DESIGNA

Operating Instructions

MFTL – Multi Function Terminal

Series: .connect
Version: 1.00

Identity no. DOCEN01065

info
www.designa.com

Original Operating Instructions

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1 General

1.1 Information regarding the operating instructions

These operating instructions are intended for operators of the DESIGNA system and provide crucial information on handling of device MFT-L.

These operating instructions describe measures *(see main chapter 14 Maintenance on page 69 and the sections of the individual modules)* which have to be carried out at regular intervals to ensure reliable and trouble-free operation of the device. The required work should only be carried out by DESIGNA trained operating personnel, who are familiar with the operating instructions and safety information.

For all other tasks, we recommend special DESIGNA training courses or separate specialist instruction manuals for trained personnel are available (e.g. special maintenance works).

Certain tasks have to be carried out by specialized staff or specially trained DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized partners. These tasks are marked accordingly.

- ⇨ Read the operating instructions carefully before starting any work.
- ⇨ Pay careful attention to the safety instructions.
- ⇨ Use the table of contents to find the sections which are important for your work routines.
- ⇨ Keep the operating instructions for later use, well accessible to the personnel at all times.
- ⇨ When passing the device on to third parties, the operating instructions must also be handed over.

DESIGNA eCademy

Discover information about courses, further documents, and all the latest news in the DESIGNA eCademy.

After registering you can download the operating instructions and further documents in the electronic read-only media format.

Printed operating instructions

Please contact DESIGNA for the printed operating instructions.

For the address, see invoice, delivery note or imprint.

1.2 Explanation of signal words and symbols

Safety messages

Following signal words are used to identify the safety messages and property damage messages:

Pay careful attention to the safety messages in order to prevent accidents as well as bodily injuries and property damage.

⚠ DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates a potentially harmful situation which, if not avoided, could lead to property damage.

Hints and recommendations

ℹ … highlights useful hints and recommendations as well as information for an efficient and trouble-free operation.

… highlights valid information for the barcode technology.

Functional symbols and designations

The following symbols and designations are used in the instructions:

–	Instructions specified in warnings
■	List
1.	Step-by-step instructions
⇨	Instructions without fixed sequence
➤	Result of the action
bold	Terms in bold are explained in the glossary
italic	Italic text refers to a component in a figure or a different chapter of these instructions or related instructions.

1.3 Consumables, spare parts and accessories

DESIGNA offers comprehensive consumables, spare parts and accessories for the device MFT-L.

> These operating instructions mention some consumables. Please refer to your spare parts catalogue and consumables catalogue for further consumables, accessories and spare parts.

1.4 Customer service & service

Your DESIGNA Service is available to you for technical information.

For the address, see invoice, delivery note or imprint.

> In order to enable fast handling note the data of the type plate such as device type, order number, identity number, serial number, etc. before calling.

2 Safety

2.1 Intended use

The device MFT-L is part of the DESIGNA series.

DESIGNA is an integrated system that controls the entrance/exit, time and cost of parking in protected areas such as car parks, airports or similar places. The automated parking system DESIGNA is designed to give a service (parking) in exchange for money.

In the system DESIGNA, the device MFT-L can be used, for example, to open a door (person access control) or to limit access to a fee-based parking area with a barrier, rolling shutter gate or bicycle gate.

In combination with a car park barrier the device MFT-L should only be used to control the entrance/exit of vehicles. There is a risk of injury for cyclists, pedestrians, etc.

Other or complementary safety facilities must be provided for motorcycles and road vehicles that cannot be detected by induction loops.

⇨ Ask your DESIGNA Service for more information about restrictions and special installations/settings and mark the barrier's danger zone accordingly.

⇨ *Refer to the barrier instructions.*

The device MFT-L was specially developed for ticketless parking management systems and provides access with various identification media:

– Licence plate:
  The licence plate is recognised by LPR cameras and serves as an identification medium in the parking system for entrance, payment and exit, or the car park customer enters the licence plate recorded in the system via a touch display.
– Scanning barcodes and QR codes
– Contactless access with RFID card

Authorisation is requested **online** at the **system server**. Depending on the configured behaviour, the corresponding reaction is triggered at the device MFT-L , e.g. opening the barrier or the door.

The device MFT-L is qualified for either indoor, protected or outdoor locations.

Only original DESIGNA spare parts and consumables should be used.

2.2 Non-intended use

Non-intended use

⚠ WARNING

Risk of injury from non-intended use!

Every non-intended use can cause severe or lethal injuries.

- Only use the device MFT-L as intended.
- Read the operating instructions carefully and pay careful attention to the safety instructions.

In combination with a car park barrier the device MFT-L is not approved for persons, bicycles or animals.

The device MFT-L must not be used in explosive environments.

Use of non-approved spare parts and accessories is prohibited.

Modifications or changes to the device are prohibited.

Use as a storage area is not permitted.

Use of unsuitable media (consumer goods, cleaning agents) is not permitted.

Deployment of non-trained personnel is prohibited.

All uses not described as intended use are prohibited and are non-intended use.

The manufacturer shall refuse to accept liability and withdraw warranty if the instructions are not followed and if the device is used incorrectly or for a purpose for which it was not intended.

2.3 Safety on site

The operator has to pay attention to the following measures in order to guarantee safety in the car park area:

⇨ Always keep children away from system devices.

⇨ Select easily recognizable warning colours and signs used in the car park area.

Fig. 1: Safety marking on the road

⇨ Provide separate footpaths next to entrances and exits and mark pedestrian areas (see figures below) to ensure that pedestrians do not have to walk near entrances and exits and on the roads.

⇨ Make sure that there are sufficient fully visible signs around the car park site. Keep signs clean and position them so that they can be read easily.

⇨ Use additional safety barriers (e.g. safety cones) to close off entrances and exits when carrying out work there and wear safety clothing in easily recognizable warning colours.

⇨ Make sure that the danger area of the devices cannot be accessed by any unauthorized persons, and in particular not by children, under any circumstances.

If barriers are installed in your DESIGNA system the operator should pay attention to the following measures:

⇨ Provide all footpaths with a sufficient distance to the lanes and the car park barriers. Observe national regulations.

⇨ Observe the safety instructions in the barrier's operating instructions.

2.4 Specialists and operating personnel

⚠ WARNING

Risk of injury in case of inadequate qualification!

Improper handling can lead to considerable bodily injuries and property damage.

– Have any activities only carried out by the individuals designated for that purpose.

The operating instructions specify the following qualification requirements for the different fields of activity:

Operating personnel

Operating personnel have been trained and authorized by DESIGNA to carry out certain cleaning and fitting tasks at the device MFT-L. It is essential that operating personnel are also completely familiar with the operating manual and relevant safety instructions.

Specialized staff

Specialized staff is due to its technical training, knowledge and experience as well as due to its knowledge of the pertinent regulations able to carry out the work assigned to it and to independently recognize potential hazards.

Electrical technicians according to DIN VDE 1000-10

Electrical technicians are able, due to their technical training, knowledge and experiences as well as knowledge of the relevant standards and regulations, to execute tasks on electrical systems and to independently recognize possible hazards.
In Germany, the electrical technicians must fulfil the provisions of the accident prevention regulation DGUV-V3 (e.g. master electrician). Appropriate regulations apply in other countries. The regulations valid there must be observed.

DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners

DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners comply with the requirements of the electrical technicians named here. Additionally, these electrical technicians are trained and authorized by DESIGNA to perform installation, connection and servicing at the device MFT-L.

2.5 Personal protective equipment

It is necessary to wear personal protective equipment when dealing with the device so as to minimize health hazards.

Before carrying out any work, properly dress in the necessary protective equipment such as work clothes, protective gloves, safety shoes, helmet, etc. and wear them during work.

2.6 Occupational safety and special dangers

The remaining risks resulting from the risk analysis are specified in the following section.

Observe the safety notes listed here and the warning notes mentioned in the other chapters of these instructions to reduce health hazards and to avoid dangerous situations.

2.6.1 Product safety labels on the device

Fig. 2: Product safety labels

1 Ground wire, internal

2 Safety sign Hot surface at the optional heater

Not shown:

3 Type plate

⇨ Check that all product safety labels are in place and display the information specified below.

⇨ Contact your DESIGNA Service if any labels are missing or damaged.

Ground wire, internal

Ground wire, internal *(see chapter 8.3 Connection power supply (terminal block -X0) on page 47)*.

■ 

Type plate

See chapter 3.1 Type plate on page 16.

Safety sign Hot surface at the optional heater

The following safety sign denotes the presence of a hot surface. Non-observance of the safety sign can lead to minor injuries *(see chapter 5.3.9 Heater (optional) on page 31)*.

■ 

2.6.2 Safety messages and operation safety

Observe the safety messages listed here to reduce health hazards and to avoid dangerous situations.

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

Contact with live components may result in death.

- Installation has to be carried out by electrical technicians or DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
- Connection and commissioning have to be carried out by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
- Filling and emptying inside the device should only be carried out by DESIGNA trained operating personnel who are familiar with the operating instructions and safety information.
- Certain maintenance work may be carried out by DESIGNA trained operating personnel familiar with the user manual and the safety instructions. All other maintenance work may only be carried out by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
- Check that the power supply line and electrical safety measures are in accordance with valid national and local regulations and standards and make sure they correspond with the specifications in the chapter *4 Technical Data on page 17*.
- National regulations for accident prevention at electrical installations and equipment must always be followed.[1] Recommended: Locally provide - e.g. at the fuse box - an all-pole disconnection main switch for the device which can be locked in the OFF position (prevents accidental reconnection, e.g. when carrying out installation work).
- Switch off power supply and secure against re-activation before performing any work. Test for absence of voltage.
- Switch off the power supply immediately in case of damage to the insulation and arrange repair.
- Never bypass or deactivate overcurrent protection devices.
- When replacing overcurrent protection devices observe the correct amperage specification.
- Keep moisture and dust away from live parts. Moisture or dust may cause a short circuit. If the electrical connection is established at precipitation, e.g. rain or snow, penetration of moisture must be prevented by suitable measures, such as a protective cover.
- Ensure that the device is always locked correctly in order to avoid endangering third parties.

[1] e.g. in Germany: BGFE accident prevention regulation for electrical installations and equipment DGUV-V3

Electric voltage:
Missing protective facilities

⚠ DANGER

Danger of death due to electric shock!

The safety installations that are required according to regional and local regulations must be provided by the customer. Usually these are:

- Overcurrent protection devices
- Lockable 2-pole main switch acc. to EN 60947-3
- Residual current device (RCD)

Thunderstorm, lightning, electric voltage

⚠ DANGER

Danger of death from lightning and electrical voltage!

If lightning strikes the device, contact to the device components and direct proximity to the device includes mortal danger.

- Never install the device during thunderstorms.
- Protect yourself in buildings or vehicles.

Improper operation

⚠ WARNING

Danger from improper operation of the device!

Improper operation of the device can cause severe or lethal injuries

- Only additions to the device that are permitted by the manufacturer may be installed.

Improper transport

⚠ WARNING

Danger from improper transport of the device!

The weight of the device can severely injure a person.

- Have them transported by specialized staff only.
- Check fasteners (packaging straps) for damage or tears.
- Use lifting gear or forklift with a suitable pallet.
- Use suitable lifting gear (loops, etc.) for lifting the device. The lifting gear must be designed for the respective weights.
- Never attempt to lift the device on your own.
- Always wear safety shoes.

Heavy weight

⚠ WARNING

Risk of injury when lifting heavy objects alone!

The weight of heavy objects can severely injure a person.

- Never attempt to lift the device on your own.
- Always wear safety shoes.

Falling components

⚠ WARNING

Risk of injury from falling components!

Calling components can cause severe injury.

– Secure the device MFT-L against tilting before assembly.
– Install the device correctly.

Insufficient fixing

⚠ WARNING

Risk of injury at insufficient fixing!

Insufficient fixing of individual components such and additions permitted by the manufacturer can cause severe injury.

– Only DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners are allowed to assemble the device and the appropriate components.
– Check the foundation anchors fit tightly before starting the commissioning.
– Check the firm fixing of all screws according to maintenance schedule.

Illegible signage

⚠ WARNING

Risk of injury by illegible symbols!

Labels and signs can become dirty or unrecognizable in the course of time.

– Always keep safety, warning and operating notes in a well readable condition.
– Immediately renew damaged or unrecognizable signs or labels.

2.7 Safety standard of the device

DESIGNA

EU DECLARATION OF CONFORMITY

according to the directive 2006/42/EC, annex II A

EU-KONFORMITÄTSERKLÄRUNG

gemäß Maschinenrichtlinie 2006/42/EG, Anhang II A

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Product/ *Produkt*

Designation/ *Bezeichnung:*	**MFT-L**
Series/ *Serie:*	**CONNECT**
Function/ *Funktion:*	**Multi Function Terminal/** ***Multi Function Terminal***
From serial no./ *ab Seriennummer:*	CST100000

We declare that the object of the declaration described above is in conformity with all requirements of the **machinery directive 2006/42/EC.**
Hiermit erklären wir, dass das oben genannte Produkt allen einschlägigen Bestimmungen der ***Maschinenrichtlinie 2006/42/EG entspricht.***

The product described above meets further applicable directives:
Das oben genannte Produkt erfüllt die Anforderungen der folgenden einschlägigen Richtlinien:

Directive 2014/30/EU (EMC Directive)
Richtlinie 2014/30/EU *(EMV-Richtlinie)*

Signed for and on behalf of/ *Unterzeichnet für und im Namen von*
Designa Verkehrsleittechnik GmbH

Place and date of issue/ *Ort und Datum der Ausstellung*

Kiel, 18/10/2021

Name, function, signature/ *Name, Funktion, Unterschrift*

Dr. Joachim Kopp
Director R&D/ *Director R&D*

CE_MFTL_ENG.docx

3 Identification

3.1 Type plate

The device type plate is located on the casing.

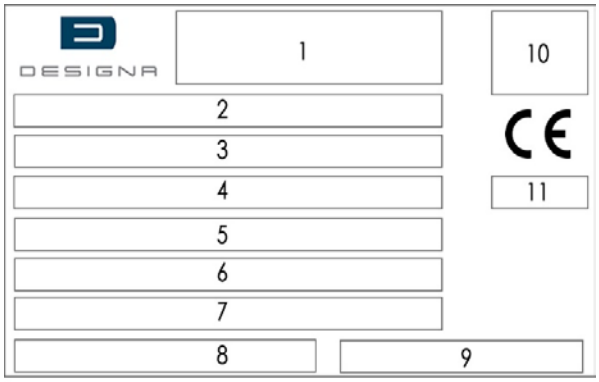


Fig. 3: Type plate

1 Manufacturer’s name and address
2 Series (system)
3 Production code
4 Model
5 Article no.
6 Serial no.
7 Input: Power supply and current consumption
8 YOM: Year and month of manufacture
9 Manufacturing country
10 QR Code
11 Ingress protection rating

Some modules are also equipped with a type plate. The type plate is then located directly on the module.

