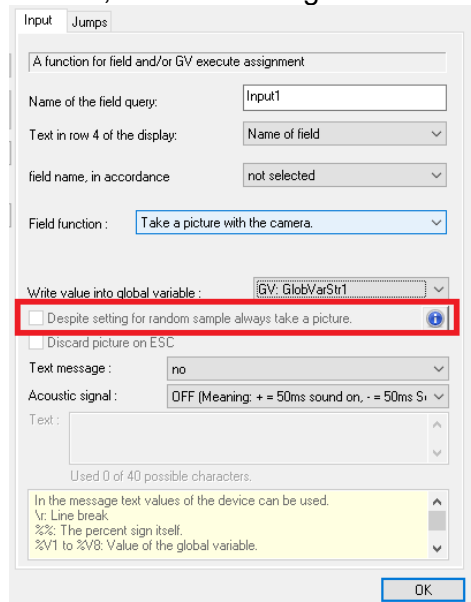


Figure 6 Simple or random picture recording by field function

### 5.14.2. Setting the storage size for camera images

When recording camera images they are being stored on the internal flash or the SD Card. The SD card is preferred if installed. To adjust memory allocation for storing camera images please use the section „Memory“ (red marker in **Fehler! Verweisquelle konnte nicht gefunden werden.**) to assign a percentage of the total memory (green marker in **Fehler! Verweisquelle konnte nicht gefunden werden.**). The percentage may range from 10% to 90%.

You should match the built-in memory (blue marker in **Fehler! Verweisquelle konnte nicht gefunden werden.**) to you device’s configuration to have a better estimate of the allocated amount of memory. The device configuration is available from your device’s data sheet.

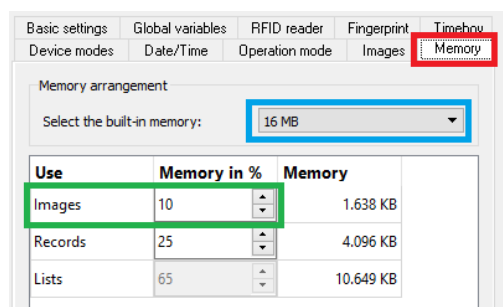


Figure 7 Memory settings

The image size depends on the compression ratio when storing PNG devices. When using BMP files, the images size stays the same for all images.

**Fehler! Verweisquelle konnte nicht gefunden werden.** associates the image resolution to the memory required for storing using BMP format. The BMP format sizes are an upper limit for the size of a PNG image. You can compute the number of images that may be stored on the device from the allocated memory and the images size.

Please Note: During test we encountered that the size of PNG images is roughly 50%-90% of the size of comparable BMP images.

Table 1 Images resolution and sizes

	Image Resolution (in Pixel x Pixel)		
	160 x 120	176 x 144	320 x 240
Image size when using BMP format	Ca. 40 KB	Ca. 52 KB	Ca. 154 KB

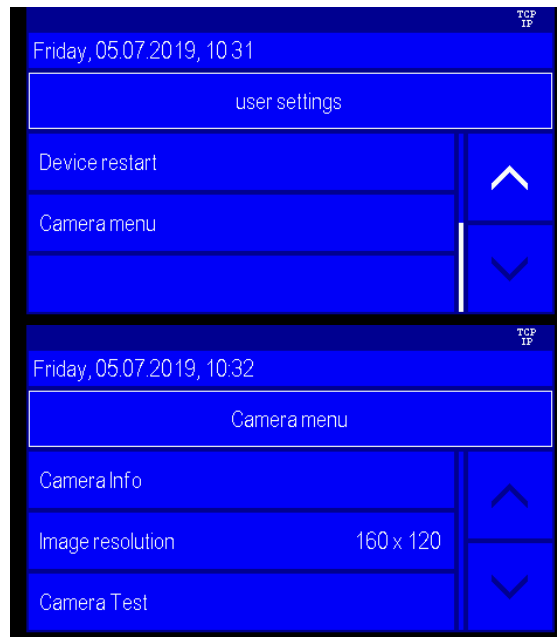
**Attention:**

!

If the image buffer's capacity is exceeded, the oldest image inside this storage will be overwritten when taking a new picture. Thus you will have access to the most current pictures always.

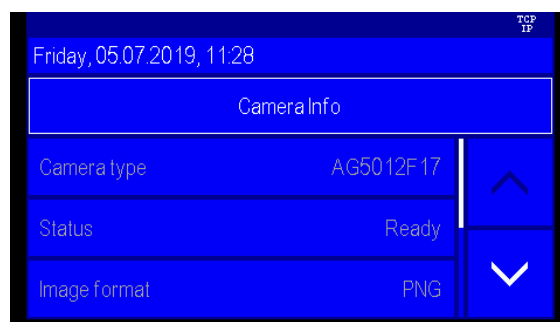
### 5.14.3. BIOS Menu

You may configure your device’s camera using the “camera menu” – the settings are detailed in the following subsections. The “camera menu” is accessible once the camera has started, which may take approximately 90 seconds after the terminals startup. During this startup period the “camera menu” will show “Please wait...”.



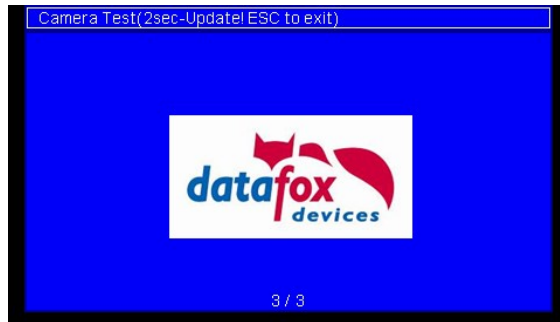
#### 5.14.3.1. Camera information

The “camera info“ menu shows details on the built in camera. These are the type of the camera, its status, the selected image format and the image resolution. You may adjust the settings here.



#### 5.14.3.2. Camera test

Using the “camera test“ menu you can retrieve live images from the camera and display them on the device’s screen. This menu is intended to verify the functionality of the device, may be used to calibrate the device’s position and will provide an impression of the image taken. Test images may be taken in all resolutions available. Since the time required for reading the image from the camera differs depending on the image resolution, the expected update frame rates are shown in section **Fehler! Verweisquelle konnte nicht gefunden werden. Fehler! Verweisquelle konnte nicht gefunden werden.**). The retrieval period is shown at the screens headline.



#### 5.14.4. Transferring images from the device to the PC

Using the DatafoxStudio you may read the images stored on the device and save them on your PC. Please use the dialog “Read image file” for this purpose (red marker in **Fehler! Verweisquelle konnte nicht gefunden werden.**). The functionality is available from the Communication menu as well.

