Datafox GmbH • Dermbacher Straße 12-14 • D-36419 Geisa • www.datafox.de

# Manual

# PZE-MasterIV

Flexible data collection with method

# Alternations

## Alternation in this Dokument

| Date | Chapter | Discription |
|---|---|---|
| 01.03.2013 | all | Revision the manual to new version 04.02.03.xx<br>Please note that not all chapters are in English. We are working on it. |
| 22.07.2013 | SMS | new version 04.02.04.xx |
| 29.08.2013 | Access control | Compleate the Wiring plan |

## 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 generation | YY. Compatibility (which versions can be used together) | ZZ. Version number (functional extension) | Build Troubleshooting (with a new version the Build number is reset) |
|---|---|---|---|---|
| z. B. AE-MasterIV | 04. | 02. | 01. | 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: | 4.02.04.xx. |
| Studio: | 4.02.04.xx |
| Dll: | 4.02.04.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. Ie, 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 download.

# Content

# 1. For Your Safety

## Safety Information for Datafox Products

The device must only be operated according to the instructions given in the manual.
Do no 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!

**Caution!**

Supply voltage: 12 to 24 volts AC / 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.
The following temperature ranges must be observed:
Working area / storage temperature: -20 °C (-4 °F) to +70 °C (158 °F)
Cellular modem -20 °C (-4 °F) to +55 °C (130 °F)
In areas with cellphone ban, GSM, 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.

**Please observe the additional instructions in chapter "Intended Use and Environmental Protection".**

# 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 fingerprint, 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 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, malfunctions 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 functionality of the PZE-MasterIVand 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 PZE-MasterIV 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 AC/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!

## 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. Maintenance / Repair

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.
In order to remove impurities, only use a dry or at the maximum a slightly damped cloth.
Never use scouring or corrosive cleaning agents.

For the removal of smudges, especially on the display, the keypad and the finger scanner, please only use a dry or very damp cloth.  Never use a scrubbing solution or acidic cleaner.

## 3.5. 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.

## 3.6. 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!

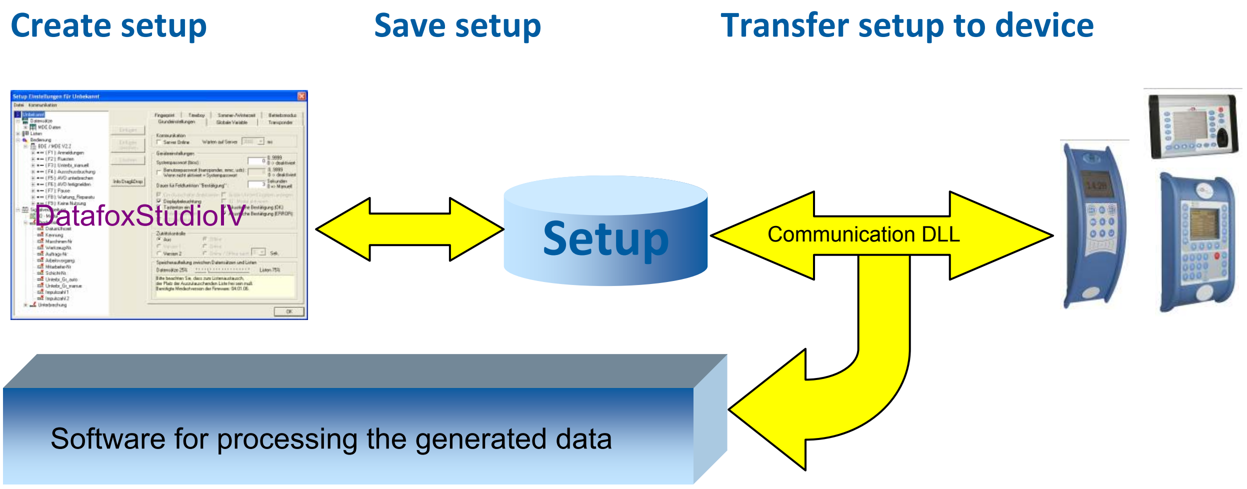
As the user, it lies within your responsibility to dispose electrical and electronic equipment via the designated collection facilities. The correct disposal of electrical and electronic equipment protects human life and the environment.

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.



## 4.2. 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:

- RS232 > a serial cable with two D-sub 9-pin sockets, that are connected one-to-one without jumpers (see Connection RS232).
- RS232 via modem > a serial null modem cable with D-sub 9-pin socket (see Connection Analog Modem).
- WLAN > a distortion-free channel to an access point (802.11 b/g) within reach (see Connection WLAN).
- GSM/GPRS > a distortion-free mobile connection (see Connection GSM).
- RS485 > a transmission path in accordance with the EIA-485 standard (see Connection RS485).
- USB > a standard USB cable (see Connection USB).
- TCP/IP > 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).

## 4.3. Kompatibilität 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

### 4.3.1. Firmware File Archive (*.dfz)

**Description**

Device files (*.hex) of the MasterIV devices are delivered in a common firmware file archive. It has the file extension DFZ (stands for Datafox Zip). Now simply the firmware file archives (*.dfz) are indicated instead of the device files (*.hex). This applies to the DatafoxStudioIV and the DLL. The indication of device files (*.hex) is still possible.

**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.

**Manual Selection of a File**

If you do not want to integrate the archive in your installation, you have the possibility to add single device files from the archive to the installation.
The file format of the firmware file archive is ZIP. Hence, you can open the archive with every standard ZIP-program. Via the entry "Open With" in the context menu you can select an appropriate program for opening the file. If necessary, you can call up a program combined with this file format to open the file by renaming the file from DFZ to ZIP.
In the archive you find a file named "Inhalt.pdf"; it contains information which file (*.hex) of the archive matches your device. Extract the desired device file (*.hex) and rename it if necessary. A renaming of a file is possible at any time, because all information are in the file itself.
You can state the device file extracted before as device file in DatafoxStudioIV and at calling the DLL function. It is still tested if the file can be loaded into the chosen device before the transfer takes place.

### 4.3.2. 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, 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:**<br>Hardware generation V 3 is supported from version 04.02.00.x onwards. The DatafoxStudioIV is compatible up to and including firmware version 04.01.x.y. Older versions 04.00.x.y are not supported any more. |
|---|---|

### 4.3.3. 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.

### 4.3.4. Device Firmware and Communications 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 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.

### 4.3.5. 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.

### 4.3.6. 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.

! **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 Versionen Stand <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.

### 4.3.7. 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:**<br>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:**<br>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

☞ **Hinweis:**
It has to be taken care of a suitable protection from direct sunlight because the synthetic materials are not 100% UV resistant. Fading simply is an optical defect which does not restrict the function of the device.

! **Caution:**
Pleas 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 PZE-MasterIV automatically starts booting, recognition of the hardware options and loading the setup. After having finished booting, the device switches to operation. Now the PZE-MasterIV is ready for use.

☞ **Note:**
On delivery, the main communication is set to RS232 with 38400 Baud.

! **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 Power suply
- ► Setting interface for communication Bios menu of the device
- ► Loading setup of the device See manual „DatafoxStudioIV"

### 5.2.2. Installation of the Device

- ► Installing the device at the intended location
- ► Establishing connections for:
    - o Power: Power supply
    - o Communication:
        - ▪ RS232
        - ▪ RS485
        - ▪ TCP / IP (HTTP)
        - ▪ GPRS/GSMw. GPRS/GSM)
    - o Digital Input
    - o Analog input
    - o Access Control
- ► Finishing installation of the device
- ► Setting the main communication Bios Menu

### 5.2.3. Troubleshooting during Commissioning

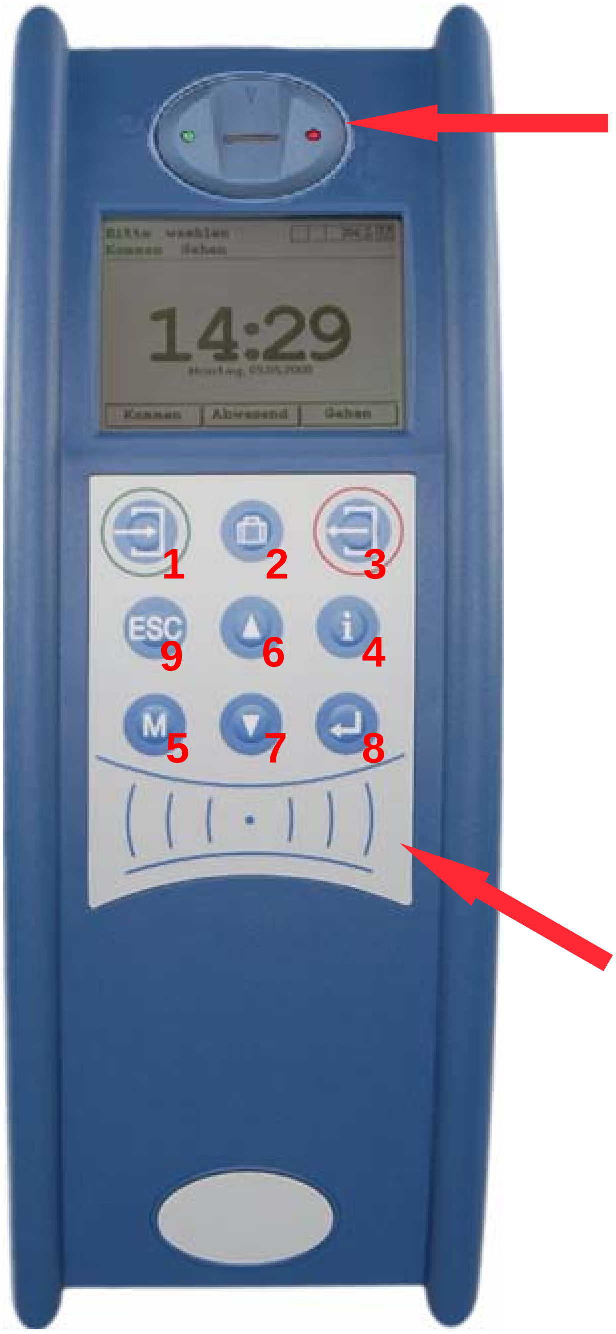
- ► Please see the FAQ on our website: http://www.datafox.de/faq-de.html.
- ► Tips:
    - o Connection to the device cannot be set up via TCP/IP
        - ▪ Check IP in the device and the application (studio)
        - ▪ Ping on IP
        - ▪ Setting "Active Connection" in BIOS? → set to NO
       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

## 5.3. Display and Operation

### 5.3.1. Keyboard

**!** **Caution:**
The buttons of the devices may only be pushed using fingers. **Under no circumstances** should the buttons be pressed by **hard** or **pointy objects** such as keys, transponders or coins.

The keyboard of the PZE-MasterIV is structured as follows:



finger scanner

Keys for input sequence 1 – 5 the function is defined in the setup.

The keys 6 and 7 use for navigation in lists and chose symbols by inputs over Keys.

The Key 8 to confirm an input or an action.

The Key 9 to stop an input.

read range for RFID

### 5.3.2. Key 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**
  - Press upward arrow + downward arrow simultaneously
  - from FW V 04.01.01 onwards also: Press ESC + ENTER in sequence and hold

- **Opening transponder menu**
  - from FW V 04.01.01 onwards: Press ESC + F1 in sequence and hold

- **Opening MMC menu**
  - Press ESC + F2 in sequence and hold

- **Opening USB host menu**
  - Press ESC + F2 in sequence and hold

- **Navigating in lists**
  - Downward arrow or upward arrow

- **Entering printable characters via keyboard (PZE only?)**
  - Downward arrow or upward arrow

- **Taking over a selected list entry**
  - ENTER key

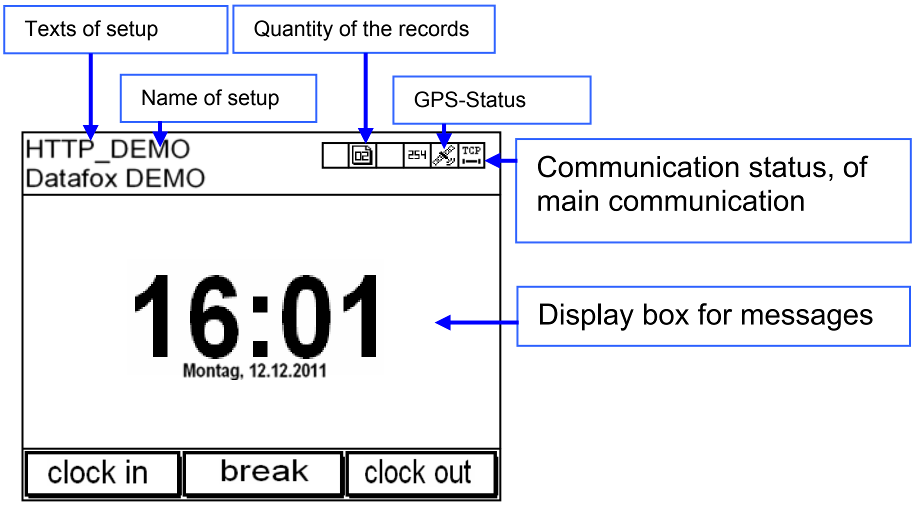
- **Cancelling any action**
  - ESC key

- **Switching to main menu in operation mode PZE**
  - ESC key

- **Changing pages e.g. at GV info screen**
  - Left arrow or right arrow
- **Rebooting the device**
  - F1(1) + F2(2) + M(5) + ENTER↵(8)

## 5.3.3. Display and Menu Bios

### 5.3.3.1. Display



- **Date and Time** corresponds to the system time of the device, these are also used in the records.
- 4 **counter of records** (to indicate up to 99, more are shown as 99+).
- **GPS-Status:**
  - 🛰 GPS-module active, A GPS data are available.
  - no Symbol: GPS-module disabled or the device have no GPS-module.
  - 🛰 GPS-module active, but no A GPS data are available.
  - 4 = The number in this field show, how many Satellites in used.
- **Communication box** with symbols for:
  - TCP IP TCP /IP when data is sent or received you see this symbol TCP.
  - rs 232 RS 232 com port
  - rs 485 RS 485 com port
  - GSM GSM with status indicator e.g.[10].

GPRS with status indicator e.g.[33] more about „Communication state”

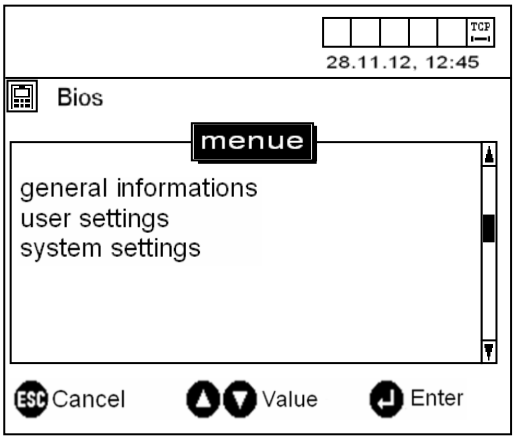
- 📶 Mobile modem is off
- 📶 Mobile modem is on, but no connection to the provider.
- 📶 Mobile modem is on and connected with the service provider.

- **Readout on Display**
  - Text in the main menu, line 1(HTTP_Demo) and 2(Datafox Demo) from setup.
  - In menus and input sequences shown in the header line 3 and 4.
  - During transmission of a setup or updates the symbol „⚒ Systemstop“ is shown.
  - On the left site in the Display:
    - ▤= read RFID
    - ▥= read barcode
    - →= to clock in
    - ←= to clock out

### 5.3.3.2. System menu BIOS

You can make directly different basic settings at the terminal via the system menu.
To open the bios menu with key combinations ▼and▲ or ESC and↵.

**This is first site at the Display bios menu:**



Select the menu with the key ▼and▲ and confirm this with the button ↵ "Enter".

**general informations:**

- firmware information
- check transponder
- Record memory
- list memory
- memory usage

The respective sub-menus should be self explanatory.

**user settings:**

- transponder menue
- display / signals
- date and time

More about transponder menu in the next caption!
The respective sub-menus should be self explanatory.

**system settings:**

- firmware information
- system information
- communication
- display / signals
- date and time

| | | |
|---|---|---|
| • interface | rs 232 | (select the communication with the device – pc to coose the communication via RS 232, TCP/IP, GPRS...) |
| • active | no | (always "no" please read the caption active connection befor they put to yes.) |
| • http | no | (select „yes" when you send date to webserver via http, select „no" when you use the DFCom.dll or the program DatafoxStudioIV) |
| • tcp / ip | | (this is for setting TCP/IP address, port, gateway… ) |

### 5.3.3.3. TCP/IP settings in the Bios-Menu

The call to this menu over the keycombination ESC+Enter. When select „Systemmenu-Bios“ → „communication“ → „TCP/IP“.

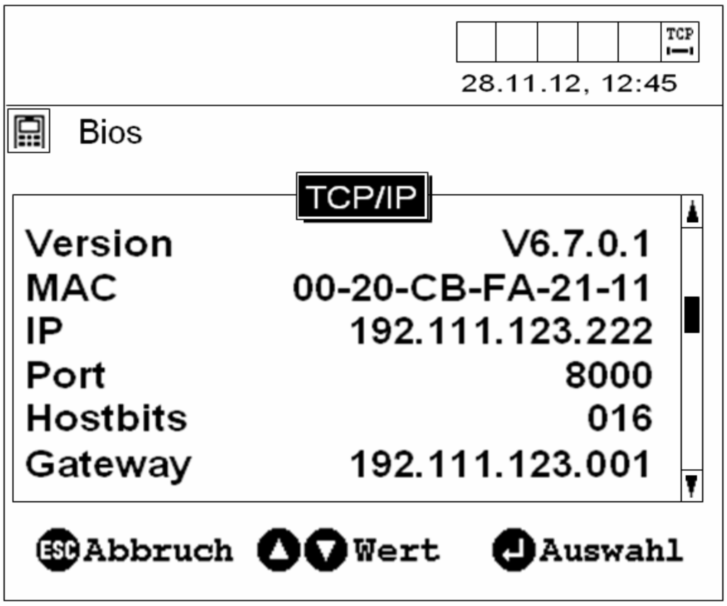
**Version**:
Shows the actual firmware of the X-Ports.

**MAC**:
Address of the device (X-Port)

**IP**:
Address of device
With IP 000.000.000.000 is DHCP activ.

**Port**:
Number of device

**Hostbits**:
With the host bits you can set the subnet musk (look in the table).



28.11.12, 12:45

Bios

TCP/IP

| | |
|---|---|
| Version | V6.7.0.1 |
| MAC | 00-20-CB-FA-21-11 |
| IP | 192.111.123.222 |
| Port | 8000 |
| Hostbits | 016 |
| Gateway | 192.111.123.001 |

**Gateway:**
It’s to use then a connection to other net is necessary.
Very important is this, if you use communication via HTTP.

With the keys “check in or check out”, can you navigate in the menu. The arrow keys ▲▼ use to change the value.

| Host bits | Subnet mask |
|---|---|
| Do Not Use | 255.255.255.254 |
| Not recommended | 255.255.255.252 |
| 003 | 255.255.255.248 |
| 004 | 255.255.255.240 |
| 005 | 255.255.255.224 |
| 006 | 255.255.255.192 |
| 007 | 255.255.255.128 |
| 008 | 255.255.255.0 |
| 009 | 255.255.254.0 |
| 010 | 255.255.252.0 |
| 011 | 255.255.248.0 |
| 012 | 255.255.240.0 |
| 013 | 255.255.224.0 |
| 014 | 255.255.192.0 |
| 015 | 255.255.128.0 |
| 016 | 255.255.0.0 |
| 017 | 255.254.0.0 |
| 018 | 255.252.0.0 |
| 019 | 255.248.0.0 |
| 020 | 255.240.0.0 |
| 021 | 255.224.0.0 |
| 022 | 255.192.0.0 |
| 023 | 255.128.0.0 |
| 024 | 255.0.0.0 |

#### 5.3.3.4. RFID Menu

**type:**
Show the RFID reader type, which installed in the device.

**write transponder:**
If the writing of data on cards was defined via the setup - that means you have chosen one or more segments with the same format to the type Hitag1, Hitag2, HitagS 48 or HitagS 56 - you can record the data on the cards via this menu item.

**increment:**
It defines how the value x increases the recorded segment value before recording data on the next card. If several segments are recorded with values on a card, each segment value will be increased by the value x. When you select this menu item and confirm with ENTER, you can change the value x.

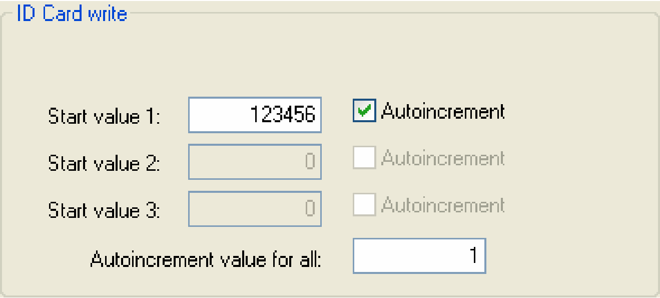
**segment n:**
It shows the segments define via the setup that can be recorded. Analogous to the increment, segment values can be changed.

**formatting:**
With transponder type Mifare there is the possibility to activate the formatting of the sector trailer or to deactivate.

#### 5.3.3.5. ID Card write

When you have entered the values for the increment and the segments that are to be written, select the menu item "Write card". After pressing ENTER, the value(s) will be displayed as contiguous string. The terminal is now awaiting a card. You will hear an acoustic signal as soon as the card is written. All segment values where the option "Auto increment" was set in the menu are increased by the increment value. When you have written all cards you can leave the menu by pressing ESC.

**The function increment:**
You must enable in the setup defaults.



ID Card write

Start value 1: 123456 ☑ Autoincrement

Start value 2: 0 □ Autoincrement

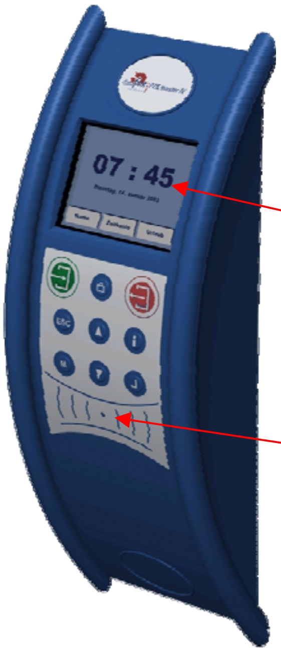
Start value 3: 0 □ Autoincrement

Autoincrement value for all: 1

## 5.4. Installation instructions of the PZE-Master

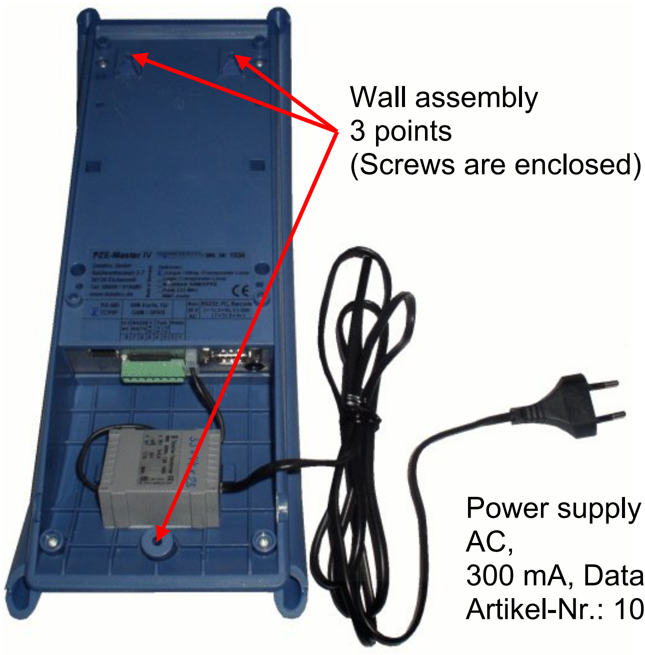
The 2-skin case has in the lower third the plug area which is accessible only from the back. Through this the plugs are completely covered in the mounted state. The manipulation possibilities are limited with it very strongly. In the same construction space the net part is also accommodated. You find a drilling template to the assembly support on the product DVD.

### 5.4.1. Wall fixing



LCD Modul
320x240 Pixel

Reading area of the
transponder reader



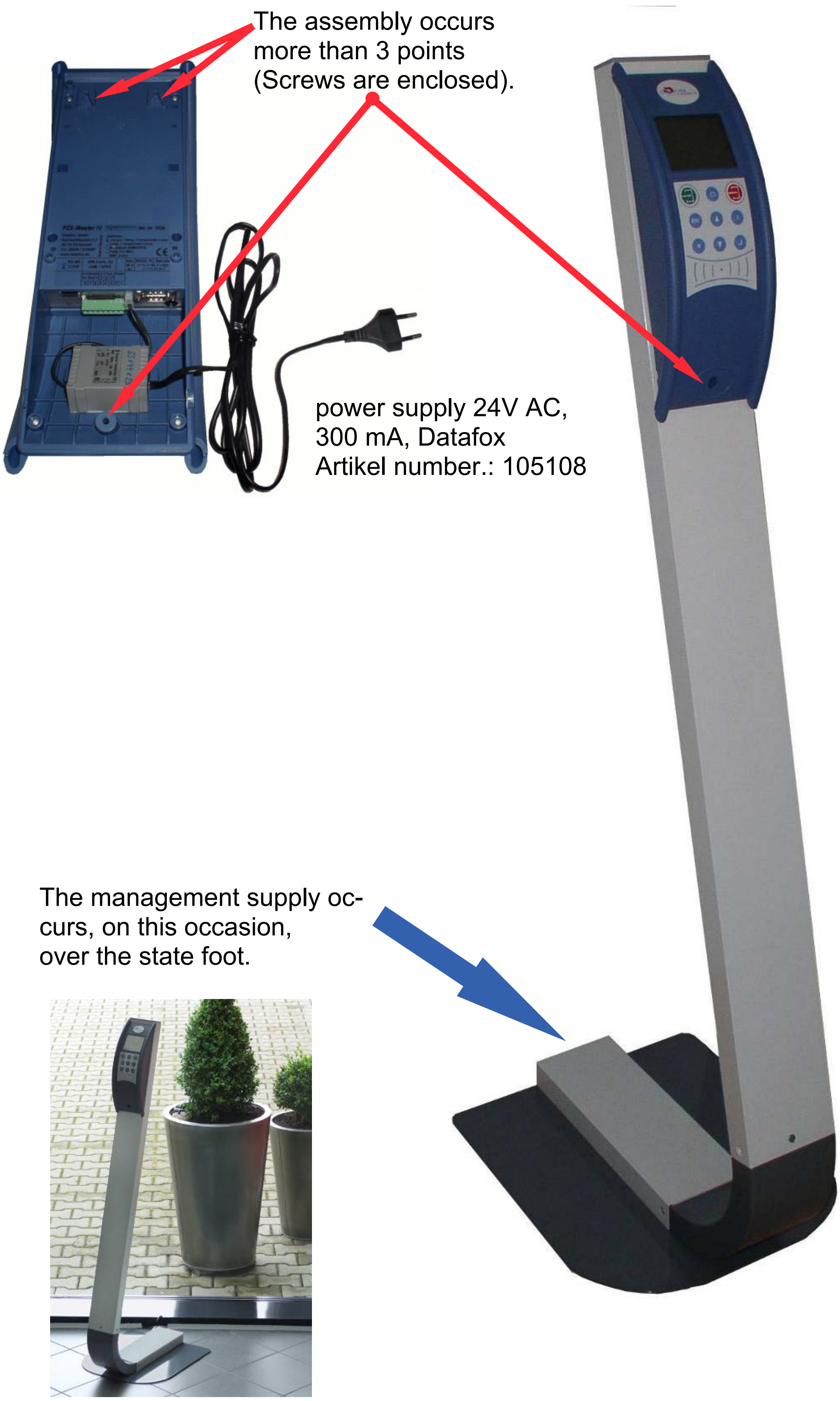
Wall assembly
3 points
(Screws are enclosed)

Power supply 24V
AC,
300 mA, Datafox
Artikel-Nr.: 105108

If the device is mounted on a flush box and there is only one screw available, simply cut off the 230 volt plug and connect the wires to the screw terminal.

! **Attention:**
By the use of Simons & Voss of readers, the net part must be mounted outside the connection area.

### 5.4.2. Installation on detached column



The assembly occurs more than 3 points (Screws are enclosed).

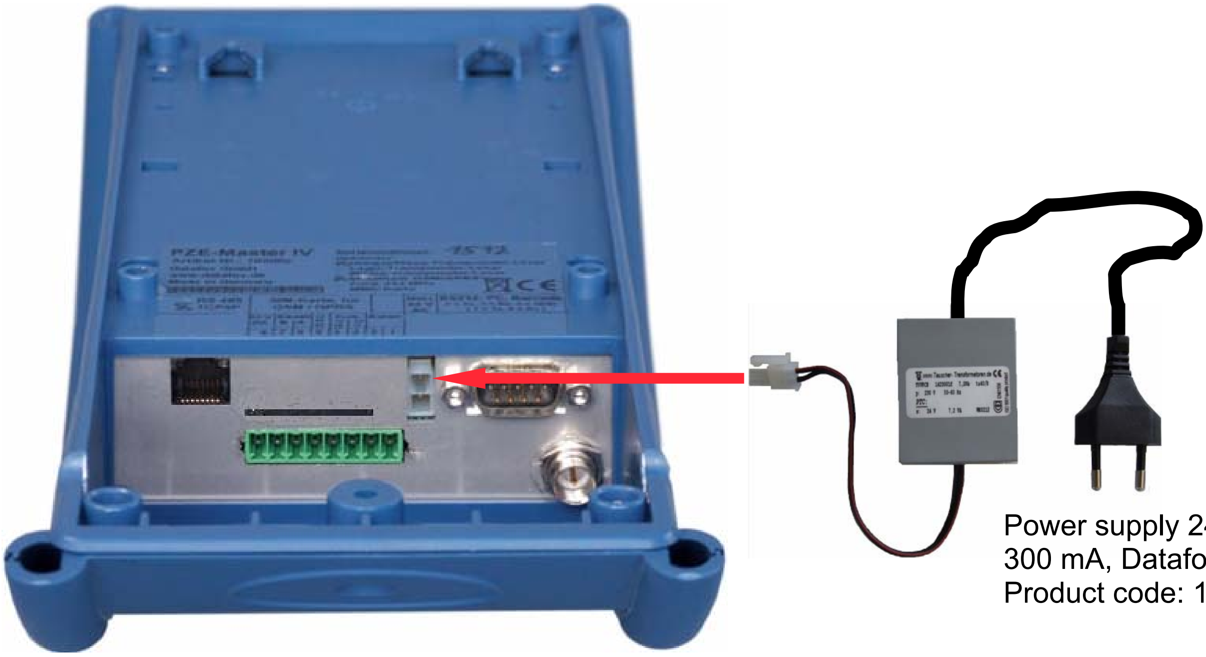
power supply 24V AC, 300 mA, Datafox Artikel number.: 105108

The management supply occurs, on this occasion, over the state foot.

## 5.5. Power supply of the PZE-MasterIV

### 5.5.1. Power supply with AC adapter

In principle, only one voltage source may be connected to the PZE-MasterIV. Use a 24 V/ 300 mA AC/DC power supply unit for this.



Power supply 24V AC,
300 mA, Datafox
Product code: 105108

**!** **Caution:**
By the use of Simons & Voss of readers, the net part must be mounted outside the connection area.

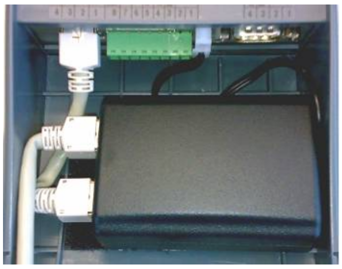
If the device is mounted on a patress box and there is only one screw terminal available, just cut the 230 V plug and connect the cores to the screw terminal.

### 5.5.2. Power supply with uninterrupted power supply (UPS)

Currently in the works is a mini-UPS for the power supply of the AE master during a power outage. The charging circuit is in this case the device and must be taken into account when ordering. The battery pack is mounted on rear panel.