4 Technical Data

Dimensions and weight

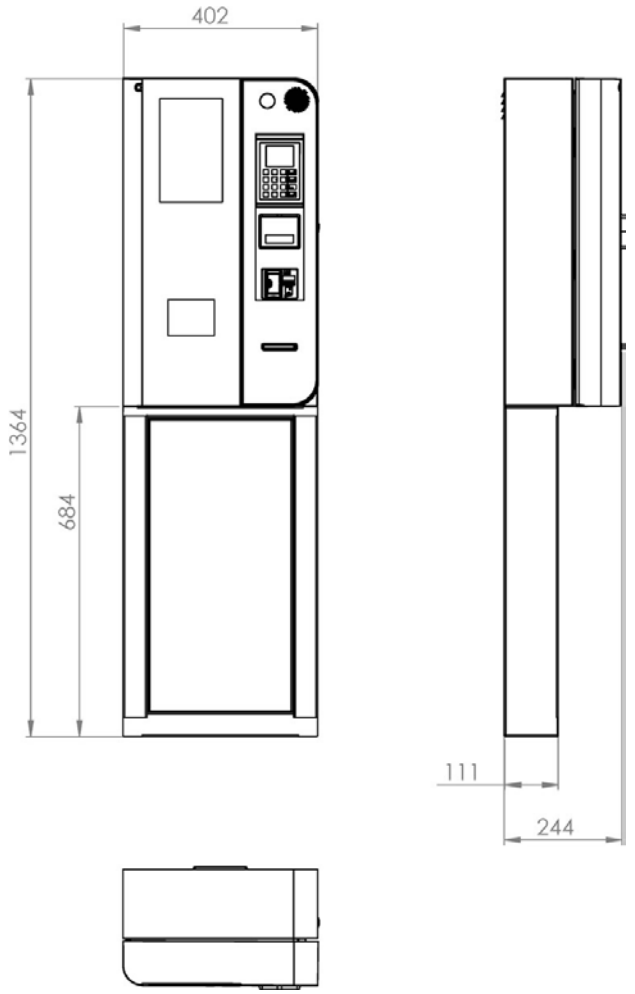


Fig. 4: Dimensions in mm

Description	
Weight	approx. 35 kg

Electrical connection

Description	
Power supply	230 V AC, 50 Hz
Current consumption device	Operation 0.21 A Standby mode 0.15 A max. 0.45 A
Current consumption heater (optional)	0.2 A
Power consumption device	Operation 48 W Standby mode 35 W max. 100 W
Power consumption heater (optional)	45 W
Network system	TN-S system
Pre-fuse	max. 16 A
Terminal cross-section	max. 2.5 mm²
Connection type	Tension spring connection
Protection class	I
Control voltage	24 V DC

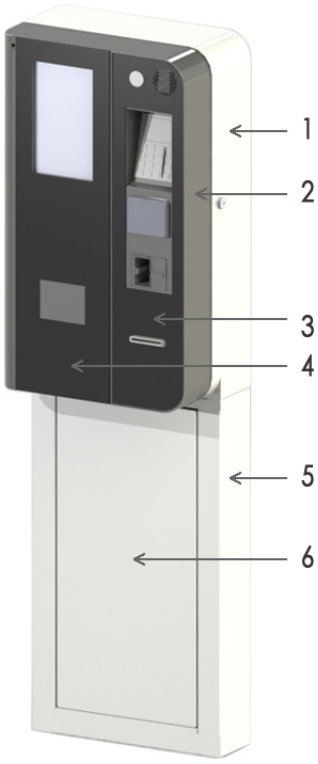
Operating conditions

Description	
Operating temperature	without optional heater: +10 to +50°C with optional heater: -20 to +50°C
Storage temperature	-25 to +70°C
Relative humidity	max. 95 %, non-condensing
Noise development	< 70 dB(A)
Ingress protection rating	IP 54

5 Device Description

Firstly there is an overview of the design and functions of a standard device. Some components which can be perceived as units are described as independent Modules at the end of these instructions.

5.1 General design



1 Casing body
2 Casing door
3 Module front panel
4 Front panel
5 Socket
6 Socket door

Fig. 5: General Design

Design

- Casing body, socket and socket door are made of stainless steel 1.4301 (V2A), outer and inner surface with durable, weather resistant powder coating, fine structure, deep matt colour[2]
- Module front panel is made of aluminium, weather resistant powder coated
- Casing door is made of plastic (ASA), wet paint coated
- Front panel is made of Plexiglas® XT

Colour

- Casing body, socket and socket door: RAL 9016 (traffic white)
- Casing door and module front panel: RAL 9017 (traffic black)

[2] Other colours and surfaces are optionally available.

5.2 Components on the casing door and their functions

Fig. 6: Components on the casing door (figure with options)

1 Intercom device
  1a) Microphone
  1b) Loudspeaker (DESIGNA VoIP)
2 Full touch display
3 SBC (Single Board Computer) IN/OUT
4 2D Barcode scanner (optional)
5 Mechanical Intercom button (optional)

Not shown:

6 Credit card reader/PINPad/NFC (optional)
7 Receipt printer (optional)
8 RFID (hands-free identification) (optional)
9 Camera (optional)
10 Hearing induction loop (optional)
11 MP3 module (optional)

5.2.1 Intercom

By selecting the phone symbol on the Full touch display or optionally by pressing the mechanical button Info, the intercom establishes a voice connection to the parking lot call centre. From here, the customer can be offered assistance.

Depending on the type of connection, a distinction is made between the integrated VoIP *intercom DESIGNA VoIP*, which does not require a separate connection when installed, and intercoms from other manufacturers, which are connected to the *terminal block -X2* or an additional *Ethernet connection*.

DESIGNA VoIP (Voice over IP)

The intercom *DESIGNA VoIP* is connected to the call center via **Ethernet**. A duplex intercom connection is enabled.

Intercom devices of other manufacturers

The intercom devices of other manufacturers require a connection via a 2 or 4-wire intercom circuit or via an additional Ethernet connection. Depending on the equipment, a simplex or duplex speech connection is enabled.[3] Optionally, a function can be triggered at the device from the central switchboard for intercommunication (default: Barrier open).

> **i** Various intercom devices are available:
> Please refer to the spare parts catalogue to identify the intercom device installed in your device.

Equipment examples

Type	Speech connection	Connection	Function triggering
Schneider ET 808	Duplex	2-wire at terminal block -X2 + potential-free contact (function triggering)	+
Schneider ET 908	Duplex	Additional Ethernet connection + potential-free contact (function triggering)	+

5.2.2 Full touch display

The DESIGNA full-touch display offers all standard functions for ticket processing at the entry, pay station and exit as well as the corresponding functionalities for ticketless payment via licence plate recognition. The processes are guided by graphical operating instructions.

According to the licences and requirements for the parking system, the touch display is configured for the respective parking solution and device type.

The full-touch display (10.1“) at the device MFT-L offers the following functionalities:

Language

⇨ Tap the symbol with the globe to switch the display texts to another language.

➤ Each tap switches to the next language set up in the system.

Help

⇨ Tap the icon with the telephone to speak directly to the operating personnel via the intercom.

Lost Ticket

⇨ Tap the icon with the ticket in case of ticket loss.

➤ The price in the amount of the daily rate is displayed. After payment, the ticket can be used for exit.

[3] Simplex speech connection: The installed *loudspeaker is equipped with and integrated microphone*. This provides an alternate one-way system, i.e. if the central switchboard for intercommunication is speaking the customer can only listen and vice-versa.
Duplex speech connection: In addition to the *loudspeaker* a separate microphone and a controller are installed: A two-way intercom connection (simultaneous listening and speaking) is possible

Receipt

⇨ Tap the receipt icon to print a receipt as a payment confirmation after payment has been made.

Cancel

⇨ Tap the symbol with the cross to cancel the execution of a function.

Keyboard

The keyboard layout is QWERTY/QWERTZ.

⇨ Tap the globe symbol on the keyboard to switch between the German and English (USA) keyboard layouts (QWERTZ/QWERTY).

⇨ Tap the umlaut function to select language-dependent special characters.

For further information on the functionality and operation of the touch display, please refer to section 12 Operation on page 62and the separate operating instructions for the touch display.

5.2.3 SBC (Single Board Computer)

In the DESIGNA system the **SBC** (Single Board Computer) controls the operation and functions of the individual device components with the required program.

The SBC is centrally controlled by the System server and identified and addressed via IP addresses.[4]

Various components are connected to the SBC and are fully or partially controlled from there.

For further details see chapter 15 SBC (Single Board Computer) module on page 79.

5.2.4 2D Barcode Scanner (optional)

A *2D Barcode Scanner* can be installed at the device MFT-L in order to process barcode ID media for optional prebookings, for the optional discount processing or for the optional processing of the barcode printed on a receipt.

For further details see chapter 12 Operation on page 62.

5.2.5 Mechanical intercom button (optional)

The device MFT-L can also be equipped with a mechanical intercom button that functions parallel to the full-touch display.

5.2.6 Credit card reader/PINPad/NFC (optional)

The MFT-L can be equipped with country-specific credit card reader, PINPad terminal and NFC for credit card and debit card processing.

[4] The IP addresses and the associated SBC **addresses** are set up in the *system configuration* for your system before delivery or by your DESIGNA service.

Some countries require certified card reading devices and PIN systems for standardized credit card processing.

Function and processing depend on the model in use. Please ask your DESIGNA service for availability and more details.

5.2.7 Receipt printer (optional)

If the function **drive&pay** is installed a payment process can take place at the MFT-L (e.g. with credit card). In order to provide customers with a receipt of this process a receipt printer can be inserted as an optional extra. A receipt is printed for each payment made with a credit card (or similar card).

For further details see chapter Module Receipt Printer on page 86.

5.2.8 RFID (Option)

Procedures using hands-free **RFID** cards can only be carried out if a respective antenna has been fitted to the device.

Various hands-free systems/antennas are available in the DESIGNA system.

For further details see chapter 18 RFID (Hands-free Identification) (optional) on page 93.

5.2.9 Camera (optional)

A camera can be installed at the device MFT-L to ensure network-based video surveillance.

Please contact your DESIGNA Service for further details.

5.2.10 Hearing induction loop (optional)

Fig. 7: Example of pictogram for hearing induction loops

A hearing induction loop can be connected to the intercom system of the device. The hearing induction loop enables hearing aid users to hear more clearly in areas of high ambient noise.

⇨ Affix a hearing induction loop pictogram to the device to indicate this hearing assistance system to hearing aid wearers.

5.2.11 MP3 module (optional)

The device MFT-L can be optionally equipped with an MP3 module for interactive speech output to enhance user guidance.

5.3 Components inside the device and their functions

Electric voltage

⚠ DANGER

Danger of death due to electric voltage!

When the device is switched on, the power supply (230V) connected to the following components Terminal block -X0, mains filter, power supply unit and, if necessary, to further optional components *(see chapter Device Description on page 19)*.

- Work inside the device should only be carried out by DESIGNA trained operating personnel who are familiar with the operating instructions and safety information.
- Switch off the device *(see chapter 5.3.7 Terminal block -X0: Voltage connection/ ON/OFF switch on page 28)* unless the work step requires a voltage supply.
- Be aware that the following components remain energized (230V) even when the ON/OFF switch is switched off:
  - ON/OFF switch, primary side
  - Power supply terminal

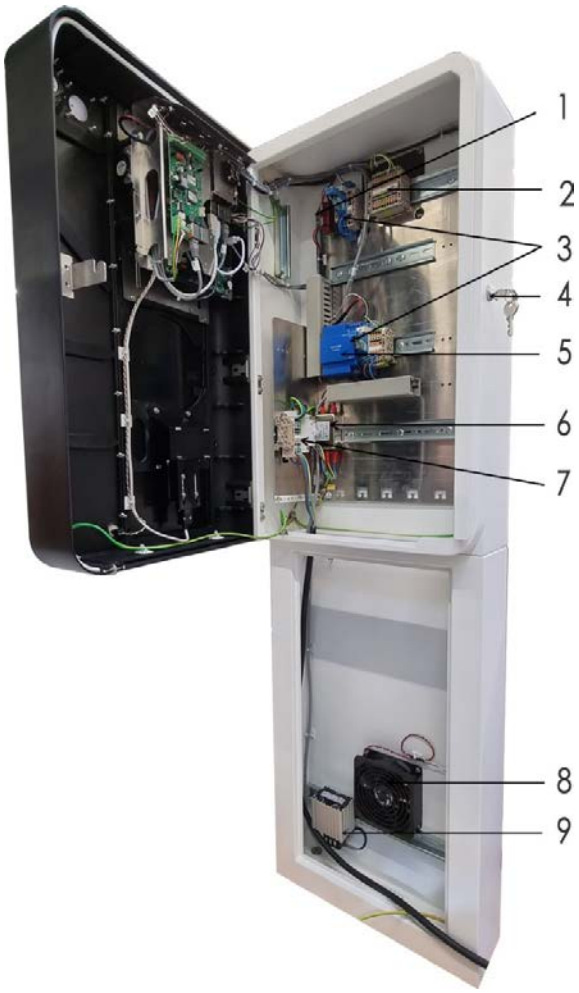


Fig. 8: Components inside the device (figure with options)

1 24 V DC Distributor
2 Terminal block -X2: Intercom system, barrier and Ethernet connection
3 Relay (optional)

4 Locking system
5 Power supply unit
6 Mains filter
7 Terminal block -X0: Voltage connection / ON/OFF switch
8 Fan
9 Heater (optional)

Not shown:

10 Socket with residual current circuit breaker (RCD) (optional)
11 I/O Interface (optional)
12 Humidity sensor
13 Induction loop detector (optional)
14 Network components (optional, e. g. DSL modem)
15 Door switch (optional)

5.3.1 24 V DC Distributor

Internal components are supplied with 24 V DC via the *24 V DC distributor*.

5.3.2 Terminal block -X2: Intercom system, barrier and Ethernet connection

Connection has to be carried out by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized partners.
For further details see chapter 8.5 Connection intercom device (terminal block -X2 or VoIP) on page 52, 8.6 Connection barrier (terminal block -X2) on page 53 and 8.4 Ethernet Connection (terminal block -X2 or additional mounting rail) on page 50.

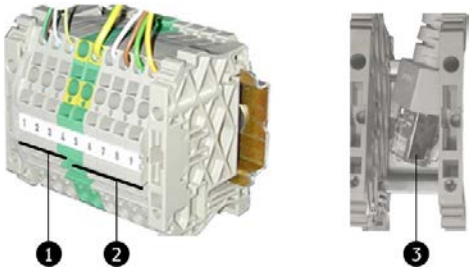


Fig. 9: Terminal block -X2 (similar to figure)

1 Serial barrier connection
2 Connection intercom system
3 Internal connector for Ethernet connection

Not shown:

4 Parallel connector barrier (optional)
5 Connection key switch (optional)

Serial barrier connection

The *serial barrier connection* is provided at the terminal block -X2 as a standard. For older barrier models and complex barrier applications the optional *parallel connector barrier* is required *(see below)*.