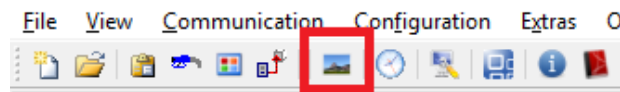


Figure 8 Reading images from a device using DatafoxStudio

Using “Directory selection for storing images:” you may select the storage location on your PC (red marker in **Fehler! Verweisquelle konnte nicht gefunden werden.**). You may set a default directory using the options dialog for storing images (**Fehler! Verweisquelle konnte nicht gefunden werden.**).

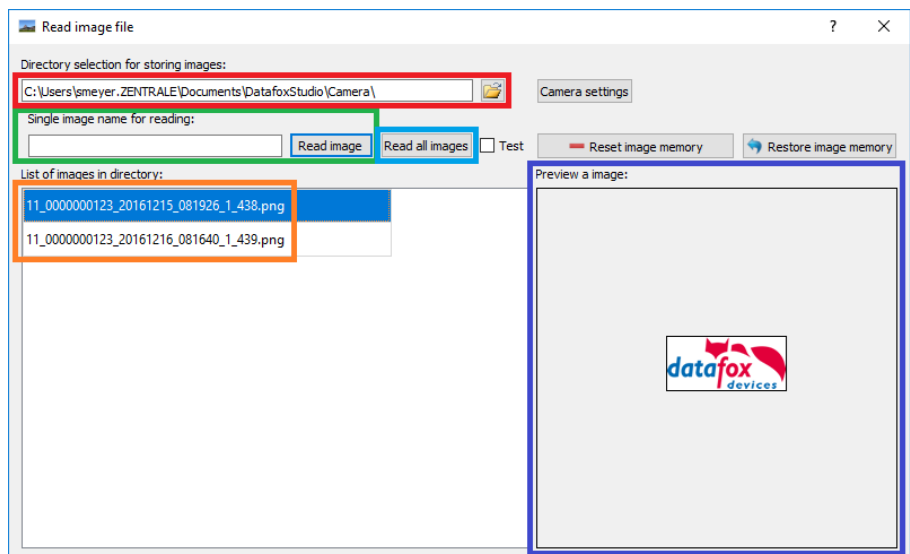


Figure 9 Dialog Read image file

You can download all images from a device using the Button „Read all images“ (light blue marker in **Fehler! Verweisquelle konnte nicht gefunden werden.**). The “List of images in directory” (orange marker in **Fehler! Verweisquelle konnte nicht gefunden werden.**) will contain the list of downloaded images – you may select an image from this list to display a preview (dark blue marker in **Fehler! Verweisquelle konnte nicht gefunden werden.**).

For downloading a specific image, you may enter its name into the field „Single image name for reading:“ and press the Button „Read image“ (green marker in **Fehler! Verweisquelle konnte nicht gefunden werden.**).

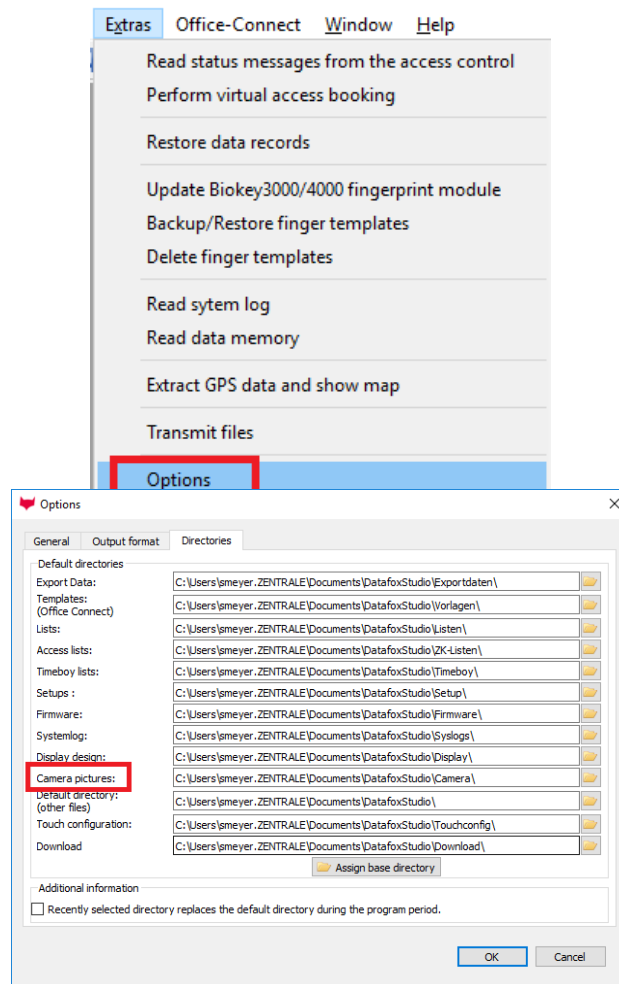


Figure 10 Setting the default image path

#### 5.14.5. Restoring camera images

After downloading the images from a device, you can restore them using the button „Restore image memory“ and download them again – provided the images have not been deleted by using the button „Reset image memory“.

#### 5.14.6. Deleting camera images

Using the button „Reset image memory“ you may permanently delete all images from the device’s memory. These images then cannot be recovered.



#### Attention:

After resetting the image memory a recovery of the images is not possible.

## 5.14.7. Additional information

### 5.14.7.1. Startup time of the camera module

Due to the start time of the module and the internal configuration of the camera the camera is available about 90 seconds after the device startup. Trying to take a photo before the camera startup is completed will result in no image being recorded – the input process may be used despite that and will create a data record.

To start the camera, a setup is required.

After the camera's startup phase, it will not be restarted when transferring a new setup. Should you send a new setup during the camera's startup phase, the camera's startup process will be restarted.

You can use the device's BIOS menu to detect that the startup phase is completed. As long as the camera is in startup, the menu will contain "Please wait..." instead of the configuration options.

### 5.14.7.2. Recommendation for placing the field function in the setup

We recommend to place the field function for taking a picture directly after the field function "Normal" that reads e.g. the transponder. At this point of time we have the highest probability that the person identified is still directly in front of the terminal and thus on the picture taken.

### 5.14.7.3. Availability of camera images

Camera images are stored in the internal flash memory or the SD Card inserted into the device. If a new setup is sent to the device, the images stored will be erased. We recommend to download the images from the camera device before sending a new setup to the device. A corresponding message is shown in the DatafoxStudio when transferring a new setup.

**Attention:**

The images stored on a device are erased when transferring a setup to the device.