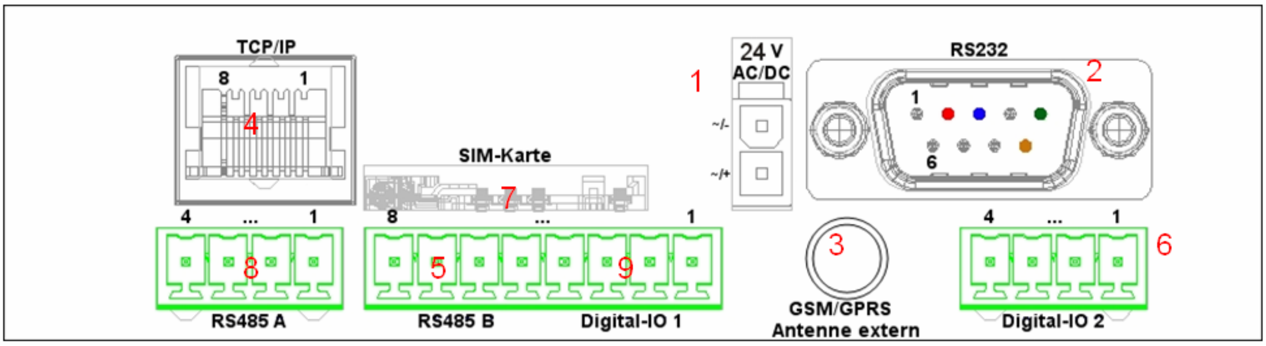
### 5.5.3. POE power supply

The PoE adapter is installed in place of the power supply.
This requires a network with power supply.
The standard of the adapter **PoE 802.3af** standard



## 5.6. Connection

### 5.6.1. Connecting plug



*contacts Hardware version 2.1 and 3.0*

| Bezeichnung | Steck- | PIN | Beschreibung |
|---|---|---|---|
| power | 1 | | 24 V 300 mA AC/DC (When a DC voltage is connected to respect the polarity.) |
| Digital input | 6 | 3 | input 5 kHz<br>0 - 2 Volt = 0 (VILmax = 2,0 V )<br>5 - 30 Volt = logic 1 (VIHmin = 5 V ) |
| | | 4 | GND |
| | 9 | 3 | input 10 Hz<br>0 - 3 Volt = 0 (VILmax = 3,0 V )<br>12-30 Volt = 1 (VIHmin = 12,0 V ) |
| | | 4 | GND / ground |
| Digital output | 6 | 1 | common (max. 2,0 A bei 42 V AC or. 30 V DC) |
| | | 2 | Normally-open |
| | 9 | 1 | common (max. 2,0 A , 42 V AC or 30 V DC) |
| | | 2 | Normally-open |
| RS232 Schnittstelle<br>D-Sub 9 polig | 2 | 2 | TxD |
| | | 3 | RxD |
| | | 5 | GND/ ground |
| RS485 Schnittstelle | 8 | 1 | GND/ ground |
| | | 2 | Data channel A |
| | | 3 | Data channel B |
| | | 6 | 24 V DC |
| RS485 interface for access control | 5 | 5 | GND |
| | | 6 | Data channel A |
| | | 7 | Data channel B |
| | | 8 | 12 V DC out max. 150 mA |
| TCP / IP | 4 | | RJ 45 |
| SIM-kart | 7 | | Slott |
| GSM | 3 | | antenna |

### 5.6.2. Barcode Reader

! **Attention:**
You can connect a bar code reader on the Datafox device, but the communication to PC not by rs232. Select in the Bios on the Device another interface than rs232.

You can connect all bar code reader with rs232 connection. PZE-MasterIVPlease note the folder wiring for rs232.

| contact | name | function |
|---|---|---|
| 1 | | |
| 2 | TxD | transmission data (connect to RxD of bar code reader) |
| 3 | RxD | recived data (connect to TxD of bar code reader) |
| 4 | | |
| 5 | GND | ground |
| 6 | + 24V | + 24 V supply. 100 mA at most (solder bridge on edge connector necessary) |
| 7<br>8<br>9 | + 5 V | + 5 V supply max. 150 mA |

### 5.6.3. Power Supply

!

**Caution:**
Only one voltage source must be connected to the PZE-MasterIV. Use a 12 – 24 V 300 mA AC/DC power supply for this purpose. At most one external load (e.g. a transponder reader for access control) may be supplied by this power supply via the RS485 interface.

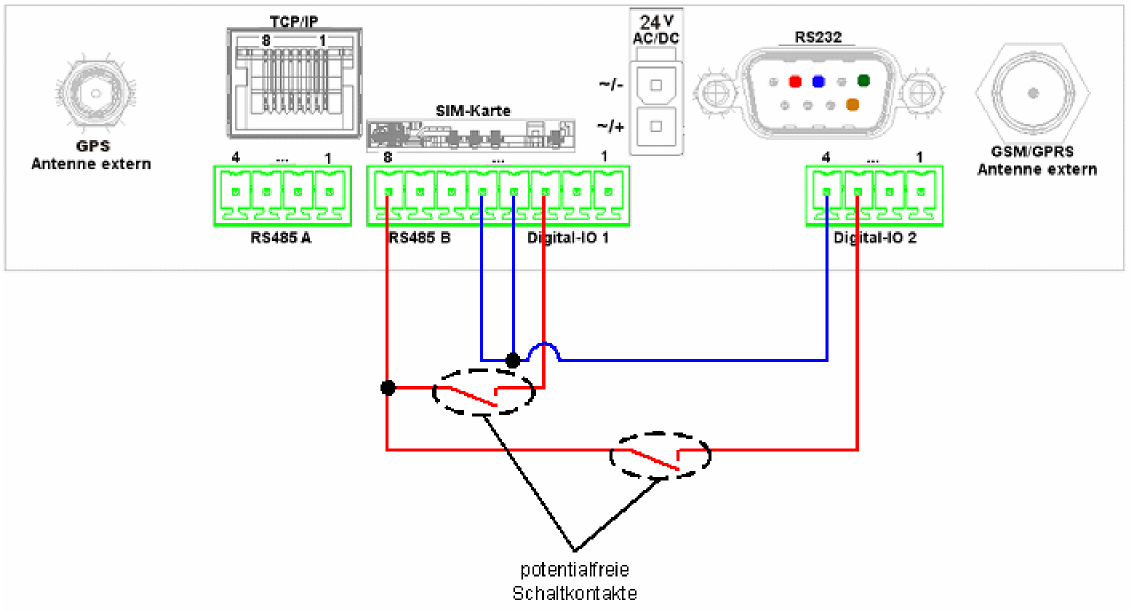
See chapter „ Power supply Spannungsversorgung“.

### 5.6.4. Digital Inputs

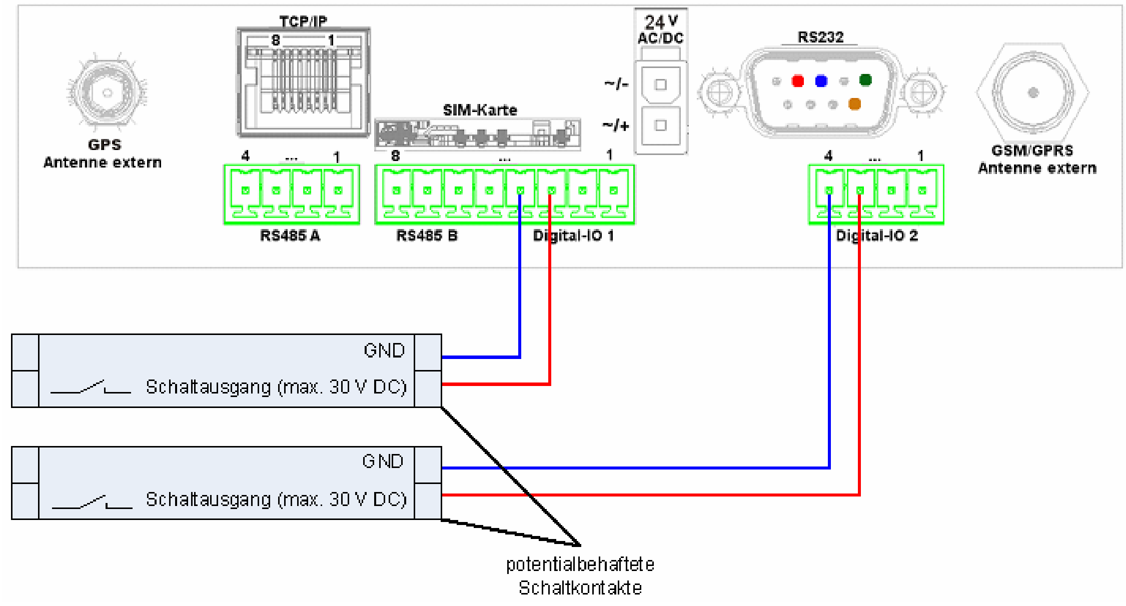
!

**Caution:**
Ensure that signals are transferred properly.

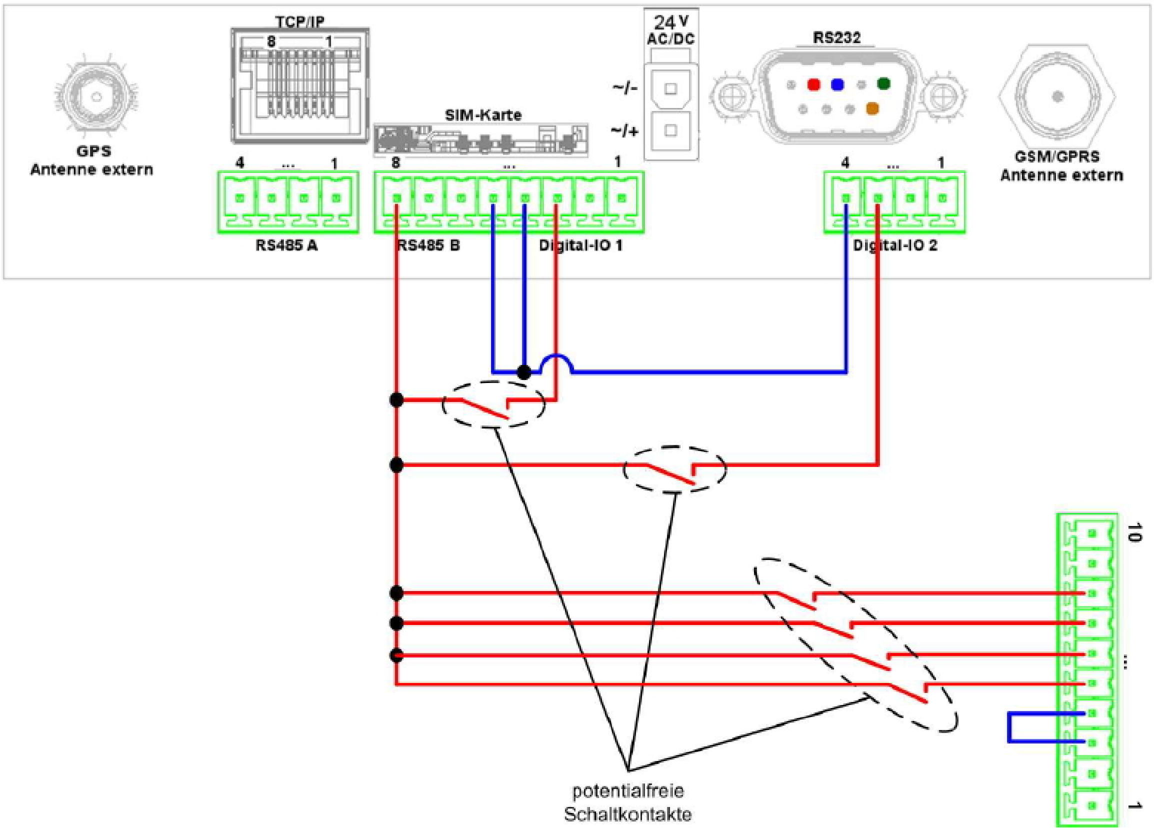
Subsequently, two connection examples for the use of the digital inputs with the PZE-MasterIV are presented. The first figure shows the connection of floating contacts, e.g. for a door monitoring without external voltage source.



The following figure shows the connection of ground-referenced contacts. Observe the max. voltage of 30 V DC at the switching output and thus at the digital input of the PZE-MasterIV.



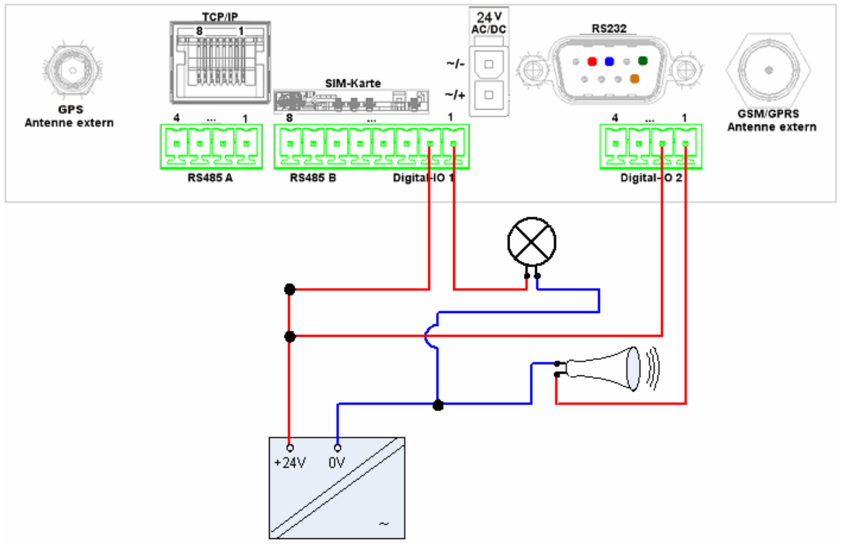
This example displays the possibility of connecting a potential-free contact to the digital inputs.



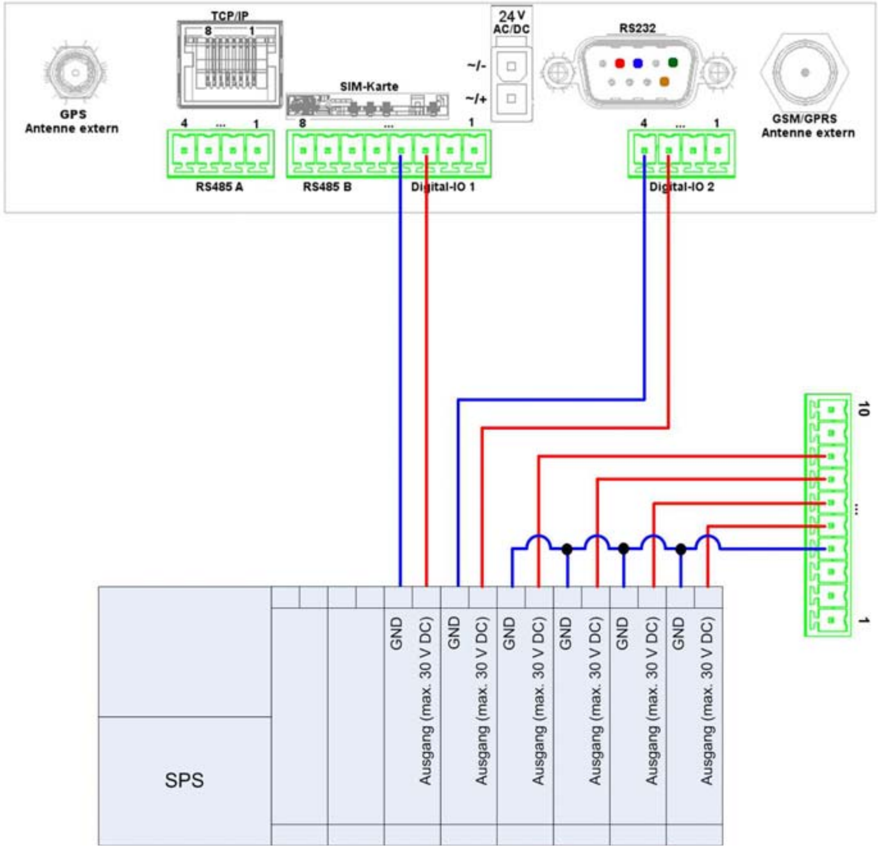
### 5.6.5. Digital Outputs

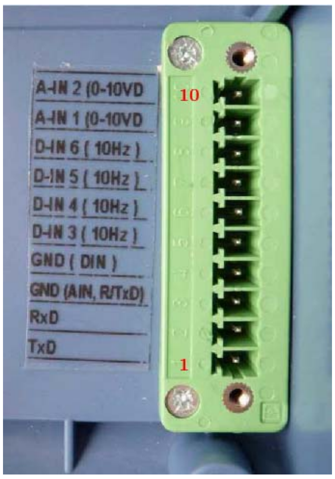
**!**

**Caution:**
Observe the max. current of 2.0 A at 42 V AC or 30 V DC when connecting consumer units.



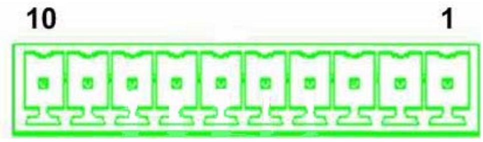
This example displays the possibility of connecting an SPS with 24 V output (electricity of ca. 7 mA / port).





**Connector strip at the terminal**

**Extension: RS 232.** For connecting the I/O module
Art.no.: **109160**



Connection table: **Extension: RS 232.** For connecting the I/O-module

| Pin | Symbol | Function |
|---|---|---|
| 1 | TxD | Transmit data (connect to RXD of the IO-module) |
| 2 | RxD | Receive data (connect to TxD of the IO-module) |
| 3 | GND | Ground |
| 4 | GND | Ground |
| 5 | D-IN3 | Digital input 3 (10Hz) |
| 6 | D-IN4 | Digital input 4 (10Hz) |
| 7 | D-IN5 | Digital input 5 (10Hz) |
| 8 | D-IN6 | Digital input 6 (10Hz) |
| 9 | A-IN1 | Analog input 1 (0-10 V) |
| 10 | A-IN2 | Analog input 2 (0-10 V) |

## 5.7. Communications

**Caution:**
The PZE-MasterIV has different communication interfaces, this is dependent on features and hardware version.

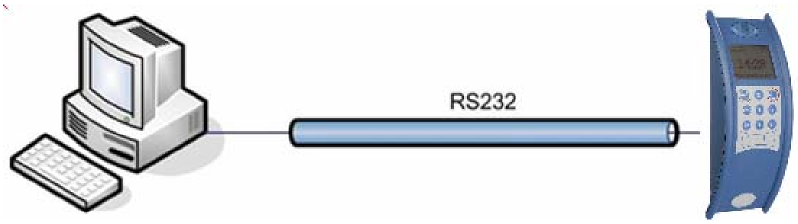
**Here are listed all types of communications that are possible in the devices via:**

1. RS 232
2. RS 485
3. TCP / IP over LAN
4. TCP / IP over internet (with protocol HTTP1.1)
5. TCP / IP via WLAN
6. USB connect to PC
7. USB with data transfer on a USB stick
8. GPRS via Mobile phone network (with protocol HTTP1.1)
9. GSM via Mobile phone network with analog Modem

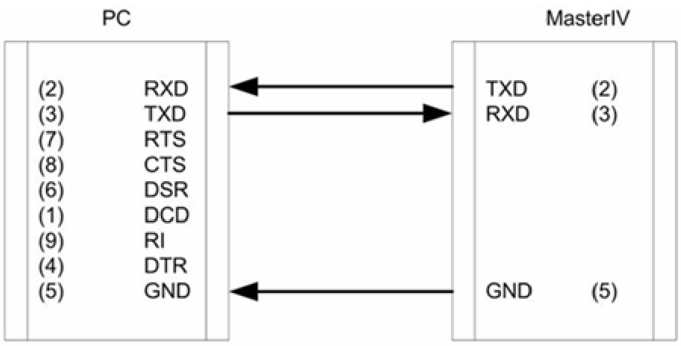
### 5.7.1. Communication via RS232

For a communication with a PZE-MasterIV over an RS-232 connection, the device has to be set for this communication in the system menu-BIOS (see chapter display Bios menu). Furthermore, baud rate and timeout of the RS232-interface of the terminal and the PC must be coordinated. Permitted baud rates are 9600, 19200 and 38400. The timeouts have to be between 100 and 2000. When you select RS232 for communication the timeout is set on 100 by default.

The cable must not be longer than 15 m. Use a RS232 cable with a 1:1 configuration, corresponding to Datafox order number 20010, as connecting cable.



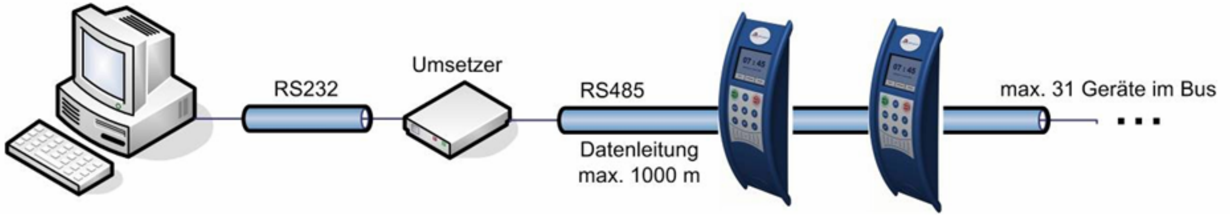
*connection viaPZE-MasterIV RS232*

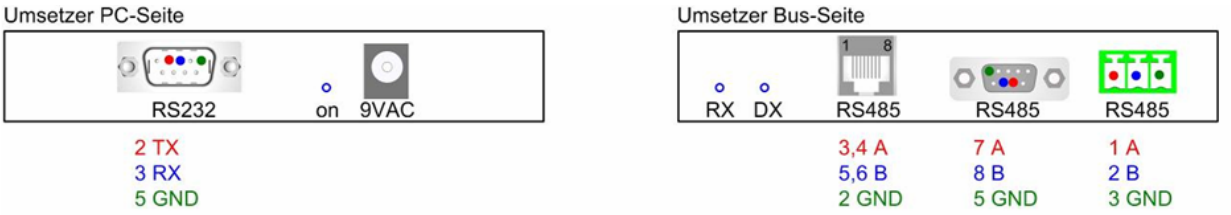


### 5.7.2. Conversion of RS232 to RS485

Up to 31 devices can be connected to a serial interface of a PC or server via a RS232-to-RS485 converter. In this case the devices are connected via a RS485 bus. The power supply can be established using a central power supply unit with adequate power. Note that the fall of voltage is dependent on wire cross section and length. The pin assignment of the converter will be demonstrated using the Datafox converter RS232/485 (small) as example. Gather the wiring of the RS485 bus from the following examples.

! **Caution:**
Pay attention to the hardware version given in the examples. It is a precondition for the prevailing example.

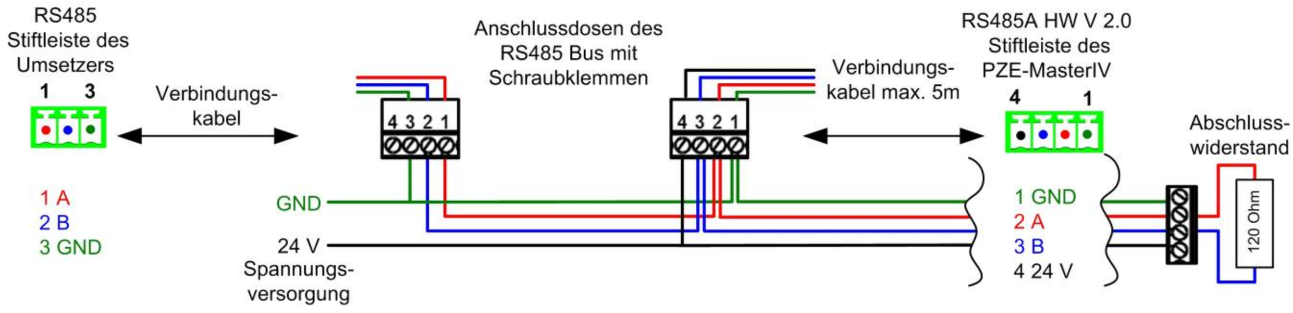




*Übergang von RS232 aus RS485*

### 5.7.3. Communication via RS 485

! **Achtung:**
The RS 485 interface for main communication is a 4 pole connector and the RS485 interface for access control is a 8 pole connector.

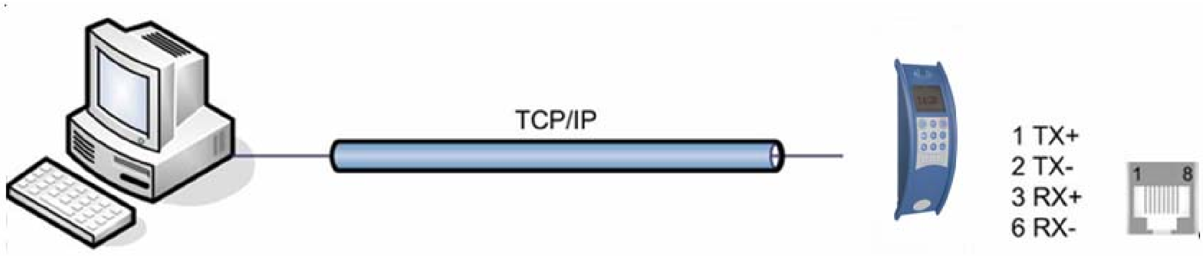


*Anschluss des PZE-MasterIV per RS485 (Stiftleiste)*

! **Achtung:**
If the power supply of the PZE-MasterIV and the RS485 bus is established via PIN 1/4 direct voltage must be used.

### 5.7.4. Communication via TCP/IP

A device with TCP/IP option can be connected with the network via the Ethernet interface on the back side of the device. If the device is to be connected directly to a PC via Ethernet, a crossover cable has to be used.



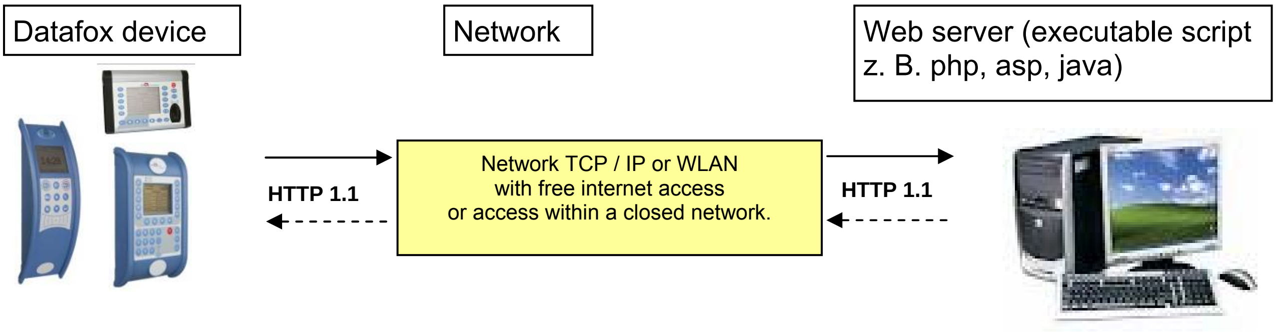
*Connection of the PZE-MasterIV via Ethernet*

!

**Caution:**
Power over Ethernet (PoE) describes a process where network-compatible devices can be energized via the 8-core Ethernet-wire. The internal TCP/IP module of the device is not PoE compatible.

#### 5.7.4.1. Sending Data Records with HTTP via LAN / WLAN

Until now, it has been possible to send the data records created in the device to a web server with HTTP via the cellular network GPRS. This functionality has been expanded to LAN.


Datafox device
Network
Web server (executable script z. B. php, asp, java)
Network TCP / IP or WLAN with free internet access or access within a closed network.
HTTP 1.1
HTTP 1.1

In each device with a TCP/IP interface, you can activate HTTP in the BIOS menu of the device under Communication. For this purpose, the entry "http" must be set to "YES".
Prerequisite for the sending of data with HTTP via LAN are the proper settings of the parameters in the .ini file and the communication must be set to TCP/IP.
For more information on the BIOS menu of the device see chapter "Structure of Display in BIOS Menu"

For more information regarding the encryption of data for sending via http see the DatafoxStudioIV manual, chapter "Configuration > Encryption of Data Fields for Sending via HTTP".

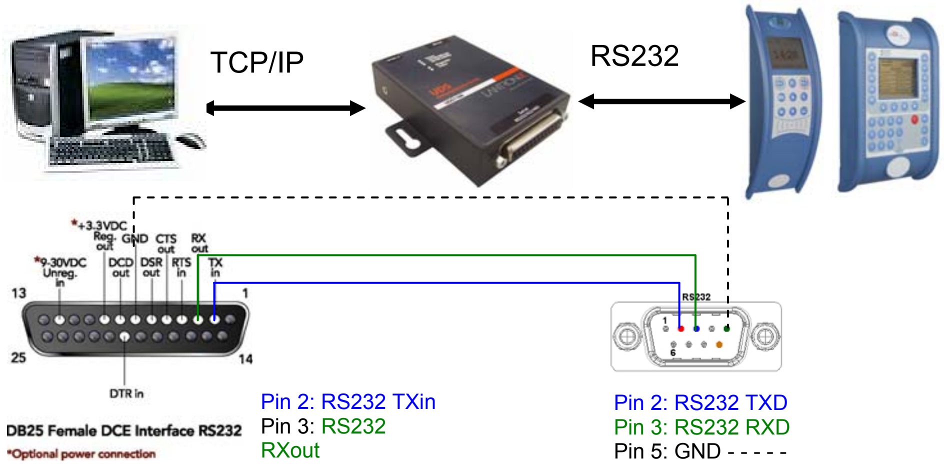
!

**Caution:**
Not all firewalls allow data transfer via HTTP. Problems could arise with Cisco-Firewall V5.0.

### 5.7.4.2. Transition from TCP/IP to RS232 / RS485 via COM Server

#### TCP / IP to RS232

In order to connect a single device via RS232 to a TCP/IP network a COM Server must be used. The COM Server (UDS 110) serves as converter.

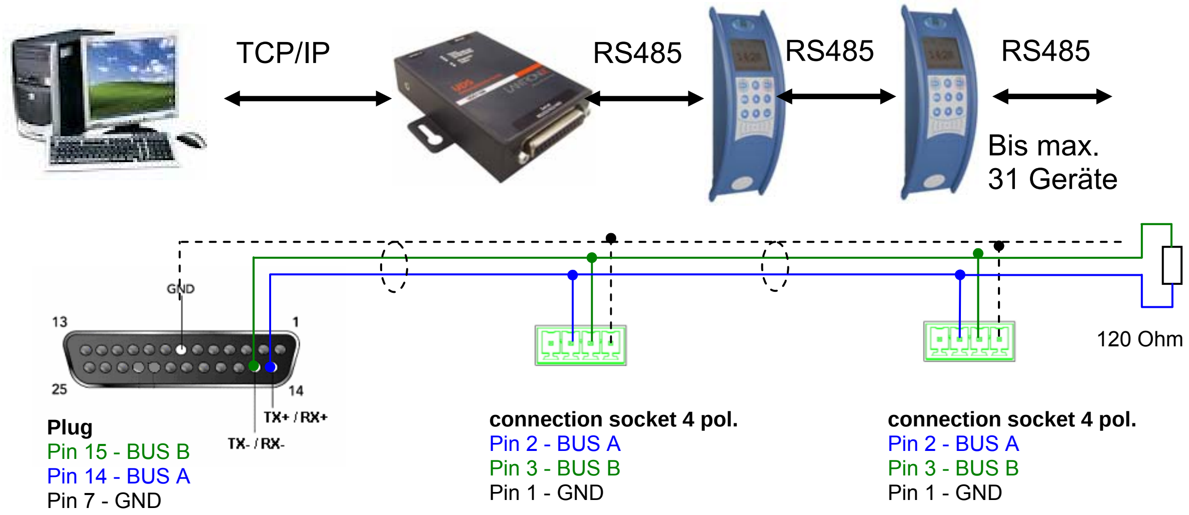


*Transition from TCP/IP to RS232*

#### TCP / IP to RS485

Up to 31 devices can be economically connected via a COM Server with RS485 bus. You can find details about the structure of an RS485 network in the separate networking description. You can request it from us or download it from our homepage. Please note that the bus number must be set directly at the terminal.

The network structure is a bus. The bus cable is looped through from one device to the other. Branching is not allowed. The COM Server can be connected at the start, the end or somewhere in the middle of the network. The total length of the bus cable must not exceed 1000 m



*Transition from TCP/IP to RS485*

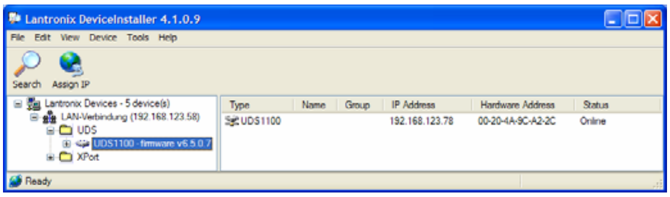
### 5.7.4.3. Set-up of the COM Server Lantronix UDS 11

In order to perform the set-up, you must install and start the "Device Installer" from the enclosed CD.

After successful installation, integrate the COM Server in your network. Plug in the power supply and the network cable.