The barrier control signals are sent from the **TCC/SBC** to the *serial connector barrier*: The data line between MFT-L and barrier control unit is connected here *(see chapter 8.6 Connection barrier (terminal block -X2) on page 53)*.

Connection intercom device (optional)

If the intercom device requires a 2 or 4-wire connection, the cable of the intercom circuit is connected to terminal block -X2.

Internal connector for Ethernet connection

Fig. 10: Ethernet connection

The *internal connector for Ethernet connection* is connected to the additionally delivered *Ethernet connection*, after this has been wired on-site with the existent **Ethernet (LAN)** and mounted to the mounting rail of the terminal block -X2 or to an additional mounting rail.

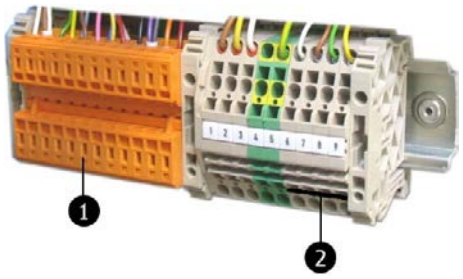
More than one *Ethernet connection* can be necessary depending on the device equipment.

Ethernet surge arrester (optional)

Fig. 11: Option surge arrester for the Ethernet

A *surge arrester* for the Ethernet can optionally be used at the internal wiring between the *Ethernet connection* and the *Ethernet interface* of the **TCC/SBC**. This protects the module TCC/SBC against overvoltage.

Parallel connector barrier (optional parallel connection)



1 Parallel barrier connection (optional)
2 Connection intercom system (optional)

Fig. 12: Terminal block -X2 with parallel connector barrier (similar to figure)

If a parallel connection of the barrier is intended at the MFT-L (e.g. older barrier models and complex barrier applications), the *parallel barrier connection* is provided at terminal block -X2.

The barrier control signals are transferred from the **TCC/SBC** via the *I/O Interface* module to the *parallel connector barrier*: Here the 12 pole pin-and-socket connector of the data line between MFT-L and barrier control unit is connected.

Assignment of contacts: *See chapter 8.6 Connection barrier (terminal block -X2) on page 53 and 16.3 Assignment of contacts on page 85.*

Connection key switch (optional)

Furthermore, a connection to the barrier is connected here for the optional *key switch* in order to relay the signal of the key switch to the barrier controller.

.

5.3.3 Relay (optional)

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

With certain options the relay is supplied with mains voltage (230 V).

Contact with live components may result in death.

– Any servicing on the relay has to be made by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
– Before carrying out work on the relay make sure it is switched off *(see chapter 5.3.7 Terminal block -X0: Voltage connection/ ON/OFF switch on page 28)*.
– Test for absence of voltage.

5.3.4 Locking system

Risk of crushing fingers

⚠ CAUTION

Risk of crushing fingers when closing the casing door and the base door!

Fingers may be crushed when closing the casing door and the base door.

– Keep your fingers out of the danger zone.

Unlocking the casing door

⇨ Unlock the *lock* with the key (clockwise).

Unlocking the socket door

If the casing door has been unlocked and opened the *socket door lock* is accessible:

⇨ Push the *socket door lock* downwards and carefully take the *socket door* out of the housing.

5.3.5 Power supply unit

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

The power supply unit is supplied with mains voltage (230 V).

Contact with live components may result in death.

– All works on the power supply unit has to be carried out by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
– Before carrying out work on the power supply unit make sure it is switched off *(see chapter 5.3.7 Terminal block -X0: Voltage connection/ ON/OFF switch on page 28)*.
– Test for absence of voltage.

Fig. 13: Power supply unit (similar to figure)

The *power supply unit* supplies electric power to the device components. The alternating input voltage is converted to 24V direct voltage. Correct operation of the power supply unit is displayed via a LED, which emits a green light during normal operation.

For some options different power supplies can be used.

5.3.6 Mains filter

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

The mains filter is supplied with mains voltage (230 V).

Contact with live components may result in death.

- Any servicing on the mains filter has to be made by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
- Before carrying out work on the mains filter make sure it is switched off *(see chapter 5.3.7 Terminal block -X0: Voltage connection/ ON/OFF switch on page 28)*.
- Test for absence of voltage.

The *mains filter* is filtering out interfering frequencies of the mains current.

5.3.7 Terminal block -X0: Voltage connection/ ON/OFF switch

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

The terminal block -X0 is supplied with mains voltage (230 V).

Contact with live components may result in death.

- Only DESIGNA trained operating personnel who are familiar with the operating instructions and safety information are permitted to operate the ON/OFF switch on the terminal block -X0.
- All other tasks at the terminal block -X0 have to be carried out by DESIGNA electrical technicians or by electrical technicians of DESIGNA trained and authorized dealers and partners.
- Switch off the device ***externally*** and make sure that it cannot be switched on again before carrying out work on the terminal block -X0 components.
- Test for absence of voltage.

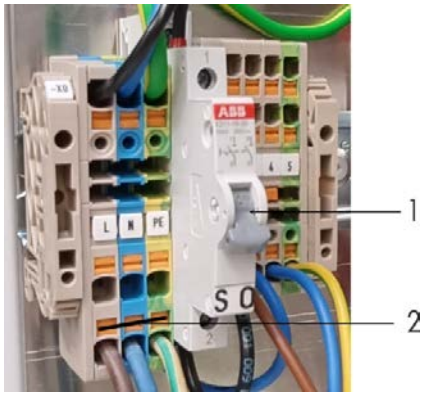
Electric voltage

⚠ DANGER

Danger of death due to electric shock!

After switching off the ON/OFF switch (position OFF) the respective connected components are de-energized.

- Be aware that the following components remain energized (230 V) even when the ON/OFF switch is switched off:
  - On/Off switch, primary side
  - Connecting terminal voltage
- Switch off the device externally and make sure that it cannot be switched on again before carrying out work on these components. Test for absence of voltage.



1 All-pole ON/OFF switch
2 Power supply terminal
Not shown:
3 Surge arrester (optional)

Fig. 14: Terminal block -X0

All-pole ON/OFF switch (optional)

The device MFT-L can be optionally fitted with an *ON/OFF switch*. This *ON/OFF switch* provides all-pole disconnection of the device from the 230V mains supply.

Position OFF/ON

1 Position OFF (downwards)

Fig. 15: ON/OFF switch

Switch off device

⇨ Flick the ON/OFF switch down (*position OFF*) to switch ***off*** the device.

Switch on device

⇨ Flick the ON/OFF switch up to switch ***on*** the device.

Surge arrester (optional)

An optional *surge arrester* can be used at the device MFT-L to protect the device against voltage spikes.

Fig. 16: Surge arrester

Power supply terminal

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

Contact with live components may result in death.

- Electrical connection has to be made by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
- *Please refer to the chapter 8.3 Connection power supply (terminal block -X0) on page 47.*

The voltage supply cable at the place of installation is connected to the *power supply terminal* at terminal block -X1.

5.3.8 Fan

Fig. 17: Fan (similar to figure)

The device is equipped with powerful fans.

The switching threshold that causes the fans to switch on is stored in the system. It is controlled by a sensor to maintain a pre-set value.

5.3.9 Heater (optional)

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

The heater and the heating relay are supplied with mains voltage (230 V).

Contact with live components may result in death.

- Any servicing has to be made by DESIGNA electrical technicians or by electrical technicians of DESIGNA trained and authorized dealers and partners.
- Before carrying out any works on the heater and the heating relay make sure they are switched off *(see chapter 5.3.7 Terminal block -X0: Voltage connection/ ON/OFF switch on page 28)*.
- Test for absence of voltage.

Hot surface

⚠ CAUTION

Danger of burns!

The surface of the heater may become hot during operation.

Contact with the heater may result in burns.

- Do not touch the surface of the heater.
- Always ensure that the heater has cooled down sufficiently before carrying out tasks in the vicinity of the heater.

Fig. 18: Heater (similar to figure)

The heater protects the device against low temperatures, prevents the formation of condensation water and allows operation at ambient temperatures of -20°C.

The temperature inside the device is controlled by a sensor located on the mainboard of the SBC.

ℹ The switching thresholds for switching the heater are stored in the system. Recommended temp.: 20°C.

5.3.10 Socket with residual current device (RCD) (optional)

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

Mains voltage (230V) is supplied to the socket and the residual current device (RCD).

Contact with live components may result in death.

- The device internal circuit of the socket must be equipped with a residual current device.
- Use the test button at regular intervals to check the residual current device is functioning correctly. This tasks should only be carried out by DESIGNA trained operating personnel who are familiar with the operating instructions and safety information.
- All other tasks at the socket and the residual current device have to be carried out by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
- Before carrying out work on the socket make sure it is switched off *(see chapter 5.3.7 Terminal block -X0: Voltage connection/ ON/OFF switch on page 28)*.
- Test for absence of voltage.

Socket

Additional devices can be supplied with mains voltage via the *socket* for servicing or cleaning purposes (1200 W max. load).

Residual current circuit breaker

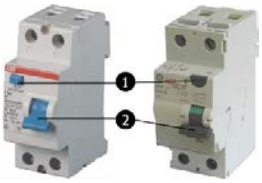


Fig. 19: RCCB type I and type II (similar to figure)

The device internal electric circuit of the optional socket is always equipped with a *residual current circuit breaker (RCCB)*[5]: If a residual current occurs in the electric circuit of the socket, it is immediately de-energized by the residual current circuit breaker.

The *switch* ❷ is set to OFF (downward position) when the supply is cut off.

ℹ Regularly use the *test button* ❶ to check correct functioning. *Please refer to the chapter 14.8 Checking the residual current circuit breaker (RCD) or residual current operated circuit-breaker with overcurrent protection (RCBO) on page 77.*

5.3.11 I/O interface (optional)

Optionally, the module *I/O interface* "Midi-P-USI" (12 I/O = 12 Inputs/ 12 Outputs) is used at the MFT-L.

For further details see chapter 16 Module I/O Interface Midi-P-USI (12 I/O) (optional) on page 83.

[5] Residual current circuit breaker (RCCB) protects against impermissible touch currents, thus preventing electrical hazards.

5.3.12 Humidity sensor

Measurement and control of the relative humidity inside the device is done by a humidity sensor.

> The optimum setting to a lower humidity (recommended: 70%) is done in the system and has to be carried out by specially trained DESIGNA Electrical Technicians.

5.3.13 Induction loop detector (optional)

Fig. 20: Induction loop detector

Optionally, an *induction loop detector* can be used to be triggered by an additional loop (e.g. used for **LPR** systems).[6]

5.3.14 Network components (optional)

Customer specific network components, such as e.g. DSL modem, switch etc., can be installed. For example, an optional DSL modem can be used in the MFT-L, if the **LAN** is a two-core cable network. Please refer to the manual which is delivered separately with the DSL modem or ask your DESIGNA service for more details.

5.3.15 Door switch (optional)

The *door switch* checks the position of the door. If the door is opened, the door switch sends a signal to the **SBC** which subsequently sends a corresponding **alarm message** to the **System server**.

The door switch is extracted in order to carry out service and maintenance work and to put the device into “normal mode“ even if the door is open: This simulates a closed door and the device functions can be tested.

[6] The *presence* and *closing loop* of a standard installation are connected to the internal detectors of the *barrier control unit* of the car park barrier. See separate instruction of the car park barrier.

6 Transport and Storage

6.1 Safety

Improper transport

⚠ WARNING

Danger from improper transport of the device!

The weight of the device can severely injure a person.

- Have them transported by specialized staff only.
- Check fasteners (packaging straps) for damage or tears.
- Use lifting gear or forklift with a suitable pallet.
- Use suitable lifting gear (loops, etc.) for lifting the device. The lifting gear must be designed for the respective weights.
- Never attempt to lift the device on your own.
- Always wear safety shoes.

Improper transport

NOTICE

The device can be damaged by improper transport.

Substantial material damages can result from improper transport.

- Have them transported by specialists only.
- When unloading the packages and during in-plant transportation always proceed with greatest care and caution.
- Observe the symbols on the packaging.
- Observe the dimensions of the device.
- Loading, unloading as well as moving the device must take place with greatest care.
- Only remove packaging directly before assembly.

Personal protective equipment

The following must be worn during all work:

- Work clothes
- Protective gloves
- Safety shoes

6.2 Transport inspection

1. Immediately check the delivery after receipt for completeness and transport damages.
2. Proceed as follows in the case of outwardly recognizable transport damage:
   - ⇨ Do not accept the delivery or only under reserve.
   - ⇨ Note the extent of damage on the transport documents or on the delivery note of the forwarder.
   - ⇨ Lodge complaint.

> **i** Lodge a complaint for each defect, as soon as it is recognized. Compensation claims can only be submitted within the valid complaint periods.

6.3 Transport

The lifting gear must be designed for the weight of the device.

For transport barrier modules refer to the safety notes.

For future transports

1. Secure loose cables.
2. Secure the device against vibrations.
3. Securely fasten the device prior to transport (e.g. screw it onto a pallet).
4. Transport and put down the device with a forklift and lift with suitable lifting gear.

6.4 Storage

Store the device or packages under the following conditions:

- Do not store outdoors.
- Store dry and dust free.
- Do not expose to aggressive media.
- Protect against solar irradiation.
- Avoid mechanical vibrations.
- Storage temperature: -25 to +70 °C
- Relative humidity: max. 95 %, non-condensing
- Check the general condition of all components and packaging regularly, if they are stored for longer periods than 3 months.

7 Installation

7.1 Safety

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

Contact with live components may result in death.

- Installation has to be carried out by electrical technicians or DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
- Make sure that the power supply is ***externally*** disconnected and that it cannot be switched on.
- Test for absence of voltage.

Inappropriate installation

⚠ WARNING

Danger by inappropriate installation!

Inappropriate installation can cause severe injuries.

- Installation has to be carried out by electrical technicians or DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
- Prior to work, ensure that there is sufficient assembly space.
- Pay attention to tidiness and cleanness at the assembly site! Loosely stacked or lying around components and tools are accident sources.
- Comply with specifications for foundations and reinforcement.
- Ensure correct arrangement and fit on all assemblies and components.
- Install the indicated fastening elements correctly.

Heavy weight

⚠ WARNING

Risk of injury when lifting heavy objects alone!

The weight of heavy objects can severely injure a person.

- Never attempt to lift the device on your own.
- Always wear safety shoes.

Risk of crushing fingers

⚠ CAUTION

Risk of crushing fingers when closing the casing door and the base door!

Fingers may be crushed when closing the casing door and the base door.

- Keep your fingers out of the danger zone.

Inappropriate cleaning with air pistols

⚠ CAUTION

Risk of injury due to inappropriate cleaning with air pistols!

Inappropriate cleaning with air pistols may result in minor injuries or damage to eyes due to flying particles.

- Always wear safety goggles.
- Prevent air penetrating the body through skin injuries.
- Do not aim air pistols at people.
- Only use air pistols with a maximum pressure of 3.5 bar.
- Only use air pistols with a reduced noise level (multi-hole nozzles).

NOTICE

Dirt, dust and building implements can endanger the sensitive electronics and mechanism of the device and impair safe operation.