#### 5.14.7.4. Status information on the camera

The device status available from the DatafoxStudio provides information on the number of pictures recorded by a device and the camera itself. Later will be provided once the camera startup phase has been completed (see 5.14.7.1).

Section “[RECORD-APPENDIX]” (red marker in **Fehler! Verweisquelle konnte nicht gefunden werden.**) shows information on the image storage area.

The record storage area has the internal type “Photos”, “Size” shows the total amount of data (measured in bytes) that can be put into the storage area. The number of images contained inside the buffer is shown as “Count”.

Section “[CAMERA]” (green marker in **Fehler! Verweisquelle konnte nicht gefunden werden.**) shows information on the camera.

“Type” details the hardware used as a built-in camera.

“Status” shows state information on the camera. The properties shown here are being reset when the device restarts. The first piece of information (here: “Ready”) shows the overall state. The detail information in braces has the following meaning:

- *Pcount* = Total count of images taken
- *PScount* = Count of images recorded by randomized picture recording function.
- *PCcount* = Count of invocations of the randomized picture recording function
- *Mnumber* = Mode of the camera as defined by the setup:
  - „0“ = Camera is deactivated by the setup,
  - „1“ = Camera is used for simple picture recording,
  - „2“ = Camera is used for simple or randomized picture recording.
- *RANumber* = If used for simple or randomized picture recording, *number* is the sample percentage as defined by the setup.
- *Ecount,count* = Number of communication errors between terminal and camera module
- *REcount* = Count of camera module reboots

The “Info” section contains settings applied. Currently, the resolution and image format are shown.

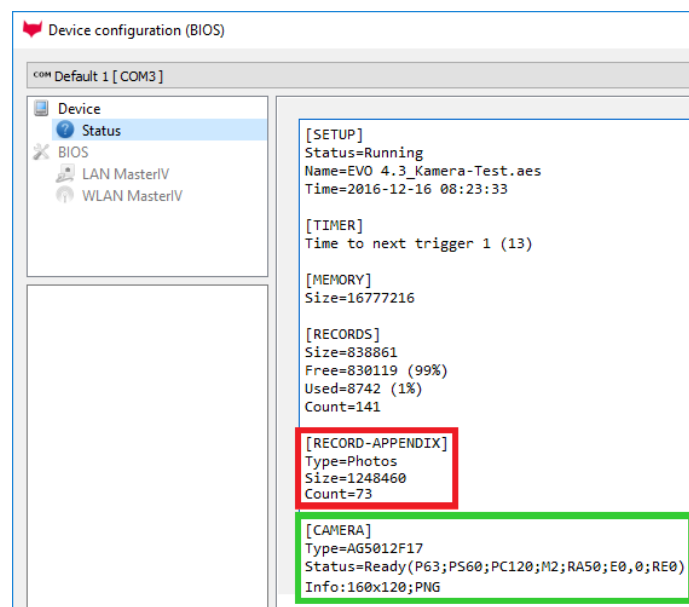


Figure 11 Device status with built-in camera



Above sample **Fehler! Verweisquelle konnte nicht gefunden werden.** shows that 73 images have been recorded. The camera collected a total of 63 images since the most recent terminal restart – of which 60 images were created using the randomized approach. The randomized approach was invoked 120 times at a setup-defined sample percentage of 50%. The camera generates images with a resolution of 160 x 120 pixels in PNG format.

### 5.14.8. Camera frame rates

Recording and retrieving image data from the camera takes a certain amount of time – this results in a certain time lag when recording images. The following table **Fehler! Verweisquelle konnte nicht gefunden werden.** shows the frame rate that can be achieved – depending on the resolution. The time estimates do not differ between storage on an SD card or using the internal flash memory.

Table 2 Camera frame rates

	Possible resolutions (in pixels x pixels)		
	160 x 120	176 x 144	320 x 240
Picture time	3 Seconds	3 Seconds	8 Seconds

Using simple picture recording (see 5.14.1.1) in combination with frequent device operation may exceed the image recording rate as defined above. In this case, the transfer of the picture taken first is completed and the subsequent picture that would be recording during this process is skipped.

#### Hint:



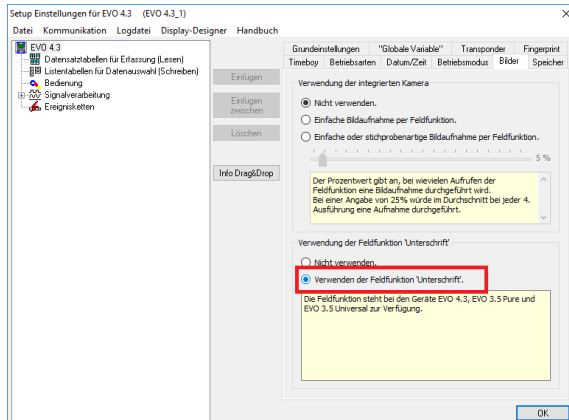
If a quick sequence of pictures to be taken is to be expected and a picture of every person is required, you can try to gap the time required by showing a text message (see 5.14.1.1). This, however, does not guarantee that all operations lead to taking a picture.

## 5.15. Signature function (EVO 4.3 only)

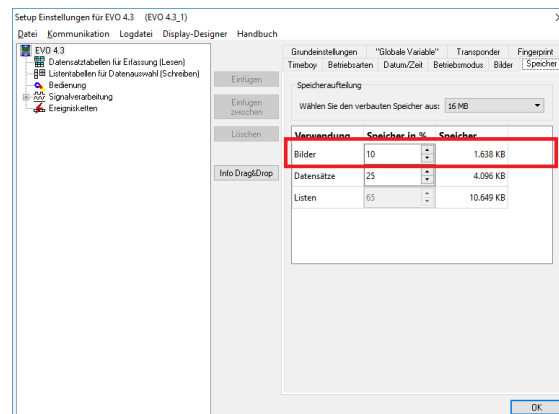
The touch display of the EVO 4.3 may be used to enter a signature directly at the screen. The operator uses a finger to draw the signature directly onto the screen.

### 5.15.1. Configuration using the Datafox Studio IV

The signature function has to be activated in the setup and memory has to be assigned to storing the signature images. You may then use the field function “Signature” at the appropriate place in your setup process.