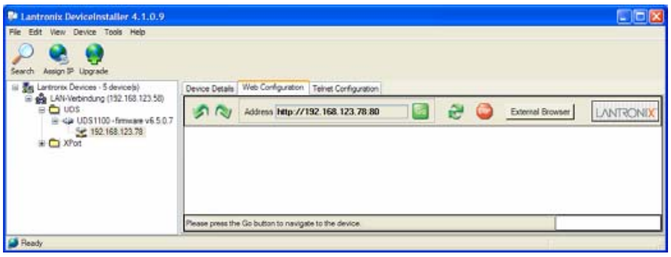
Start the "Device Installer".

All „Lantronix COM Server“ of the network are displayed. In this example a COM Server with the “IP address 192.168.123.78”. If several COM Servers are displayed, look at the “Hardware Addresses” (MAC address).


Lantronix DeviceInstaller 4.1.0.9
File
Edit
View
Device
Tools
Help
Search
Assign IP
Lantronix Devices - 5 device(s)
LAN-Verbindung (192.168.123.58)
UDS
UDS1100 - firmware v6.5.0.7
XPort
Ready

| Type | Name | Group | IP Address | Hardware Address | Status |
|---|---|---|---|---|---|
| UDS1100 | | | 192.168.123.78 | 00-20-4A-9C-A2-2C | Online |

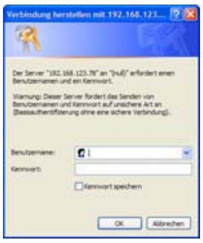
If you mark the “IP address” in blue, the settings for the COM Server can be made via a “Web Configuration”. Copy the “Address” into your own browser or click on “Go” to use the available browser.



Address http://192.168.123.78:80

Please press the Go button to navigate to the device.

You are asked for a username and password. Because the COM Server is in the state as delivered, no username or password is set. Thus, make no entries and only confirm with “OK”.



Der Server "192.168.123.78" an "(null)" erfordert einen Benutzernamen und ein Kennwort.

Warnung: Dieser Server fordert das Senden von Benutzernamen und Kennwort auf unsichere Art an (Basisauthentifizierung ohne eine sichere Verbindung).

Benutzername:

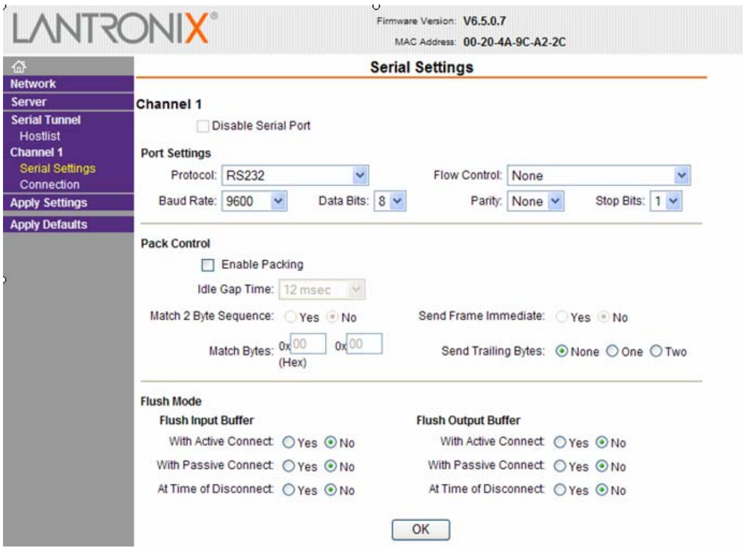
Kennwort:

□ Kennwort speichern

## RS232

Settings of the serial interface for RS232:

1. The baud rate must be set to  38400.



Firmware Version: V6.5.0.7
MAC Address: 00-20-4A-9C-A2-2C

Serial Settings

Channel 1

☐ Disable Serial Port

Port Settings

Protocol: RS232  Flow Control: None
Baud Rate: 9600  Data Bits: 8  Parity: None  Stop Bits: 1

Pack Control

☐ Enable Packing
Idle Gap Time: 12 msec
Match 2 Byte Sequence: ○ Yes ● No  Send Frame Immediate: ○ Yes ● No
Match Bytes: 0x 00  0x 00 (Hex)  Send Trailing Bytes: ● None ○ One ○ Two

Flush Mode

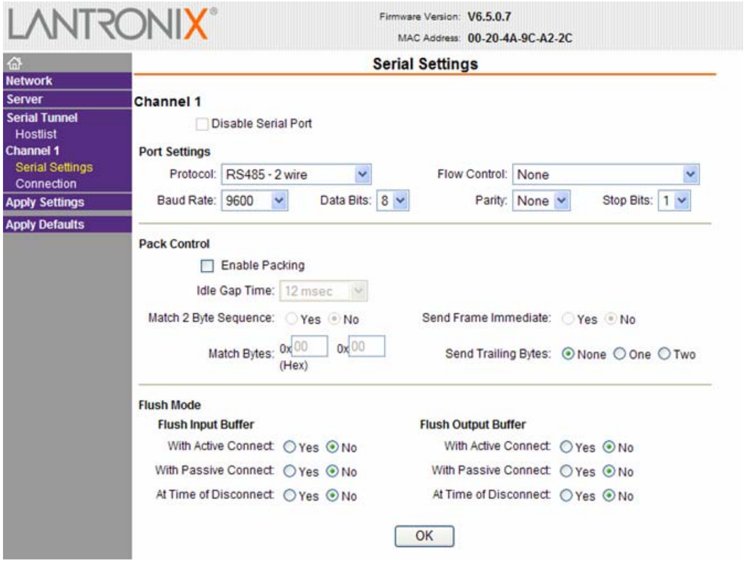
Flush Input Buffer
With Active Connect: ○ Yes ● No
With Passive Connect: ○ Yes ● No
At Time of Disconnect: ○ Yes ● No

Flush Output Buffer
With Active Connect: ○ Yes ● No
With Passive Connect: ○ Yes ● No
At Time of Disconnect: ○ Yes ● No

## RS485 – 2 wire

Settings of the serial interface for RS485 - 2 wire:

1. The default setting for the baud rate is  38400.



Firmware Version: V6.5.0.7
MAC Address: 00-20-4A-9C-A2-2C

Serial Settings

Channel 1

☐ Disable Serial Port

Port Settings

Protocol: RS485 - 2 wire  Flow Control: None
Baud Rate: 9600  Data Bits: 8  Parity: None  Stop Bits: 1

Pack Control

☐ Enable Packing
Idle Gap Time: 12 msec
Match 2 Byte Sequence: ○ Yes ● No  Send Frame Immediate: ○ Yes ● No
Match Bytes: 0x 00  0x 00 (Hex)  Send Trailing Bytes: ● None ○ One ○ Two

Flush Mode

Flush Input Buffer
With Active Connect: ○ Yes ● No
With Passive Connect: ○ Yes ● No
At Time of Disconnect: ○ Yes ● No

Flush Output Buffer
With Active Connect: ○ Yes ● No
With Passive Connect: ○ Yes ● No
At Time of Disconnect: ○ Yes ● No

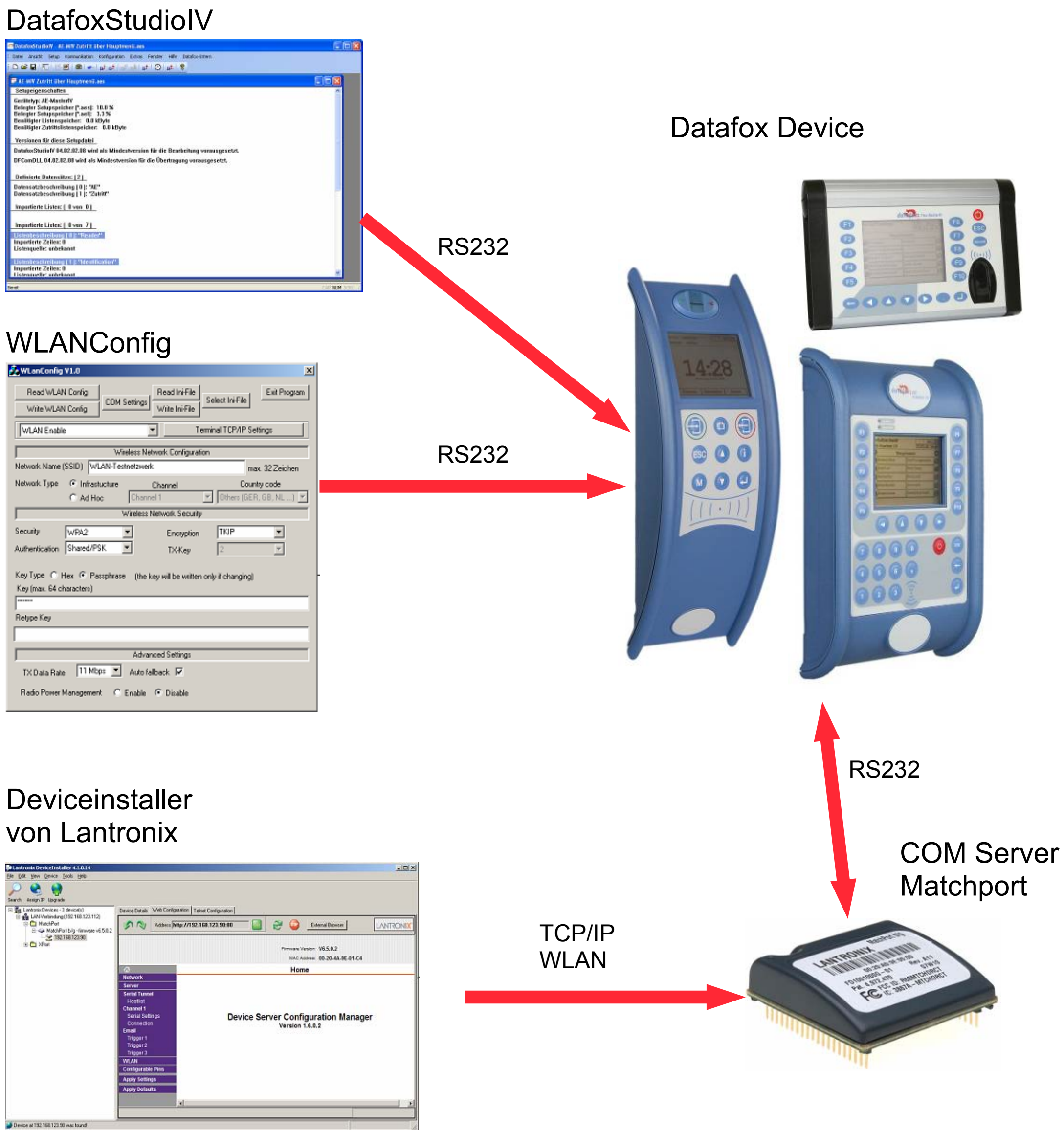
2. The "Local Port" must be set to 8000 via the setting option "Connection".
3. Save your settings with "OK" and then "**Apply Settings**", otherwise they will not be taken over.

Restart the COM Server and check the connection.

### 5.7.5. Communication via WLAN

In order to communicate with the wireless terminal, it must first be configured. See more in the next chapter.
When communicating via wireless connection to exclude a connecting by LAN. In the bios – menu is to choose the interface TCP/IP.
More about the bios – menu you find in the capture „Aufbau Display im Bios-Menü“ .

**Possibilities to configure:**
There are two possibilities to configure the match port. Either via the TCP/IP with the DeviceInstaller of Lantronix or via the RS232 using the tool WLANConfig and the DatafoxStudio (from version 04.01.06.xx on).



WLanConfig V1.0

Read WLAN Config | Write WLAN Config | COM Settings | Read Ini-File | Write Ini-File | Select Ini-File | Exit Program

WLAN Enable | Terminal TCP/IP Settings

Wireless Network Configuration

Network Name (SSID) WLAN-Testnetzwerk max. 32 Zeichen

Network Type ● Infrastucture ○ Ad Hoc   Channel: Channel 1   Country code: Others (GER, GB, NL ...)

Wireless Network Security

Security: WPA2   Encryption: TKIP
Authentication: Shared/PSK   TX-Key: 2

Key Type ○ Hex ● Passphrase (the key will be written only if changing)
Key (max. 64 characters): ******
Retype Key

Advanced Settings

TX Data Rate: 11 Mbps   Auto fallback ☑
Radio Power Management ○ Enable ● Disable

Lantronix DeviceInstaller 4.1.0.14

File Edit View Device Tools Help
Search Assign IP Upgrade

Lantronix Devices - 3 device(s)
LAN-Verbindung (192.168.123.112)
MatchPort
MatchPort b/g - firmware v6.5.0.2
192.168.123.90
XPort

Device Details | Web Configuration | Telnet Configuration

Address http://192.168.123.90:80 | External Browser

Firmware Version: V6.5.0.2
MAC Address: 00-20-4A-9E-01-C4

Home

Network
Server
Serial Tunnel
Hostlist
Channel 1
Serial Settings
Connection
Email
Trigger 1
Trigger 2
Trigger 3
WLAN
Configurable Pins
Apply Settings
Apply Defaults

Device Server Configuration Manager
Version 1.6.0.2

Device at 192.168.123.90 was found!

# Terms and explanations

## Infrastructure Mode

(Loose translation of an excerpt from the German version Wikipedia, the free encyclopaedia)
The Infrastructure mode is similar to the structure of the mobile communications network: A special base station (Access Point) is used to coordinate the other network nodes (Clients). The base station sends small data packets (so called Beacons) in adjustable intervals (ten times per second by default) to all stations being in the footprint. The beacons contain among others the following information: Network name ("Service Set identifier", SSID), List of supported transfer rates, Type of encryption.
This beacons ease the connection establishment, because the clients just have to know the network name and optional some parameters for the encryption. The permanent sending of beacon-packets also allows a control of the reception quality - also when no user data are sent or received. The beacons are always sent with the lowest transfer rate (1 MBit/s), the successful reception of the beacons does not guarantee a steady connection to the network.

## Ad-hoc Mode

(Loose translation of an excerpt from the German version Wikipedia, the free encyclopaedia)
In the Ad-hoc mode (lat.: "created for this moment") no station is favoured; they all are on a par. Ad-hoc networks can be established quickly and without great effort. But for a spontaneous networking of a few terminals other techniques (Bluetooth, Infrared) are commonly used.
The preconditions for using the Ad-hoc mode are the same as for the Infrastructure mode: All stations use the same network name ("Service Set Identifier", SSID) and optionally also the same settings for the encryption. Because there is no central instance for this operating mode and because no beacon-packets are sent, a client cannot determine, whether there are other stations (using the same settings) within reach, who is part of the network or how good the connection quality is. Therefore, the Ad-hoc mode is suitable only for a small number of stations, that have to be close to each other because of the limited reach of the transmitter. Otherwise, it is possible, that a station cannot communicate with the other stations, because they simply do not receive a signal.
Forwarding data packets between the stations is not intended and not possible without further ado in practice, because in the Ad-hoc mode no information are exchanged, that might give the single stations an overview over the network. Gathering and exchanging these information is part of the upgrading of an Ad-hoc network to a mobile Ad-hoc network: Software components on each stations collect data (e.g. for visibility of other stations, connection quality etc.), exchange them among each other and make decisions concerning the forwarding of the user data. The development in this field is not finished yet.
By now a long list of experimental protocols (OLSR, MIT RoofNet, B.A.T.M.A.N etc.) and several proposals for standardisation (Hybrid Wireless Mesh Protocol, 802.11s) as well as some commercial solutions (e.g. Adaptive Wireless Path Protocol from Cisco) were produced.

## Frequencies and ports

| Chanal Number | Frequenz (GHz) | Permit in | Chanal Number | Frequenz (GHz) | Permit in |
|---|---|---|---|---|---|
| 1 | 2,412 | Europa, USA, Japan | 8 | 2,447 | Europa, USA, Japan |
| 2 | 2,417 | Europa, USA, Japan | 9 | 2,452 | Europa, USA, Japan |
| 3 | 2,422 | Europa, USA, Japan | 10 | 2,457 | Europa, USA, Japan |
| 4 | 2,427 | Europa, USA, Japan | 11 | 2,462 | Europa, USA, Japan |
| 5 | 2,432 | Europa, USA, Japan | 12 | 2,467 | Europa, Japan |
| 6 | 2,437 | Europa, USA, Japan | 13 | 2,472 | Europa, Japan |
| 7 | 2,442 | Europa, USA, Japan | 14 | 2,484 | Japan |

## Security and encryption

(Loose translation of an excerpt from the German version Wikipedia, the free encyclopaedia)
Part of the WLAN standard IEEE 802.11 is the Wired Equivalent Privacy (WEP), a security standard containing the RC4 algorithm. The contained encryption, with a static key of a length of just 40 bits (called 64 bits) or 104 bits (called 128 bits), sometimes also 232 bits (called 256 bits), does not guarantee, that the WLAN is secured sufficiently. By collecting pairs of keys Known-Plaintext-Attacks may happen. There are freely available programs, that are able to decrypt the password (a fast computer assumed), sometimes even without a complete packet cycle. Furthermore, each user of the network can read along the whole communication. The combination of RC4 and CRC is considered to be cryptographic insecure.
Therefore, technical complements were developed (e.g. WEPplus, Wi-Fi Protected Access (WPA) as advance and subset of 802.11i, Fast Packet Keying, Extensible Authentication Protocol (EAP), Kerberos or High Security Solution, that reduce the insecurity of WLAN more or less effective.
Child of the WEP is the new security standard 802.11i. It offers an increased security by using the TKIP (Termporal Key Integrity Protocol) for WPA or the AES (Advanced Encryption Standard) for WPA2. At the moment, it is regarded to be non-decipherable, as long as no trivial passwords are used, that can be decrypted via a dictionary-attack. It is recommended to create the passwords with a password generator, that contain special, numeric and alphabetical characters (upper and lower case) and have a minimum length of 32 characters.
CCMP (= Counter Mode with Cipher Block Chaining Message Authentication Code Protocol) or also Counter-Mode/CBC-Mac Protocol is, according to IEEE 802.11i, a cryptography algorithm. CCMP is based on the Advanced Encryption Standard (AES) and uses a 128-bit-key with a 48-bit-initialisator for answer query.

## Authentification

(Loose translation of an excerpt from the German version Wikipedia, the free encyclopaedia)

Extensible Authentication Protocol ist ein Protokoll zur Authentifizierung von Clients. Es kann zur Nutzerverwaltung auf RADIUS-Server zurückgreifen. EAP wird hauptsächlich innerhalb von WPA für größere WLAN-Installationen eingesetzt.

Extensible authentication Protocol is a protocol for authenticating clients. It can access to the RADIUS server for user administration. EAP is mainly used for large WLAN installations within WPA.

Encryption systems, that require, that both members know the keys before communicating (= symmetric systems), are called Pre-Shared Key (PSK). An advantage of the PSK encryption is, that it can be realized more easily between two known members than asymmetric encryption. The major disadvantage of this system is, that the two members have to exchange the key in private before the communication takes place. Therefore, the PSK system is not suitable for many applications in the internet (e.g. online shopping), because there the prior exchange of a key is impossible or far too extensive. In such a case it is easier to use the Public-Key system.

## Passwords:

(Loose translation of an excerpt from the German version Wikipedia, the free encyclopaedia)

Modern encryption system are technical advanced insofar as they often can only be decrypted via dictionary attacks (except from trying all possible keys = Brute-Force method). At both attacks the weak point is the password (key), set by the user. In order to create a password, that is not less insecure than the actual encryption (112 to 128-bit-key for current systems), theoretically a sequence of about 20 random characters is necessary. If no random characters are used, considerable longer passwords are necessary in order to guarantee the same security level.

The length of passwords, that can be used for encryption, is often limited by the software (e.g. using AES passwords with more than 32 characters do not increase the security). Therefore, you should always use combinations of characters, that consist of rare words or word orders, fantasy or foreign-language words, initial letters of a sentence, numeric and/ or special characters or even combinations thereof. Its components should be unforeseeable for an attacker, who is well-informed about the person and his/her interests. As alternative you can use a password generator and fix the password in you memory or you note it on a secret place.

A relatively secure password could be: 0aJ/4%(hGs$df"Y! (16 characters). The major problem of such sequences using random characters is, that they are difficult to be kept in mind and therefore have to be noted somewhere. A simpler alternative is, to use a rehearsed sentence and to change some characters, e.g. "‘dIE bANANNE*3 durch 1/4 nIKOTIN"’ (32 characters). It is very important to work in enough random characters. Suitable is the use of the initial letters of a sentence, e.g. "‘LS-Wbt7m/Ia1000tftY"’, created with the initial letters of the sentence "‘Little Snow-White beyond the 7 mountains/ Is a 1000 times fairer than You"’.

Although the use of special characters can increase the security, because the password becomes morecomplicated, you should use them carefully, if there is the possibility, that the password has to be used in foreign countries: It might be possible, that some special characters do not exist on foreign keyboards.

## Resetting the WLAN settings

On the terminal (from version 04.01.04.57 and 04.01.05.19 on) you can reset the device to firmly defined default values under Factory default WLAN of the menu item Communication of the BIOS dialogue. The following settings are made then.

-WLAN: enabled

-Topology: Infrastructure Network name (SSID): WLAN-DATAFOX Security: none

The settings of your WLAN router have to be adjusted to the default values, so that you can work with

the terminal again. In that case the module can be configured again with the device installer of Lantronix.

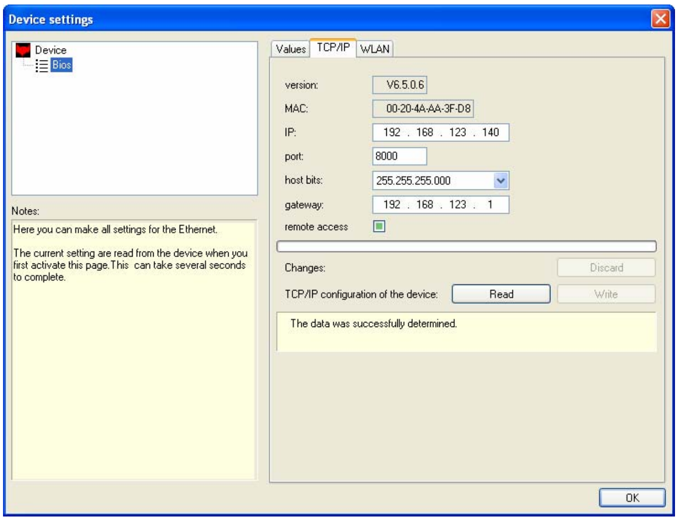
Another possibility is, to use the program WLANConfig by Datafox, which accesses to the device via RS232 and configures the MatchPort from there. An access to the MatchPort is always possible via RS232, provided that the main communication is set on RS232.

## WLAN configuration via the DatafoxStudioIV

Please connect the Datafox Device to the Program DatafoxStudioIV via RS232

After then activate the bios - mod des of the Device. More information you find in the Manual „DatafoxStudioIV“ caption „configuration>Bios“.

Here you can make any necessary adjustments that are necessary for TCP / IP.



Notes:

Here you can make all settings for the Ethernet.

The current setting are read from the device when you first activate this page.This  can take several seconds to complete.

version: V6.5.0.6

MAC: 00-20-4A-AA-3F-D8

IP: 192 . 168 . 123 . 140

port: 8000

host bits: 255.255.255.000

gateway: 192 . 168 . 123 . 1

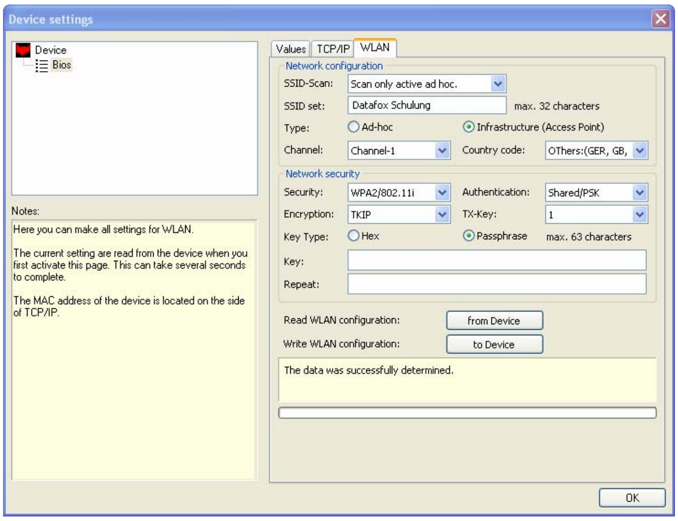
remote access ☑

Changes:

TCP/IP configuration of the device:

The data was successfully determined.

Here you can make any necessary adjustments that are necessary for WLAN.



Notes:

Here you can make all settings for WLAN.

The current setting are read from the device when you first activate this page. This can take several seconds to complete.

The MAC address of the device is located on the side of TCP/IP.

SSID-Scan: Scan only active ad hoc.

SSID set: Datafox Schulung max. 32 characters

Type: ○ Ad-hoc ● Infrastructure (Access Point)

Channel: Channel-1 Country code: OThers:(GER, GB,

Security: WPA2/802.11i Authentication: Shared/PSK

Encryption: TKIP TX-Key: 1

Key Type: ○ Hex ● Passphrase max. 63 characters

Key:

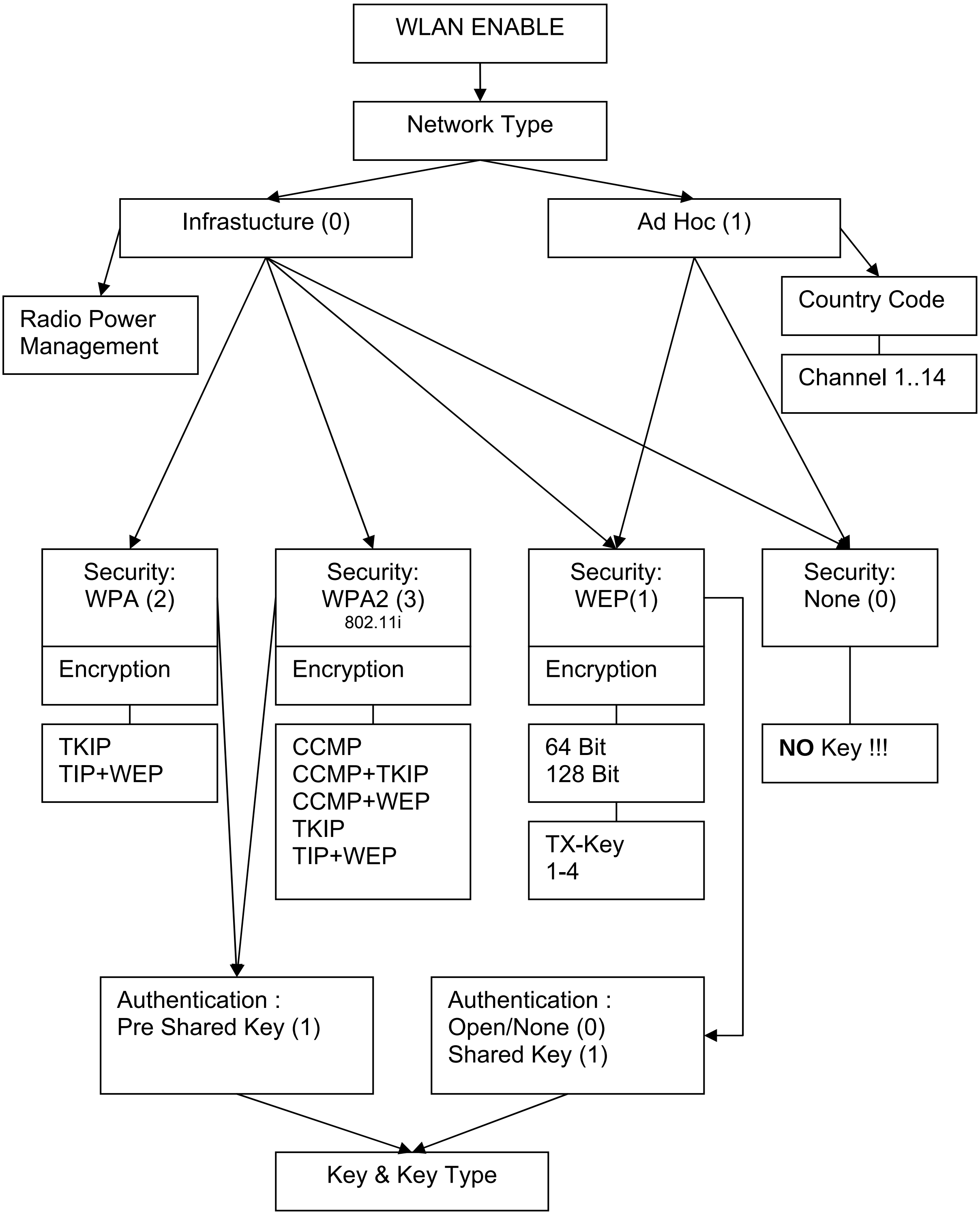
Repeat:

Read WLAN configuration:

Write WLAN configuration:

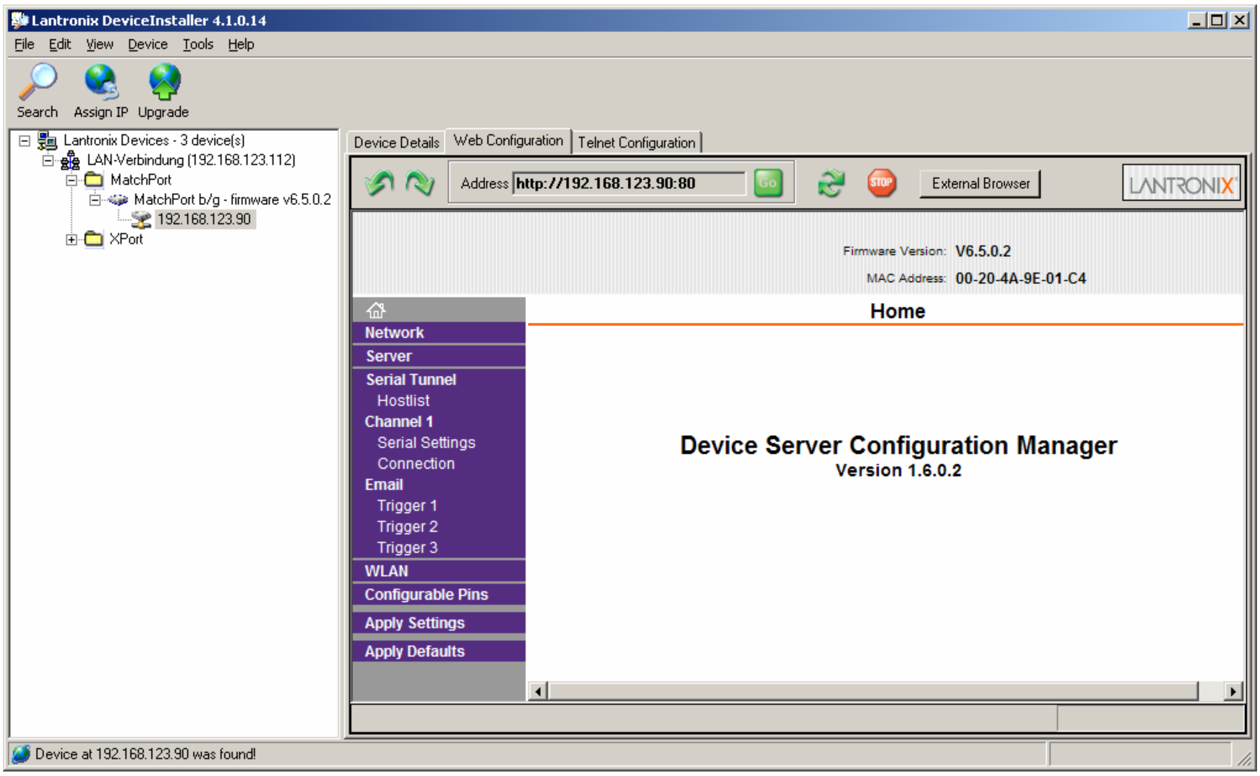
The data was successfully determined.

## overview WLAN dependencies



## WLAN configuration via the Lantronix tool

You may find the device installerTM of Lantronix R on the enclosed Datafox product DVD under DVD:
Datafox-Optionen ( eingebaute Module )wLAN, Matchport.
With the help of this tool the COM servers Xport and MatchPort of the Datafox devices can be configured. The device installer accesses to the COM server via TCP/IP, the Datafox terminals via S232. If a COM server is not available, because it is adjusted that much, so that the device installer is unable to access, it is possible to reset the COM server to the default values via the BIOS menu of the terminal.



Address http://192.168.123.90:80

Firmware Version: V6.5.0.2

MAC Address: 00-20-4A-9E-01-C4

Home

Device Server Configuration Manager
Version 1.6.0.2

Device at 192.168.123.90 was found!