- The shell of the car park building should be completed before installing devices.

Personal protective equipment

The following must be worn during all work:

- Work clothes
- Protective gloves
- Safety shoes

7.2 Installation preparation

Location requirements

The device is qualified for either indoor, protected or outdoor locations.

- ⇨ Please see the chapter *4 Technical Data on page 17* for the area required for installation.
- ⇨ Choose a location which offers enough additional operating space (for opening the door etc.).
- ⇨ Make sure that there are sufficient, fully visible signs around the car park site. Keep signs clean and position them so that they can be read easily.
- ⇨ Use signs to clearly display areas (e.g. entrance and exit).
- ⇨ Provide separate footpaths next to entrances and exits and mark pedestrian areas, to ensure that pedestrians do not have to walk near entrances and exits or on the roads.
- ⇨ It is essential to observe the safety information in the barrier operating instructions and the following notes if barriers are installed in your system.

Foundation requirements

The device has to be installed on a concrete foundation.

> The concrete foundation must be sufficiently rigid as to withstand the weight of the unit fully loaded: it needs to have a strength of 25 N/mm².
> The foundation needs to have a frost-depth of approx. 800 mm and must be non-flammable!
> The foundation has to have a smooth concrete finish.

1. Pour the foundation according to manufacturer specifications.
2. Lead the ductworks into the middle of the foundation from the foundation cast. Ensure that the cables are led through the middle of the pedestal opening.
3. Leave at least 1.5 m of the supply cables for a simple connection.
4. Embed (if available) the DESIGNA foundation frame into the concrete during the building stage and level the foundation frame with a spirit level.

   > Observe the information on the foundation frame.
   > The correct position towards the road is marked.

   MFT-L: The longer side of the foundation frame with the labelling faces the road.
5. Provide the foundation with a smooth concrete finishing.
   If a foundation frame is embedded, make sure its surface is flush with the smooth concrete finishing after embedding.
6. Ensure that the surface is a non-flammable surface and sufficiently rigid as to withstand the weight of the unit fully loaded (25 N/mm²) and that in outdoor locations a frost-depth of approx. 800 mm is ensured.
7. Ensure that the poured foundation material has completely hardened before installing the device onto the *foundation frame* or before preparing the mounting with the *DESIGNA mounting kit*.

7.3 Different mounting possibilities

Mounting possibilities

There are the following possibilities for mounting the device:

- with a DESIGNA foundation frame
- with a DESIGNA mounting kit.

Additionally, you may install a ram protection to protect the device *(see chapter 7.6 Installation of ram protection on page 43)*.

7.3.1 Preparation with DESIGNA foundation frame

Scope of delivery

DESIGNA foundation frame (DESIGNA Ident. no. 2 710 570 028): Hot galvanized frame with prepared holes and dowels for simple mounting.

Delivered with the foundation frame: bolts and washers, 2 mounting bars (fixing the device onto the transport aid).

Dimensions

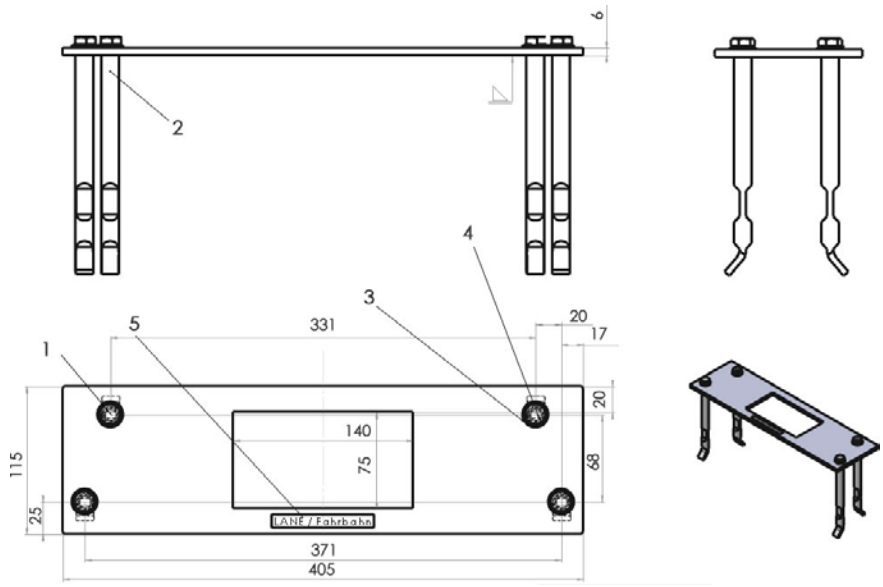


Fig.21: DESIGNA foundation frame: Dimensions mm

1 Bore hole with thread (M10) (4 x)
2 Foundation anchor, welded (4 x)
3 Washer (A10.5; DIN 125; ISO 4093) (4 x)
4 Hexagon bolt (M10 x 30; ISO 4017) (4 x)
5 Labelling

Not shown (contained in scope of delivery):

6 Mounting bar (2 x)

1. Check completeness of the fastenings.
2. Embed the DESIGNA foundation frame into the concrete during the construction stage *(see chapter 7.2 Installation preparation on page 38)*.
3. Keep in place the mounting accessories for final mounting of the device.

7.3.2 Preparation with DESIGNA mounting kit

The devices are fastened with the DESIGNA mounting kit, if no DESIGNA foundation frame is provided (e.g. not embedded into the concrete during construction or not available for the device).

The following is required for mounting:

DESIGNA mounting kit

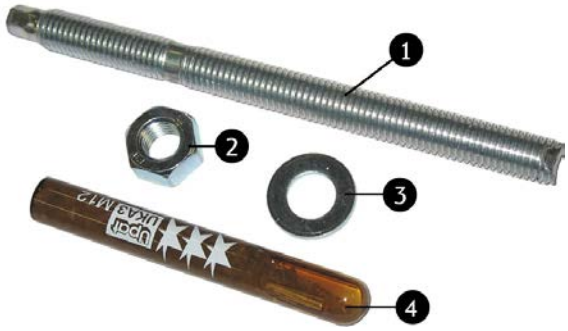


Fig. 22: DESIGNA mounting kit

1 Galvanized threaded rod (M12x160) (4x)
2 Stainless steel hexagon nuts (M12; ISO 4032, DIN 934) (4x)
3 Stainless steel washers (A13; DIN 125) (4x)
4 Mortar cartridge (M12) (4x)

Not shown:

5 If included in the scope of delivery: 2x mounting bars)

Skin and eye irritation

⚠ CAUTION

Skin and eye irritation from improper application of the mortar cartridges!

Improper application of the mortar cartridges may cause skin and eye irritations.

– Use the mortar cartridges only if undamaged.
– Avoid eye and skin contact.
– See also the instructions for the mortar cartridges.

Setting the anchor bolts

Prerequisite: The concrete foundation must be fully cured.

1. Check completeness and quality of the fastenings.
2. Use the drilling pattern of the foundation frame *(see chapter 7.3.1 Preparation with DESIGNA foundation frame on page 39)* to mark the bore holes or position the device and mark the holes using the bore holes in the casing base.
3. Drill holes in the concrete foundation with a diameter of 14 mm and a depth of 110 mm.
4. Clean the holes with compressed air.
5. Fully insert the mortar cartridges into the clean holes.
6. Use a hammer drill or percussion drill to insert the threaded rods into the bore hole and mortar cartridges. Please pay careful attention to the mortar cartridges instructions.
7. Observe the hardening times mentioned below:

Typical hardening times

Hole temperature	Waiting time valid for dry material	Waiting time valid for wet material
> 20 °C	20 min	40 min
10 - 20 °C	30 min	1 h
0 - 10 °C	1 h	2 h
–5 - 0 °C	5 h	10 h

8. Have the mounting accessories ready for final mounting.

7.4 Unpacking the device

The individual packages have been packed according to the expected transport conditions.

The packaging must protect the individual components against transport damage, corrosion, etc. prior to assembly. Therefore, do not damage the packaging and only remove it immediately before assembly work.

1. Transport the device to its place of installation and then unpack it.
2. Loosen the screwed connections with which the device is mounted to its transport aid (e.g. wooden pallet).
3. Have the mounting profiles ready for final mounting.
4. Separate the packaging according to type and size, and either reuse it or recycle it.

7.5 Installation of the device

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

Contact with live components may result in death.

- Installation has to be carried out by electrical technicians or DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
- Make sure that the power supply is ***externally*** disconnected and that it cannot be switched on.
- Test for absence of voltage.

DESIGNA foundation frame

DESIGNA mounting kit

1. Lift the device onto the foundation frame and align the bore holes in the casing base with the holes drilled in the foundation frame.

   Lift the device with the bore holes[7] in the casing base onto the anchor bolts.
2. Hold the device in a position that the cable can be fed through the opening in the base and into the casing.
3. Use mounting profiles, hexagon screws/ nuts and washers to attach the device to the foundation frame or anchor bolts. At first, only hand-tighten the hexagon nuts/ screws.
4. Align the device with a spirit level (clearance is guaranteed due to the clamp fixture). Ensure that the casing is not buckled due to unevenness of the floor.
5. Now tighten the hexagon nuts (45 N m).
6. Check that the device is fixed and standing securely.
7. Remove the transport safety devices of the device components, if available.
8. Seal the gap between the device and foundation with silicone.

[7] ENT/EXT 120 und In/Out 1307: with the outer bore holes in the casing base

7.6 Installation of ram protection

Ram protection can also be installed at the device to prevent it being damaged by vehicles. A ram protection rail, a 950 mm ram protection post and a 425 mm ram protection post are available.

Ram protection is installed using the *DESIGNA mounting kit* [8].

Scope of delivery

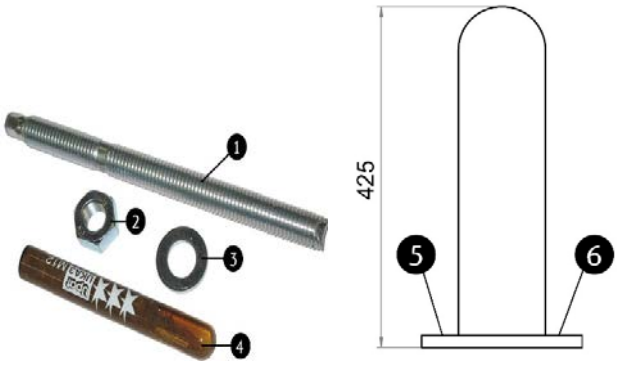


Fig. 23: Ram protection

1 Stainless steel threaded rod (M12x160) (6 x)
2 Stainless steel hexagon nuts (M12; ISO 4032, DIN 934) (6 x)
3 Stainless steel washers (A13; DIN 125) (6 x)
4 Mortar cartridge (M12) (6 x)
5 Ram protection
6 Flange cover (2 x)

Not shown:

7 Countersunk screws (M3x10; DIN 963) (8 x)

Dimensions

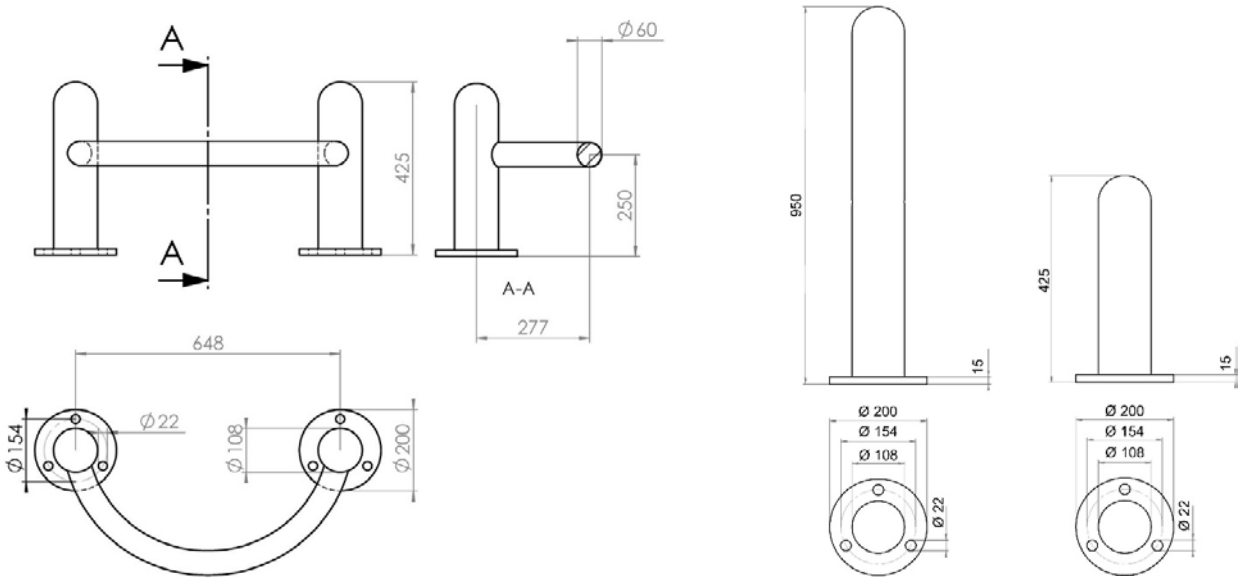


Fig. 24: Ram protection: approx. dimensions in mm

[8] A robust dowel set (M 10) for concrete mounting can be used alternatively.

Skin and eye irritation

⚠ CAUTION

Skin and eye irritation from improper application of the mortar cartridges!

Improper application of the mortar cartridges may cause skin and eye irritations.

- Use the mortar cartridges only if undamaged.
- Avoid eye and skin contact.
- See also the instructions for the mortar cartridges.

Setting the anchor bolts

Prerequisite: The concrete foundation must be fully cured.

1. Check completeness and quality of the fastenings.
2. Mark the holes using the bore holes in the ram protection base.
3. Drill holes in the concrete foundation with a diameter of 0.55 in 14 mm and a depth of 4.33 in 110 mm.
4. Clean the holes with compressed air.
5. Fully insert the mortar cartridges into the clean holes.
6. Use a hammer drill or percussion drill to insert the threaded rods into the bore hole and mortar cartridges. Please pay careful attention to the mortar cartridges instructions.
7. Observe the hardening times mentioned below:

Typical hardening times

Hole temperature	Waiting time valid for dry material	Waiting time valid for wet material
> 20 °C	20 min	40 min
10 - 20 °C	30 min	1 h
0 - 10 °C	1 h	2 h
–5 - 0 °C	5 h	10 h

Installing the ram protection

1. Lift the ram protection with the bore holes in the ram protection base onto the anchor bolts.
2. Attach the ram protection to the anchor bolts using the washers and the hexagon bolts.
3. Tighten the hexagon nuts (45 N m).
4. Check that the ram protection is fixed and standing securely.
5. Attach the flange cover using the countersunk bolts at the flanges.
6. Seal the gap between the ram protection post and the flange cover with silicone.

8 Connection

8.1 Safety

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

Contact with live components may result in death.

Damage to the insulation or to individual components may result in death.