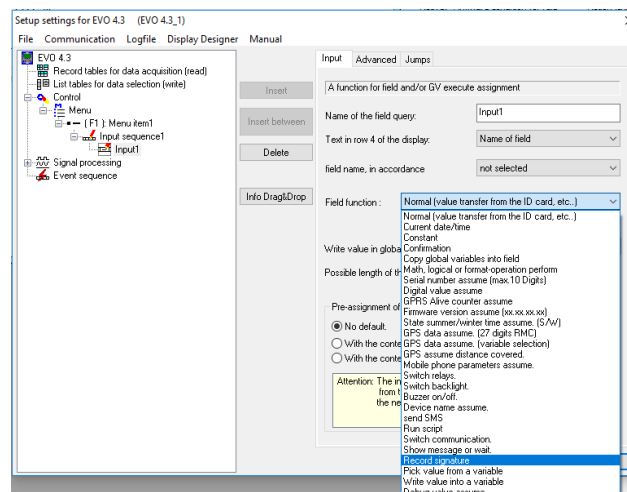
Activating the signature function



Assigning storage to the signatures

### 5.15.2. Integration into the setup process

As soon as the signature function has been activate, the field function “Signature” becomes available. This function can be placed into the setup at the appropriate place where you want to record the signature.



Field function Signature

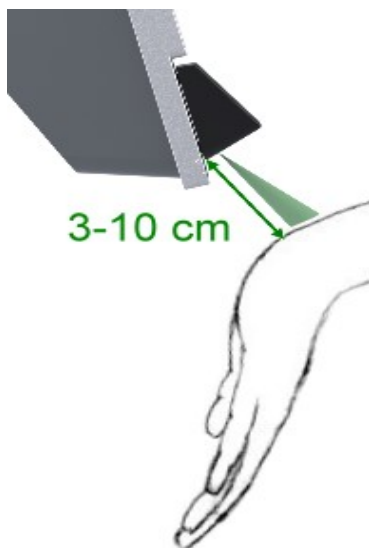
Running the field function Signature on a device results in the image’s name just created by the function being returned. You may store this filename within the data record created – please assign a 40 character wide, alphanumeric record field.

Transferring the signature images is done in the same way as camera images are being transferred (see section Fehler! Verweisquelle konnte nicht gefunden werden.).

## 5.16. Fever measurement on the wrist

			EVO 4.3/4.6	EVO 2.8/3.5	Unive rsal	Agera ZK	Inloc	Mobil Box	IO-Box	Oneloc			EVO- PC
			✗	✗									

The temperature measurement option on Datafox terminals measures the skin temperature behind the wrist at a distance of 3-10 cm. This measurement can give an indication of whether the person at the terminal may have a fever. Fever is often an early sign of contagious infectious diseases, as it is the case with Covid-19.



### Attention:



The temperature measurement of the terminals is only an indication. If an increased temperature is detected here, this must be repeated by another measurement with a medical thermometer.

Which steps are then taken in the individual case must be regulated by the operator, Datafox only offers the technical possibility to measure the skin temperature.

### Attention:



As with all infrared thermometers, only the surface temperature of the skin is measured. This provides a good indication of the body temperature inside.

However, the temperature can also deviate significantly due to external influences, for example:

- Cold outside temperature
- Resting the arms on cold surfaces
- Cold hands
- Poor blood circulation
- Solar radiation
- Sweat

It is recommended to have a few minutes of acclimatisation before the measurement so that the external influencing factors are reduced.

### 5.16.1. Operating sequence of the measuring process

To make operation easier for the user, instructions are given on the display and an LED is also used in the sensor.

1. Start of the procedure by the field function.
2. Notice on the display to hold the wrist under the sensor.
3. The LED flashes. The light indicates where the measurement will take place.
4. When the wrist is close enough to the sensor, ideally 3-10 cm, the LED lights up continuously. At a greater distance it flashes slowly, at a smaller distance it flashes quickly, accompanied by a rapid beep.
5. The measurement takes place and lasts about 2-3 seconds. The arm should be held still during this time.
6. The end of the measurement is signalled by a short beep and the LED switching off.
7. The measured value is shown on the display in different colours depending on the status of the result, see table below.

### 5.16.2. Results of the measurement

The temperature measurement can be integrated into the booking procedure on the unit via a field function. The temperatures described are the default values, they can be adjusted in the field function

Based on the measured temperature, 4 result states are determined:

Status	Range	Colour	Description
1	< 30,0°C	Blue	The temperature is too low, it should not be a human body temperature. Display of the temperature value in blue.
2	30,0°C bis 37,9°C	Green	Body temperature is fine.
3	38,0°C bis 42,0°C	Red	The temperature indicates a fever.
4	> 42,0°C	Purple	The temperature is too high, it should not be a human body temperature.

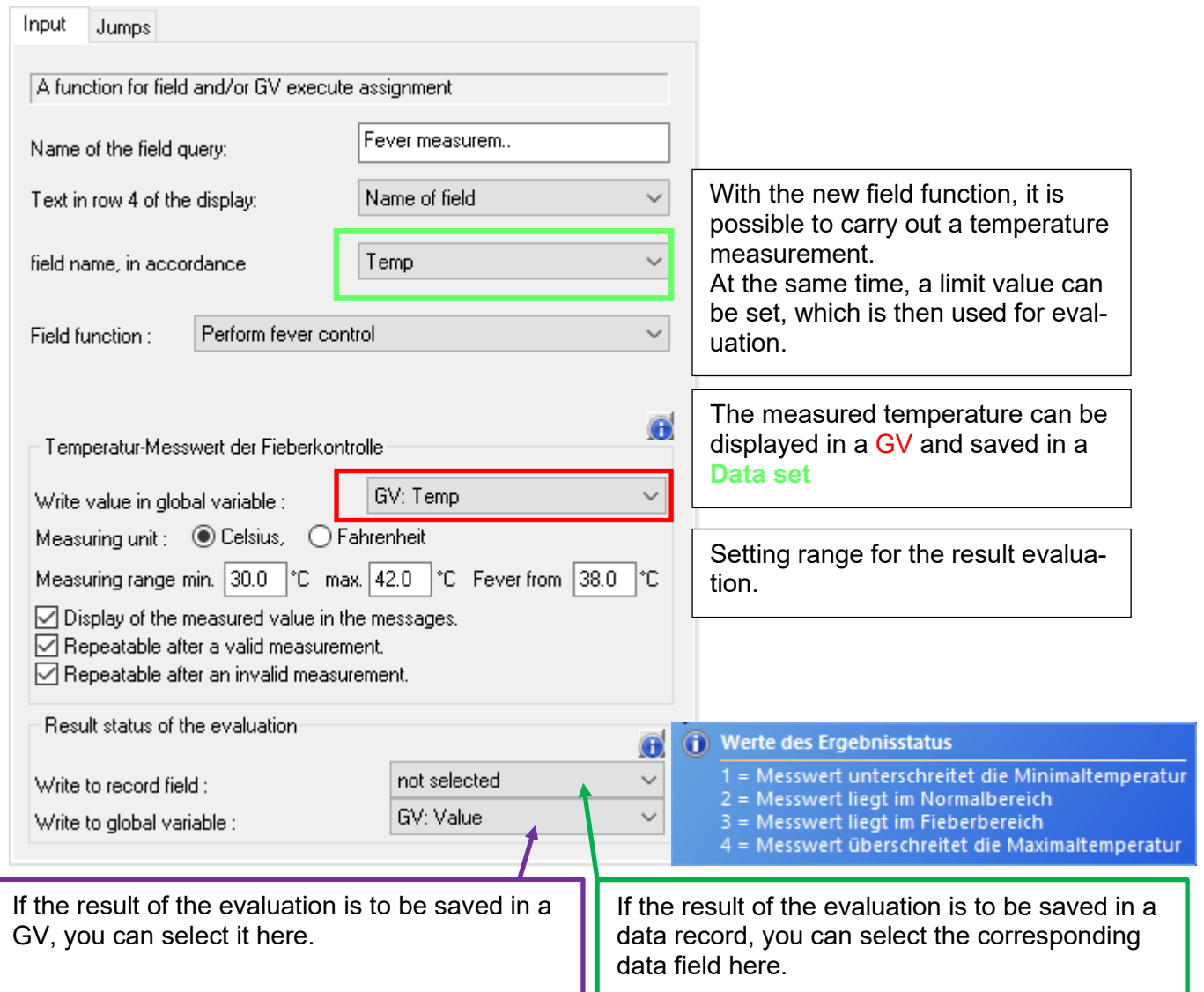
Either the temperature value itself can be used for further processing. The status is also available and facilitates conditional jumps in the further input chain.