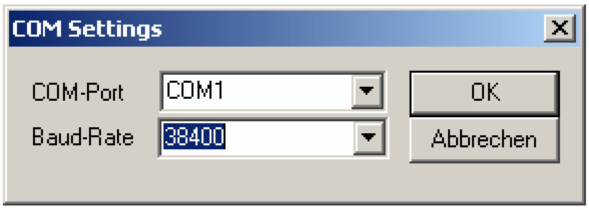
## Selection of the configuration file

### General

The program WLANConfig can set the TCP/IP and the WLAN settings of the MatchPort via RS232. These settings can be saved as a file and the data of this file can be transmitted to the device. The dependencies
of the single parameters among each other are permitted or locked by the program automatically. Four dialogues are provided for working with the program.

- WLAN settings (main dialogue)
- Selection of the serial interface (COM settings)
- Selection of the configuration file (Select INI-File)
- TCP/IP settings (Terminal TCP/IP settings)

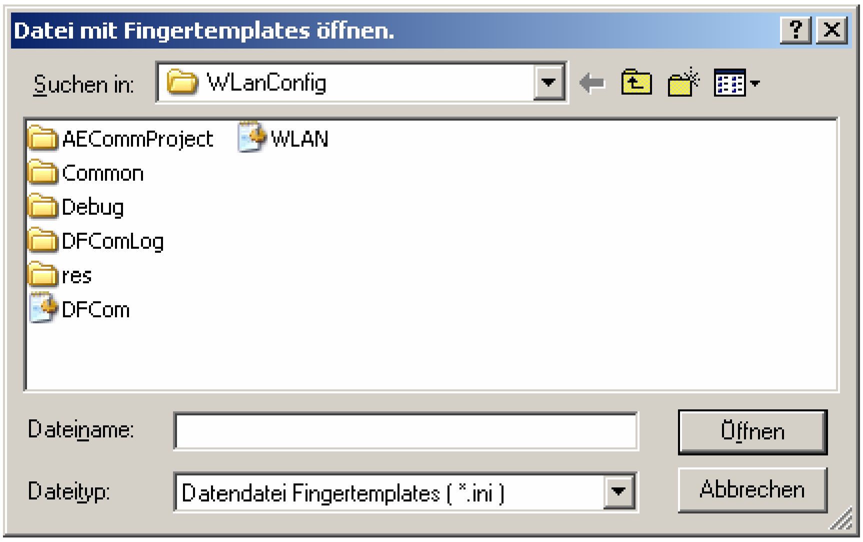
## Selection of the serial interface



COM-Port: COM1
Baud-Rate: 38400

Via this dialogue you can select the interface of the PC, to which the MasterIV terminal is connected. Usually a baud rate of 38400baud is set, which has to correspond to that one of the terminal. You start the dialogue by pressing the button COM settings.

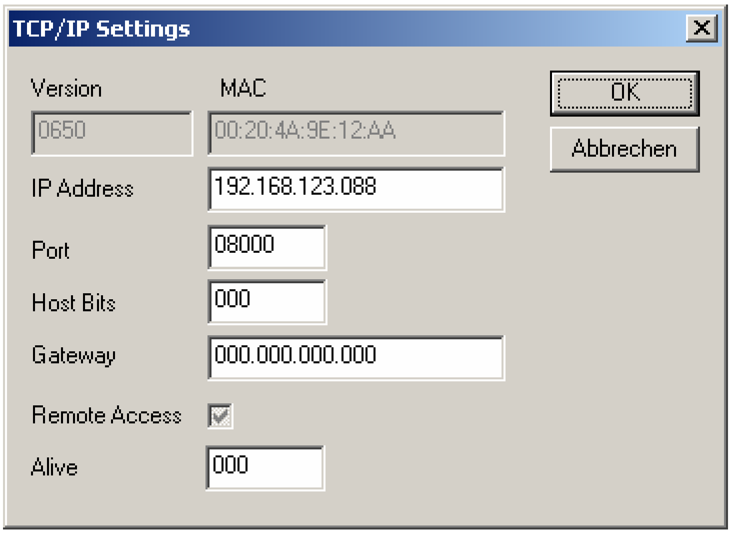
## Selection of the configuration file



Suchen in: WLanConfig
Dateiname:
Dateityp: Datendatei Fingertemplates ( *.ini )

Via the button Select INI-File the dialogue is started. Here you can create new files or select a file, here data are logged on. On the INI file all settings of the TCP/IP and the WLAN are logged.

## TCP/IP settings



Version: 0650

MAC: 00:20:4A:9E:12:AA

IP Address: 192.168.123.088

Port: 08000

Host Bits: 000

Gateway: 000.000.000.000

Remote Access: ☑

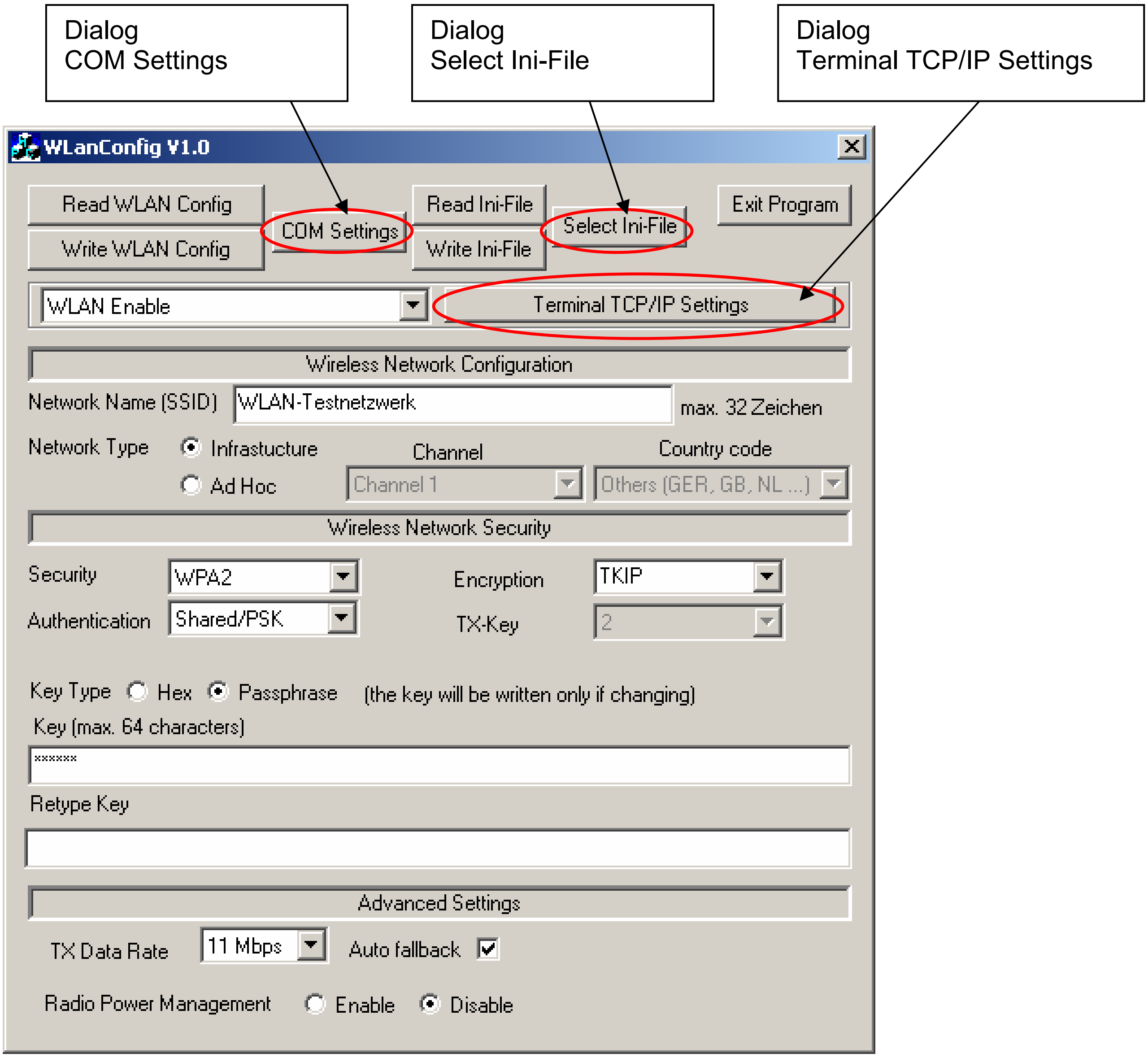
Alive: 000

Via the button Terminal TCP/IP Settings the dialogue is started. The current firmware version of the MatchPort and the MAC-address are displayed. You can edit the other parameters, which are equal to those of the BIOS dialogue of the terminal and of the Datafox Studio.

## WLAN Settings

The WLAN settings allow the editing of values, that were read out of the terminal and loaded inon a INI file or entered manually. It is very important, that the key cannot be read out of the terminal. It also cannot be re-recorded, if it was not entered. If the key is available in the INI file, a group of * characters is displayed on the key-edit fields after loading the data. It is also transmitted to the device then. In order to use WLAN you have to set WLAN Enable. This parameter can also be set by the device installer of Lantronix. If you want to configure several devices via WLANConfig, you have to note, that the IP-address of the devices has also to be set.

! **Caution:**
After transmitting the parameters the device has to be set from RS232 to TCP/IP, so that the MatchPort is activated. Only then it is available in the network.



Dialog COM Settings

Dialog Select Ini-File

Dialog Terminal TCP/IP Settings

WLAN Enable

Network Name (SSID): WLAN-Testnetzwerk max. 32 Zeichen

Network Type: ● Infrastucture ○ Ad Hoc

Channel: Channel 1

Country code: Others (GER, GB, NL ...)

Security: WPA2

Authentication: Shared/PSK

Encryption: TKIP

TX-Key: 2

Key Type ○ Hex ● Passphrase (the key will be written only if changing)

Key (max. 64 characters): ******

Retype Key:

TX Data Rate: 11 Mbps

Auto fallback ☑

Radio Power Management ○ Enable ● Disable

Via Read WLAN Config the data are loaded from the device to the program.

Via Write WLAN Config Config the data are loaded from the program into the device.

Via Read Ini-File the data are loaded from the selected file into the program.

Via Write Ini-File INI file the data are written from the program in the file.

### 5.7.6. Communication via USB

#### USB to PC

The MasterIV device is connected to a PC via an USB standard A to mini-B cable.

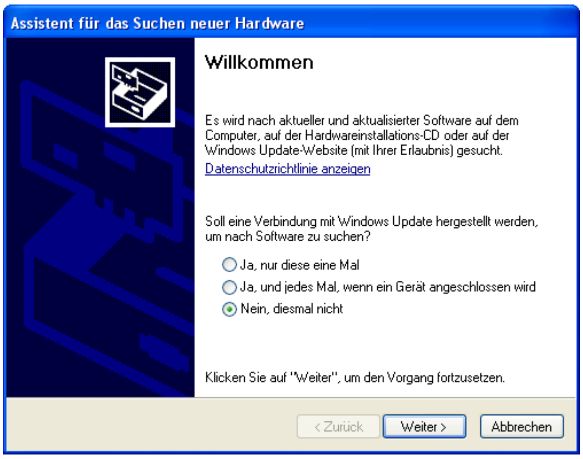
! **Caution:**
Note that the USB interface of the terminal is an USB type B, when communicating with the PZE-MasterIV . That means the terminal works in slave mode and therefore cannot manage other USB devices.

You must install the USB device drivers and the USB serial converter drivers which are necessary to communicate via USB.

! **Caution:**
Only use the drivers delivered with the device.

#### USB Driver Installation

After connecting the MasterIV to the PC, the terminal is detected as new USB device and the supplied drivers are installed.



Willkommen

Es wird nach aktueller und aktualisierter Software auf dem Computer, auf der Hardwareinstallations-CD oder auf der Windows Update-Website (mit Ihrer Erlaubnis) gesucht.

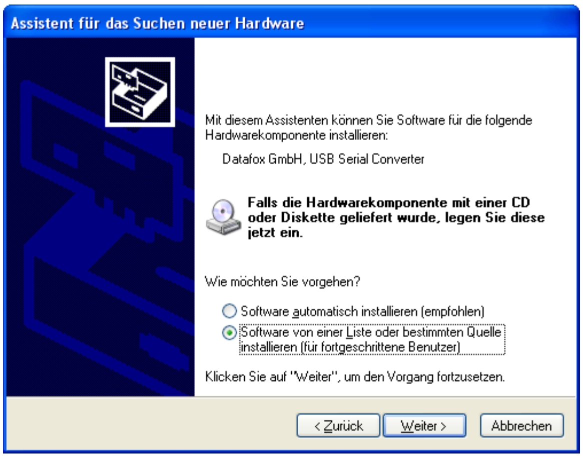
Datenschutzrichtlinie anzeigen

Soll eine Verbindung mit Windows Update hergestellt werden, um nach Software zu suchen?

○ Ja, nur diese eine Mal
○ Ja, und jedes Mal, wenn ein Gerät angeschlossen wird
● Nein, diesmal nicht

Klicken Sie auf "Weiter", um den Vorgang fortzusetzen.

After connecting the MasterIV to the PC, the terminal is detected as new USB device and the supplied drivers are installed.
.



Mit diesem Assistenten können Sie Software für die folgende Hardwarekomponente installieren:

Datafox GmbH, USB Serial Converter

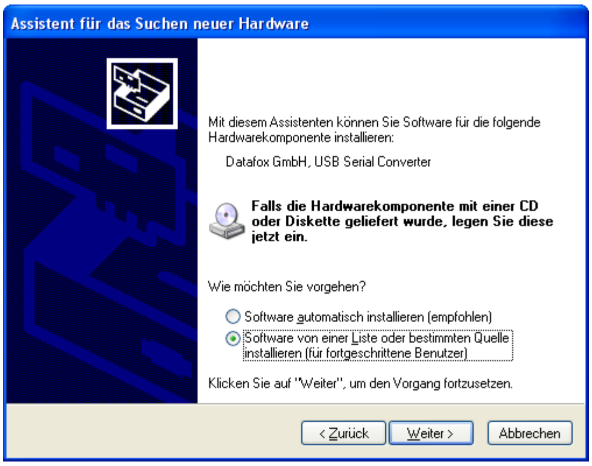
**Falls die Hardwarekomponente mit einer CD oder Diskette geliefert wurde, legen Sie diese jetzt ein.**

Wie möchten Sie vorgehen?

○ Software automatisch installieren (empfohlen)
● Software von einer Liste oder bestimmten Quelle installieren (für fortgeschrittene Benutzer)

Klicken Sie auf "Weiter", um den Vorgang fortzusetzen.

Select the directory which contains the drivers.



**Assistent für das Suchen neuer Hardware**

Mit diesem Assistenten können Sie Software für die folgende Hardwarekomponente installieren:

Datafox GmbH, USB Serial Converter

**Falls die Hardwarekomponente mit einer CD oder Diskette geliefert wurde, legen Sie diese jetzt ein.**

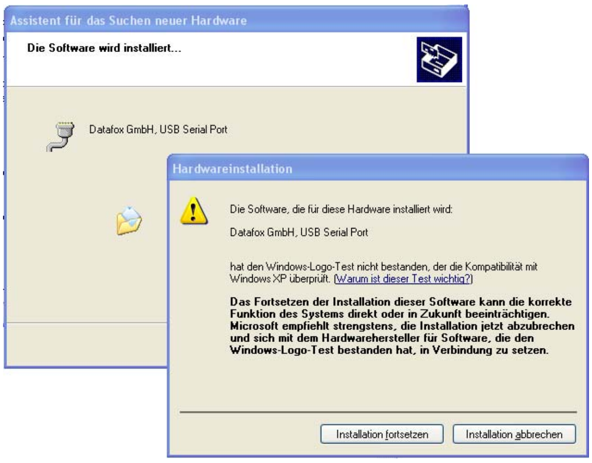
Wie möchten Sie vorgehen?

○ Software automatisch installieren (empfohlen)

● Software von einer Liste oder bestimmten Quelle installieren (für fortgeschrittene Benutzer)

Klicken Sie auf "Weiter", um den Vorgang fortzusetzen.

Installation of the drivers for the virtual COM port. At this installation step you receive the message that the driver has not passed the Microsoft logo test. Click “Continue Installation” in order to use the driver.



**Assistent für das Suchen neuer Hardware**

**Die Software wird installiert...**

Datafox GmbH, USB Serial Port

**Hardwareinstallation**

Die Software, die für diese Hardware installiert wird:

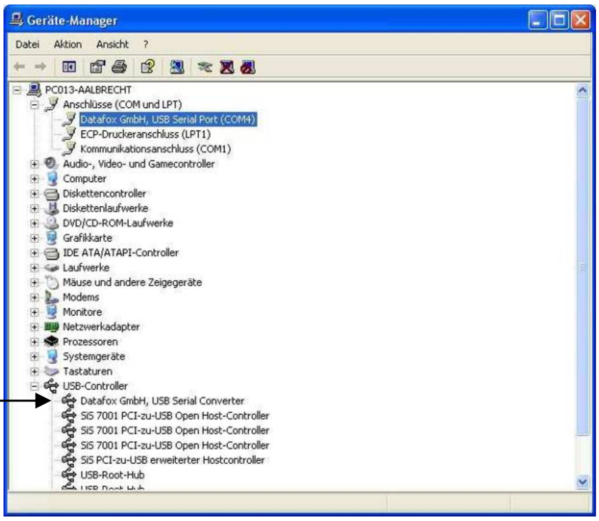
Datafox GmbH, USB Serial Port

hat den Windows-Logo-Test nicht bestanden, der die Kompatibilität mit Windows XP überprüft. (Warum ist dieser Test wichtig?)

**Das Fortsetzen der Installation dieser Software kann die korrekte Funktion des Systems direkt oder in Zukunft beeinträchtigen. Microsoft empfiehlt strengstens, die Installation jetzt abzubrechen und sich mit dem Hardwarehersteller für Software, die den Windows-Logo-Test bestanden hat, in Verbindung zu setzen.**

In the Device Manager the entry for the Datafox USB serial port has been added. Via this COM port you can establish a connection to the MasterIV device with the DatafoxStudioIV or your own application using the DFComDLL.dll.

You can check the successful installation of the USB drivers in the Device Manager. The following entries must be displayed without a yellow exclamation mark.



**Geräte-Manager**

```
PC013-AALBRECHT
  Anschlüsse (COM und LPT)
    Datafox GmbH, USB Serial Port (COM4)
    ECP-Druckeranschluss (LPT1)
    Kommunikationsanschluss (COM1)
  Audio-, Video- und Gamecontroller
  Computer
  Diskettencontroller
  Diskettenlaufwerke
  DVD/CD-ROM-Laufwerke
  Grafikkarte
  IDE ATA/ATAPI-Controller
  Laufwerke
  Mäuse und andere Zeigegeräte
  Modems
  Monitore
  Netzwerkadapter
  Prozessoren
  Systemgeräte
  Tastaturen
  USB-Controller
    Datafox GmbH, USB Serial Converter
    SiS 7001 PCI-zu-USB Open Host-Controller
    SiS 7001 PCI-zu-USB Open Host-Controller
    SiS 7001 PCI-zu-USB Open Host-Controller
    SiS PCI-zu-USB erweiterter Hostcontroller
    USB-Root-Hub
```

## USB Stick as Data Medium

In addition to the main communication USB, it is possible to use an USB stick as data medium. Thus, you can read data records from a PZE-MasterIV and process them on a PC or create lists for the master data or the access control.

In order to guarantee the data transfer between the terminal and the USB stick, you have to create a directory structure on the USB stick at first. Please use the DatafoxStudioIV for this purpose.
A complete description of setting up the USB stick is contained in the manual "DatafoxStudioIV".

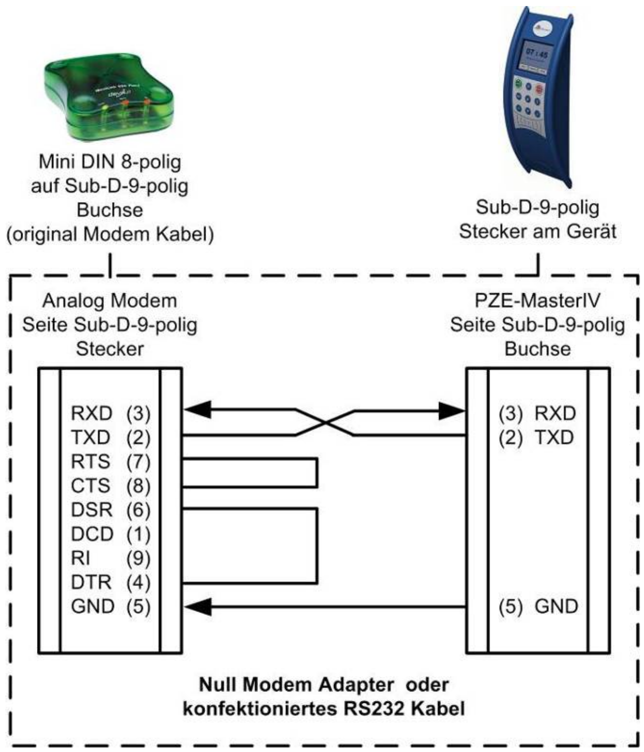
## Password and Communications Security

For a description of how to set a password for the communication with the USB stick, see the manual "DatafoxStudioIV".
It is also possible to store data for single terminals separately on the stick.
For more information see the manual "DatafoxStudioIV".

### 5.7.7. Communication via Modem

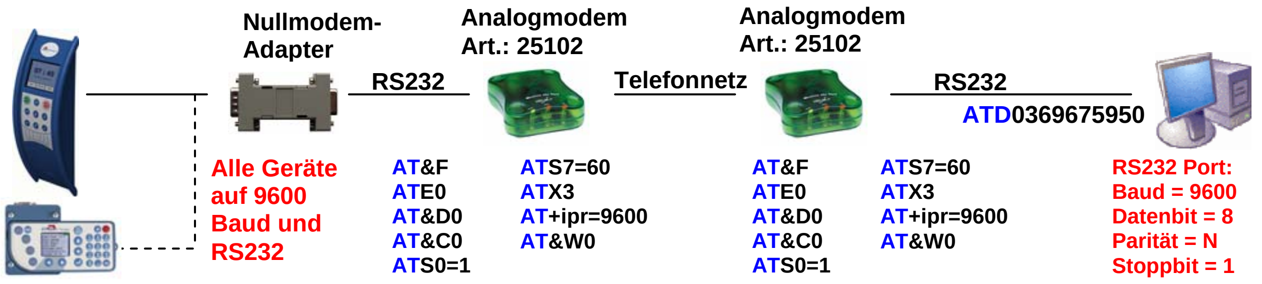
The analogous modem is connected to the COM interface of the device. For the connection is a zero modem adaptor or one according to the picture the manufactured
To use cable. Pay attention to the fact that on the side of the device no connections bridge are.

☞ **Note:**
Pay attention to the fact that the main communication stands on RS232 and the Baudrate of the modem on the Baudrate of the device is put. The modem must be configured before the application.



For the communication about an analogous modem the communication kind "RS232" must be put in the system menu bios of the device. The Baudrate of the terminal must agree with the Baudrate of the connected modem. Time-out is as a function of the management quality of the telephone network (which sturgeon springs the management is put out?) to put. The worse the management quality should be put the higher Time-out. The modem in which the terminal should be connected must be configured above the COM interface of a PC's. The in the following performed steps refer II“ modems to tested and recommended „Devolo-MicroLink 56 K fun II.”

## Analogmodem zu Analogmodem



Alle Geräte auf 9600 Baud und RS232

AT&F
ATE0
AT&D0
AT&C0
ATS0=1

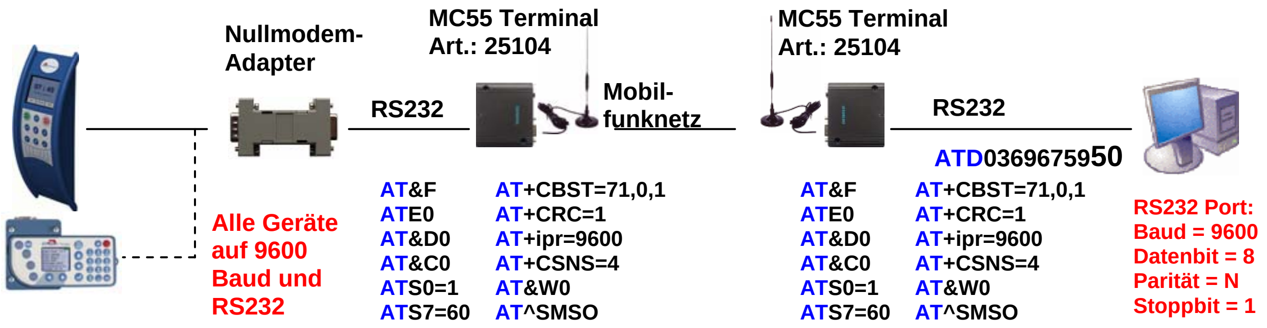
ATS7=60
ATX3
AT+ipr=9600
AT&W0

AT&F
ATE0
AT&D0
AT&C0
ATS0=1

ATS7=60
ATX3
AT+ipr=9600
AT&W0

RS232 Port:
Baud = 9600
Datenbit = 8
Parität = N
Stoppbit = 1

## Mobilfunkmodem zu Mobilfunkmodem



Alle Geräte auf 9600 Baud und RS232

AT&F
ATE0
AT&D0
AT&C0
ATS0=1
ATS7=60

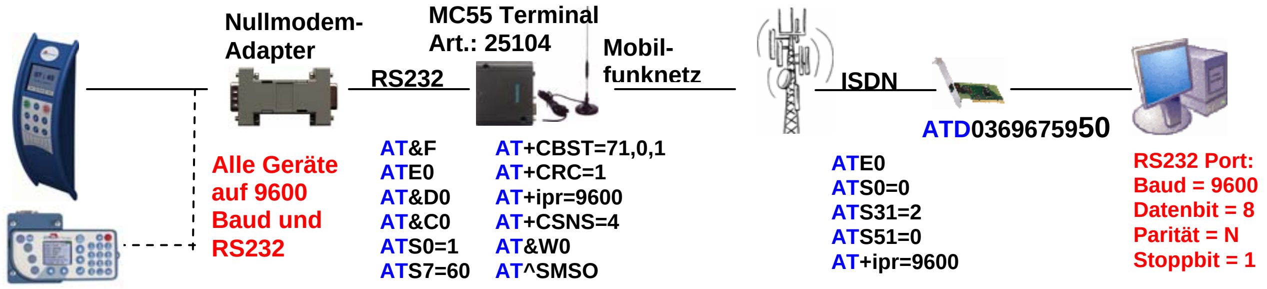
AT+CBST=71,0,1
AT+CRC=1
AT+ipr=9600
AT+CSNS=4
AT&W0
AT^SMSO

AT&F
ATE0
AT&D0
AT&C0
ATS0=1
ATS7=60

AT+CBST=71,0,1
AT+CRC=1
AT+ipr=9600
AT+CSNS=4
AT&W0
AT^SMSO

RS232 Port:
Baud = 9600
Datenbit = 8
Parität = N
Stoppbit = 1

### ISDN (Festnetz) zu Mobilfunkmodem



Alle Geräte auf 9600 Baud und RS232

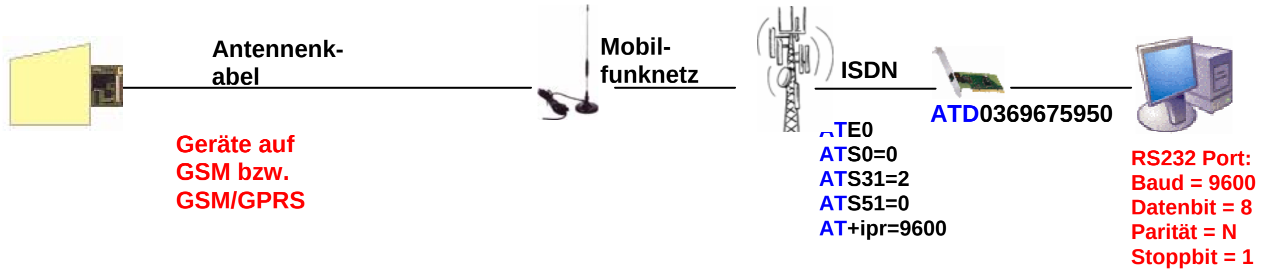
AT&F
ATE0
AT&D0
AT&C0
ATS0=1
ATS7=60

AT+CBST=71,0,1
AT+CRC=1
AT+ipr=9600
AT+CSNS=4
AT&W0
AT^SMSO

ATE0
ATS0=0
ATS31=2
ATS51=0
AT+ipr=9600

RS232 Port:
Baud = 9600
Datenbit = 8
Parität = N
Stoppbit = 1

### ISDN (Festnetz) zu MC55 (im Gerät intern verbaut)



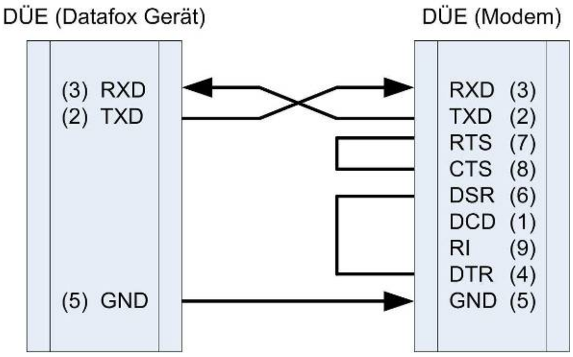
Geräte auf GSM bzw. GSM/GPRS

ATE0
ATS0=0
ATS31=2
ATS51=0
AT+ipr=9600

RS232 Port:
Baud = 9600
Datenbit = 8
Parität = N
Stoppbit = 1

☞ **Note:**
The configurations mentioned above are no guarantee for a connection. They are just based on experience and maybe have to be set to the different telephone systems. Configurations that are not listed here usually do not work.

## Connector Datafox-Device and Modem



| Pin | Bezeichnung | Funktion |
|---|---|---|
| 1 | DCD data carrier detect | Träger erkannt |
| 2 | RxD receive data | Empfangsdaten |
| 3 | TxD transmit data | Sendedaten |
| 4 | DTR data terminal ready | DEE empfangsbereit |
| 5 | GND ground | Signalmasse |
| 6 | DSR data set ready | Betriebsbereitschaft |
| 7 | RTS request to send | Sendeanforderung |
| 8 | CTS clear to send | Sendebereitschaft |
| 9 | RI ring indicator | Ankommender Ruf |

| Abkürzung | Beschreibung |
|---|---|
| DCD | It becomes active when the connected modem has contacted another modem. It indicates the PC that a connection is established and data can be sent. |
| DTR | The computer signals his ready status, e.g. at a direct connection. |
| DSR | As response to DTR (at crossed lines.) |
| RTS | Becomes active when the terminal is ready to send data. |
| CTS | Becomes active when the terminal is ready to receive data. |
| RI | Is produced by a connected modem when a ring comes in. |

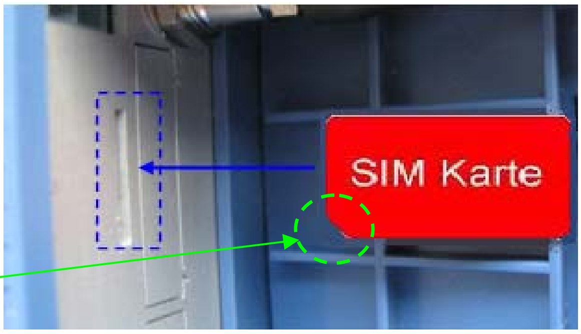
**Output:**
Low-Pegel = + 12V High-Pegel = - 12V; Output current: up to 10 mA
**Input:**
Low-Pegel is recognized till ca. + 1V
High-Pegel is recognized from ca. + 1V
Driving point impedance = 10 kOhm

### 5.7.8. Communication via Cellular Network (GSM or GPRS/GSM)

The PZE-MasterIV 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 PZE-MasterIV.

The SIM card must be inserted into the device in this position.

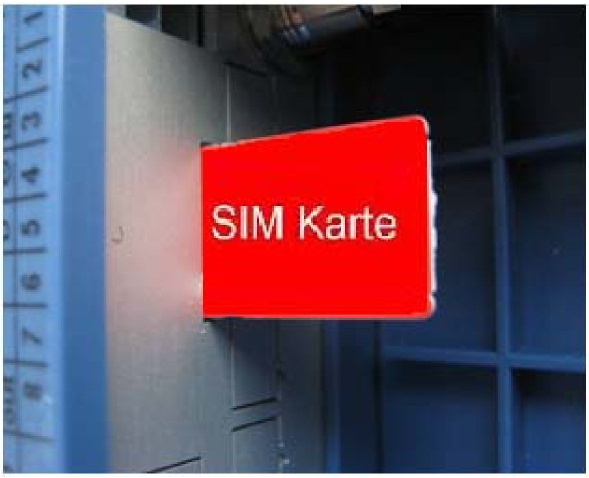
Mind the bevelled corner.