- Connection has to be carried out by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
- Make sure that the power supply is ***externally*** disconnected and that it cannot be switched on. Test for absence of voltage.
- Switch off the power supply immediately in case of damage to the insulation and arrange repair.
- Never bypass or deactivate overcurrent protection devices.
- When replacing overcurrent protection devices observe the correct amperage specification.
- Keep moisture and dust away from live parts. Moisture or dust may cause a short circuit. If the electrical connection is established at precipitation, e.g. rain or snow, penetration of moisture must be prevented by suitable measures, such as a protective cover.
- Ensure that the device is always locked correctly in order to avoid endangering third parties.

Inappropriate connection

⚠ WARNING

Danger by inappropriate connection!

Inappropriate connection can cause severe or lethal injuries.

- Connection has to be carried out by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
- Pay attention to tidiness and cleanness at the assembly site. Loosely stacked or lying around components and tools are accident sources.
- Tighten all screws correctly.

Hot surface

⚠ CAUTION

Danger of burns!

The surface of the heater may become hot during operation.

Contact with the heater may result in burns.

- Do not touch the surface of the heater.
- Always ensure that the heater has cooled down sufficiently before carrying out tasks in the vicinity of the heater.

Personal protective equipment

The following must be worn during all work:

- Work clothes
- Protective gloves
- Safety shoes

8.2 Installing electrical protective devices

The safety installations that are required according to regional and local regulations must be provided by the customer. Usually these are:

- Overcurrent protection devices
- Lockable 2-pole main switch acc. to EN 60947-3
- Residual current device (RCD)

8.3 Connection power supply (terminal block -X0)

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

If the power cable is not connected to the terminal clamps correctly, loosens from the connection clamps and touches the casing or door, there is a direct danger to life from electric shock.

- Connection has to be carried out by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
- Check that the power supply line and electrical safety measures are in accordance with valid national and local regulations and standards and make sure they correspond with the specifications in chapter *4 Technical Data on page 17*.
- Make sure that the power supply is ***externally*** disconnected and that it cannot be switched on. Test for absence of voltage.
- Connect power supply according to the following description.
- Please observe the connection diagrams supplied with the device for options and special versions.

Terminal block -X0

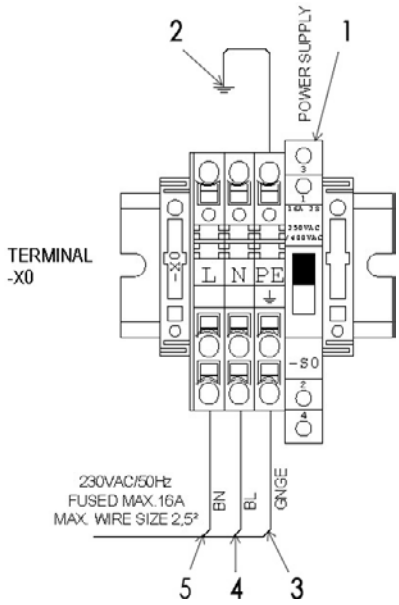


Fig. 25: Terminal block -X0

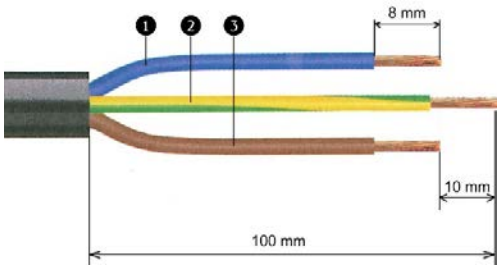
1 ON/OFF switch
2 Ground wire, internal/ factory wired
3 Ground lead, external, green or green/yellow cable
4 Neutral lead, blue cable
5 Conducting lead, black or brown cable

Power supply cable

The power supply cable at the place of installation has to be laid separately from the sub-distribution to the terminal block -X0.

Removing the insulation

1. Make sure that the power supply is externally disconnected and that it cannot be reconnected. Ensure no voltage is applied.
2. If necessary, shorten the supply cable to the required connection length.
3. Insulate the feeder and the individual wires according to the following illustration. Do not damage the insulation of the individual wires when stripping the cable.



1 Neutral lead
2 External ground lead
3 Conducting lead

Fig. 26: Removing the insulation

Connecting the supply cable

4. Connect the *external ground lead* (green/yellow) to position *PE* of the terminal block.
5. Connect the *neutral lead* (blue) to position *N* of the terminal block.
6. Connect the *conducting lead* (brown or black) to position *L1* of the terminal block.
7. Check whether all connections are fitted correctly and securely.

Checking the internal ground wire

8. Check whether the factory-wired *internal ground wire* is correctly connected to the device casing.

ON/OFF switch

The applied device voltage is switched on and off via the ON/OFF switch. *(see chapter 5.3.7 Terminal block -X0: Voltage connection/ ON/OFF switch on page 28)*.

The ON/OFF switch can, after switching on the power supply at the place of installation, be switched on for testing purposes (position ON, upwards), but they should stay switched off (position OFF, downwards) until final connection.

Power supply terminal -X0 with surge arrester (option)

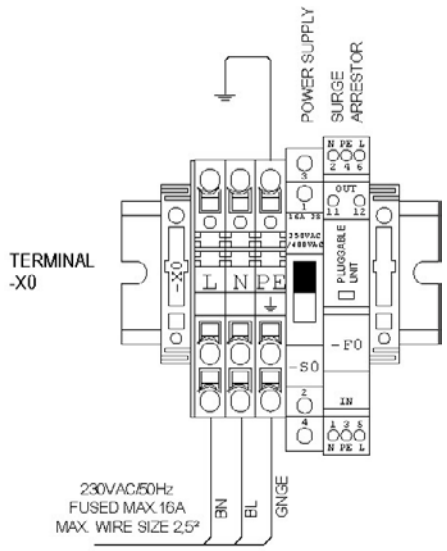


Fig. 27: Power supply terminal -X0 with surge arrester (option)

8.4 Ethernet Connection (terminal block -X2 or additional mounting rail)

Defective data transmission

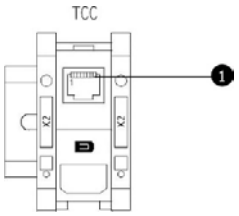
NOTICE

Inappropriate connection can cause defective data transmission.

- Connection has to be carried out by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized partners.
- Check the already used assignments of the **Ethernet** connections in your system. These can be conducted according the standards *EIA/TIA-T568**A*** or *EIA/TIA-T568**B***.
- Observe the chosen assignment for all Ethernet connections in your system.
- Clamp the Ethernet connection ***tightly*** (top and bottom) onto the mounting rail. This creates the required earthing and ensures trouble-free operation of the data line.
- Please pay attention to the enclosed instructions for preparation, wiring and mounting of the *Ethernet connection* as well as to the following description.
- Do not damage the insulation of the individual wires when stripping off the sheath.

The **Ethernet** (**LAN)** line is connected to the *Ethernet connection*.

The component *Ethernet connection* is part of the scope of delivery and is wired and mounted on site to a free location of the mounting rail



1 Ethernet connection -> TCC/SBC [9]

Fig. 28: Terminal block -X2; Ethernet connection

More than one *Ethernet connection* can be necessary depending on the device equipment (e.g. VoIP intercom device).

Connecting Ethernet

1. If necessary, shorten the wires of the Ethernet data line to the required length.
2. Strip off the sheath of the Ethernet data line in order to wire up the wires individually.
3. Carry out wiring and installation as described in the instructions supplied with the *Ethernet connection*.
4. Attach tightly the present connection cable of *terminal block -X2* to the *Ethernet connection-> TCC/SBC* ❶.

[9] or another controller board (e.g. at the DCT 120

Assignment according to EIA/TIA-T568A

If ***no*** assignment has already been used or if the standard *EIA/TIA-T568**A*** is already assigned, conduct the wiring according to *EIA/TIA-T568**A***:

> The wiring according to standard *EIA/TIA-T568**A*** is described in the instructions enclosed to the *Ethernet connection*.

Pin	Colour
1	White/ Green
2	Green
3	White/ Orange
4	Blue
5	White/ Blue
6	Orange
7	White/ Brown
8	Brown

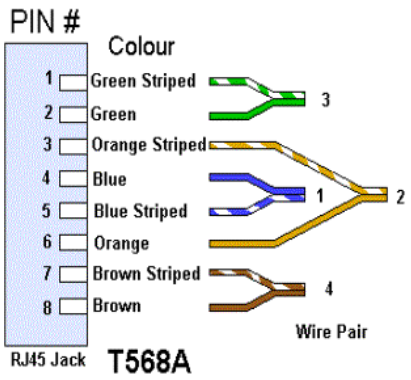


Fig. 29: Assignment of the Ethernet connection, EIA/TIA-T568A

Assignment according to EIA/TIA-T568B

Observe the assignment if it has already been used according the standard *EIA/TIA-T568**B***.

> The wiring in this case is conducted ***against*** the instructions enclosed to the *Ethernet connection*.

⇨ Connect the conductors *green* and *white/green* to the positions 3 and 6 of the conductors *orange* and *white/orange* of the instructions and vice versa:

Pin	Colour
1	White/ Orange
2	Orange
3	White/ Green
4	Blue
5	White/ Blue
6	Green
7	White/ Brown
8	Brown

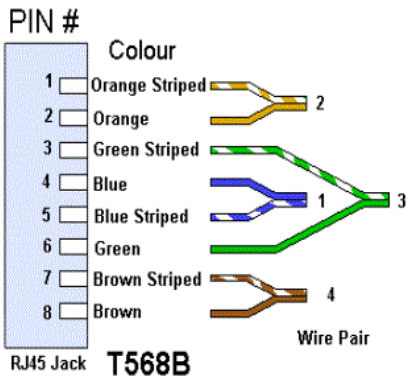


Fig. 30: Assignment of the Ethernet connection, EIA/TIA-T568B

8.5 Connection intercom device (terminal block -X2 or VoIP)

Defective data transmission

NOTICE

Inappropriate stripping can cause defective data transmission.

- Connection has to be carried out by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
- Do not damage the insulation of the individual wires when stripping off the sheath.

Connection intercom device (terminal block -X2)

If the intercom device requires a 2 or 4-wire connection *(see chapter 5.2.1 Intercom on page 20)*, the cable *of the intercom circuit* is connected to terminal block -X2.

The wiring of the intercom system is carried out star-shaped, i.e. a line is laid from each device MFT-L to the central switchboard for intercommunication.

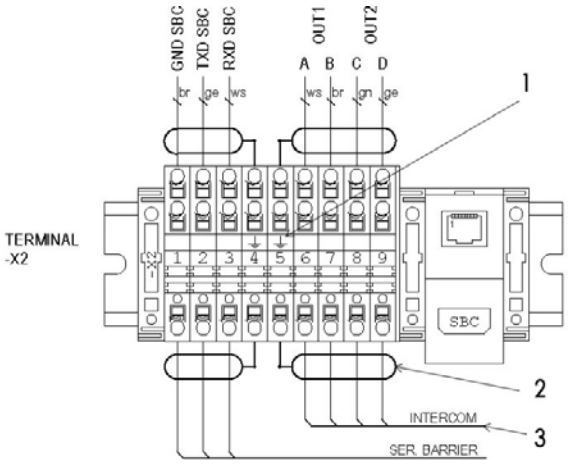


Fig. 31: Terminal block -X2, Connection intercom system, with 4-wire connection

1 Protective ground
2 Intercom cable screen
3 Intercom cable

1. If necessary, shorten the wires of the *intercom cable* to the required length.
2. Strip off the sheath of the *intercom cable* in order to wire up the wires individually.
   Use the wire-braiding as *intercom cable screen*.
3. Remove approx. 8 mm of the insulation at the ends of the wires.
4. Clamp the wires to the terminal block.
   2 wires (standard intercom device): terminal positions 6+7
   4 wires (optional two-way intercom device): terminal positions 6-9
5. Connect the *intercom cable screen* to the terminal *protective ground,* terminal position 5.

Connection intercom system (VoIP)

DESIGNA VoIP

The integrated VoIP intercom device *DESIGNA VoIP* does not require a separate connection during installation.

Other VoIP intercom devices

An (additional) *Ethernet connection* is used if other optional VoIP intercom devices are installed.
Connection: *See chapter 8.4 Ethernet Connection (terminal block -X2 or additional mounting rail) on page 50*.

8.6 Connection barrier (terminal block -X2)

Defective data transmission

NOTICE

Inappropriate stripping can cause defective data transmission.

- Connection has to be carried out by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
- Do not damage the insulation of the individual wires when stripping off the sheath.

Serial barrier connection

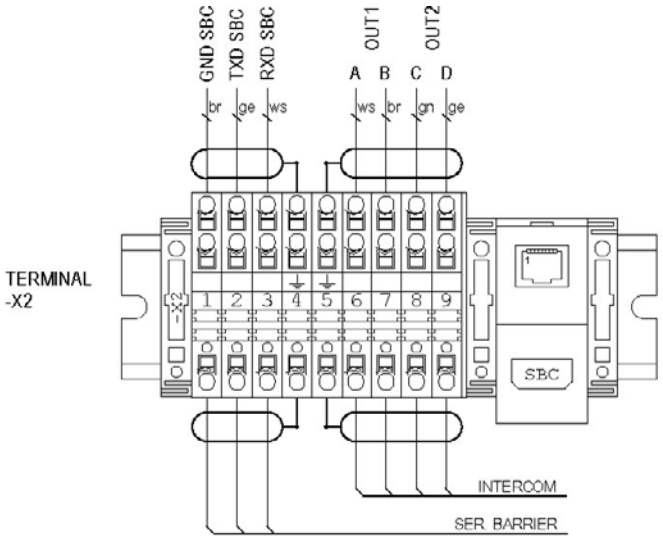


Fig. 32: Terminal block -X2, Serial barrier connection

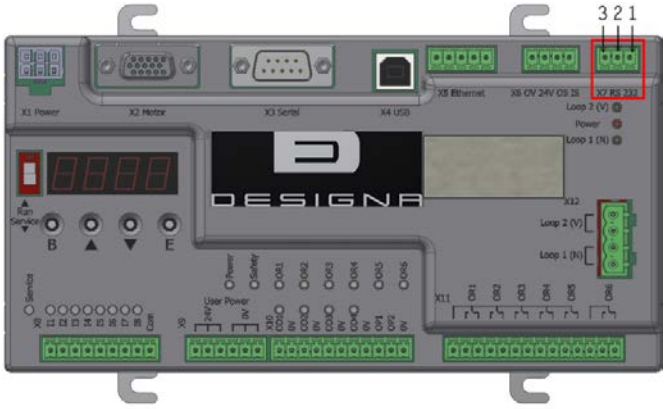


Fig. 33: Serial barrier connection

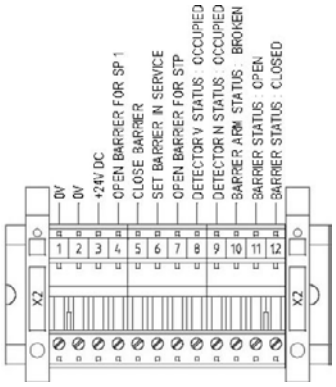
1 GND
2 RX (RxD - Received Data)
3 TX (TxD - Transmitted Data)

The data line (installation cable, screened, e. g. Li2YCY (TP)) between the MFT-L and the barrier control unit*, RS-232 interface* is connected to the serial barrier connection.