#### **Result status of the evaluation:**

In addition to the measured value, the field function provides a corresponding "result status of the evaluation". This can be used in the further course of the input chain in input chain fields to display information messages or to perform other actions (e.g. green or red light).

The value of the result status can be assigned to a record description field or also to a "global variable" for a subsequent evaluation.

### 5.16.2.1. Description of the field function



**Input** Jumps

A function for field and/or GV execute assignment

Name of the field query: Fever measurem..

Text in row 4 of the display: Name of field

field name, in accordance: Temp

Field function: Perform fever control

Temperatur-Messwert der Fieberkontrolle

Write value in global variable: GV: Temp

Measuring unit:  Celsius,  Fahrenheit

Measuring range min. 30.0 °C max. 42.0 °C Fever from 38.0 °C

Display of the measured value in the messages.  
 Repeatable after a valid measurement.  
 Repeatable after an invalid measurement.

Result status of the evaluation

Write to record field: not selected

Write to global variable: GV: Value

**Werte des Ergebnisstatus**

- 1 = Messwert unterschreitet die Minimaltemperatur
- 2 = Messwert liegt im Normalbereich
- 3 = Messwert liegt im Fieberbereich
- 4 = Messwert überschreitet die Maximaltemperatur

With the new field function, it is possible to carry out a temperature measurement. At the same time, a limit value can be set, which is then used for evaluation.

The measured temperature can be displayed in a GV and saved in a Data set

Setting range for the result evaluation.

If the result of the evaluation is to be saved in a GV, you can select it here.

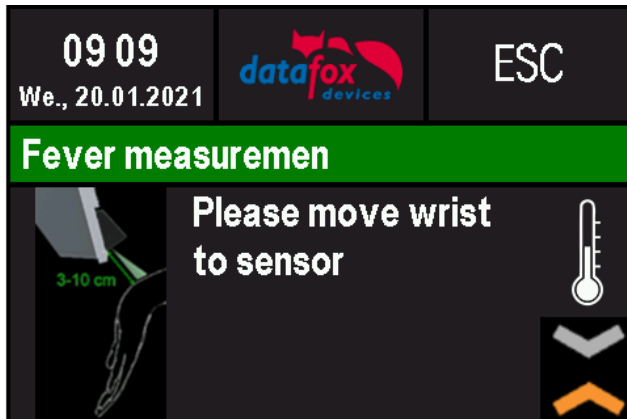
If the result of the evaluation is to be saved in a data record, you can select the corresponding data field here.

The measured temperature is stored in the record description field "Temperature" after successful completion of the function in this example.

The following settings are made in the "Temperature measured value of fever control" area:

- The measured temperature can be written to a "Global Variable".
- The unit of measurement can be selected between Celsius and Fahrenheit, and the measured value is then displayed accordingly. The unit is also written into the record description field and possibly into the "Global Variable".
- The valid measuring range can be adjusted within its limits if necessary. Below 30°C and above 42°C it is to be assumed that no valid body temperature was measured. Elevated temperature and thus suspected fever is indicated from 38.0°C. Which status value is assigned to the result depends on these limits and has already been explained above.
- After a valid or only after an invalid measurement, a query can be activated to be able to repeat the measurement. This gives the user the possibility to perform measurements again by one or more repetitions, e.g. if there were still clothes in the measuring range.

### 5.16.2.2. Operation on the unit

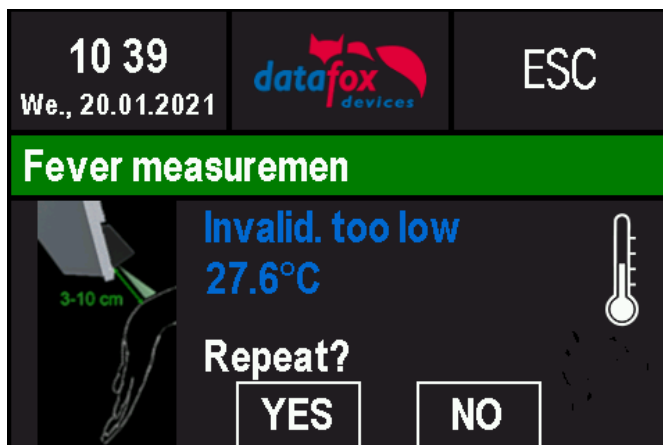
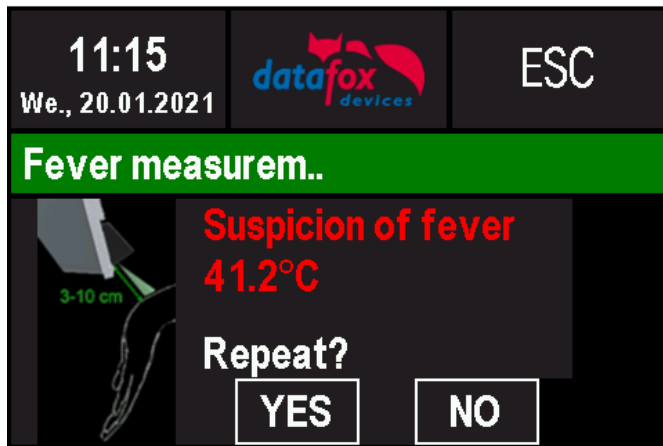


In this case the wrist is **too far** from the sensor.