Now insert the SIM card.

For inserting, use a tool like a pen or screwdriver.

The SIM card must perceptively engage.



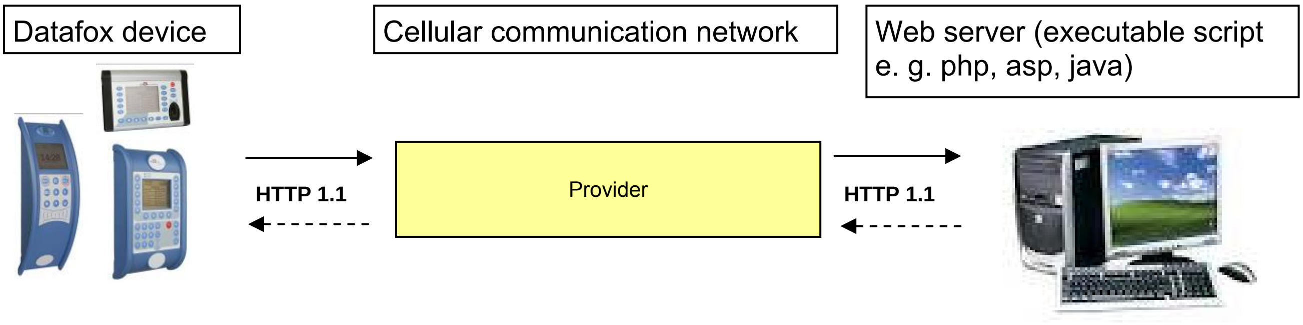
! **Caution:**
For inserting the SIM card a tool in pen or screwdriver form is required. Take care that the SIM card is not damaged.

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.

### 5.7.8.1. Necessary Settings for Communication via Cellular Network

In order to enable communication via cellular network, the main communication must be set to GPRS in the BIOS of the device. For information on accessing the BIOS menu see chapter Display and Menu Bios

**Illustration for Connection via Cellular Network**


Datafox device
Cellular communication network
Web server (executable script e. g. php, asp, java)
HTTP 1.1
Provider
HTTP 1.1

Information like SIM card PIN, provider and dial-up specifications must be provided. The information is saved in a GPRS.ini file and written to the device.
For more information see the DatafoxStudioIV manual, chapter "Configuration of System Variables HTTP / GPRS".

**Encryption of Data Fields for Sending via HTTP (GPRS)**
If data records are sent via HTTP, field content can be transferred in encrypted form. The data fields of the data record are encrypted with a RC4 encryption. The encrypted characters are transferred as field content in hexadecimal format.

For more information regarding the encryption of data for sending via http see the DatafoxStudioIV manual, chapter "Configuration > Encryption of Data Fields for Sending via HTTP".

### 5.7.8.2. Communication state

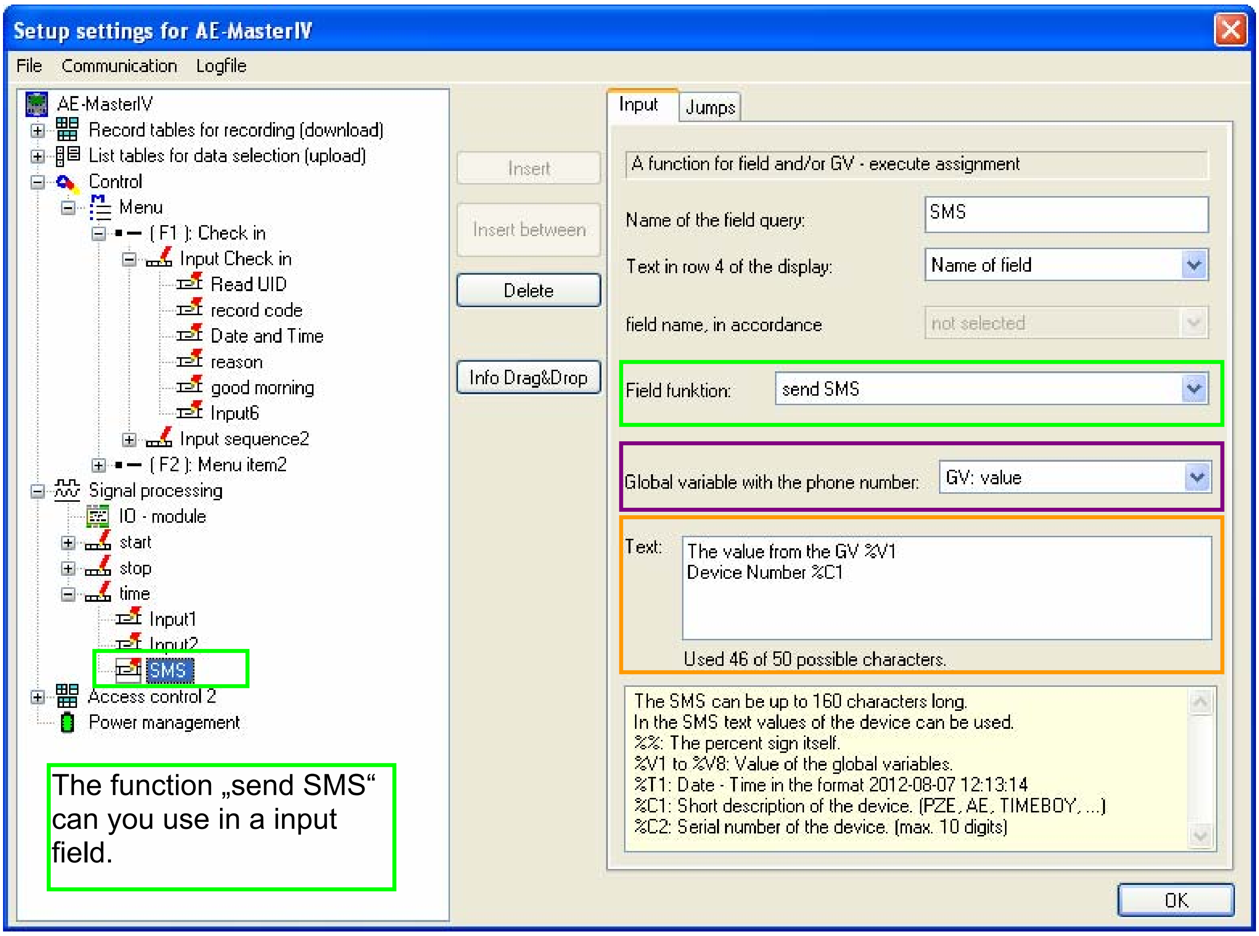
The state of GPRS-/GSM-connection you can always see in the state bar on the display.

| 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 |
| | |
| 40 | timeout after failed connection , to 15 minutes |
| 41[1)] | timeout after failed connection Provider, to 15 minutes. |
| 42[1)] | 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 bzw. Roaming impossible |
| | |
| 50 | close connection |
| 55 | Turn modem off |
| | |

## 5.7.9. Communication via SMS

### 5.7.9.1. Send a SMS

With the Datafox devices it's possible to send an 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.



A function for field and/or GV - execute assignment

Name of the field query: SMS

Text in row 4 of the display: Name of field

field name, in accordance: not selected

Field funktion: send SMS

Global variable with the phone number: GV: value

Text: The value from the GV %V1
Device Number %C1

Used 46 of 50 possible characters.

The SMS can be up to 160 characters long.
In the SMS text values of the device can be used.
%%: The percent sign itself.
%V1 to %V8: Value of the global variables.
%T1: Date - Time in the format 2012-08-07 12:13:14
%C1: Short description of the device. (PZE, AE, TIMEBOY, ...)
%C2: Serial number of the device. (max. 10 digits)

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

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

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

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..

!

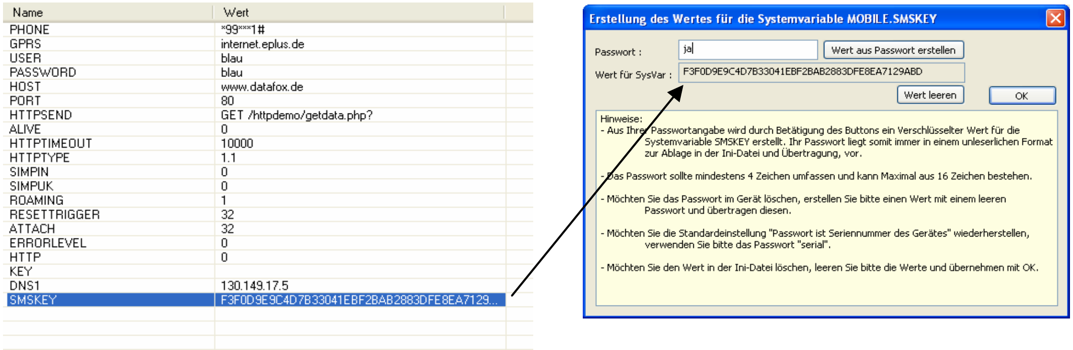
**Caution:**
Enter the phone number always with a country code.
Example.: +49161458✳✳✳✳✳

### 5.7.9.2. Receive SMS

The follows functions are possible:

- View the SMS on the display. The sam 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 fort he device can set in the GPRS/HTTP .ini file.



| Name | Wert |
|---|---|
| PHONE | *99***1# |
| GPRS | internet.eplus.de |
| USER | blau |
| PASSWORD | blau |
| HOST | www.datafox.de |
| PORT | 80 |
| HTTPSEND | GET /httpdemo/getdata.php? |
| ALIVE | 0 |
| HTTPTIMEOUT | 10000 |
| HTTPTYPE | 1.1 |
| SIMPIN | 0 |
| SIMPUK | 0 |
| ROAMING | 1 |
| RESETTRIGGER | 32 |
| ATTACH | 32 |
| ERRORLEVEL | 0 |
| HTTP | 0 |
| KEY | |
| DNS1 | 130.149.17.5 |
| SMSKEY | F3F0D9E9C4D7B33041EBF2BAB2883DFE8EA7129... |

Erstellung des Wertes für die Systemvariable MOBILE.SMSKEY

Passwort : ja

Wert für SysVar : F3F0D9E9C4D7B33041EBF2BAB2883DFE8EA7129ABD

Hinweise:
- Aus Ihrer Passwortangabe wird durch Betätigung des Buttons ein Verschlüsselter Wert für die Systemvariable SMSKEY erstellt. Ihr Passwort liegt somit immer in einem unleserlichen Format zur Ablage in der Ini-Datei und Übertragung, vor.

- Das Passwort sollte mindestens 4 Zeichen umfassen und kann Maximal aus 16 Zeichen bestehen.

- Möchten Sie das Passwort im Gerät löschen, erstellen Sie bitte einen Wert mit einem leeren Passwort und übertragen diesen.

- Möchten Sie die Standardeinstellung "Passwort ist Seriennummer des Gerätes" wiederherstellen, verwenden Sie bitte das Passwort "serial".

- Möchten Sie den Wert in der Ini-Datei löschen, leeren Sie bitte die Werte und übernehmen mit OK.

**Textmassage**
The keyword must be included in the SMS-text is:
message=text1↵ text line2 ↵ line3 etc.
&delay=10&key=ja

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 “.

**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).

Example:

a) service=1
b) service=1&host=www.datafox.de
c) service=1&host=123.123.123.123
d) service=1&host=www.datafox.de&port=4711

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

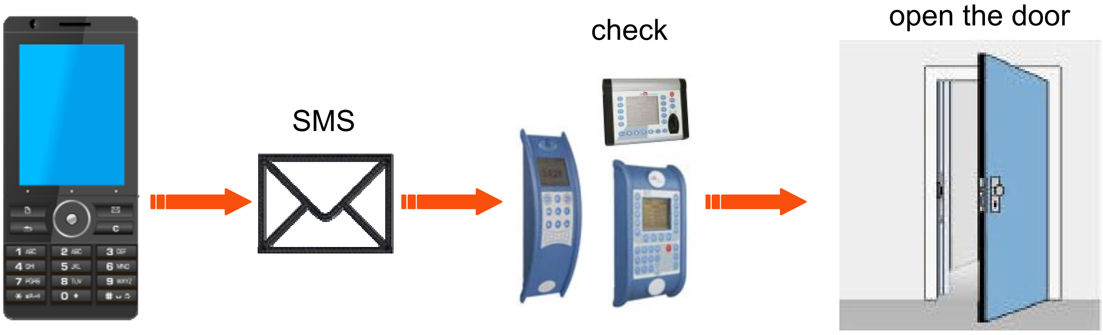
The keyword, if you need in the SMS is:
ek=name&key=ja   (the name of the input sequence).

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

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

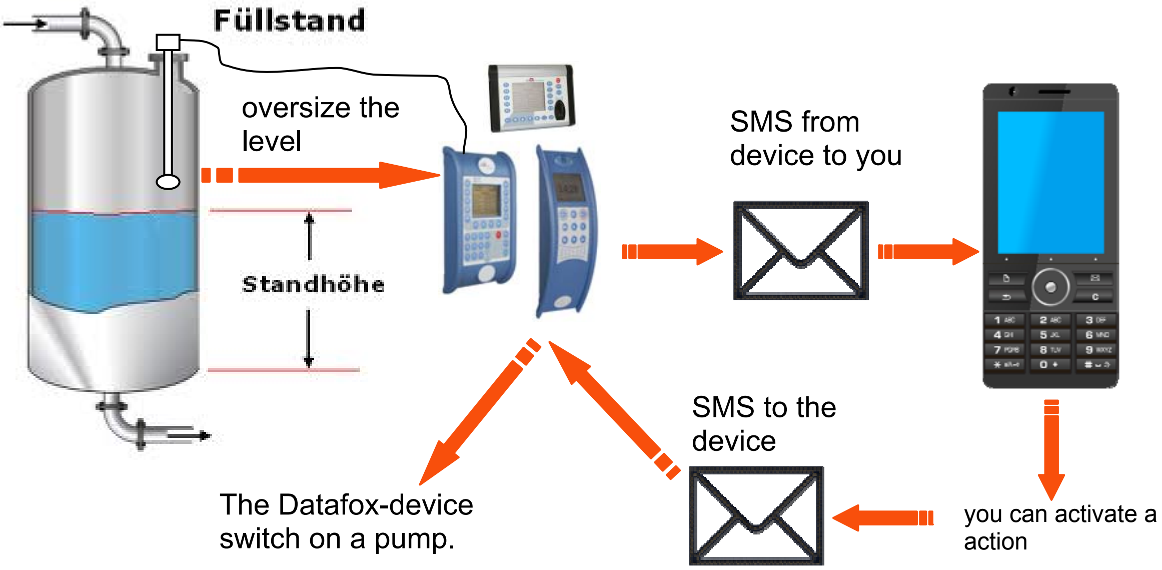
With this are many different variants are possible.
Here some example:

*Open a door via SMS.*



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

Is the level of regulation from the system not correct then gives a report via SMS.
The Datafox MasterIV is here not the regulator. 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.

## 5.8. Set-up of Access Control

### 5.8.1. 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.
PZE-MasterIV

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**

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**

50 x 50 x 43 mm (WxHxD)

The RELINO 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.

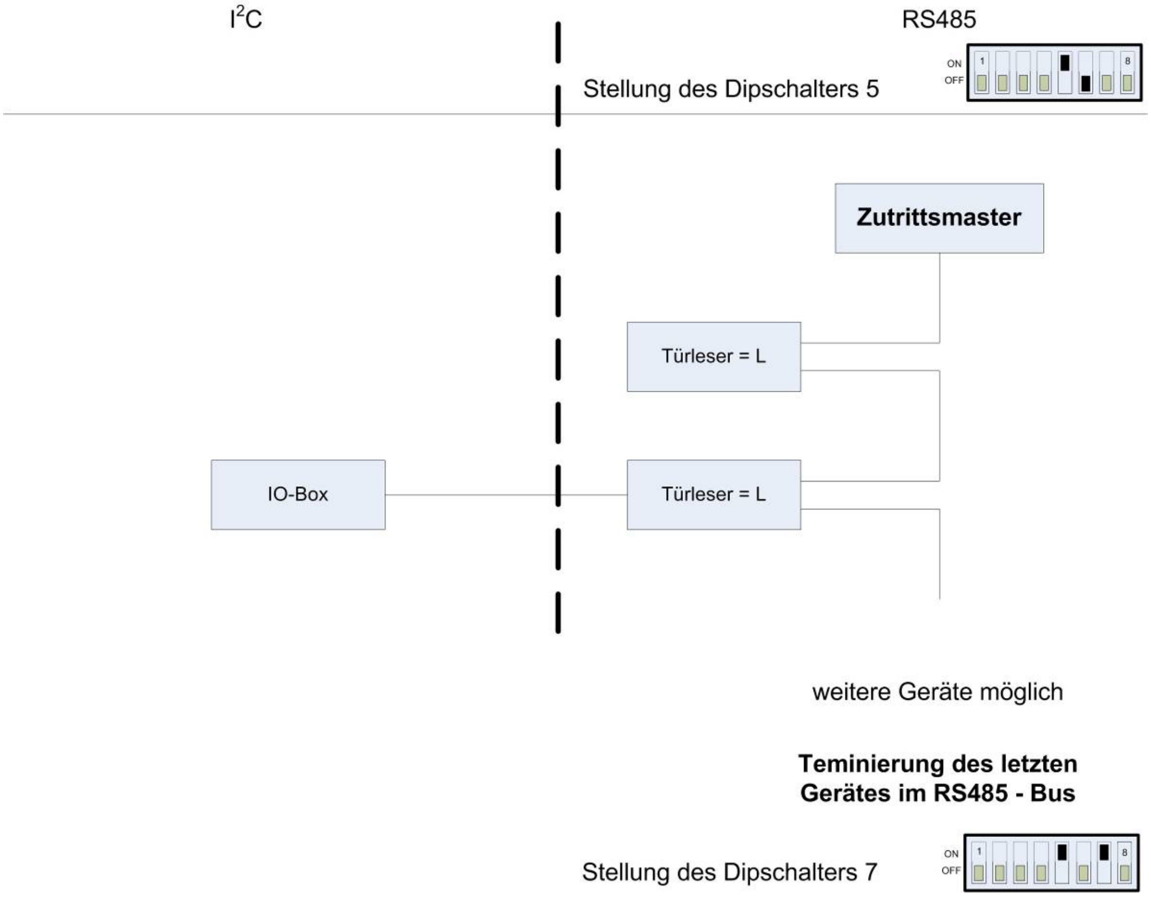
**I/O Box**

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 I2C bus is used as interface.

### 5.8.1.1. Connection of PHG Readers

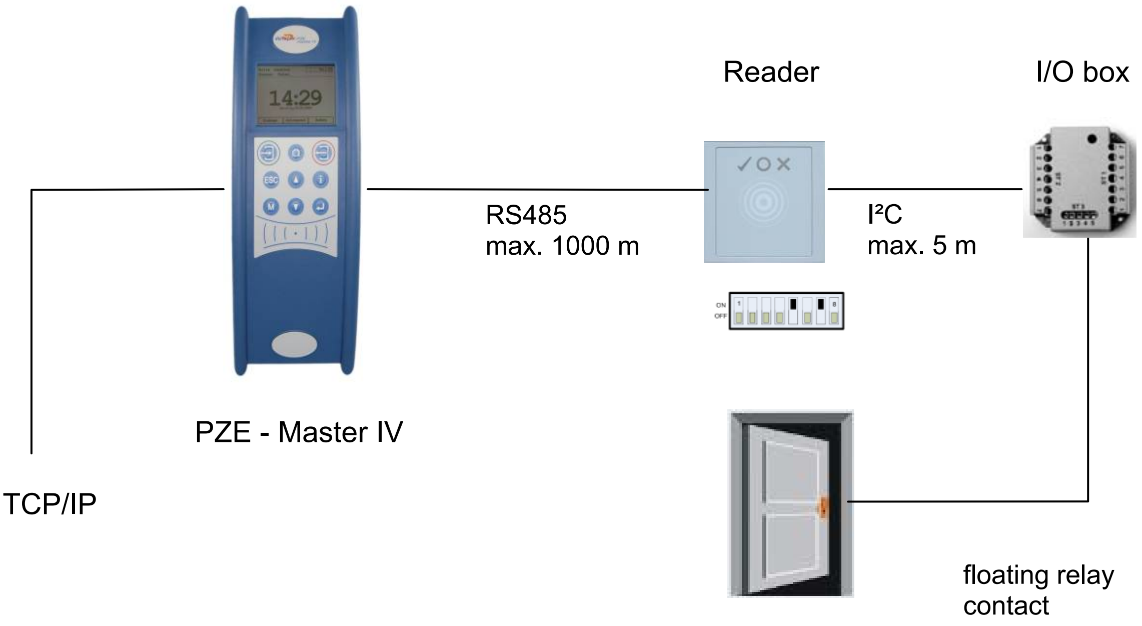
In order to connect the PHG modules, please note the PHG documentation on the Datafox CD:
<Datafox-Geräte- Datafox-Zutritt-Module PHG *.pdf>

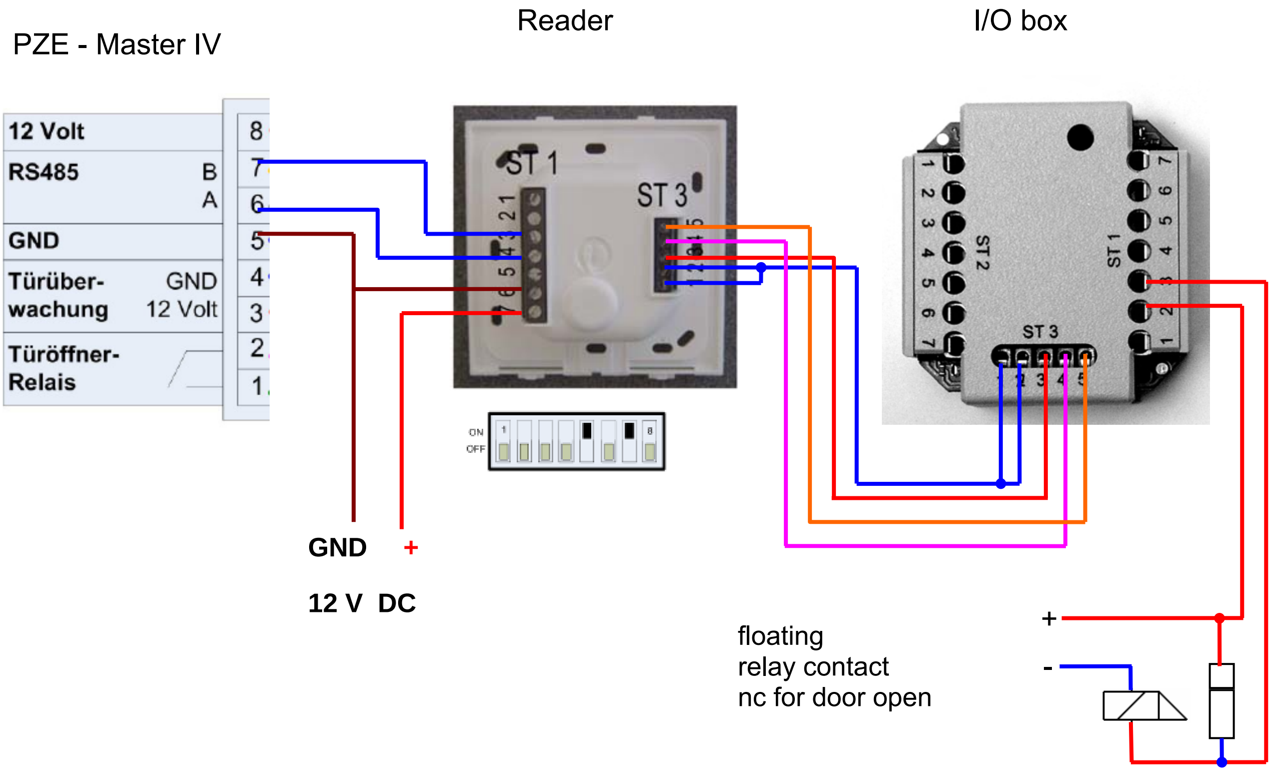
In the PHG documents for the single modules, the pin assignment and configuration via the DIP switches are described. In order to carry out an access control with the PZE-MasterIV the option "'access"' has to be integrated (Datafox art. no. 105201). The following figure shows the possibilities for connecting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



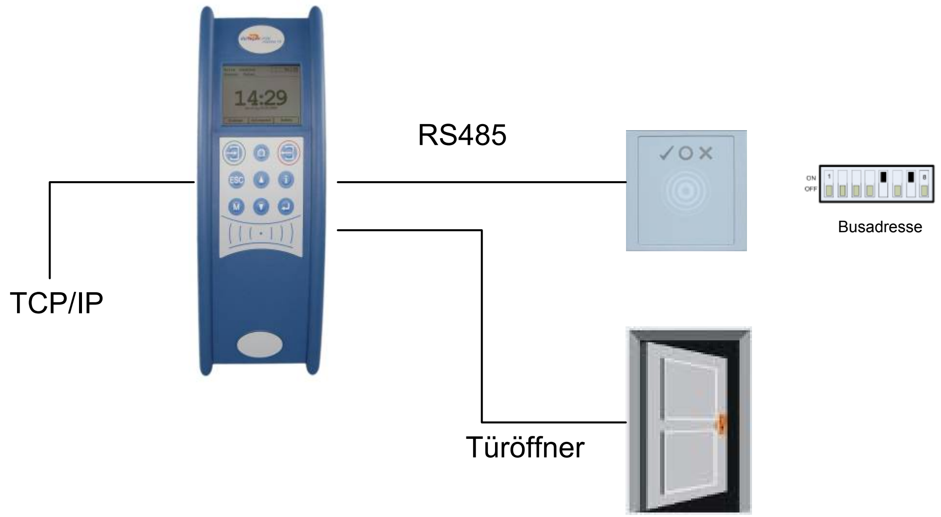
The bus number of the module is set via the DIP switches 1 - 4. The DIP switch 5 always must be set to "ON". The DIP switches 6 and 8 always must be set to "OFF". With the DIP switch 7 = "ON" the RS485 bus is terminated at the last module, otherwise always "'OFF"'.
If a door-opener is to be controlled 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:

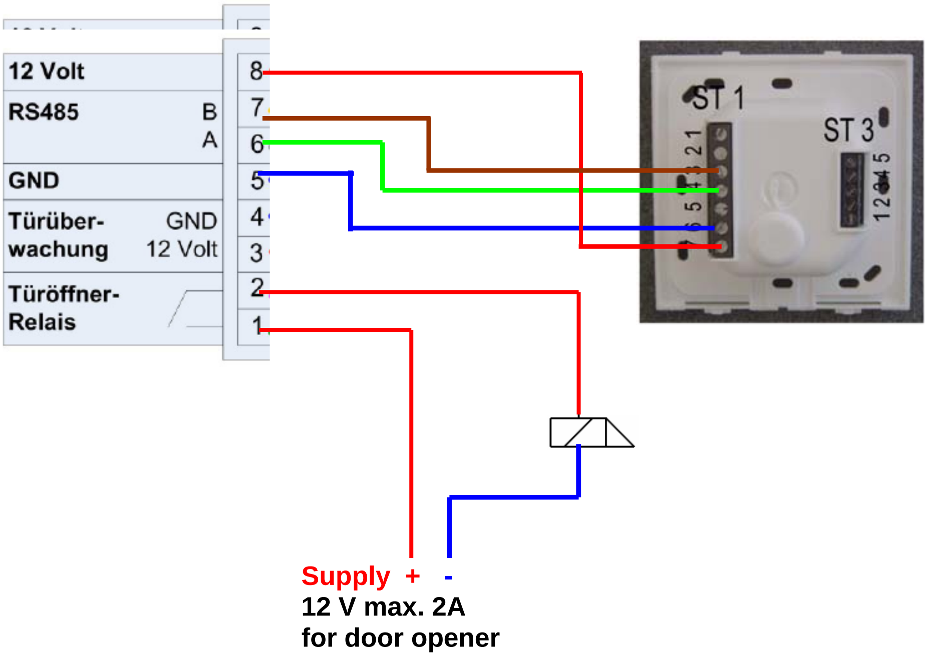




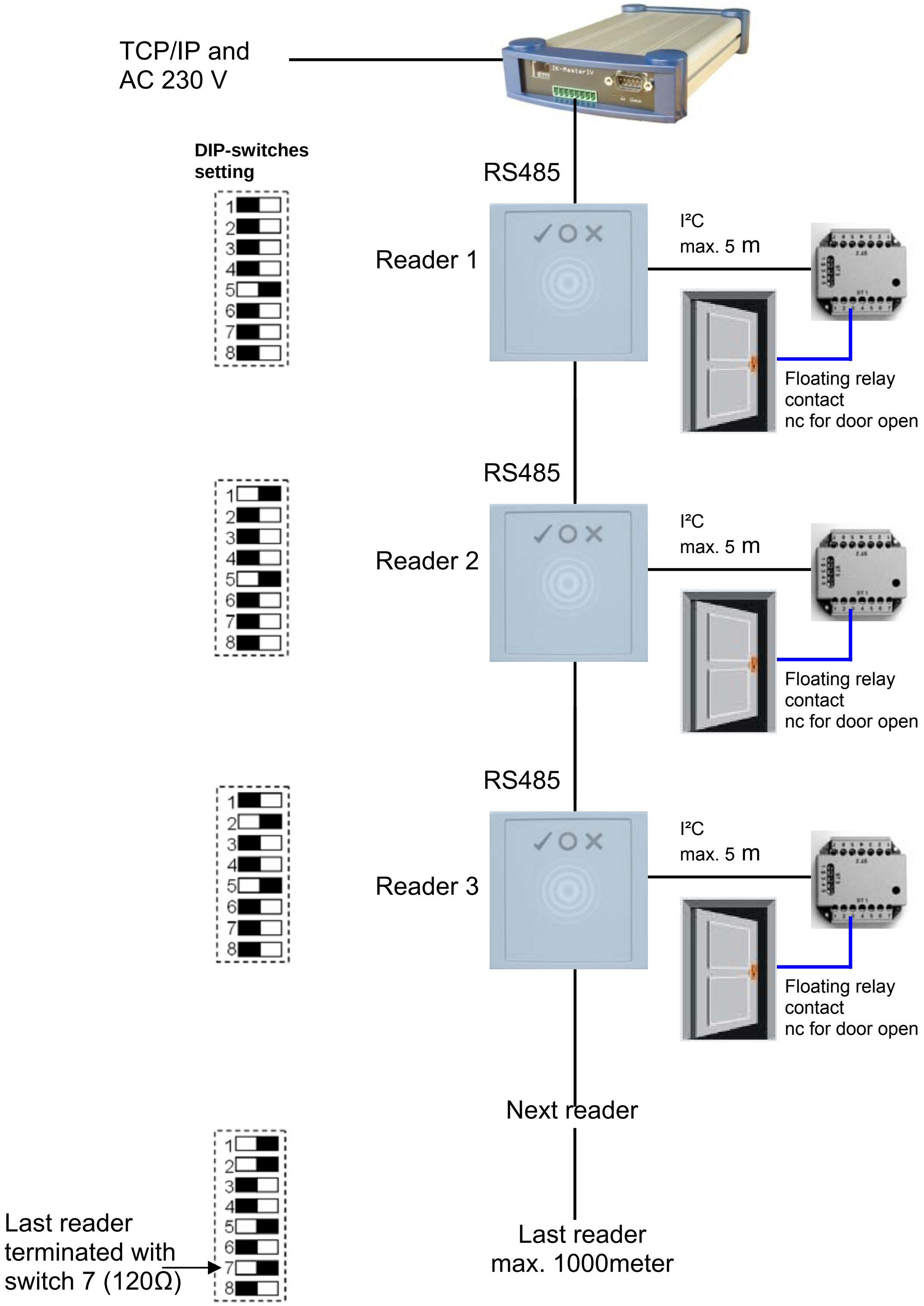
## Connecting example with one door and without I/O-Box:

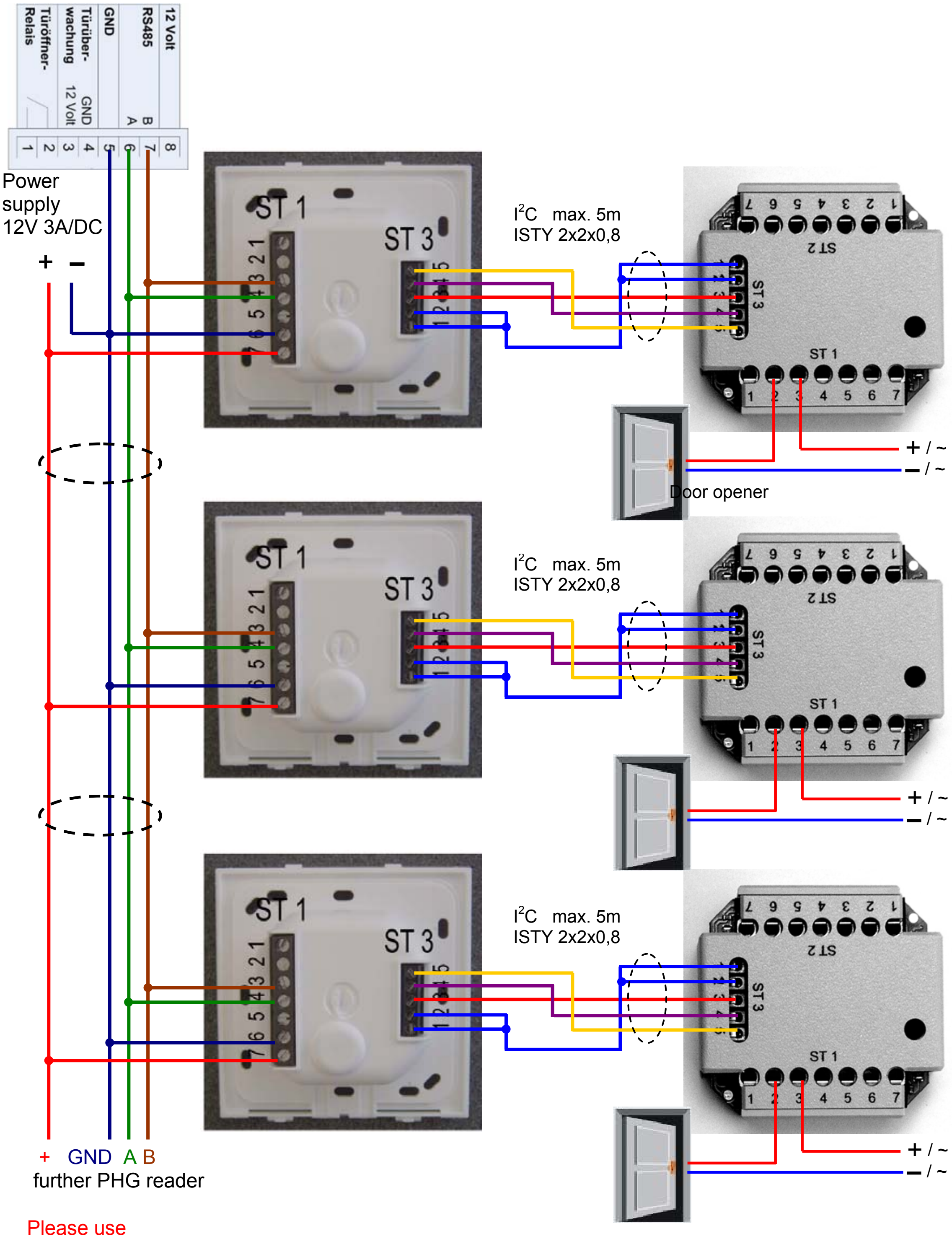


## Wire plan



## RS485 bus diagram for access control with PHG- modules

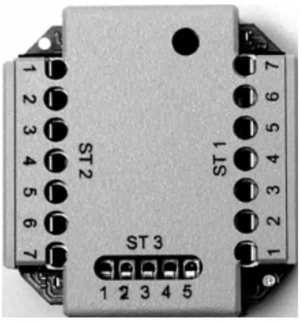


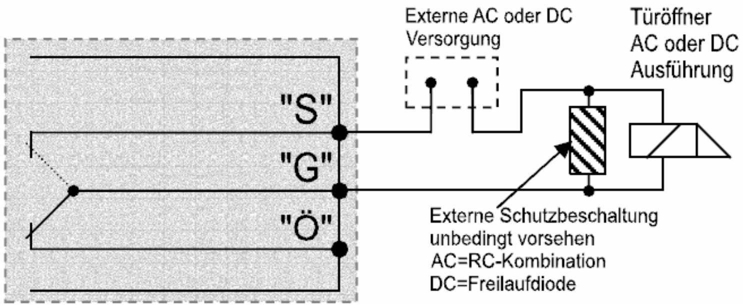


Please use
a J-Y(ST)Y 0,8 or
CAD line.