1. Prepare the ends of the data line such as for the connection intercom system.
2. Pay attention to the marking of the wires at the *barrier control unit, RS-232 interface* and connect the data line accordingly to the *serial barrier connection*.

Barrier control unit, RS-232 interface (assignment from bottom to top)		Serial barrier connection (pin assignment)	
1	GND	1	Signal GND SBC
2	RX (RxD - Received Data)	2	TX SBC (TxD - Transmitted Data)
3	TX (TxD - Transmitted Data)	3	RX SBC (RxD - Received Data)

Parallel barrier connection



Optionally, the data line between the control device and the barrier control unit is connected via a *12-pole pin-and-socket connector* to the *parallel connector barrier (see chapter 16.3 Assignment of contacts on page 85)*.

Fig. 34: Parallel connector barrier

The *12 pole pin-and-socket connectors* of the data line are to be prepared as follows:

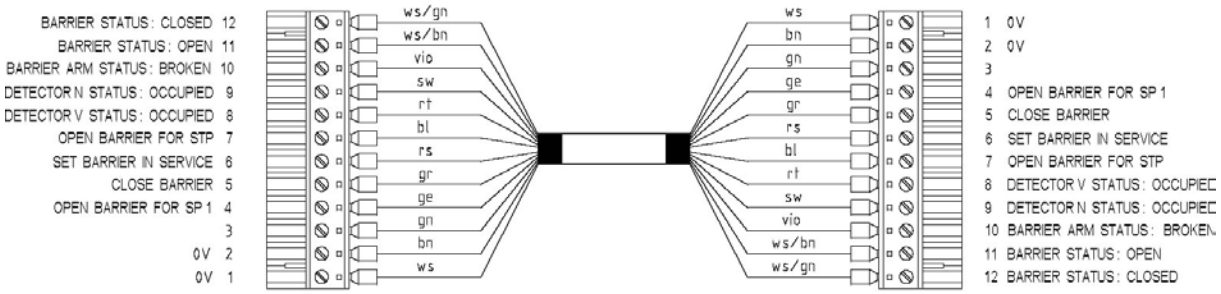


Fig. 35: Connectors control device ↔ barrier

1. Remove approx. 8 mm of the insulation of the individual wires.
2. Clamp the wires to the connectors as shown in the figure above.

The following assignment is pre-wired from the *I/O interface* to the *parallel connector barrier (see chapter 5.3.2 Terminal block -X2: Intercom system, barrier and Ethernet connection on page 25)*:

Barrier inputs and outputs (0V switching)		
Connector	**I/O Interface**	**Signal DESIGNA (to MFT-L)**
1	GND	0V
2	GND	0V
3	+24V	+24 V
4	A7	Open barrier for season parkers 1 (SP 1)
5	A6	Close barrier
6	A3	Set barrier in service
7	A1	Open barrier for short term parkers (STP)
8	E7	Detector V (presence loop) status: occupied
9	E5	Detector N status: occupied
10	E4	Barrier arm status: broken
11	E3	Barrier status: open
12	E1	Barrier status: closed

Connection 2 control devices to 1 barrier (optional)

If one barrier is used for two control devices the printed circuit board *PCB 2 terminals at 1 barrier* is additionally used:

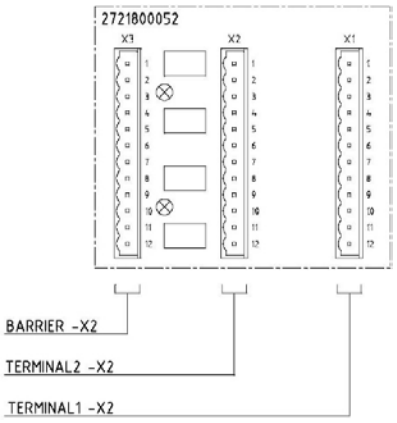


Fig. 36: PCB 2 terminals at 1 barrier

9 Testing in accordance with accident prevention regulations

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

Direct contact with live electrical equipment is potentially lethal.

– According to the accident prevent regulations testing should only be carried out by fully trained and qualified electricians.

The efficient working order of electrical systems and equipment must always be checked prior to initial start-up, after any changes or repairs and at regular intervals.

In Germany, testing must satisfy the requirements specified by the accident prevention regulations (DGUV-V3). Appropriate regulations apply in other countries. Always comply with the relevant regulations.

9.1 Initial device testing

The device MFT-L has been tested ex-works in accordance with the accident prevention regulations (DGUV-V3). Testing was carried out in line with recognized standards of good engineering practice[10].

The following tests were executed.

Visual inspection

A visual inspection of the insulation, earthing, strain relief, etc.

Protective earth conductor test: Measuring the continuity of the protective earth conductor

This test involved measuring the continuity of the protective earth conductor. Relevant measurements are carried out between the protective earth conductor/main device connection and specified measuring points *(see chapter 9.2 Measuring points for the protective earth conductor test on page 57)*.

Measuring the fault loop impedance

This test involved measuring the resistances of the entire outward and return path of an electric circuit. The measurements were carried out between the line conductor and protective conductor and the line conductor and neutral conductor using an installation tester *(see chapter 9.3 Measuring points for the fault loop impedance measurement on page 57).*

Measuring the insulation resistance

The initial insulation resistance test was carried out with a leakage current probe using differential current or as a direct measurement (500 V test voltage).

Optional residual current device (RCD) or residual current operated circuit-breaker with overcurrent protection (RCBO)

With the optional residual current device (RCD) (type A) or the residual current operated circuit-breaker with overcurrent protection (RCBO), the switch-off time, switch-off current and touch voltage were measured and the function checked.

Documenting the tests

All the tests have been documented in a report on initial device testing.

[10] In Germany, e.g., DIN VDE 100 Part 600

9.2 Measuring points for the protective earth conductor test

The following measuring points have been specified for measuring the continuity of the protective earth conductor. The measuring points are indicated by yellow labels. If an earthing rod is specified as a measuring point, the measurement is carried out at the top of the earthing rod (not at the protective earth conductor cable).

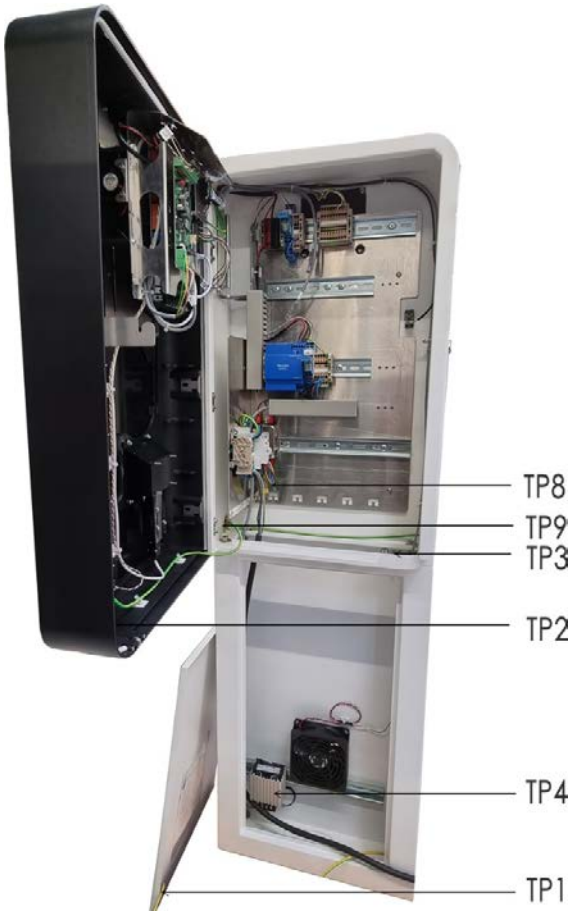


Fig. 37: Measuring points MFT-L

Measuring point TP1: Earthing rod at socket door
Measuring point TP2: Earthing rod at module front panel
Measuring point TP3: Earthing rod at casing, bottom
Measuring point TP4: Heater (only heater with metal casing) (optional)
Measuring point TP8: Earthing rod at mounting plate
Measuring point TP9: Earthing rod at casing, top
Not shown:
Measuring point TP5: Socket (PE contact) (optional)

9.3 Measuring points for the fault loop impedance measurement

The following measuring points have been specified for measuring the fault loop impedance.

- Transfer point on the terminal block -X0

10 Commissioning

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

Contact with live components may result in death.

– Commissioning has to be carried out by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized partners.

Commissioning is carried out on-site by your DESIGNA Service according to the respective requirements of your system and is therefore not described in these operating instructions.

11 Function check

11.1 Safety

Electric voltage

⚠ DANGER

Danger of death due to electric voltage!

When the device is switched on, the power supply (230V) connected to the following components Terminal block -X0, mains filter, power supply unit and, if necessary, to further optional components *(see chapter Device Description)*.

- Work inside the device should only be carried out by DESIGNA trained operating personnel who are familiar with the operating instructions and safety information.
- Switch off the device *(see chapter 5.3.7 Terminal block -X0: Voltage connection/ ON/OFF switch on page 28)* unless the work step requires a voltage supply.
- Be aware that the following components remain energized (230V) even when the ON/OFF switch is switched off:
  - ON/OFF switch, primary side
  - Power supply terminal

Risk of crushing fingers

⚠ CAUTION

Risk of crushing fingers when closing the casing door and the base door!

Fingers may be crushed when closing the casing door and the base door.

- Keep your fingers out of the danger zone.

11.2 Check condition of device

1. Check completeness of the safety labels *(see chapter 2.6.1 Product safety labels on the device on page 11)*. Consult your DESIGNA service if any are missing or the quality is below standard.
2. Check the quality of the device components.
   Consult your DESIGNA service if any damages are visible.
3. Make sure the device components are fitted correctly.
   Tighten any loose screw connections.
4. Check that the plug and clamping connections are connected correctly.

11.3 Induce general function and check

1. Switch on the MFT-L: *See chapter 5.3.7 Terminal block -X0: Voltage connection/ ON/OFF switch on page 28*.

➤ The MFT-L “boots (starts and sets the device components ready for functional operation) and is subsequently ready for operation.[11]

A connection to the System server is achieved via the **Ethernet**: If no **device configuration** is yet assigned to the **TCC/SBC**, the TCC/SBC is registered with a request in the system. The assignment is then carried out with the function *Search new TCC/SBC* at the **WinOperate** *(see separate manual Main Menu Settings)*. The device is now **online**.

The device specific program and further necessary data (e.g. tariff information) for operation are transferred to the **TCC/SBC** (if problems occur, “Reset 8” can be sent from WinOperate to the device (please note duration))

The MFT-L carries out a self-test: The standby of the device components is checked.

2. Check at the WinOperate whether **alarm messages** occur for the newly installed device and its device components.
3. Hold the function card No. 2 (TCC/SBC in operation) (optional 2D barcode scanner required) in front of the 2D barcode scanner or set the device via the command Set device in service at the System server (operating interface WinOperate) into operating mode.

➤ The device is now in its normal operating mode. Please contact your DESIGNA service if problems arise during the function check.

Checking correct functioning of the door opener

1. Depending on the equipment of the device, check the following functions:
   - ⇨ Use the keypad on the touch display to enter a complete licence plate.
   - ⇨ Hold a card or receipt with a barcode or QR code printed on it in front of the 2D barcode scanner.
   - ⇨ Hold an RFID card in front of the RFID reader.
2. Make sure that the elements being displayed function correctly.

Simulating entrance/exit

1. Occupy loop V (presence loop) with a car.
2. Depending on the equipment of the device, check the following functions:
   - ⇨ Check whether the licence plate has been read by LPR cameras.
   - ⇨ Hold a card or receipt with a barcode or QR code printed on it in front of the 2D barcode scanner.
   - ⇨ Hold an RFID card in front of the RFID reader.
3. Make sure that the elements being displayed function correctly.

[11] The first booting can take up to 7 minutes.

11.4 Check other device components

Check intercom device

1. Together with a colleague at the central switchboard for inter-communication, make sure that speech contact is established with the intercom device of the MFT-L, and check the function and quality of this connection.

Check heater (optional)

⚠ CAUTION

Hot surface!

The surface of the heater may become hot during operation.

Contact with the heater may result in burns.

– Do not touch the surface of the heater.

The switching thresholds for switching the heater are stored in the system. The setting and adjustment of the values (recommended temp.: 20°C) is carried out exclusively by DESIGNA electrical technicians or by electrical technicians of DESIGNA trained and authorized dealers and partners.

Check fan

The switching thresholds for switching the fan are stored in the system.

Any settings and adjustments have to be made by DESIGNA electrical technicians or by electrical technicians of DESIGNA trained and authorized dealers and partners.

Check humidity sensor

The humidity inside the device is controlled by a humidity sensor.

Any settings and adjustments have to be made by DESIGNA electrical technicians or by electrical technicians of DESIGNA trained and authorized dealers and partners. Recommended humidity: 70%.

12 Operation

The device MFT-L is a multi-function terminal specially designed for ticketless parking management systems. In the DESIGNA system, the device MFT-L can perform the following functions:

- Act as an online door opener
- Act as an entrance/exit control terminal
- Request card properties
- Trigger functions with function cards (optional)

These processes as well as possible error status recognition at the MFT-L are described below:

- Recognize error status

12.1 Online Door Opener

The device MFT-L with door opening function was specially developed by DESIGNA for ticketless parking management systems and provides access with various identification media:

- Entering the licence plate recorded in the system via a touch display (optional)
- Scanning barcodes and QR codes (optional)
- Contactless access with RFID card (optional)

Authorisation is requested **online** at the **system server**. Depending on the configured behaviour, the corresponding reaction is triggered at the device MFT-L, e.g. opening the door.

An **I/O check** (inside/outside check) is not performed.

12.1.1 Licence plate as identification medium (optional)

The car park customer is identified by entering the licence plate recorded in the system via a touch display.

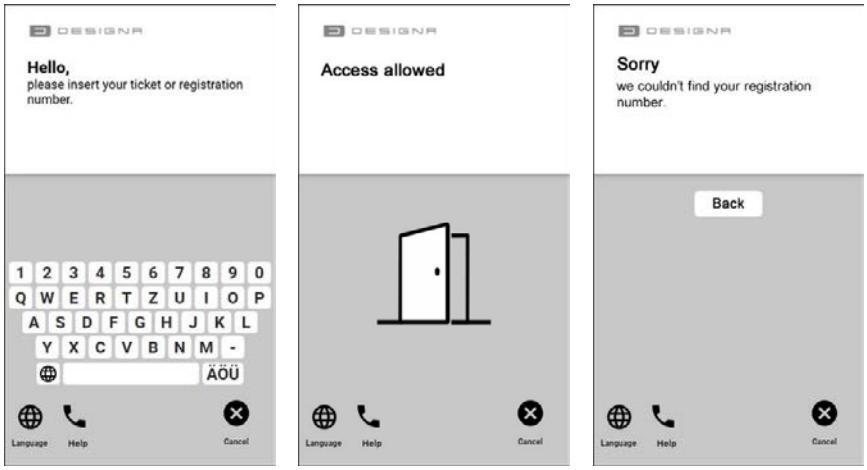


Fig. 38: Licence plate entry

Entering the licence plate

1. Use the keypad on the touch display to enter your complete licence plate with or without spaces.
2. Subsequently tap *Search.*

Licence plate search successful

➢ If the licence plate is found in the system database, the connected door opens.