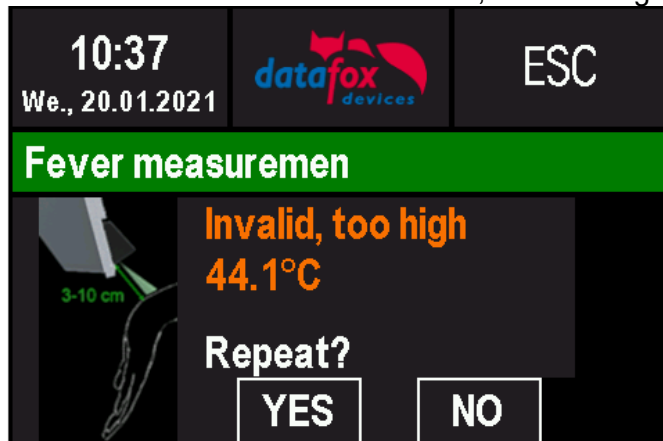


In this case the wrist is **too close** to the sensor.





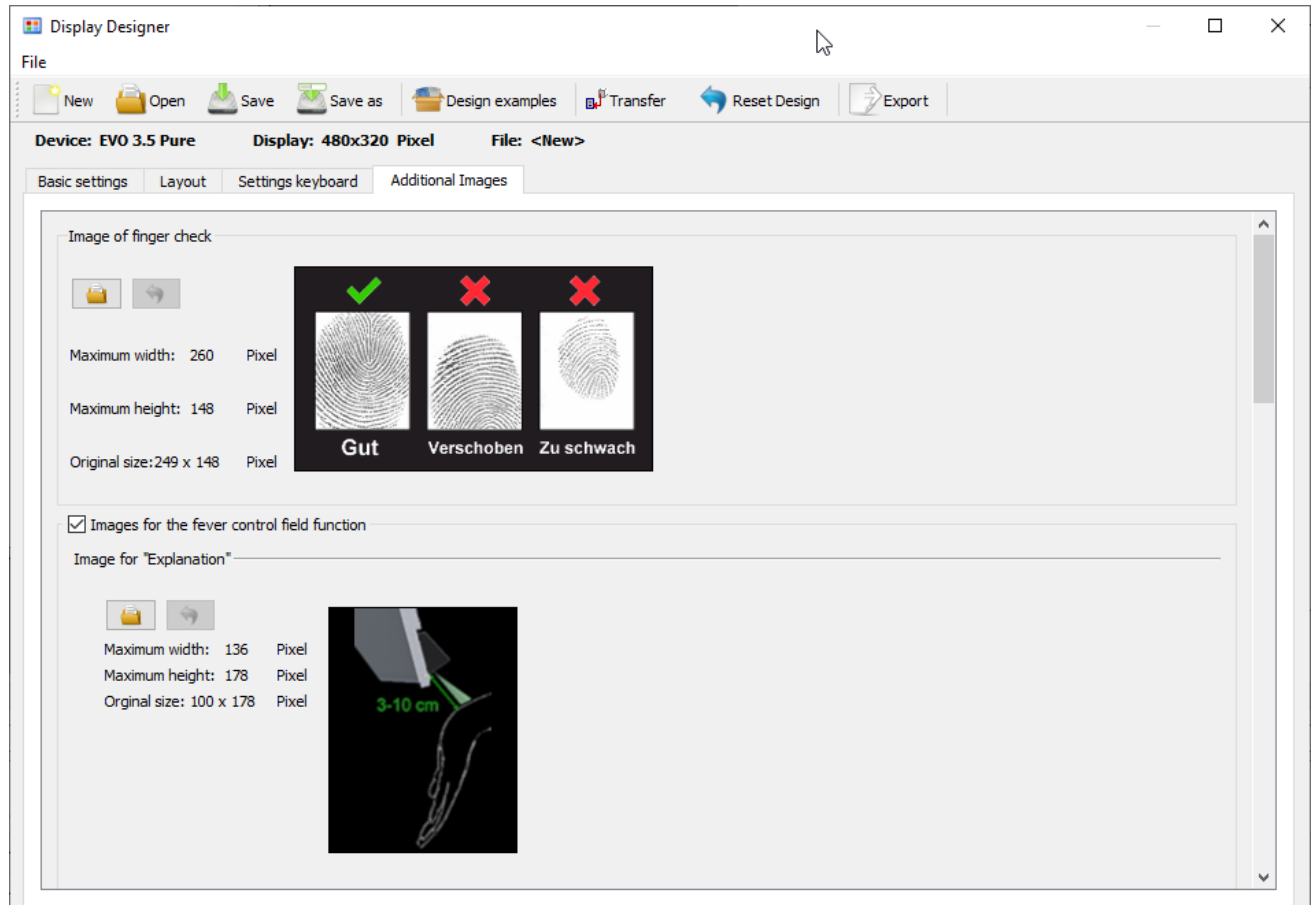
If the maximum set value is reached, this message appears.



### 5.16.3. Description of the field function in the Display Designer

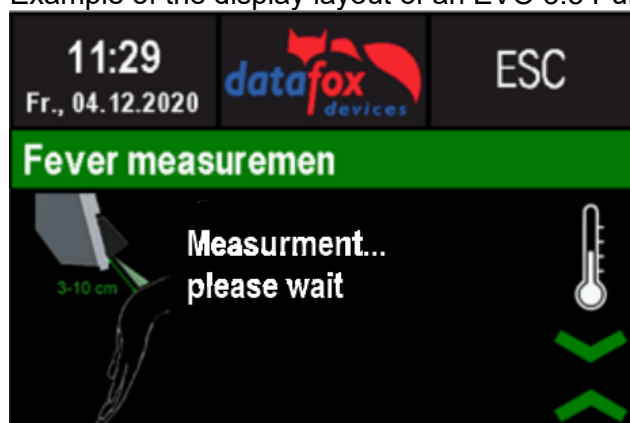
You can adapt the images and symbols that are displayed during fever measurement to your own wishes.

On the page "Additional images" you can decide whether the "Images for the field function for fever control" are displayed and also transferred to the device if the hardware is present.