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

| Connection (ST1,2,3) | Terminal No. | Description |
|---|---|---|
| **ST1** | 1 | Relay 1→ „Ö“ normally closed |
|  | 2 | Relay 1→ „G“ common |
|  | 3 | Relay 1→ „S“ normally open |
|  | 4 | Not connected |
|  | 5 | Not connected |
|  | 6 | Input 2 signal |
|  | 7 | Input 2 ground |
| **ST2** | 1 | Relay 2→ „Ö“ normally closed |
|  | 2 | Relay 2→ „G“ common |
|  | 3 | Relay 2→ „S“ normally open |
|  | 4 | Not connected |
|  | 5 | Not connected |
|  | 6 | Input 1 signal |
|  | 7 | Input 1 ground |
| **ST3** | 1 and 2 | Ground |
|  | 3 | U+ 8…..30V |
|  | 4 | SCL |
|  | 5 | SDA |

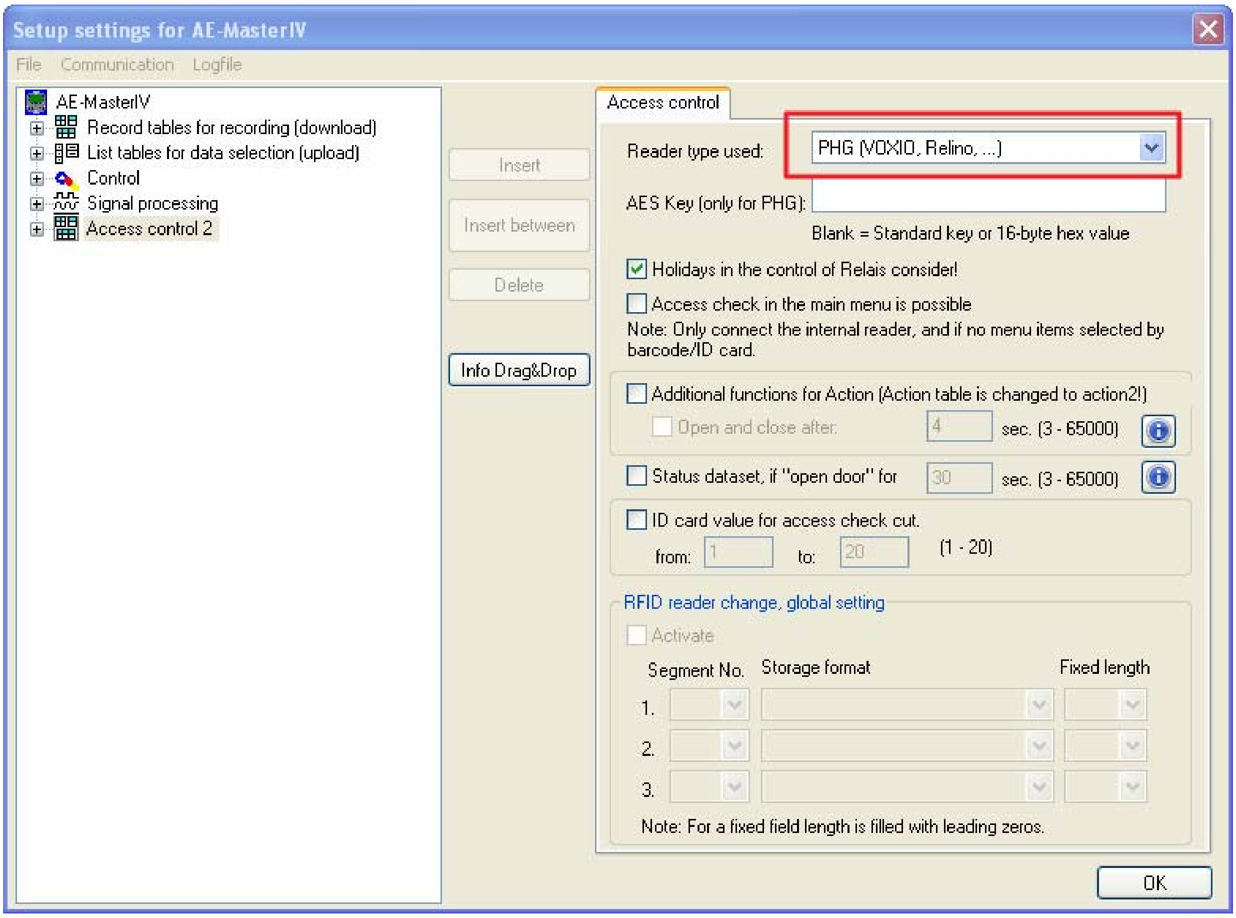




| ST 1 |  | Circuit diagram |
|---|---|---|
| 3 | = | “S“ |
| 2 | = | “G“ |
| 1 | = | “Ö“ |

#### 5.8.1.2. Configuration

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



Reader type used: PHG (VOXIO, Relino, ...)

AES Key (only for PHG):

Blank = Standard key or 16-byte hex value

☑ Holidays in the control of Relais consider!

□ Access check in the main menu is possible

Note: Only connect the internal reader, and if no menu items selected by barcode/ID card.

□ Additional functions for Action (Action table is changed to action2!)

□ Open and close after: 4 sec. (3 - 65000)

□ Status dataset, if "open door" for 30 sec. (3 - 65000)

□ ID card value for access check cut.

from: 1 to: 20 (1 - 20)

RFID reader change, global setting

□ Activate

| Segment No. | Storage format | Fixed length |
|---|---|---|
| 1. | | |
| 2. | | |
| 3. | | |

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

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.

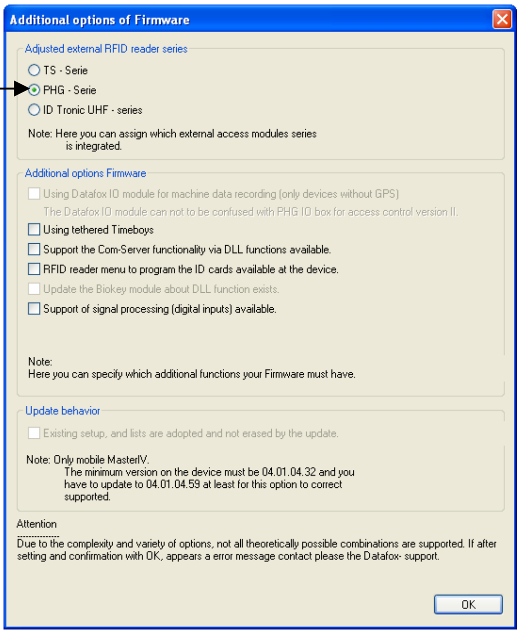
Contrary to GIS readers, PHG readers always have 2 digital inputs and a sabotage contact. The firmware regards input 1 and input 2 as normal inputs with the number 1 and 2 and the sabotage contact as number 3. The sabotage contact is integrated in the reader. The PHG reader has no analog-switch-input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



Additional options of Firmware

Adjusted external RFID reader series

○ TS - Serie
● PHG - Serie
○ ID Tronic UHF - series

Note: Here you can assign which external access modules series is integrated.

Additional options Firmware

□ Using Datafox IO module for machine data recording (only devices without GPS)
The Datafox IO module can not to be confused with PHG IO box for access control version II.
□ Using tethered Timeboys
□ Support the Com-Server functionality via DLL functions available.
□ RFID reader menu to program the ID cards available at the device.
□ Update the Biokey module about DLL function exists.
□ Support of signal processing (digital inputs) available.

Note:
Here you can specify which additional functions your Firmware must have.

Update behavior

□ Existing setup, and lists are adopted and not erased by the update.

Note: Only mobile MasterIV.
The minimum version on the device must be 04.01.04.32 and you have to update to 04.01.04.59 at least for this option to correct supported.

Attention

Due to the complexity and variety of options, not all theoretically possible combinations are supported. If after setting and confirmation with OK, appears a error message contact please the Datafox- support.

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$^2$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$^2$C-Bus~~ |
| 4 | 020 | 1 | 2 | 2 | 0 | Reader at RS485 (LTM) |
| ~~5~~ | ~~021~~ | ~~1~~ | ~~2~~ | ~~2~~ | ~~0~~ | ~~IO-Box at I$^2$C-Bus~~ |

### 5.8.2. Access Control with TS Readers

The following hardware is available to set-up access control with TS TMR33 modules. The different options can be combined with each other according to the hardware requirements of the single devices.

PZE-MasterIV

The MasterIV device supports the opening of up to 8/16 doors.

**Opening Module (TS TMR33-TM)**
72 x 72 x 40 mm

The door module is offered as pure electronic component e.g. to build it in a patress box, or in a housing for surface mounting with alarm control panel.

**Reader (TS TMR33-L)**
80 x 80 x 25 mm

The reader can be ordered separately to connect it directly to a PC or another access check. A connecting diagram and a description of the commands for the activation are included.

**Reader and Opening Module (TS TMR33-LTM)**
80 x 80 x 25 mm

The module set can be ordered separately to connect it directly to a PC or another access check. A connecting diagram and a description of the commands for the activation are included.

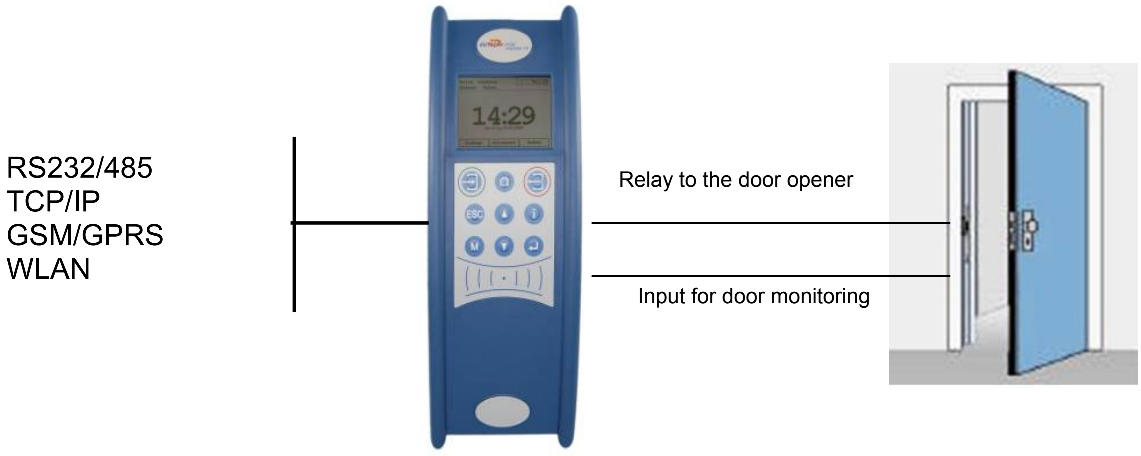
☞ **Note:**
The single modules are connected to a bus. DIP switch 5 sets whether the modules are to communicate via RS232 or RS485.

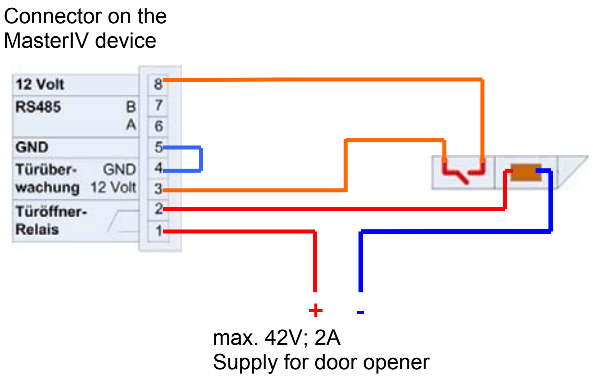
### 5.8.2.1. Set-up and Installation Variants

The following chapters explain different possibilities to set the device up. The PZE-MasterIV is used as reference device.

### A Door without a Separate Reader

The time recording terminal is access scanner, access master and door-opener at the same time. This solution should only be used in protected areas so that the door opening relay cannot be manipulated.



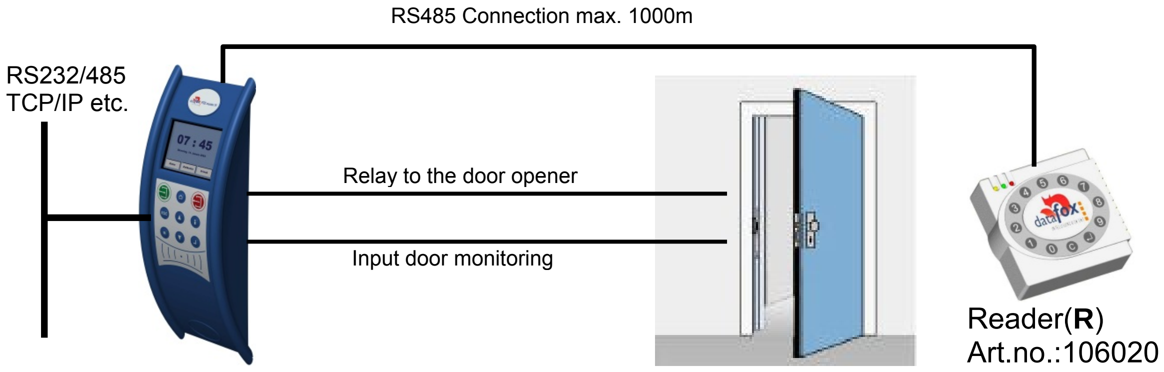


| | |
|---|---|
| ! | **Caution:**<br>The installation and connection of the TMR33 module may only be carried out by a qualified specialist. Avoid switching the connecting terminal (reverse polarity). |

## A Door with a Separate Reader

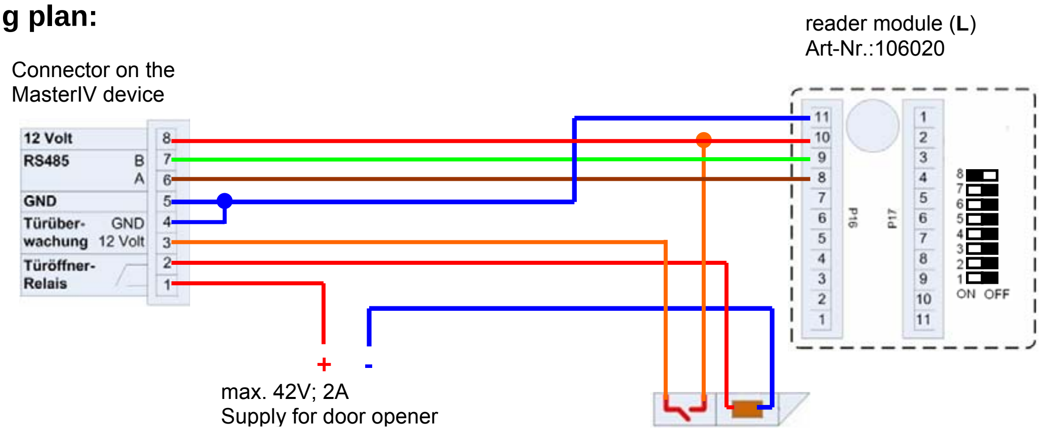
The Gerät is installed in a protected area inside a building and the reader is installed outside. The terminal is access master and door-opener at the same time. The door opening relay is in the PZEMasterIV and thus installed in the protected area. The access identification captured by the reader is transferred to the Gerät and analyzed by it. If access is permitted, the door is opened via the relay in the Gerät.

**Installation plan:**

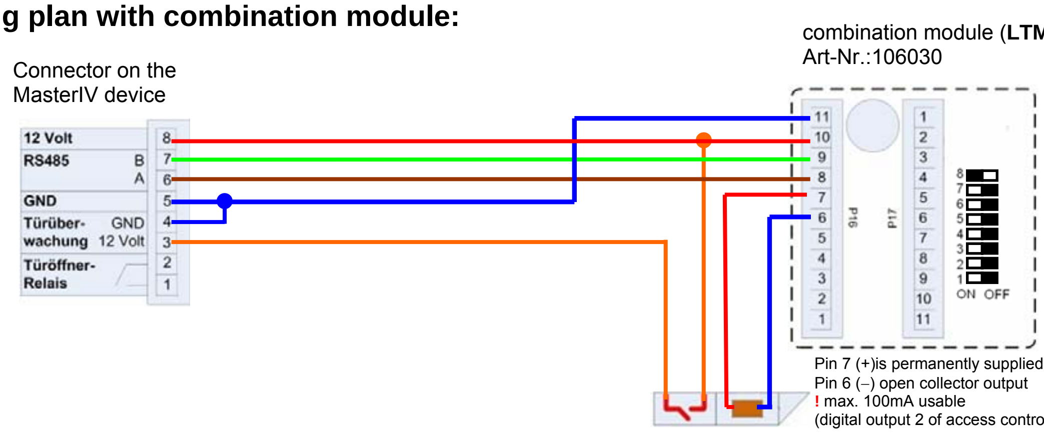


This version is used frequently and can be installed easily and economically as shown in the figure above.

### Wiring plan:



### Wiring plan with combination module:



Pin 7 (+)is permanently supplied 8-12V
Pin 6 (–) open collector output
! max. 100mA usable
(digital output 2 of access control)

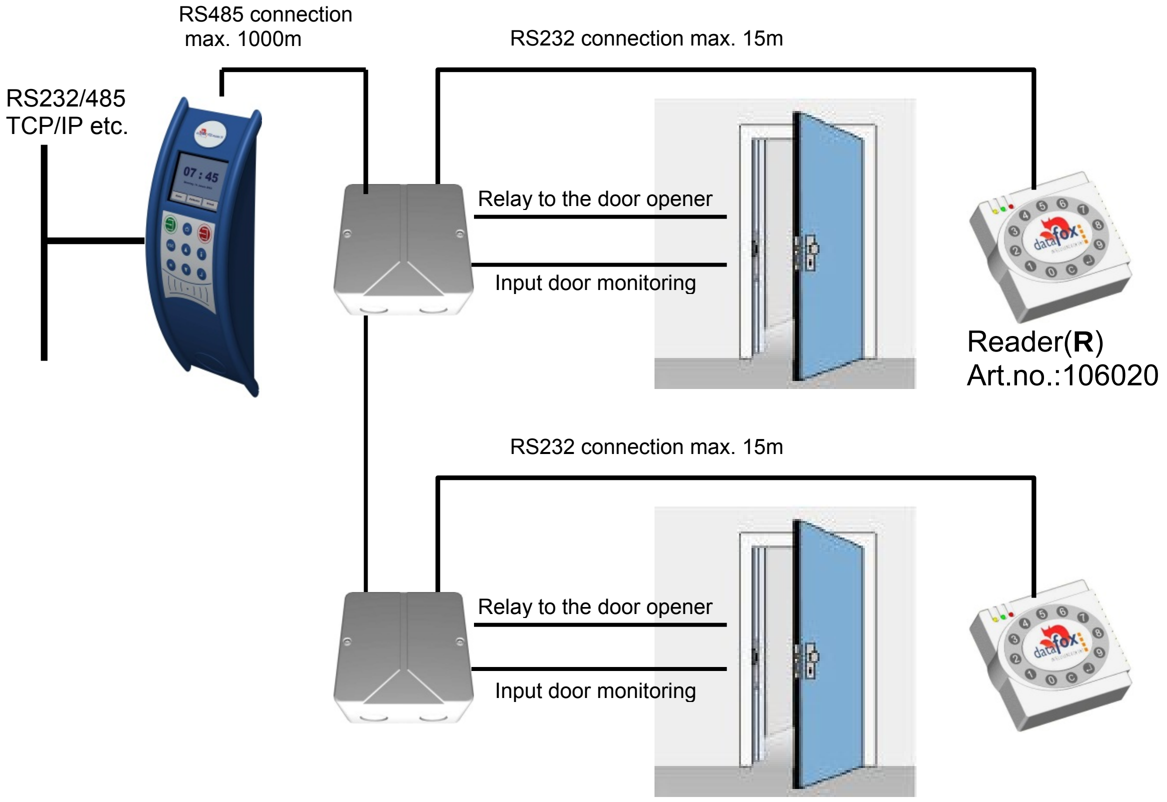
*Reader table fro this example*

| ID | ZM | TM | RefLocation | RefAction | PinGeneral | Beschreibungstext |
|---|---|---|---|---|---|---|
| 1 | 1 | 320 | 0 | 1 | 0 | Master device |
| 2 | 1 | 010 | 1 | 1 | 0 | reader on RS485 (L) |

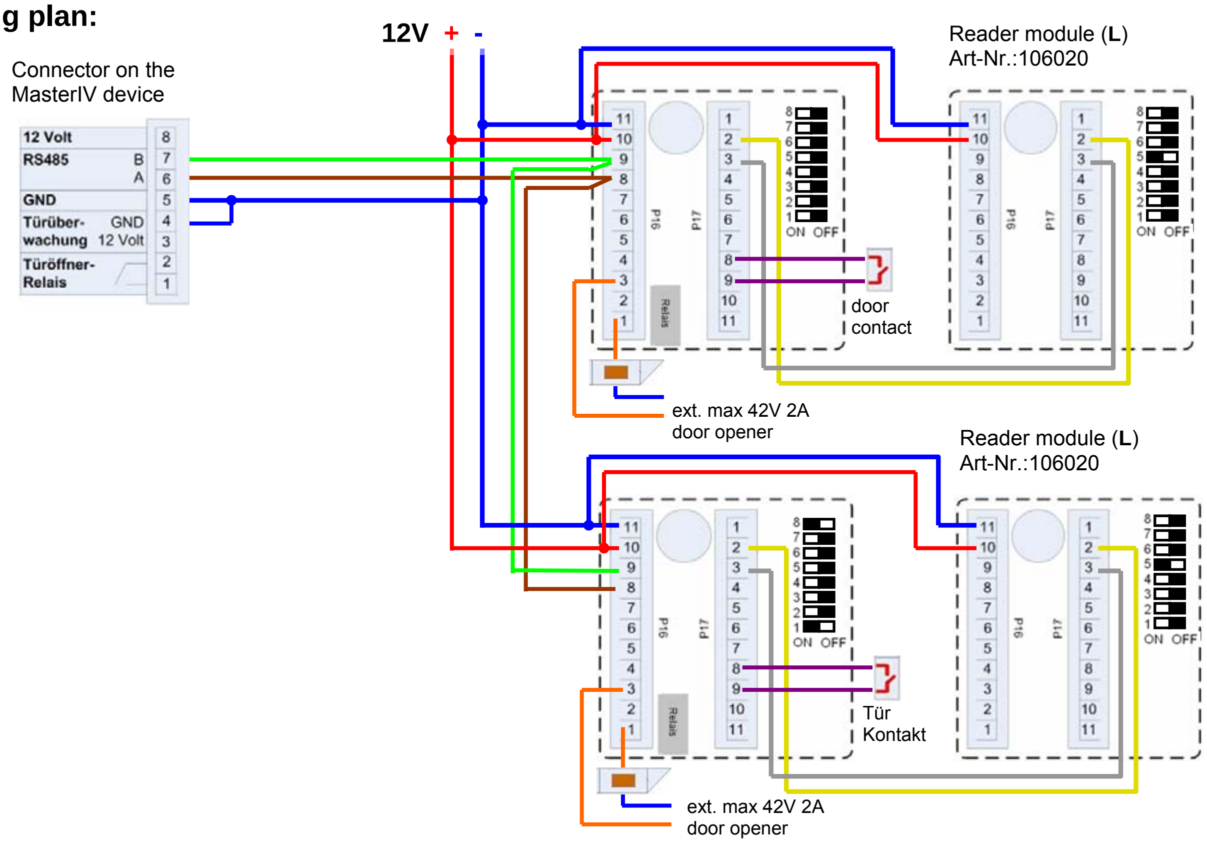
## Several External Doors via RS485 Bus

Here, a door module has to be used so that the door opening relay is within the protected area.

**Installation plan:**



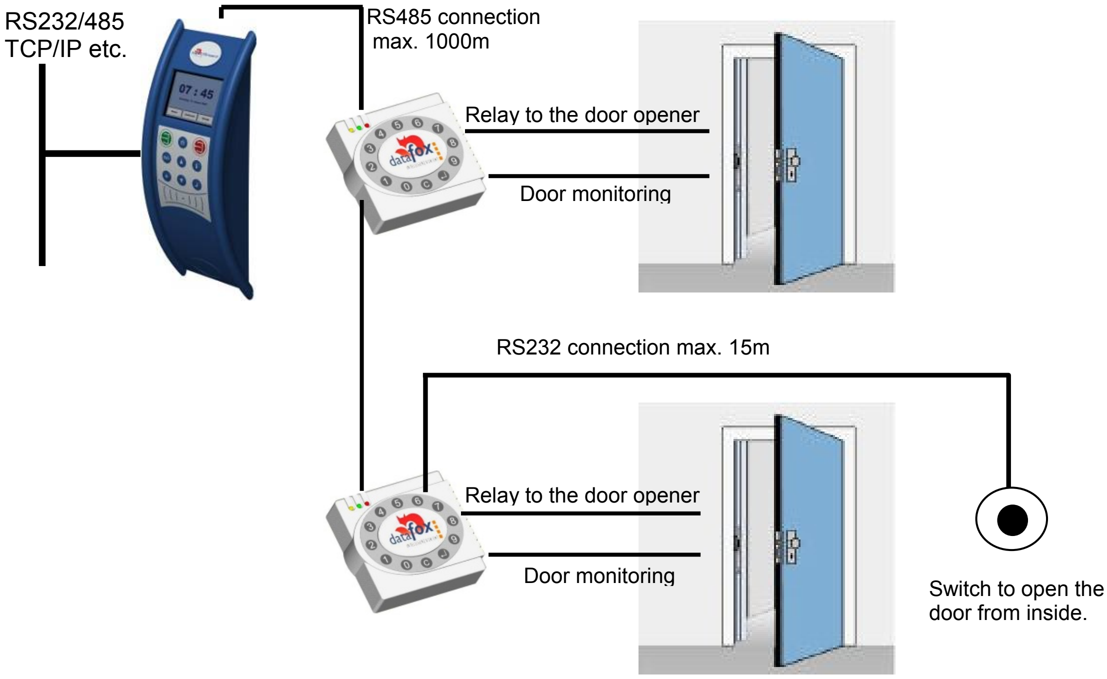
**Wiring plan:**



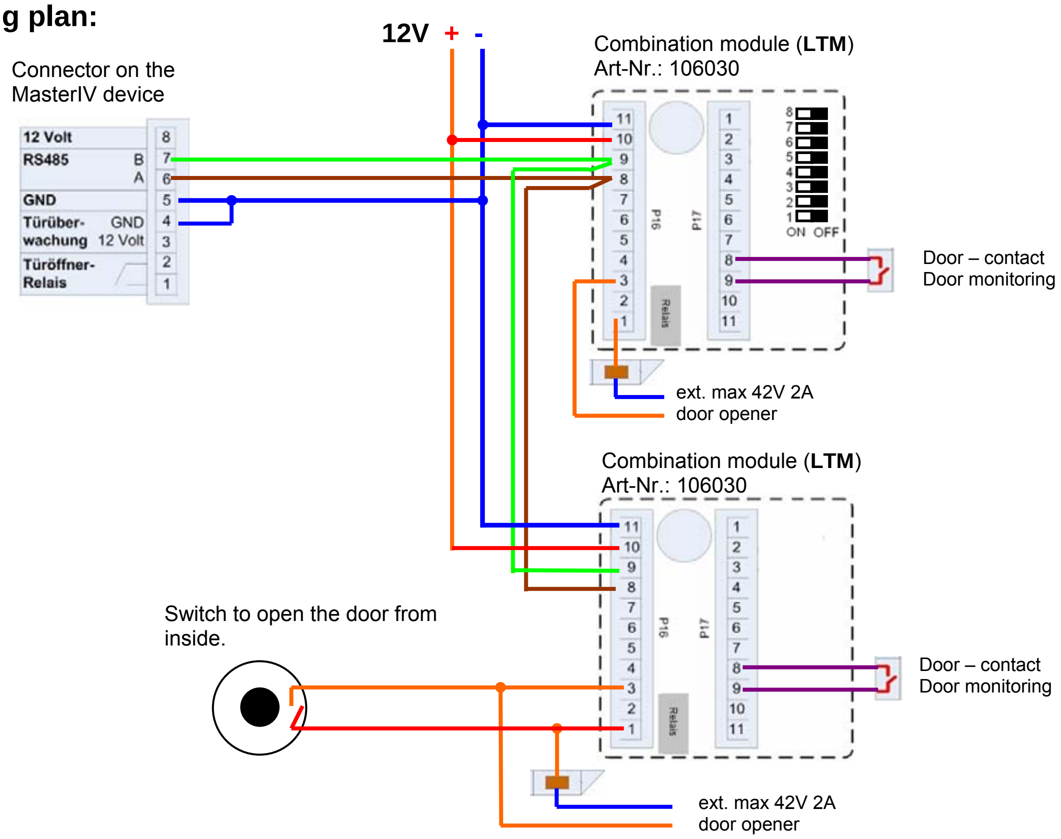
## Several Internal Doors via RS485 Bus

The combined reader + door-module is used here. The door opening relay is included in the combined module. Caution: This assembly must not be used at outdoor locations because then the relay is not within a protected area.