Licence plate search unsuccessful

1. If the licence plate was not found in the system database after entering it, tap *Back*.
2. Use the keypad to enter your complete licence plate again.
3. If the licence plate was not found in the system database again, tap the *Help button*. Staff have the option of opening the door via the WinOperate system application or the intercom.

Device offline

➢ If the device MFT-L is offline, the connected door is opened without checking the licence plate after entering a licence plate.

For further information on the functionality and operation of the touch display, please refer to the separate operating instructions for the touch display.

12.1.2 RFID card as identification medium (optional)

RFID cards have a unique card number. When the RFID card approaches the antenna, the card number is read, requested from the **system server** and checked for certain parameters.

> The desired validity parameters for the parking area must be programmed on the device MFT-L by your DESIGNA service.

If the card is valid for the car park, the connected door opens.

If the device MFT-L is offline, the connected door is opened without checking the validity parameters.

12.1.3 Barcode or QR code as identification medium (optional)

The car park customer uses a card or receipt with a printed barcode or QR code. If the barcode or QR code is valid for the car park, the connected door opens.

If the device MFT-L is offline, the connected door is opened without checking the barcode or QR code.

12.2 Entrance/ Exit Control Terminal

The device MFT-L that functions as an entrance/exit control terminal was specially developed by DESIGNA for ticketless parking management systems and, together with a barrier, rolling shutter gate or bicycle gate, ensures entrance to or exit from a controlled area.

If a vehicle occupies loop V (presence loop), this is detected as an input signal at the device MFT-L and readiness for checking the identification media is triggered at the device.

The device MFT-L manages various processes:

- Entrance/ exit as short term parker (optional)
- Entrance/ exit with season parker cards (optional)
- Entrance/ exit with debit cards (optional)
- Entrance/ exit with online reservation (optional)

12.2.1 Entrance/ exit as short term parker (optional)

Entrance/ exit with licence plate (optional)

At the entrance, LPR cameras register the licence plate together with the entry data.

The licence plate then serves as a means of identification for payment at the automatic pay station, at the exit or digitally via web or app.

At the exit, the licence plate is read by LPR cameras and the **exit authorisation** is checked. An exit authorisation also exists if a **free passaging time** is provided for in the system and the short term parker ticket still "moves" within this period.

For more information, see separate instructions Ticketless and WinOperate.

Entrance/ exit with credit cards and debit cards as short term parker tickets (optional)

The short term parker uses a credit card or debit card as a means of identification after occupying loop V. The magnetic strip, chip or NFC chip is read, a hash value[12] of the card is determined and sent to the **system server** together with the **TCC address**, car park number and entrance time and date and stored there. The barrier subsequently opens.

At the exit, the corresponding data record is searched for, the fee calculated and displayed. After paying with a debit card, a receipt of the payment transaction will be issued upon request.

The barrier subsequently opens.

12.3 Entrance/ exit with season parker cards (optional)

Season parkers are customers who wish to use the car park over a longer period and usually pay the incurred fees as lump sums in advance. In exchange, season parkers receive a season parker card as an entry medium, e.g. an **RFID** card, a barcode card or their licence plate is listed as a season parker card in the system.

Entrance/ exit with licence plate (optional)

At the entrance/exit, the licence plate is read by LPR cameras.

[12] Bank debit card numbers are stored in the system as hash values and are therefore encrypted.

The licence plate is requested at the system server and the access authorisation is checked.

If the licence plate is valid for the car park, the current information and the registered card number are sent to and filed at the **System server**. The barrier opens.

For more information, see separate instructions Ticketless and WinOperate.

RFID card as season parker card (optional)

After occupying the loop V, season parkers bring their **RFID** cards closer towards the **RFID** antenna (at different reading distances according to the type of **RFID** cards and antennas). The corresponding number is read, requested at the **System server** and checked for certain parameters.

If the card is a valid season parker card for the car park, the current information and the registered card number are sent to and filed at the **System server**. The barrier opens.

Barcode or QR-Code as season parker card (optional)

Some item details can only be checked **online** in barcode systems (e.g. validity). Therefore, barcode season parker cards are refused **offline**, unless the barcode system configuration allows season parker cards to enter and exit the car park **offline**. This means certain item details are not checked offline (e.g. validity, **group time**).

After occupying the loop V, the season parker holds his barcode debit card with pre-printed barcode in front of the 2D barcode scanner. The information on the card is read and requested **online** at the **System server** and checked for certain parameters.

If the card is a valid season parker card for the car park, the current information and the registered card number are sent to and filed at the **System server**. The barrier opens.

12.4 Entrance/ exit with value cards

Value cards are coded with a certain value (amount of money) and subsequently sold to the customers for a set price. The incurred parking fee is deducted from the value card when exiting. This has the advantage that the customer does not have to pay at the automatic pay station. The residual value of the card is shown on the display when entering and exiting.

The customer receives a pre-printed barcode card or an RFID card.

RFID card as value card (optional)

After occupying the loop V, the customers bring their **RFID** card closer towards the **RFID** antenna (at different reading distances according to the type of **RFID** cards and antennas). The respective number is read and requested at the **System server**.

If the card is a valid value card for the car park, the current information and the registered card number are sent to and filed at the **System server**. The barrier opens.

At the exit, the parking fee is calculated, displayed and deducted from the value card at the **System server** based on the entry information

(**TCC/SBC address**, car park no., as well as the entrance time and date). The barrier opens.

Barcode card as value card (optional)

Some item details can only be checked **online** in barcode systems (e.g. *validity*). Therefore, barcode value cards are refused **offline**.

At the entrance, the customer holds his barcode value card with pre-printed barcode in front of the 2D barcode scanner after occupying the loop V. the information on the card is read and checked for certain parameters.

If the card is a valid value card for the car park, the current information and the registered card number are sent to and filed at the **System server**. The barrier opens.

At the exit, the parking fee is calculated, displayed and deducted from the value card at the **System server** based on the entry information (**TCC/SBC address**, car park no., as well as the entrance time and date). The barrier opens.

12.4.1 Entrance/ Exit with prebooking (optional)

If the prebooking option is available in the DESIGNA system, car park customers can carry out prebookings: a planned stay in a car park can be booked and paid for in advance via a web application, e.g. at the car park operator's website, or via a smartphone park app.

Numerous **ID media** can be used at the entrance and exit: printed barcode, print@home ticket with QR Code, smartphone with QR Code, licence plate recognition, number code, etc.

Car park customers are identified at the entrance via their ID medium. The information is read, requested at the **system server** and checked for validity. The barrier opens if the ID medium is approved and valid for the car park.

Car park customers are identified at the exit via their ID medium, e.g. a barcode or QR code. The information is read, requested at the **system server** and checked for validity. The barrier opens if **exit entitlement** is confirmed.

12.5 Requesting card parameters

Blacklist check

In the DESIGNA system the **blacklist** serves to register undesired cards or number plates at the devices. Cards can either be put on the blacklist automatically by the system (**card not entered**) or manually *(see the separate operator manual WinOperate)*.

The **blacklist check** can be switched on or off for each device at the operating interface of the WinOperate If the blacklist check for the device is switched on, the entered cards or number plates is checked to see whether it is on the blacklist or not. Listed cards or number plates are rejected.

If the blacklist check is switched off, the device also accepts cards or number plates on the blacklist.

I/O-check

The **I/O-check** (Inside/Outside-check) checks the **I/O-identification** of the card: For the I/O-identification of a card, the last used device (TCC/SBC number) is assigned as information in the **System server**. Cards with incorrect I/O-identification are rejected

If the card was last used at an Entrance or Pay Station, it is "inside" and next use, if the I/O-check is switched on, has to occur at an Exit (or Pay Station). If the card was last used at an Exit next use has to occur at an Entrance or Pay Station.

The I/O-check can thus stop several vehicles being taken out of the car park with one card (e.g. if two exits, one after the other, are attempted with the same card without an entrance having been used in the meantime) because, after using the card *once* at an exit, next use has to be at an entrance.

For **credited season** parkers the I/O-check always has to be switched on otherwise no tariff calculation occurs *(see separate operator manual WinOperate)*.

If the barcode system configuration allows season parker cards to enter and exit the car park **offline**, there is no offline I/O-check.

12.6 Trigger functions with function cards (optional)

Besides normal operation it is possible to trigger certain functions at the MFT-L with **function cards,**if a 2D barcode scanner or a RFID reader is optionally installed).

If the device MFT-L has to be temporarily taken out of service due to an error status, it can be done using the function card 01 *TCC/SBC out of service*: No further functions are carried out and the display shows the message *Out of service*.

The 2D barcode scanner or RFID reader remains active, so that the device can be put back into operation using the function card 02 *TCC/SBC in service*. This function can also occur via the command *Device in service* at the WinOperate.

See the separate operator manual Function cards for further functions and the handling of the function cards.

12.7 Recognize error status

If errors or shortages occur at the device components, they are registered as a signal at the **TCC/SBC**. The TCC/SBC generates corresponding **alarm messages** and these are sent to the **System server**.

The **WinOperate** displays an occurred device alarm message, detailed information can be requested via the *alarm message overview* of the device *(see the separate operator manual WinOperate).*

13 Filling and Emptying

13.1 Safety

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

Filling and emptying are carried out with the device switched on.

When the device is switched on, the power supply (230V) is connected to the following components: Terminal block-X0, mains filter, power supply unit, and to the optional socket, heater and, if necessary, to further optional components *See chapter 5 Device Description on page 19*.

Contact with live components may result in death.

– Work inside the device should only be carried out by DESIGNA trained operating personnel who are familiar with the operating instructions and safety information.

Risk of crushing fingers

⚠ CAUTION

Risk of crushing fingers when closing the casing door and the base door!

Fingers may be crushed when closing the casing door and the base door.

– Keep your fingers out of the danger zone.

13.2 Tickets and reels

13.2.1 Replacing the receipt reel

1. Check the supply of paper on the receipt reel.
2. If necessary, replace the receipt reel or have a paper reel ready, if an imminent exchange is expected *(see chapter 17.4 Filling and emptying the receipt printer on page 88)*.

14 Maintenance

14.1 Safety

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

Contact with live components may result in death.

- Certain maintenance work may be carried out by DESIGNA trained operating personnel familiar with the user manual and the safety instructions. All other maintenance work may only be carried out by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners and is marked accordingly.
- Switch off the device unless the work step requires a voltage supply.
- Keep moisture and dust away from live parts. Moisture or dust may cause a short circuit. If the maintenance work is established at precipitation, e.g. rain or snow, penetration of moisture must be prevented by suitable measures, such as a protective cover.

Inappropriate cleaning and basic services

⚠ WARNING

Risk of injury from inappropriate cleaning and basic services!

Inappropriate cleaning and basic services can cause severe or lethal injuries.

- Work inside the device should only be carried out by DESIGNA trained operating personnel who are familiar with the operating instructions and safety information.
- Make sure that cleaning fluids are neither swallowed nor come into contact with eyes.

Risk of crushing fingers

⚠ CAUTION

Risk of crushing fingers when closing the casing door and the base door!

Fingers may be crushed when closing the casing door and the base door.

- Keep your fingers out of the danger zone.

Inappropriate cleaning with air pistols

⚠ CAUTION

Risk of injury due to inappropriate cleaning with air pistols!

Inappropriate cleaning with air pistols may result in minor injuries or damage to eyes due to flying particles.

- Always wear safety goggles.
- Prevent air penetrating the body through skin injuries.
- Do not aim air pistols at people.
- Only use air pistols with a maximum pressure of 3.5 bar.
- Only use air pistols with a reduced noise level (multi-hole nozzles).

Inappropriate cleaning

NOTICE

Inappropriate cleaning can result in damage to the device.

There are sensitive electronic components inside the device. Dust and moisture can have a negative effect on the accuracy and the service life of the individual components.

Aggressive cleaning agents and auxiliary materials can damage or destroy the components or surface coating of the casing.

- Always keep the inside of the device clean and ensure that no moisture enters into it.
- If necessary, completely wipe off any water from the casing or door before opening the device.
- Do not use aggressive cleaning agents, such as thinners or cleaning solvents, to clean the device.
- Do not use any steam cleaners or high-pressure cleaners.

Personal protective equipment

The following must be worn during all work:

- Work clothes
- Protective gloves
- Safety shoes

14.2 Cleaning items

The following cleaning items can be ordered from DESIGNA:

DESIGNA order no.	Description	Content
7232148935	Cleaning tickets for receipt printer	15 tickets
7232148939	Cleaning kit for PIN pad	2 cleaning tickets with moving slider 3 pre-soaked cleaning tickets
7232148941	Cleaning cloths soaked with plexiglass cleaner	10 cloths
7232148915	Cleaning fluid	100 ml
7232148909	Compressed air spray	400 ml

14.3 Maintenance Schedule

The following sections describe maintenance work that is necessary to guarantee reliable and trouble-free operation.

Certain maintenance work may be carried out by DESIGNA trained operating personnel familiar with the user manual and the safety instructions. All other maintenance work may only be carried out by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners and is marked accordingly.

Maintenance intervals are given in months or cycles, depending on whichever comes first.

The maintenance intervals should be seen as approximate values and may differ depending on the ambient conditions and frequency of use.

If an increase in contamination is detected during routine inspections, the specified maintenance intervals must be shortened accordingly based on the actual level of contamination.

Perform maintenance work during periods of low traffic so as not to interrupt normal service.

Have replacements of the individual components at the ready so that they can be replaced as part of extensive maintenance work.

If you have any questions about maintenance work and intervals, contact your DESIGNA Service.