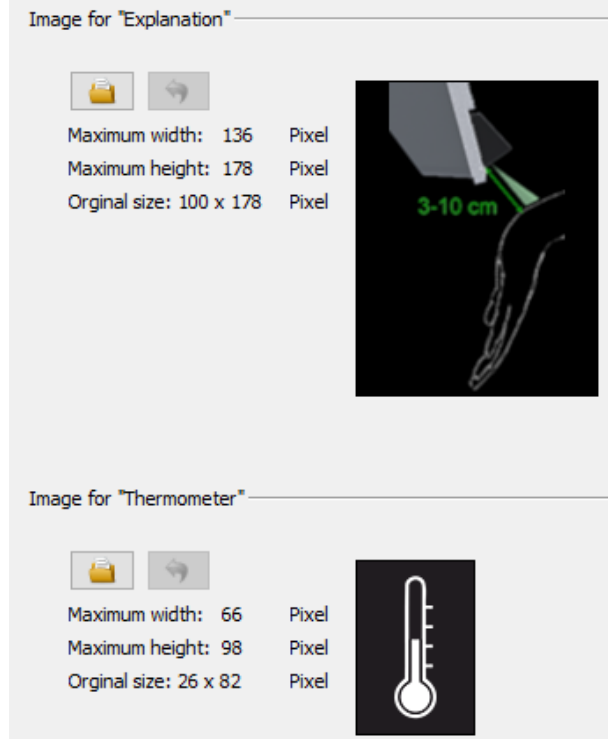
If the option "Images for the field function for fever control" is not selected, the images will not be transferred to the unit, even if a corresponding fever control function has been installed in the unit. If the option is selected, the images are only transferred to devices with a built-in fever control function.

Example of the display layout of an EVO 3.5 Pure during measurement.



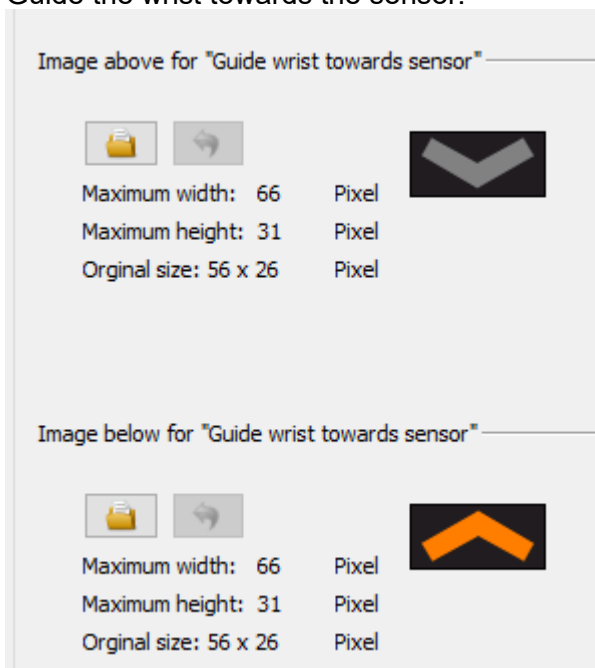


In the display designer, the images are to be specified as follows if the option is selected. Firstly, the image for the explanation (in the left-hand area) and for the thermometer (in the right-hand area).

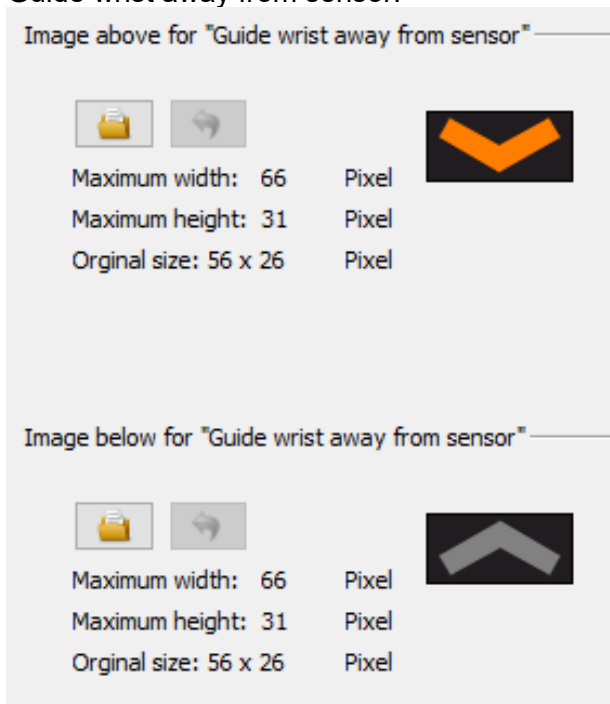


The combination of arrow symbols for the three possible distance states.

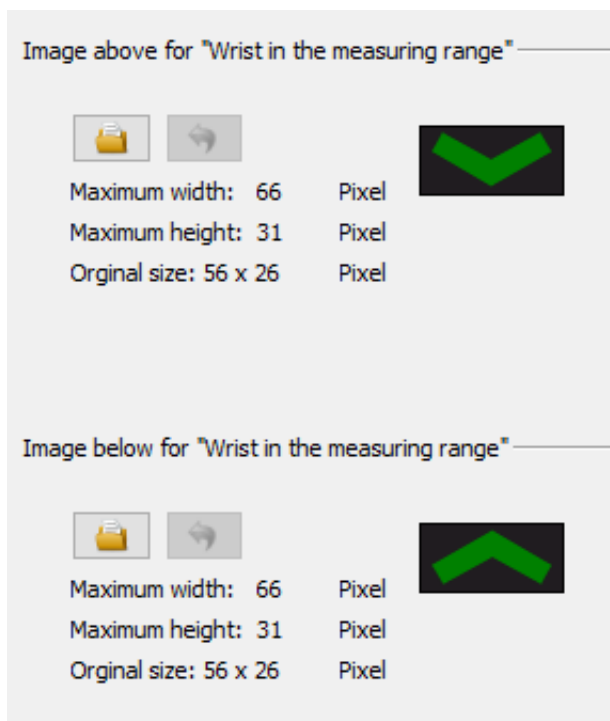
- Guide the wrist towards the sensor.



- Guide wrist away from sensor.



- Wrist in the measuring range.



Please note the maximum image sizes when specifying. Images that are too large will be scaled down to the maximum possible size. Smaller images will be aligned in the centre.