**Installation plan:**



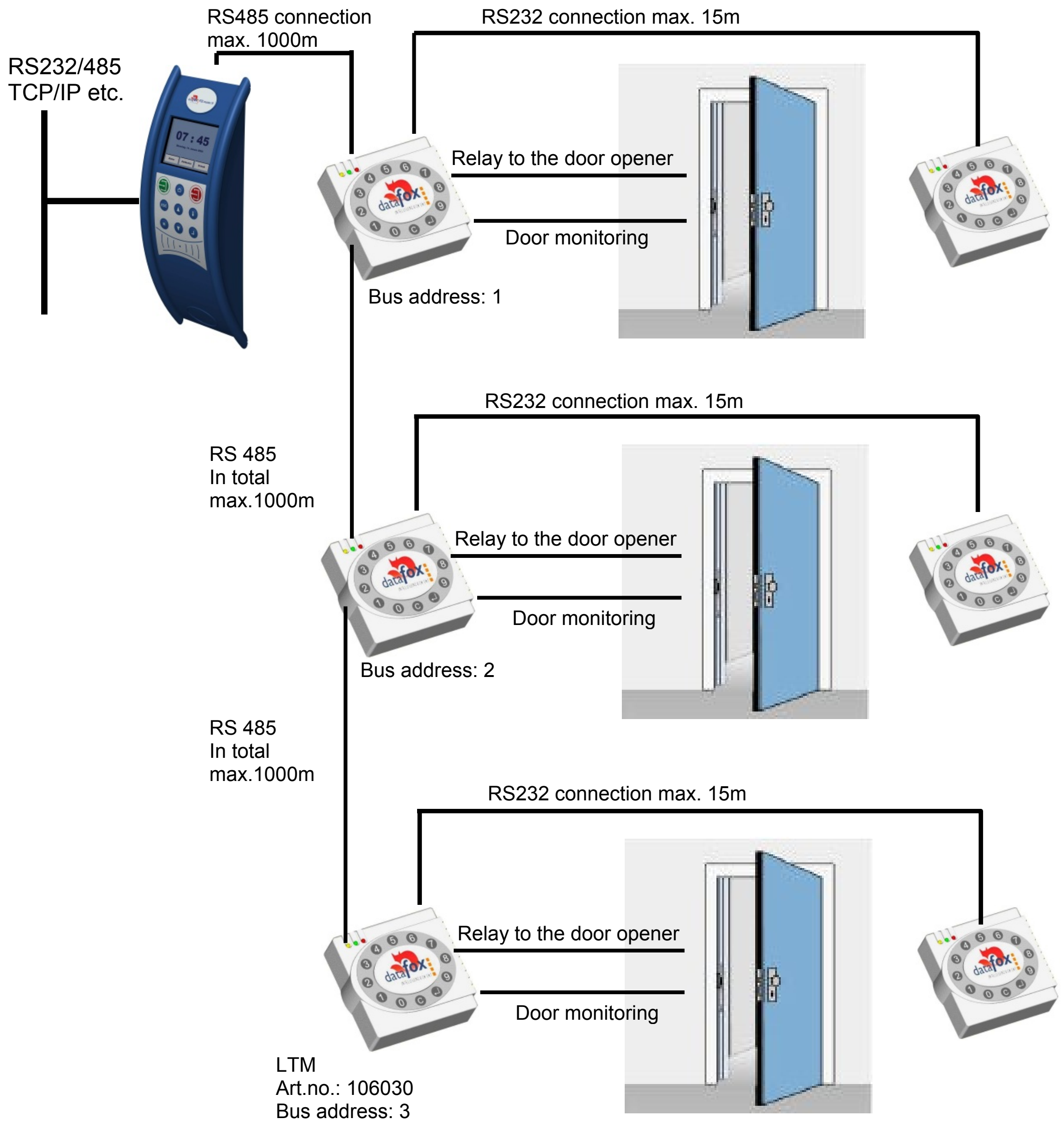
**Wiring plan:**



## Interlocking Function with RS485 Bus

The combined reader + door-module and the reader-module is used here.

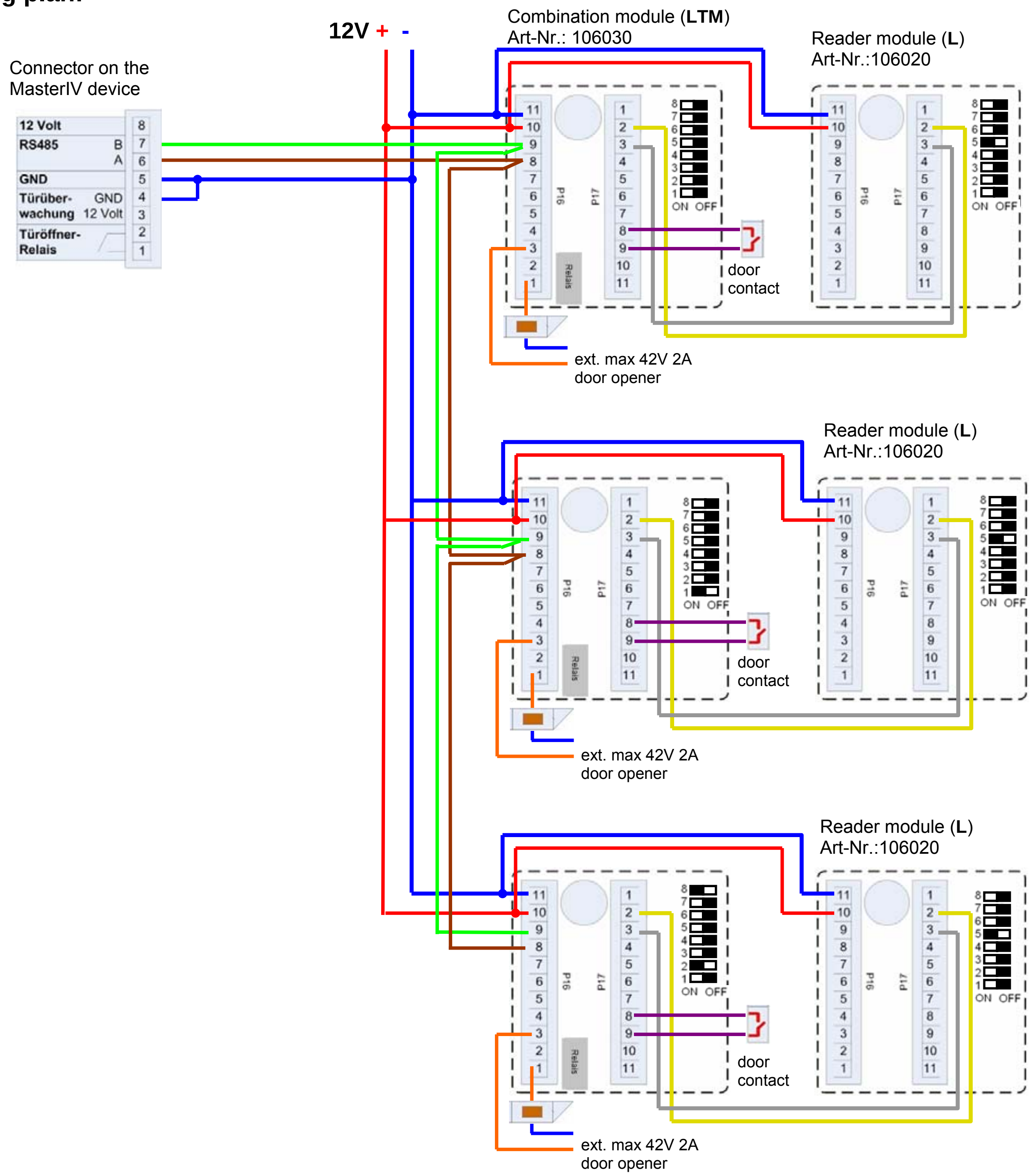
**Installation plan:**



Corresponding reader table:

| ID | ZM | TM | RefLocation | RefAction | PinGeneral | Description |
|---|---|---|---|---|---|---|
| 1 | 320 | 1 | 0 | 1 | 0 | Master on bus RS485 |
| 2 | 010 | 1 | 1 | 1 | 0 | Reader and relay on RS485 (LTM) |
| 3 | 011 | 1 | 1 | 1 | 0 | Reader on RS232 (L) |
| 4 | 020 | 1 | 2 | 2 | 0 | Reader and relay on RS485 (LTM) |
| 5 | 021 | 1 | 2 | 2 | 0 | Reader on RS232 (L) |
| 6 | 030 | 1 | 3 | 3 | 0 | Reader and relay on RS485 (LTM) |
| 7 | 031 | 1 | 3 | 3 | 0 | Reader on RS232 (L) |

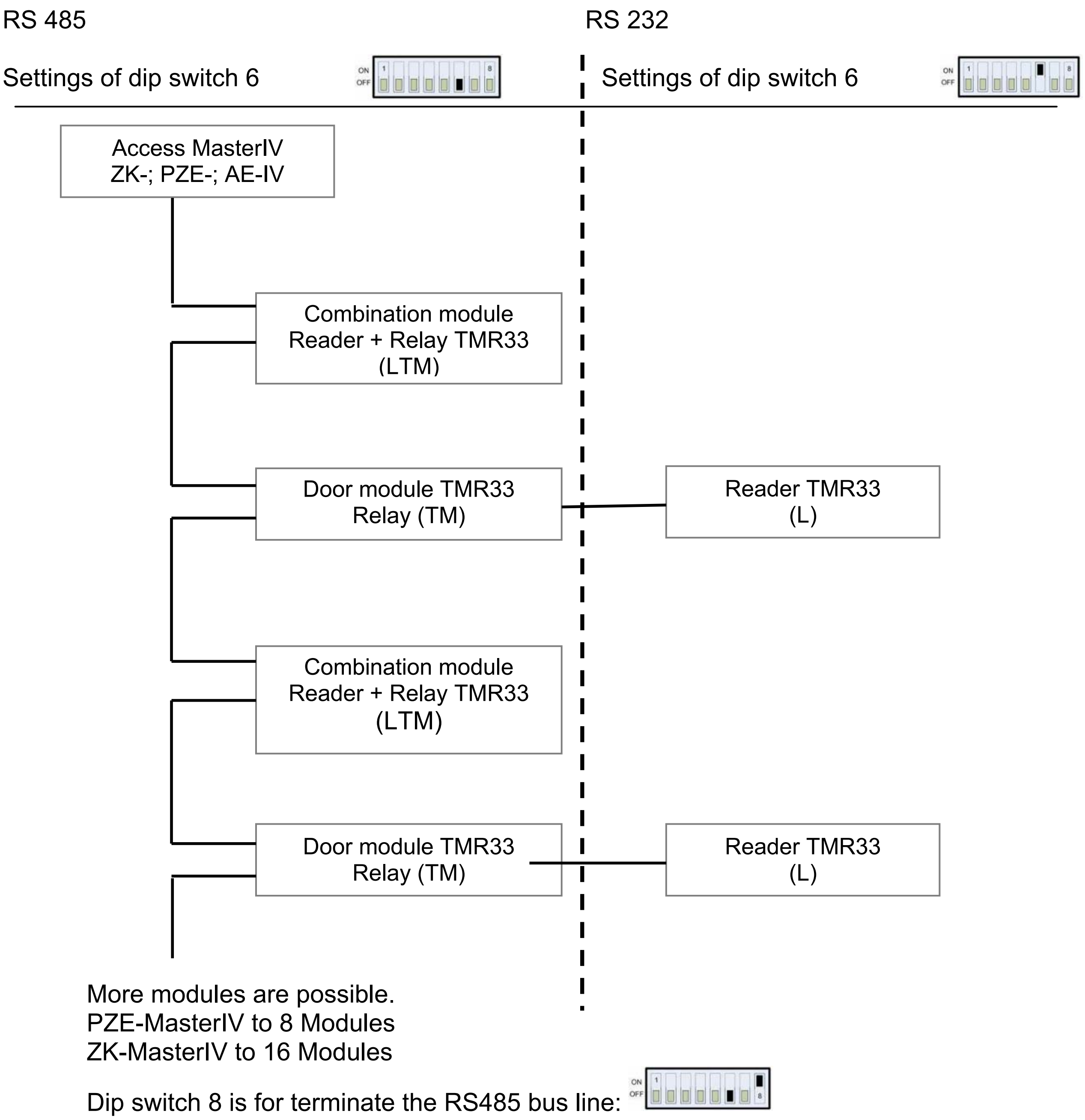
## Wiring plan:



**Note:**
Connection for current supply via power supply unit or bell transformer. Please note the hints for the calculation of the cable cross-section and the cable length. Install the door-opener in the protected area when using it for exterior doors.
At closed door contact ca. 15 mA are used up at 12 V = 0.18 Watt. This means a consumption of ca. 1.6 kWh per year.

### 5.8.2.2. Connection of TS-Reader

The following figure shows the possibilities for connecting the TMR33 devices to a PZE-MasterIV for access control. The TMR33 devices have to be set depending on the interface used (RS232 or RS485).

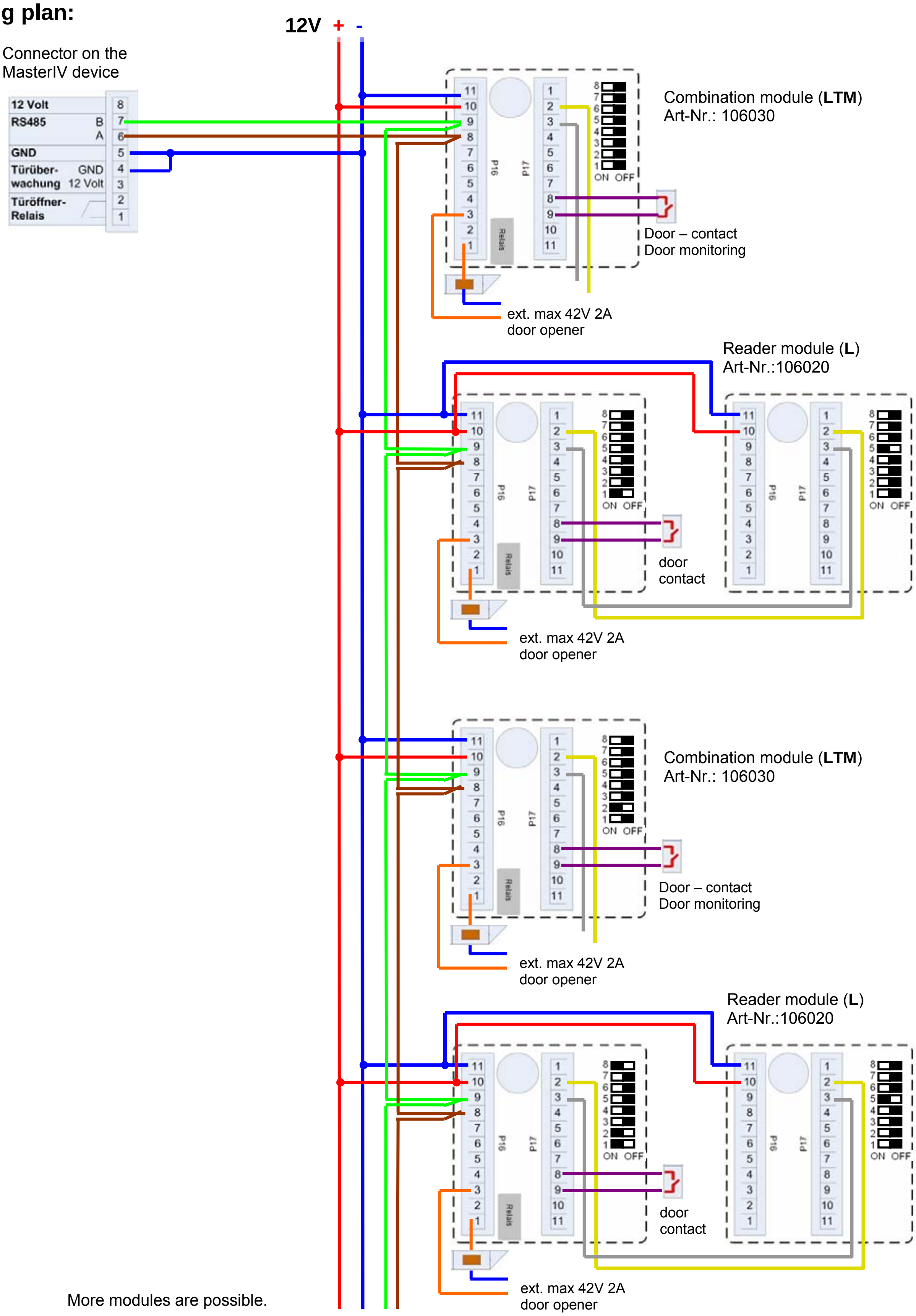


More modules are possible.
PZE-MasterIV to 8 Modules
ZK-MasterIV to 16 Modules

Dip switch 8 is for terminate the RS485 bus line:

The DIP switches 1 - 5 are for bus configuration. Via the switches, the bus number of the device is set. DIP switch 1 in position "ON" and switches 2 - 5 in position "‘OFF"’ stand for bus number "1". DIP switches 1 and 2 in position "ON" and switches 3 - 5 in position "OFF" stand for bus no. "3".

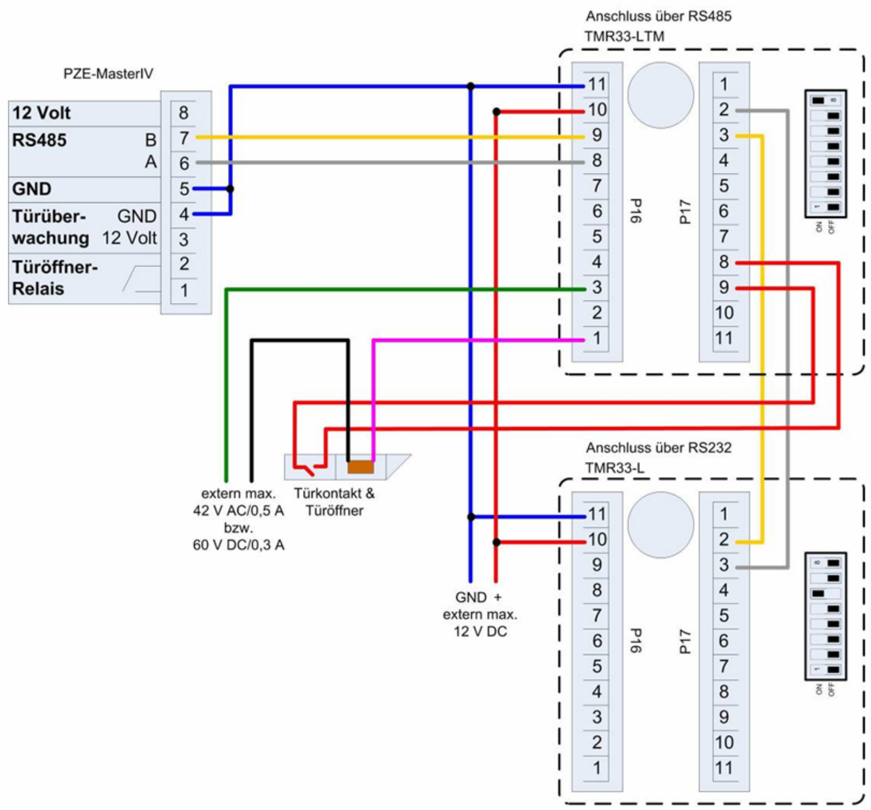
## Wiring plan:



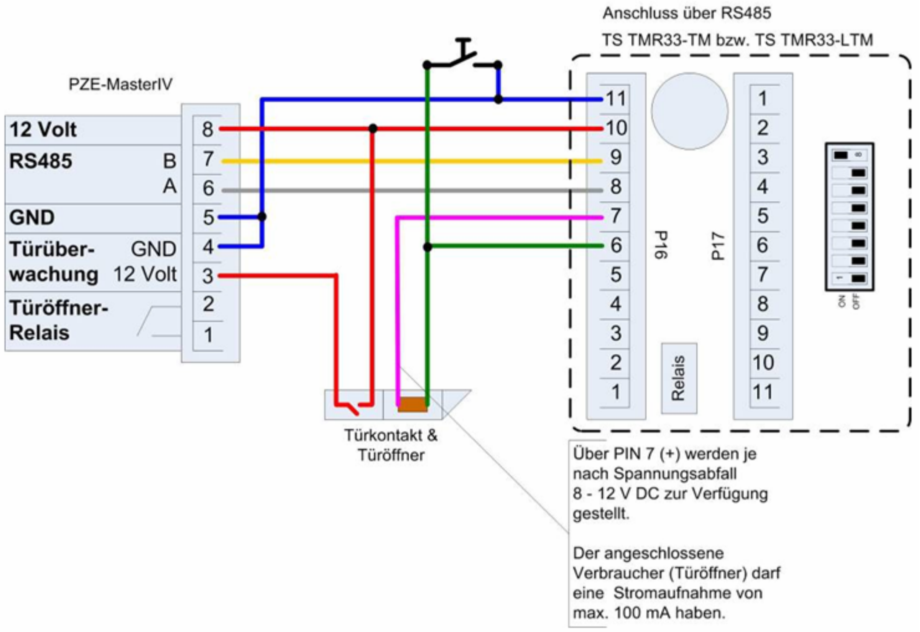
More modules are possible.

**Example:** Wiring for interlocking function

A door is controlled via an internal door module with integrated reader TMR33-TMR and an external access reader TMR33-TR as mantrap. In this case, the internal door module is connected to the Gerät via an RS485 bus. The external access reader is connected to the internal door module with an RS232 stub. The door opening is controlled via the relay integrated in the door module TMR33-TMR.
In this case, the door module with the relay is in the protected area and the external access reader without a relay is in the unprotected area.

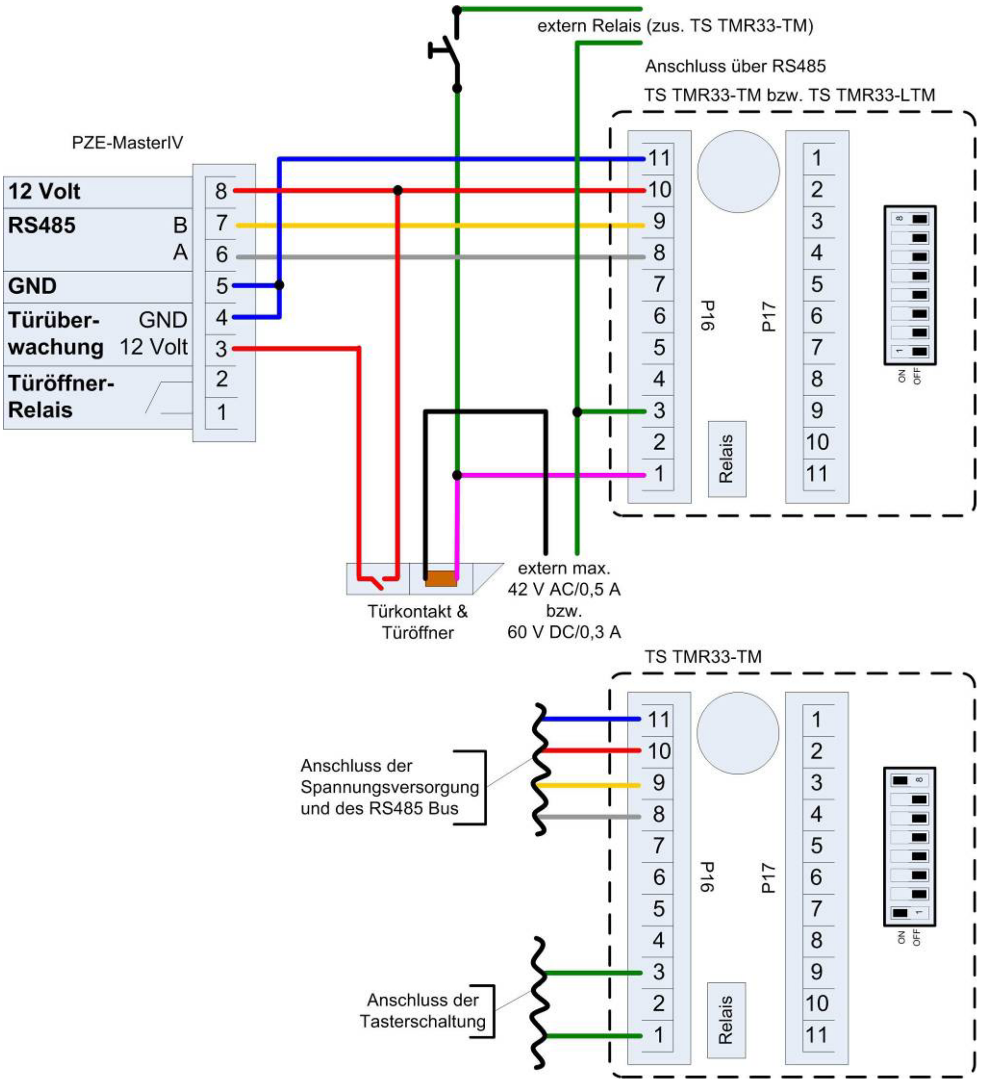


**Example:** Controlling the door-opener via the ZK-II and a push-button
It is possible to additionally connect a push-button for controlling the door-opener.



Anschluss über RS485
TS TMR33-TM bzw. TS TMR33-LTM
PZE-MasterIV
12 Volt
RS485 B A
GND
Türüber-wachung GND 12 Volt
Türöffner-Relais
P16
P17
Relais
Türkontakt & Türöffner
Über PIN 7 (+) werden je nach Spannungsabfall 8 - 12 V DC zur Verfügung gestellt.
Der angeschlossene Verbraucher (Türöffner) darf eine Stromaufnahme von max. 100 mA haben.

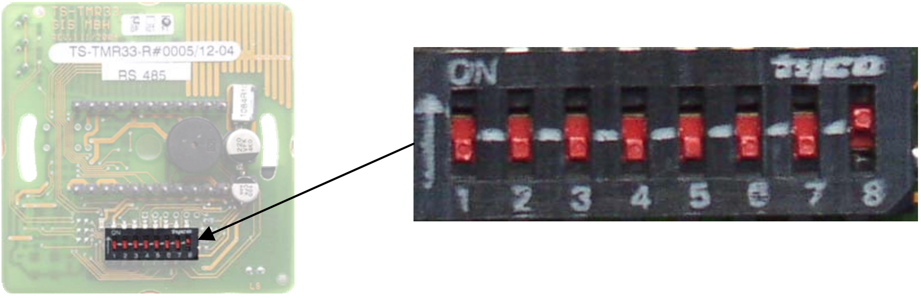
**Example:** Controlling the door-opener via the ZK-II, relay and push-button
You want to control the door-opener directly via the access control-II. In a lobby with a view of the entrance area, you want to open the door without transponder via a push-button. Additionally, this push-button circuit should only be active at certain times. This scenario can be reproduced as follows:



Initially, we use an external voltage source for the supply of the door-opener. It is controlled via the relay of the TS TMR33-TM, connection 1 and 3 of the strip terminal P16. The NC contact of the relay is bridged with the push-button. The activation of the push-button circuit is realized via an additional relay (TS TMR33-TM). You can configure the period of time of the activation at the access control lists in the ZK-II. For this purpose, you have to include the additional TS TMR33-TM module in the reader table. Set in the action table which output (relay) is switched on which module of the reader table. Set the elapse-value on 0. Define the time from which the relay switches (push-button circuit activated) and when the relay drops out again by referencing a time model (RefTime).

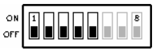
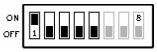
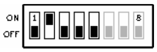
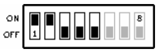
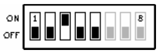
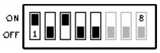
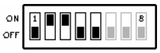
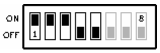
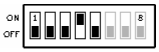
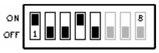
## Setting the DIP Switches TS-TMR33

The *addressing* of the bus devices is effected by means of the *DIP switches 1-5* (range 0-31). The *DIP-switch 6* serves for switching from *RS232* to *RS485* communication (for door modules no external reader can be connected at RS232 communication). The *DIP switch 7* is not used and must always be set to *OFF*. *DIP switch 8* turns the *termination* of RS485 on/off; the switch must always be turned on at the last module of the RS485 bus.



| DIP switch | Meaning |
|---|---|
| 1 | Bus number (Bit 0) |
| 2 | Bus number (Bit 1) |
| 3 | Bus number (Bit 2) |
| 4 | Bus number (Bit 3) |
| 5 | Bus number (Bit 4) |
| 6 | DIP switch communication RS232 or RS485 (0=RS485, 1=RS232) |
| 7 | always **OFF** |
| 8 | Termination for RS485 bus (0= termination off, 1= termination on) 120Ω |

**Example bus address register:**

| Address | Bit 0 | Bit 1 | Bit 2 | Bit 3 | Bit 4 | DIP switch |
|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |  |
| 1 | 1 | 0 | 0 | 0 | 0 |  |
| 2 | 0 | 1 | 0 | 0 | 0 |  |
| 3 | 1 | 1 | 0 | 0 | 0 |  |
| 4 | 0 | 0 | 1 | 0 | 0 |  |
| 5 | 1 | 0 | 1 | 0 | 0 |  |
| 6 | 0 | 1 | 1 | 0 | 0 |  |
| 7 | 1 | 1 | 1 | 0 | 0 |  |
| 8 | 0 | 0 | 0 | 1 | 0 |  |
| 9 | 1 | 0 | 0 | 1 | 0 |  |
| **folder.** | | | | | | |

## Wiring Calculations for Power Supply

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 |
| TS-TMR33-TM | 156.0 mA |
| TS-TMR33-TMR | 180.0 mA |

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:**

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

$Q$ = cable cross-section in mm$^2$
$I$ = current (A)
$l$ = cable length in m

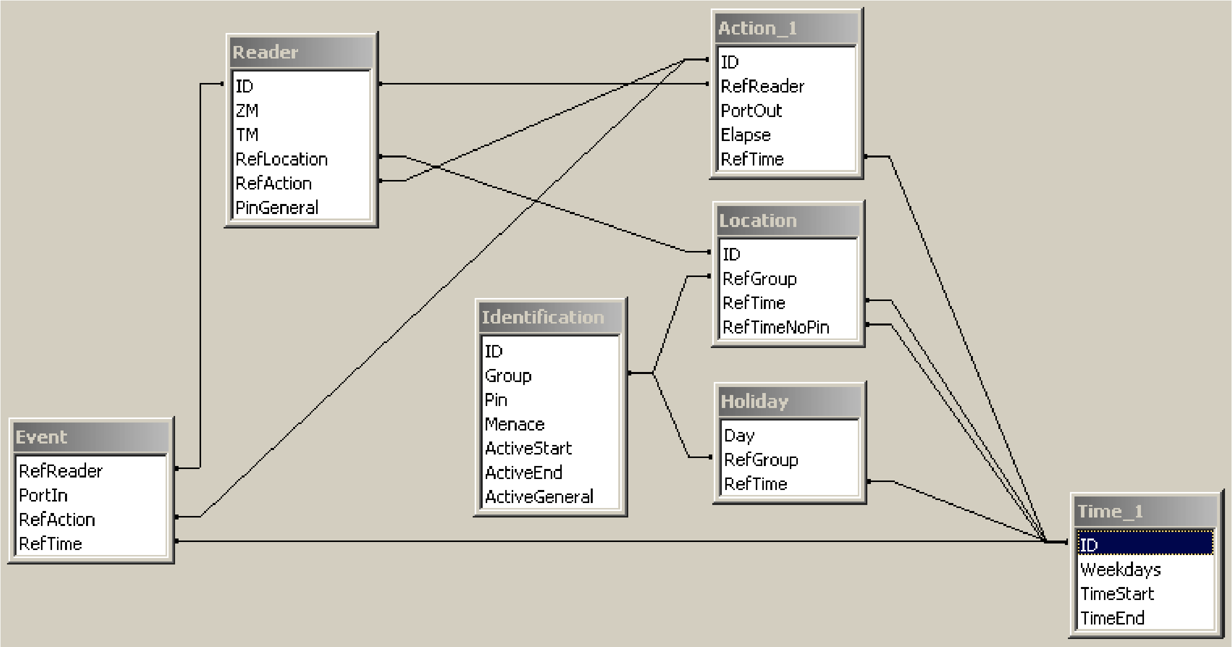
$k$ = electrical conductivity (kappa) 56 $\frac{m}{\Omega \bullet mm^2}$
$Uv$= voltage drop. 4V at most

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

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

## Configuration

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.

| ;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<br>„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.