## 6. Technical data Evo 4.6 FlexKey Terminal

09.07.2021 EN | TECHNICAL DATA

Housing	Structure	Front panel made of aluminium and glass, capacitive touch, rear housing shell plastic: ABS
	Dimensions (width x height x depth)	140 mm x 266 mm x 95 mm
	Weight (Without power supply)	base unit 0,98 KG plus wall mount plate 0,235 KG
Individualization	Integrated backlit logo	Illuminated logo on panel 35 x 25mm D-Tile
	Colour of Print	Background and D-Tile freely designable
System	Clock	Real-time clock
Data storage	Flash	16 MB, 100,000 write cycles
	Memory expansion (optional)	SD card, max 2 GB
Display	LCD	TFT: 480 x 800 pixels (480 x 453 for keyboard), active area 85,9 x 154,0 mm LED backlight
Keys	Type	Customizable Buttons on a capacitive glass touch with backlight
	Size	Touch are overall: 95 x 156mm; touch area for user definable keys: 95 x 86mm
Sensors	Proximity / Ambient light	Activating the device by user approach, about 0.8m / Display backlight adjusted to environment
Power	Power Supply / Power	12 V DC / Base unit 4 watts, depending on the equipment up to max. 15 W
	Clock / RAM buffering	Lithium Battery + goldcap
Environment values	Ambient temperature	-20 ° C to +70 ° C (Power Supply -20 ° C to +60 ° C)
	Protection	IP 65 front side, IP54 complete
Software	Configuration program	Setup program (Datafox-Studio) to configure without programming effort
	Communication tools	http, DLL or C source code for integration in the application
Module extensions	For the extension to a variety of functions such as communication, inputs / outputs, sensors, ... are 7 expansion slots for modules.	
Data transmission to PC/Server	USB	Micro USB integrated
	TCP / IP (optional)	TCP / IP operating with integrated TCP / IP stack, 10/100 Mbit
	WLAN (optional)	integrated wireless LAN module, WLAN 802.11 bg and 802.11 n (only 2.4GHz, from 03/2021 also 5GHz)
	Mobile Radio (optional)	online via mobile module 2G, 3G or 4G
	RS485 (optional)	RS485 2-wire bus
	USB host (optional)	for data transfer via USB stick, protection IP22
	Bluetooth (optional)	Bluetooth module integrated; range up to max. 100 m
Readers Connection	RS232 external (optional) (ML01-RS232)	Connection of bar code readers, magnetic card readers, etc. via mini-DIN connector
Access Options	RS485 external (ML01-RS485)	Connection of up to 3 busses with up to 16 external door modules / access readers in total
	Door lock relay with Door Monit. (ML01-DR1)	1 relay changeover, 30 V AC, 30 V DC, 2 A, max. 60 W, 1 digital input (elect. isol.) for door monitoring, ...
MDE Options	Module digital inputs (ML01-D01)	4 x digital input, electrically isolated, up to 100kHz, or 250Hz, Low 0,0...1,5V; High 3,5...30,0V
	Module relay outputs (ML01-R01)	1 x NO, 1 x changeover contact, 30 V AC, 30 V DC, 2 A, max. 60 W
	Module analog voltage inputs (ML01-A1)	4 x input, 15-bit resolution, accuracy ± 2% measuring range 0-10 V, other ranges and functional insulation 230 V on request
	Module analog inputs Current (ML01-A2)	4 x input, 15-bit resolution, accuracy ± 2%, measuring range 0-25 mA; Functional insulation 230 V on request
Additional Options	Fingerprint	Fingerprint module integrated; sensor on the right below
	Integrated transponder reader	125kHz, for example Unique, titanium, Hitag 13.56 MHz, e.g. Legic, Mifare, ISO14443, ISO15693, Simon Voss, iButton, Nedap
	GPS receiver / receiver	50 Channels, GPS L1 frequency C / A, Galileo Open Service L1
	Bar code scanner integrated	1D or 2D/QR bar code scanner
	Column	Column for free mounting
	Camera for random test integrated	Resolution up to 320 x 240 pixel, memory requirements ca. 154 KB per picture
	Fever control at wrist	Only at room temperature +15 - +35°C, no wind, no direct sunlight. Mounted on the side of the device.

## 6.1. communication modules

LAN (TCP / IP)	Width 20mm	10 / 100Mbit, IPv4, IPv6
WLAN	Width 20mm	Standard 802.11.b/g, encryption WEP, WPA2 802 / 11i
GPRS	Width 40mm	GPRS class 10, quad band, mini-SIM socket
RS485	Width 20mm	RS485 connections, up to 30 participants

## 6.2. access modules

RS485	Width 20mm	RS485 connection for the access reader, relay modules, ... power supply from 1 external reader when using Datafox power supplies with 12V
Access Control-IO	Width 20mm	1 relay changeover, 42 V AC, DC 60 V, 2 A, max. 60 W; 1 digital input for monitoring door, ...

## 6.3. Module digital in and out

Digital inputs	20mm	4 x digital input, functional insulation 230V, depending on the device type, up to 250kHz, Low 0.0 ... 1.0 V; High 3,5 ... 30,0V
Digital outputs relay	20mm	1 x NO contact, 1 x change-over contact, 30 V AC, 30 V DC, 2 A, max. 60 W
Digital outputs Open Coll.	20mm	4 x open collector output, 2A, 30V (in preparation)
Analog inputs voltage	20mm	4 x input, 15-bit resolution, accuracy $\pm 2\%$ , range 0-10 V, other ranges and functional insulation 230 V on request

## 6.4. Modules miscellaneous

RS232-Modul	Width 20mm	RS232 interface, with MiniDIN connector or spring terminal 5V-output max. 0,5A, with USB supply max. 100mA.
GPS	Width 20mm	50 Channels, GPS L1 frequency C/A, GALILEO Open Service L1
Micro-SD Card	Width 20mm	Micro-SD Card max. 2GB, depending on device accessible from outside the device
Mobil-Box-Modul	Width 40mm	Central connector for power supply, (8-30V DC), 1 relay, 2 digital inputs and connection for Mobile-Dockingstation with Timeboy
<i>Acceleration sensor</i>	Width 20mm	<i>3D acceleration sensor in preparation</i>

## 7. FAQ

An extensive collection of FAQs can be found on our homepage:

<http://www.datafox.de/faq-de.html>

## 8. Index

### A

Access 85  
Access with PHG reader 109

### B

Bios 21

### D

Device 16  
DHCP 21  
DNS 74

### F

FAQ 189  
For your Safety 1

### G

GPRS 76  
graphic on display 37

### H

Holiday Control 85  
Holiday control ZK 85

### I

Image for the key area 42  
Intended Use and Environmental Protection 5  
introduction 2

### K

Kommunikation 62  
Umschalten 62

### M

Mobilfunk Verbindung Status 77

### P

power supply  
POE 52

### S

SMS 78  
Switch Relays via time table: 85  
System Requirements / Hardware 10

### T

TCP/IP 67  
Technical data Evo 4.6 FlexKey Terminal 188

### U

UPS 12  
USB 62, 64