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 |

### 5.8.3. Description of Tables for Access Control II_1

| 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. |
| 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 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 Reader (List of all devices installed in the system)

| 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.<br>(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.<br>0 = card blocked<br>1 = card active<br>2= virtual card (use only via DLL)<br>3 = access only by entering the PIN<br>8 = general authority (with PIN request)<br>9 = general authority (no PIN request) |

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

| 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 Holiday (setting blocking days like holidays or company holidays)

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

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

| Name | Data type | Length | Description |
|---|---|---|---|
| RefReader | Number (int) | 4 | Module (door module or master) where the digital input is. |
| PortIn | Number (int) | 1 | Number of the digital input on the module. |
| 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 Event (assigning an action to a signal at the digital input)

| 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 (int) | 1 | Indicates the number of the output on the module. |
| 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) |

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)

## 5.8.4. Function extention for access control II

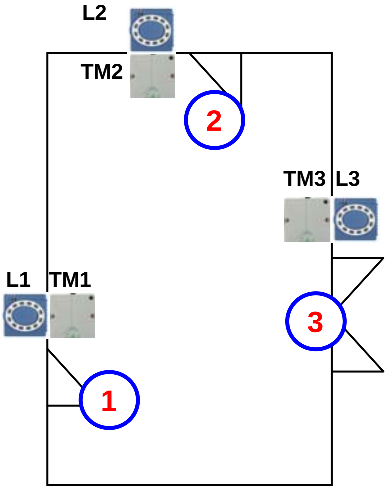
### 5.8.4.1. General description

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“. Because of a lot of additional references are now possible many scenarios.

The follows edfxample gives overview:

### 5.8.4.2. Examples

*Example Garage:*



The facility manager come in the morning 7.00 a clock and uses the Entry 1.
- with his RFID-chip open the door 1 for 5 seconds.
- with the same action gives the door 3 free, the opening is now possible with a switch, until 16.00 a clock.
- entry 2 is now open until 16.00 a clock for the other person.

the clothing is possible with:

- 1 – one RFID-chip registry on group 40
- 2 – double read of on normal RFID-chip
- 3 - Automatic at 16.00 a clock (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<br>Need not a listing in the table „action“ |
| 3 | 1 | 011 | 100 | 1000 | 0 | RFID-reader on RS232 wire (L1) only reader<br>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<br>Need not a listing in the table „action“ |
| 5 | 1 | 021 | 200 | 2000 | 0 | RFID-reader on RS232 wire (L2) only reader<br>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<br>Need not a listing in the table „action“ |
| 7 | 1 | 031 | 300 | 3000 | 0 | RFID-reader on RS232 wire (L3) only reader<br>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 | 24houers 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*

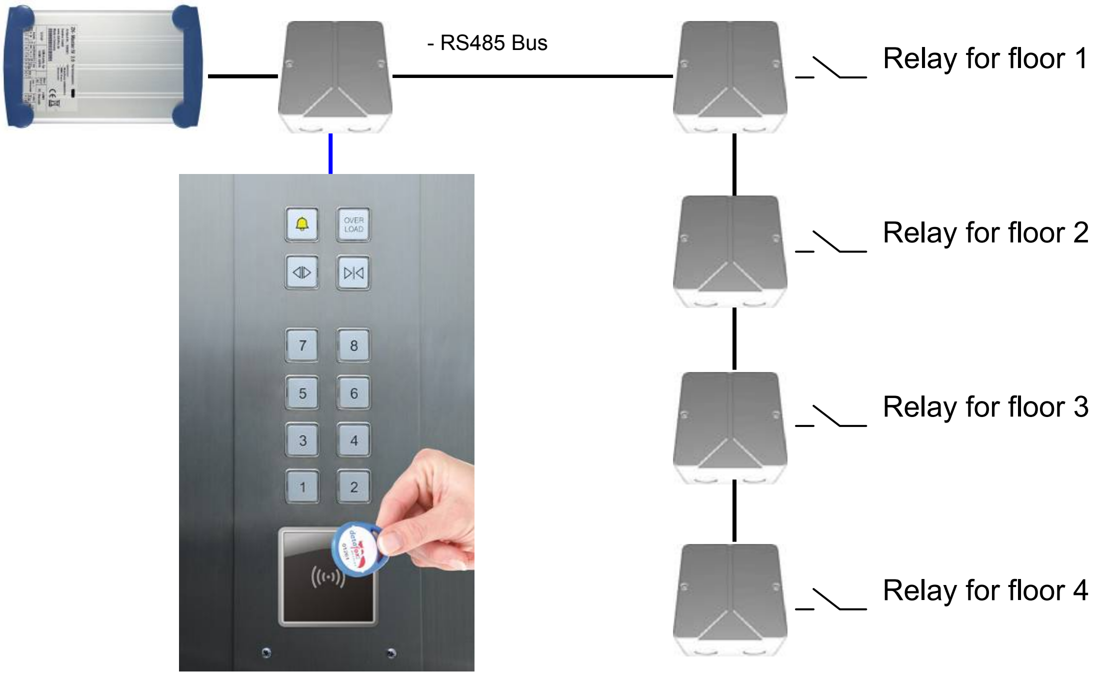
| ID | refGroup | refTime | refTimeNoPin | Bemerkungen |
|---|---|---|---|---|
| 100 | 10 | 1 | 0 | Group 10, 20, 30 and 40 have access on this reader. |
| 100 | 20 | 1 | 0 | |
| 100 | 30 | 1 | 0 | |
| 100 | 40 | 1 | 0 | |
| 200 | 10 | 1 | 0 | Group 20 can not use this entrance 2. |
| 200 | 30 | 1 | 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 that can drive the respective tenants only your floor.
Then tenant use the transponder to give only the switch for his floor free.

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



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

Table *Reader*

| ID | ZM | TM | RefLocation | RefAction | PinGeneral | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 010 | 100 | 0 | 0 | Door-module on RS485 wire (TM1) only relays include for floor 1 |
| 2 | 1 | 020 | 100 | 0 | 0 | Door-module on RS485 wire (TM1) only relays include for floor 2 |
| 3 | 1 | 030 | 100 | 0 | 0 | Door-module on RS485 wire (TM1) only relays include for floor 3 |
| 4 | 1 | 040 | 100 | 0 | 0 | Door-module on RS485 wire (TM1) only relays include for floor 4 |
| 5 | 1 | 320 | 0 | 0 | 0 | Master device |
| 6 | 1 | 000 | 100 | 1000 | 0 | Reader on RS485 wire |

Table *Action2*

| ID | RefGroup | RefTime | RefReader Relais | PortOut | Elapse | RefReader LED | RefTime Relais | Description |
|---|---|---|---|---|---|---|---|---|
| Read an RFID chip on reader in the cabin | | | | | | | | |
| 1000 | 10 | 0 | 1 | 1 | 20 | 1 | 0 | Group 10 moving only to floor 1 |
| 1000 | 20 | 0 | 2 | 1 | 20 | 2 | 0 | Group 20 moving only to floor 2 |
| 1000 | 30 | 0 | 3 | 1 | 20 | 3 | 0 | Group 30 moving only to floor 3 |
| 1000 | 40 | 0 | 4 | 1 | 20 | 4 | 0 | Group 40 moving only to floor 4 |
| 1000 | 50 | 0 | 1 | 1 | 20 | 5 | 0 | Group 50 moving to floor 1 or 2 |
| 1000 | 50 | 0 | 2 | 1 | 20 | 5 | 0 | |
| 1000 | 60 | 0 | 1 | 1 | 20 | 5 | 0 | Group 60 can move to floor 1; 2; 3 or 4 |
| 1000 | 60 | 0 | 2 | 1 | 20 | 5 | 0 | |
| 1000 | 60 | 0 | 3 | 1 | 20 | 5 | 0 | |
| 1000 | 60 | 0 | 4 | 1 | 20 | 5 | 0 | |

Table *Location*

| ID | refGroup | refTime | refTimeNoPin | Description |
|---|---|---|---|---|
| 100 | 10 | 1 | 0 | All Groups 10, 20, 30, 40, 50 und 60 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 | |

Table *Identification*

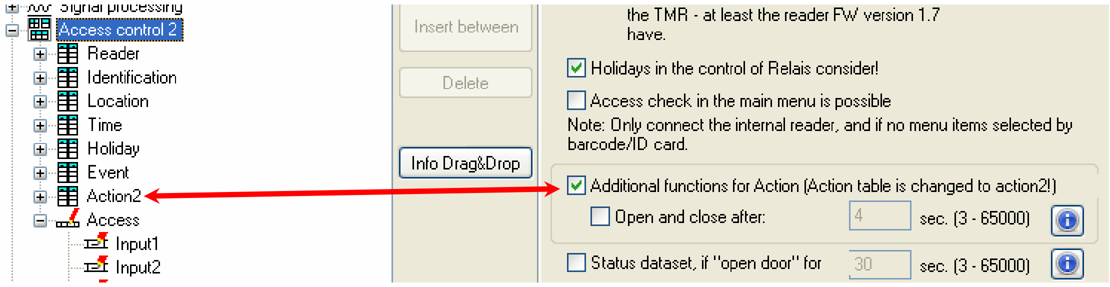
| ID | Group | Pin | Menace | ActiveStart | ActiveEnd | Active | Description |
|---|---|---|---|---|---|---|---|
| 1111 | 10 | 0 | 0 | 2005-01-01 | 2015-12-31 | 1 | Tenant of an apartment on the floor 1 |
| 1112 | 10 | 0 | 0 | 2005-01-01 | 2015-12-31 | 1 | |
| 1113 | 10 | 0 | 0 | 2005-01-01 | 2015-12-31 | 1 | |
| 2222 | 20 | 0 | 0 | 2005-01-01 | 2015-12-31 | 1 | Tenant of an apartment on the floor 2 |
| 3333 | 30 | 0 | 0 | 2005-01-01 | 2015-12-31 | 1 | Tenant of an apartment on the floor 3 |
| 4444 | 40 | 0 | 0 | 2005-01-01 | 2015-12-31 | 1 | Tenant of an apartment on the floor 4 |
| 5555 | 50 | 0 | 0 | 2005-01-01 | 2015-12-31 | 1 | Tenant can move to the floor 1 and 2 |
| 6666 | 60 | 0 | 0 | 2005-01-01 | 2015-12-31 | 1 | The facility manager can move to all floors |

Table *Time*

| ID | Weekdays | TimeStart | TimeEnd | Description |
|---|---|---|---|---|
| 1 | 1234567 | 00:01 | 23:59 | 24 houers and seven days allowed |
| | | | | |

### 5.8.4.3. Description of the table „Action2"

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



the TMR - at least the reader FW version 1.7 have.

☑ Holidays in the control of Relais consider!

☐ Access check in the main menu is possible

Note: Only connect the internal reader, and if no menu items selected by barcode/ID card.

☑ Additional functions for Action (Action table is changed to action2!)

☐ Open and close after: 4 sec. (3 - 65000)

☐ Status dataset, if "open door" for 30 sec. (3 - 65000)

| 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.<br>0 = for all groups work this action. |
| RefTime | Number (int) | 4 | Give a time, and only works this action to this time.<br>(0 = works ever)<br>! Not mixed with times in RefTimeRelais! |
| RefReader Relais | Number (int) | 4 | Reference to the list reader, action to switch a relay on this listed reader in table reader. |
| PortOut | Number (Byte) | 1 | Switch relay 1 or 2 |
| Elapse | Number (int) | 6 | Specifies the period of time a relay is switched<br>! The time is in seconds!<br>If here listed a (-1), then switch the relays to off<br>If here listed (0), then switch the relay for RefTime of for period on. |
| RefReaderLED | Number (int) | 4 | This is a reference to the table Reader to switch the LED on other modules |
| RefTimeRelais (nur für Automatische Zeitsteuerung) | Number (int) | 4 | The time model indicates when the output may be switched. (0 = not used). (Automatic time control)<br>! Action how here work with automatic times, be not mixed with action from the access! |

**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.

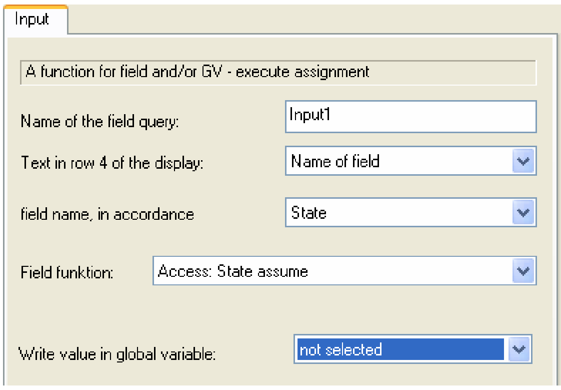
**Caution:**
Would you like to continue working with the "action" table, the table "Action 2" may not be transferred to the device.
A table "Action 2" has already been transferred to the device, it must be cleared by loading a new setup.

## 5.8.5. State message off access control

| display | Assigned status message |
|---|---|
| 0 | module detected everything OK |
| 3 | module not in the list defined but found in the bus rs485 |
| 4 | module in the list reader added but not found in the bus rs485 |
| 5 | wrong Encryption password |
| 6 | login password is wrong |
| 7 | RFID-typ (Mifare, Legic, Unique, etc.) wrong |
| 8 | Failed to configure the module |
| 9 | No modules |
| 10 | the Key for communication with PHG-Modules was changed |
| 11 | the Key for communication with PHG-Modules was not changed |
| display | Assigned status message |
| 20 | ID ok,  accses succesful |
| 21 | ID is not in the list identification. |
| 22 | ActiveGeneral not correct. |
| 23 | Validity period does not fit. |
| 24 | Could not find the room. (group definitions) |
| 25 | Could not find am Time in time-table. |
| 26 | wait for PIN-input. |
| 27 | Pin wrong |
| 28 | threat code was input. |
| 29 | the PIN is right, accses successful. |
| 30 | the Master-PIN was input, accses successful. |
| 31 | PIN-Timeout. |
| 32 | Master-ID right, accses successful. |
| 33 | accses successful with PIN input. |
| 34 | Online-TP. |
| 35 | Online-PIN. |
| 36 | Make Action closing |
| display | Assigned status message |
| 40 | digital output 1 is low (off) |
| 41 | digital output 1 is HIGH.(on) |
| 42 | digital output 1 is for the time ELAPSE, HIGH. |
| 43 | digital output 2 is low (off) |
| 44 | digital output 2 is HIGH.(on) |
| 45 | digital output 12 is for the time ELAPSE, HIGH. |
| 100 | the access-control is off. |
| 101 | server not online (online accses-control) |
| 102 | the device have no lists. |
| 103 | Type not correct in setup settings (GIS, PHG). |

| display | Assigned status message | |
|---|---|---|
| | GIS | PHG |
| 60 | digital input 1 is Low | IO-Box is closed (contact closed) pull down |
| 61 | digital input 1 is High | IO-Box is open (contact open) pull up |
| 62 | digital input 2 is Low | IO-Box is closed (contact closed) pull down |
| 63 | digital input 2 is High | IO-Box is open (contact open) pull up |
| 64 | digital input 3 is  Low | Sabotage-contact-input is OK -> |
| 65 | digital input 3 is High | Sabotage-contact-input is broken/interupted |
| 66 | digital input 3 was interupted | PHG not used |
| 67 | digital input 3 was short circuit | PHG not used |
| 70 | not used | digital input 1 is Low |
| 71 | not used | digital input 1 is High |
| 72 | not used | digital input 2 is Low |
| 73 | not used | digital input 2 is High |
| 74 | not used | Sabotage-contact-input is OK -> |
| 75 | not used | Sabotage-contact-input is broken/interupted |
| | | |
| display | Assigned status message | |
| 80 | alarm-input 1 | |
| 81 | alarm-input 2 | |
| 83 | alarm-input 3 | |
| 84 | alarm-input 4 | |
| | | |

☞ **Hinweis:**
Do you want see the status from accses control, to coose this settigs in the Setup.



A function for field and/or GV - execute assignment

Name of the field query: Input1

Text in row 4 of the display: Name of field

field name, in accordance: State

Field funktion: Access: State assume

Write value in global variable: not selected

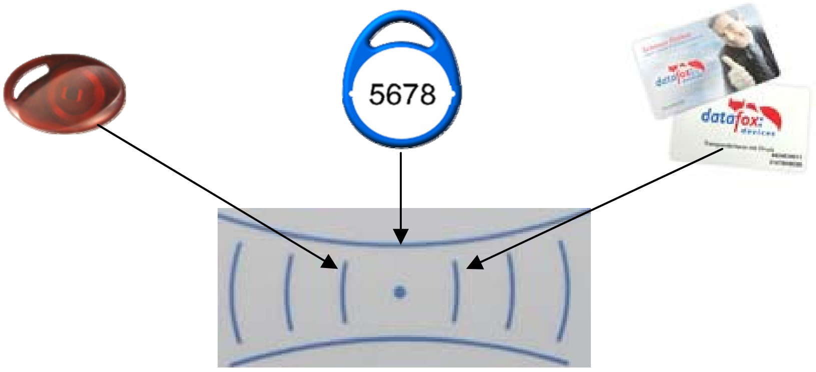
### 5.8.6. Statusanzeige der Zutrittsmodule über LEDs

| Gelb | Grün | Rot | Zustand des TS TMR33-xx |
|---|---|---|---|
| aus | aus | aus | Es liegt keine Versorgungsspannung an |
| an | aus | aus | Es liegt eine Versorgungsspannung an,<br>Leser vom Master erkannt und konfiguriert<br>Zustand nach Modultest = Status „OK“ |
| an | an (ca. 1 s) | an (ca. 1 s) | Akustisches Signal durch Summer (ca. 1s) signalisiert Modul-test |
| an | aus | an (ca. 10 s) | Die Listen des Zutrittsmasters werden aktualisiert |
| an | aus | an (Dauer) | Konfigurationsfehler über die Zutrittslisten (Prüfung der Statusmeldungen notwendig.) |
| blinkt | aus | aus | Signalisiert lesbare Karte im Bereich,<br>oder der Leser ist von Master nicht erkannt |
| an | an (ca. 1 s) | aus | Gelesene Karte ist Zutrittsberechtigt,<br>zusätzlich akustisches Signal durch Summer (ca. 1s) |
| an | an | an (ca. 1 s) | Gelesene Karte ist nicht Zutrittsberechtigt |
| an | blinkt | aus | Es wird eine PIN Eingabe erwartet |

## 5.9. RFID Reader

The RFID reader is built-in the PZE-MasterIV. 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 PZE-MasterIV:

**PZE-MasterIV mit 125 kHz:** Unique EM4102, Hitag1, Hitag2, HitagS, Hewi EM4450
LRW  8 cm R/W (LeseReichWeite “Read range” with card)

**PZE-MasterIV with Legic-Prime:** LRW 4 cm  R/W = read/write

**PZE-MasterIV with Legic-Advant:** LRW 4 cm  R/W

**PZE-MasterIV with Mifare-Classic:** LRW 4 cm  R/W  reading Desfire serial nr. from FW 4.1.7

**PZE-MasterIV with Mifare-Desfire:** LRW 4 cm  R/W  for MifarePlus / 7 Byte UID necessary

**PZE-MasterIV with i-Button-Reader:** Touchmemory only reading

**PZE-MasterIV with HID  125kHz:** LRW 6 cm  only reading  ProxPoint Plus 4065

**PZE-MasterIV with HID-iCLASS:** LRW 4 cm  only reading  13,56MHz

**PZE-MasterIV withNedap:** LRW 4 cm  only reading

**with SimonsVoss SmartRelais:** LRW optimum at approx. 20 cm! If the transponder is too close, it might be not recognized. (interface Siemens: CLS-Signal=Yes).

☞ **Note:**
More information you found in the manual from DatafoxStudioIV capter „The RFID Technology”

## 5.10. Fingerprint

### 5.10.1. 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.

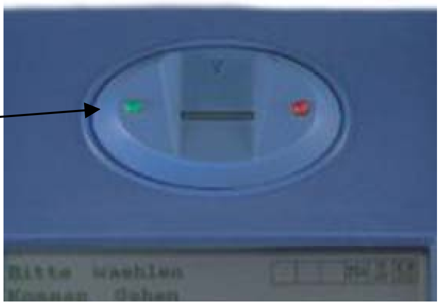
The "security level" (false acceptance rate / false rejection rate) defines when a read finger is accepted or rejected. 60 means that 60% of the minutiae of the scanned template must match 60% of the reference template, in order to declare the detection as valid. We recommend setting the value not lower 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.

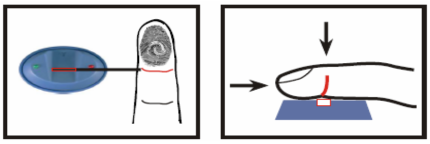
The "count of minutiae" defines how many minutiae must be determined from the image so that a template for a matching can be created or declared as valid.
We recommend setting the value not lower than 7, better set to 10.

### 5.10.2. Operation

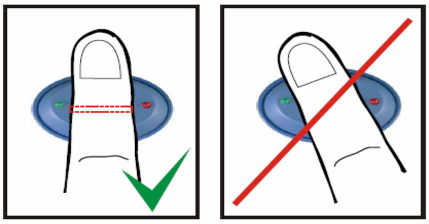
The flashing green LED signals that the fingerprint reader is ready for scanning.



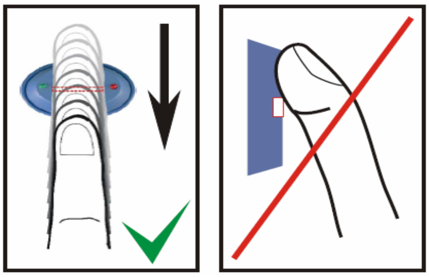
1.) Place the fingertip on the scanner.



2.) Position the finger flatly not tilted.

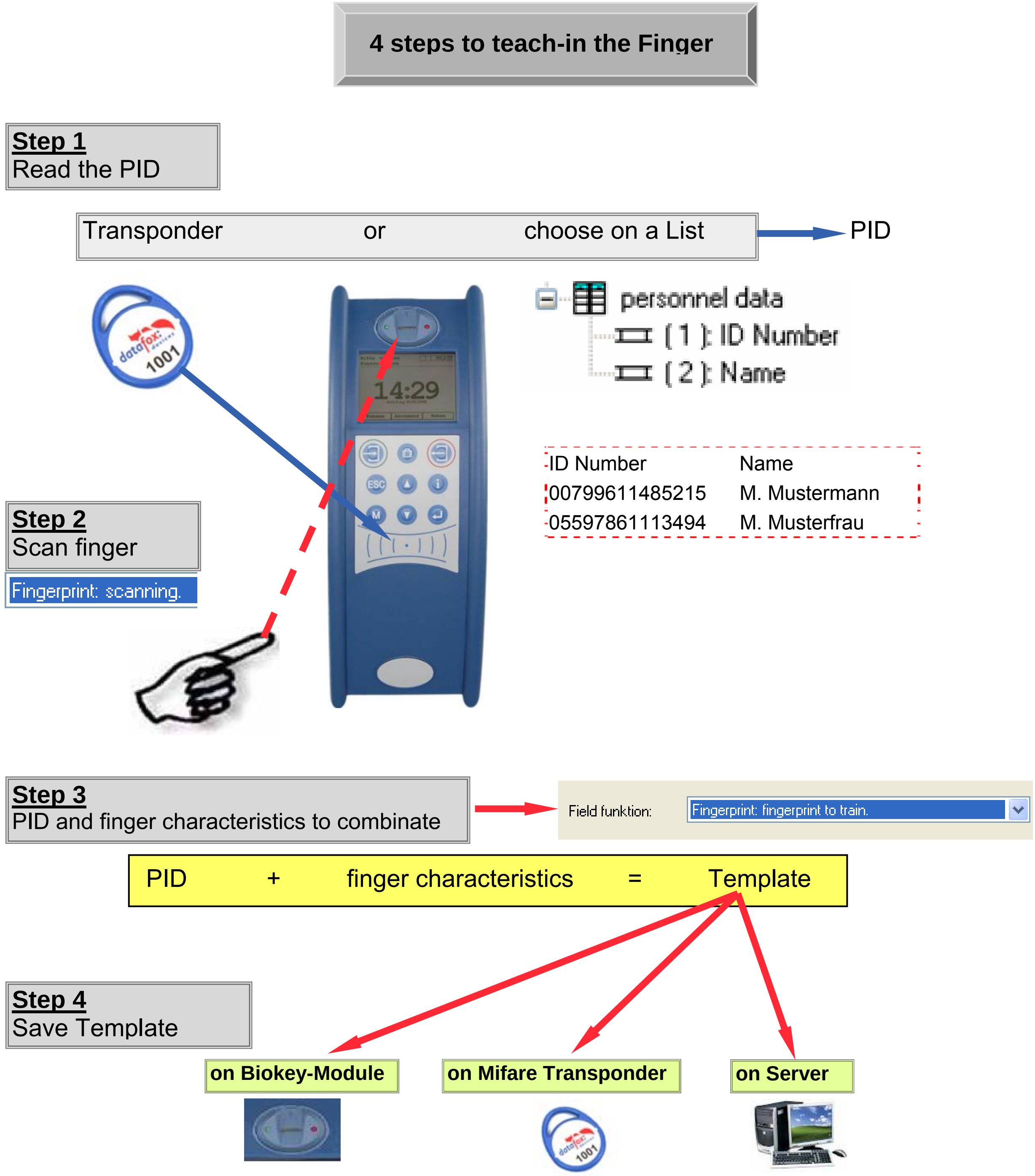


3.) Swipe the flat finger across the scanner.



### 5.10.3. 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

Transponder or choose 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 combinate

Field funktion: Fingerprint: fingerprint to train.

PID + finger characteristics = Template

**Step 4**
Save Template

**on Biokey-Module** **on Mifare Transponder** **on Server**

## 5.10.4. 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.

### 5.10.5. 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

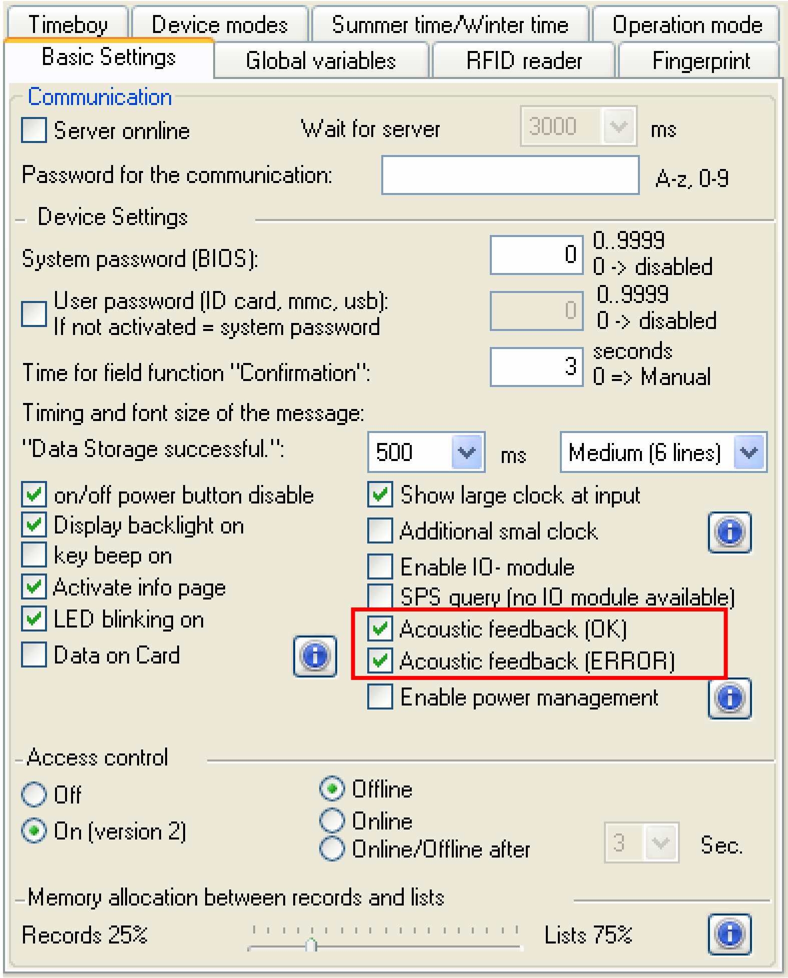
☞ **Note:**
For more information on possible settings see the manual DatafoxStudioIV, chapter "Functions in the Setup > Fingerprint".

### 5.10.6. 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 uA
- 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 x 10-2
- False Acceptance Rate (FAR) 1,0 x 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.

## 5.11. Buzzer

The buzzer gives a response to the data input.
1 beep = correct input.
2 beeps = input error
Condition for that is, you have enabled the buzzer in the setup Basic Settings.



Timeboy | Device modes | Summer time/Winter time | Operation mode
Basic Settings | Global variables | RFID reader | Fingerprint

Communication

□ Server onnline    Wait for server 3000 ms

Password for the communication: A-z, 0-9

Device Settings

System password (BIOS): 0    0..9999 0 -> disabled

□ User password (ID card, mmc, usb): If not activated = system password    0    0..9999 0 -> disabled

Time for field function "Confirmation": 3    seconds 0 => Manual

Timing and font size of the message:

"Data Storage successful.": 500 ms    Medium (6 lines)

☑ on/off power button disable
☑ Display backlight on
□ key beep on
☑ Activate info page
☑ LED blinking on
□ Data on Card

☑ Show large clock at input
□ Additional smal clock
□ Enable IO- module
□ SPS query (no IO module available)
☑ Acoustic feedback (OK)
☑ Acoustic feedback (ERROR)
□ Enable power management

Access control

○ Off
● On (version 2)

● Offline
○ Online
○ Online/Offline after 3 Sec.

Memory allocation between records and lists

Records 25%    Lists 75%

The buzzer loudness can to modulate in the device BIOS menu.

More details are given in the caption "Menu(Bios)".

# 6. Technical Data

### PZE-MasterIV Hardware-Version V2.1 / V3.0

| Hardwareversion | | **V2.1** (delivery until 2010) | **V3.0** |
|---|---|---|---|
| System | clock | real-time clock | |
| Data Memory | Flash | 2 MB; 100,000 write cycles | 4 MB; 100,000 write cycles |
| | memory extension (optional) | MMC- or SD-Card; max. 1 GB | |
| Display | LCD | graphic: 1/4 VGA 320 x 240 Pixel, 82 x 62 mm | |
| | backlight | LED | |
| Keys | type | tactile feedback with full switch way | |
| | size | Ø 14 mm | |
| | number | 9 | |
| Power Supply | power supply | 12 V - 24 V AC or DC voltage | |
| | backup clock / RAM | lithium battery | lithium battery + goldcap |
| | power consumption | max. 7.2 W | |
| Dimensions | height x width x depth | 360 mm x 130 mm x 70 mm | |
| Weight | without power supply | approx. 750 g | |
| Environmental Factors | ambient temperature | -20 °C to +70 °C (with mobile radio modem MC55: -20 °C to +55 °C) | |
| | protection class | IP 65 front-sided; completely IP65 in mounted position | |
| Software | configuration program | setup program for configuration without programming | |
| | communication tools | DLL or C source code for integration in application | |
| Data Transfer | RS232 / RS485 | RS232 in basic unit (RS485 optional) | |
| | TCP/IP (optional) | TCP/IP with integrated TCP/IP stack | |
| | WLAN (optional) | wireless LAN module built-in | |
| | GSM / GPRS (optional) | online via mobile network with GSM and GPRS | |
| | Bluetooth (optional) | Bluetooth module built-in; operating distance up to 100 meters | |
| | USB interface (optional) | for communication with a PC, built-in | |
| | USB interface (optional) | for communication with USB flash drive (except SD-Card) | |
| Reader Connection | RS232 external | connection of bar code reader, magnetic card reader etc. | |
| Access Options | RS485 external | connection of up to 8 external door modules / readers | |
| | door opener relays | 2 x 42 V AC or 30 V DC | 2 x max. 60 V, 2 A, 60 W |
| | door supervision | 2 x digital input | |
| Additional Options | fingerprint | fingerprint module built-in; sensor above LCD | |
| | transponder reader built-in | 125 kHz, e.g. Unique, Titan, Hitag,<br>13,56 MHz, e.g. Legic, Mifare, ISO14443, ISO15693,<br>SimonsVoss, iButton, Nedap | |
| | GPS receiver | 50 channels, GPS L1 frequency C/A, GALILEO Open Service L1 | |
| | column | column for free installation | |

Subject to technical change without notice.

# 7. FAQ

An extensive collection of FAQs can be found on our homepage.

http://www.datafox.de/faq-de.html

## 8. index