14.3.1 General maintenance

	Required qualification		Maintenance intervals							
	Operating personnel	DESIGNA electrical technicians	Weekly	Monthly	Every 2 months	Every 3 months	Every 6 months	Every 12 months	Every 4 years	According to cycles
Visual inspection of device and components	x					x				
Checking safety relevant user guidance stickers and images *See Checking safety labels on page 75*	x			x						
Casing *See Cleaning the casing on page 76*										
Check door locks and bolts for ease of movement	x					x				
Clean casing exterior	x						x			
Clean front plate	x						x			
Clean device interior	x							x		
Adjust device door, grease hinges	x							x		
Check door switch	x							x		
Check the device interior and exterior as well as all the fastening materials for damage and corrosion and, if necessary, eliminate corrosion damage, touch up paintwork		x						x		
Make sure the casing and bolt connections are secured firmly		x						x		
Display *See Cleaning the display on page 77*										
Clean display and check it for damage	x					x				
Checking intercom and speech connection *See Checking the intercom device on page 77*	x						x			

	Required qualification		Maintenance intervals							
	Operating personnel	DESIGNA electrical technicians	Weekly	Monthly	Every 2 months	Every 3 months	Every 6 months	Every 12 months	Every 4 years	According to cycles
Connection, cabling, voltage, grounding *See Checking the residual current circuit breaker (RCD) or residual current operated circuit-breaker with overcurrent protection (RCBO) on page 77*										
Check installed residual current device (RCD) or residual circuit breaker with overcurrent protection (RCBO) using the test button	x			x						
Check electrical cables for damage		x						x		
Make sure cable connections (terminal blocks and plugs) are inserted correctly		x						x		
Visually inspect all the ground connections		x						x		
Measure voltages		x						x		
Checking and adjusting heater (in the winter) *See Checking and adjusting heating on page 77*		x						x		
Checking and adjusting humidity sensor *See Checking and adjusting humidity sensor on page 78*		x						x		
Checking and adjusting fan (in the summer) *See Checking and adjusting fan on page 78*		x						x		
Cleaning and checking 2D Barcode Scanner *See Cleaning the 2D Barcode Scanner on page 78*										
Check and clean 2D Barcode Scanner	x			x						
Check firmware version of the 2D Barcode Scanner and, if necessary, update it		x						x		
Cleaning and checking surveillance camera (visual inspection)	x			x						
Cleaning and checking LPR camera (visual inspection)	x			x						
Cleaning PIN pad *See Cleaning the PIN pad on page 78*										
Clean chip contacts using a slider ticket	x		x							

	Required qualification		Maintenance intervals							
	Operating personnel	DESIGNA electrical technicians	Weekly	Monthly	Every 2 months	Every 3 months	Every 6 months	Every 12 months	Every 4 years	According to cycles
Clean chip and magnetic track reader using a cleaning ticket	x				x					
Check correct functioning	x							x		
RFID systems										
Check correct functioning	x							x		
Check antenna for damage and, if necessary, make sure it is inserted correctly	x							x		
Checking correct functioning of key-operated switch/fire department switch	x			x						
Checking correct functioning of relay output		x						x		
Checking correct functioning of external switching options		x						x		
Checking correct functioning of network components (e. g. DSL modem)		x						x		
Checking correct functioning after completing maintenance work		x						x		
Testing to German accident prevention regulation (DGUV-V3) *See Testing in accordance with accident prevention regulations on page 56*		x						x		

14.3.2 Maintenance of modules

	Required qualification		Maintenance intervals							
	Operating personnel	DESIGNA electrical technicians	Weekly	Monthly	Every 2 months	Every 3 months	Every 6 months	Every 12 months	Every 4 years	According to cycles
SBC *See chapter SBC (Single Board Computer) module on page 79*										
Check plug contacts		x						x		

	Required qualification		Maintenance intervals							
	Operating personnel	DESIGNA electrical technicians	Weekly	Monthly	Every 2 months	Every 3 months	Every 6 months	Every 12 months	Every 4 years	According to cycles
Receipt printer *See Carrying out maintenance work at the receipt printer on page 90 and Filling and emptying the receipt printer on page 88*										
Clean receipt printer using compressed air	x							x		
Clean receipt printer using cleaning strips	x			x						

14.4 Checking safety labels

Check safety signs

1. Make sure that the safety signs near the device are visible and can always be easily read.

Check safety labels

2. Make sure that the safety labels on the device are visible and can always be easily read.

Check user prompting labels and diagrams

3. Pay attention to good perceptibility of the user prompting labels and diagrams.

14.5 Cleaning the casing

14.5.1 Cleaning casing outside

Clean the casing

1. Clean the casing regularly with a soft cloth and a mild cleanser. Clean the casing more often, if there is a high degree of soiling (e.g. dusty environment).

Clean the casing when using gritting salt in the winter

NOTICE

Gritting salt can damage the paintwork of the casing and may result in corrosion.

Clean the outside of the casing monthly with a soft cloth and a mild cleaning agent if gritting occurs in the vicinity.

14.5.2 Cleaning the Plexiglas® front panel

1. Clean the front panel with a soft cloth and a plexiglass cleaning agent.

NOTICE

Do not dry clean the front panel, dry cleaning may cause electrostatic charges to build up.

Do not use any customary microfibre clothes, abrasive agents or aggressive agents like ethyl alcohol or Isopropanol.

Recommended cleanser: DESIGNA cleaning clothes, washing-up liquid-water-solution or antistatic plexiglass cleaning agent.

14.5.3 Cleaning inside the device

1. Switch off the device.
2. **NOTICE**

   Device might become damaged.

   – Pay attention to cleanliness inside the device and clean it more than once a month if there is a high degree of soiling (e.g. dusty environment).

   – Do not use any aggressive agents like thinners or petroleum ether for cleaning the casing. Recommended cleanser: Washing-up liquid-water-solution.

   Clean the inside of the device regularly with a soft cloth and a mild cleanser.
3. Carefully vacuum inside the device if it is very dirty beforehand
4. Carefully vacuum the mounting plates.
5. Switch on the device.

14.5.4 Checking the door switch

1. Open the device door and check that an alarm message has been sent to the system server.
2. Pull out the door switch and make sure a closed device door is simulated.

14.6 Cleaning the display

1. Clean the display with a soft cloth and a mild cleaning agent Recommended cleanser: antistatic plexiglass cleaning agent.
2. Check the display for damage.

14.7 Checking the intercom device

1. Together with a colleague at the central switchboard for inter-communication, make sure that speech contact is established with the intercom device of the device, and check the function and quality of this connection.

14.8 Checking the residual current circuit breaker (RCD) or residual current operated circuit-breaker with overcurrent protection (RCBO)

Device switched on.

1. Regularly use the RCD or RCBO test button to check correct functioning.

➤ This simulates a fault and, if the RCD or RCBO is functioning correctly, the electric circuit of the device is disconnected: The RCD or RCBO switch is set to OFF (downwards).

2. Click the RCD or RCBO switch to ON (upwards) after a successful test. If the test was unsuccessful, inform your DESIGNA Service.

> **i** Recommended:
> Always record the functional test - principally for reasons of liability.

14.9 Checking and adjusting heating

⚠ CAUTION

Hot surface!

The surface of the heater may become hot during operation.

Contact with the heater may result in burns.

– Do not touch the surface of the heater.

> **i** The switching thresholds for switching the heater are stored in the system. The setting and adjustment of the values (recommended temp.: 20°C) is carried out exclusively by DESIGNA electrical technicians or by electrical technicians of DESIGNA trained and authorized dealers and partners.

14.10 Checking and adjusting humidity sensor

Measurement and control of the relative humidity inside the device is done by a humidity sensor.

> The optimum setting to a lower humidity (recommended: 70%) is made in the system and has to be carried out exclusively by DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized partners.

14.11 Checking and adjusting fan

> The switching thresholds for switching the fan are stored in the system. Any settings and adjustments have to be made by DESIGNA electrical technicians or by electrical technicians of DESIGNA trained and authorized dealers and partners.

14.12 Cleaning the 2D Barcode Scanner

⇨ Clean the plexiglass plate of the 2D Barcode Scanner with a soft cloth and a mild cleaning agent.
Recommended cleanser: antistatic plexiglass cleaning agent.

14.13 Cleaning the PIN pad

14.13.1 Cleaning the chip contacts using cleaning ticket and slider

Switched on device.

1. Insert the cleaning ticket with the moving slider and the fleece facing up into the ticket reader.
2. Hold the cleaning ticket firmly with one hand and simultaneously move the slider back and forth several times with the other hand.
3. Mark the cleaning process on the field. When you have marked all 12 fields, dispose of the cleaning ticket.

14.13.2 Cleaning the chip and magnetic track reader using a cleaning ticket

Switched on device.

1. Insert the pre-soaked cleaning ticket into the card reader.
2. Repeat this process several times.

15 SBC (Single Board Computer) module

15.1 Function

In the system DESIGNA, the **SBC** (Single Board Computer) controls the operation and functions of the individual device components with the required program.

The SBC is centrally controlled by the **system server** and identified and addressed via IP addresses.[13]

Various components are connected to the SBC and are fully or partially controlled from there.

15.2 Design and operation

CAUTION

Improper operation of the SBC may lead to the device malfunctioning.

- If the SBC needs to be replaced, the entire module is replaced.
- Avoid unnecessary switching on and off at the device MFT-L An operating system is installed on the SBC, which needs some time to boot after switching on.

The device is delivered with user-specific default settings.

Adjustments to the setting values are made exclusively in WinOperate and are carried out by your DESIGNA service.

The components are delivered with user-specific default settings.

The threshold values for the heater and fan are stored in the system and are controlled via the SBC.

The setting values for the TFT colour display (24"), the Full touch display (10.1"), VoIP and RFID are already stored in the system and are controlled via the SBC.

[13] The IP addresses and the associated SBC addresses are set up in the *system configuration* for your system before delivery or by your DESIGNA service.

SBC (Single Board Computer)

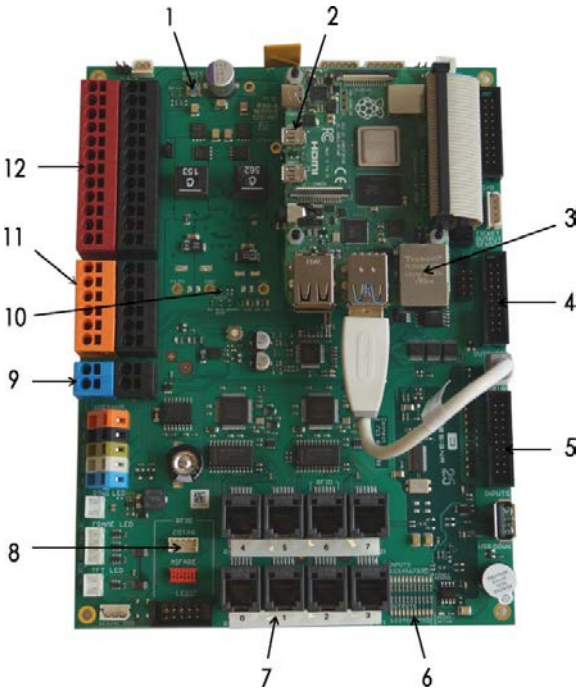


Fig. 39: SBC Mainboard IN/OUT V3

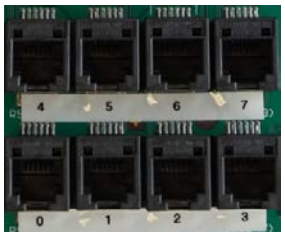
1 Power/Reset
2 HDMI port for display
3 Ethernet interface, RJ45
4 Outputs:
- Optional relay output
- Intercom request
- Fan
- Heater
- 6 optional outputs

5 Inputs:
- Ticket/Ticket shortage
- Door switch
- EMI 1 / EMI 2 / EMI 3
- Ticket request
- 4 optional outputs

6 Activity LED, inputs/outputs
7 Serial interfaces
8 RFID port
9 5V voltage supply
10 Voltage supply LED
11 12V voltage supply
12 24V voltage supply

Serial interfaces

The device-internal communication takes place via serial data exchange (RS 232).[14]



0 = tty USB 0
1 = tty USB 1
2 = tty USB 2
3 = tty USB 3
4 = tty USB 4
5 = tty USB 5
6 = tty USB 6
7 = tty USB 7

Fig. 40: Serial interfaces

Ethernet interface, RJ45

The LAN (Local Area Network) is connected to the SBC at the *Ethernet interface*.

[14] A conversion for parallel device components (e.g. older barrier models and complex barrier applications) is performed via the *I/O interface module* (see separate module section).

Activity LED	The *Activity LED* indicates send and receive activity during data transmission (**Ethernet**).
Voltage supply LED	The *Voltage supply LED* indicates that supply voltage is applied.
24V voltage supply	The SBC is provided with 24V DC via the voltage supply.
microSD slot	Slot for a *microSD memory card* that contains the SBC's operating system.
Power/Reset button	Activating the *Power/Reset button* restarts the SBC. This process takes about 45 seconds. The SBC module can be switched off via the on/off switch.
Heater	The switching thresholds for switching the heater are stored in the system. Temperature settings in the system are carried out by your DESIGNA service.
Fan	The switching thresholds for switching the fan are stored in the system. Settings in the system are carried out by your DESIGNA service.
Display	The contrast for the TFT colour display (24") and the Full touch display (10.1") is set in the system by your DESIGNA service.
DESIGNA VoIP	The volume of the *DESIGNA VoIP speakers* is set in the system by your DESIGNA service. The sensitivity of the *DESIGNA VoIP microphone* is set in the system by your DESIGNA service. Noise suppression of the microphone amplifier is set in the system by your DESIGNA service.

15.3 Assignment of contacts

The inputs and outputs are assigned as follows depending on the function in the device:

15.3.1 SBC Mainboard IN/OUT: Digital Inputs

Input type:	IN1 - IN10	Low active, Switching threshold <= 2 V DC
Maximum voltage:	IN1 - IN10	26 V DC

PIN	Name	Input	Function
1	IN1	DIG IN1	Ticket request button
2	GND		
3	IN2	DIG IN2	Intercom call request button
4	GND		
5	IN3	DIG IN3	Free configurable
6	GND		
7	IN4	DIG IN4	Free configurable
8	GND		
9	IN5	DIG IN5	Free configurable
10	GND		
11	IN6	DIG IN6	Free configurable
12	GND		
13	IN7	DIG IN7	Ticket storage low
14	GND		
15	IN8	DIG IN8	Vehicle classifying (large vehicle/ small vehicle)
16	GND		
17	IN9	DIG IN9	Free configurable
18	GND		
19	IN10	DIG IN10	Free configurable
20	GND		

15.3.2 SBC Mainboard IN/OUT: Digital Outputs and Relays

Output type:	REL1 - REL2	Potential free
	OUT3 - OUT10	0 V switching (to GND)
Maximum voltage:	REL1 - REL2	60 V DC
	OUT3 - OUT10	40 V DC
Current carrying capacity:	REL1 - REL2	max. 1 A, 24 V DC
	OUT3	max. 1.4 A, short-circuit proof
	OUT4 - OUT10	max. 285 mA per output, current-limited

PIN	Name	Output	Function
1	OUT1	REL1	Relay contact door opener
2	OUT1		
3	OUT2	REL2	Relay contact 3rd party intercom
4	OUT2		
5	OUT3	DIG OUT3	Housing fan
6	+24V		
7	OUT4	DIG OUT4	housing heater
8	+24V		
9	OUT5	DIG OUT5	activate speaker MP3/Intercom
10	+24V		
11	OUT6	DIG OUT6	Free configurable
12	+24V		
13	OUT7	DIG OUT7	Free configurable
14	+24V		
15	OUT8	DIG OUT8	Transparent 1
16	+24V		
17	OUT9	DIG OUT9	Transparent 2
18	+24V		
19	OUT10	DIG OUT10	Transparent 3
20	+24V		

16 Module I/O Interface Midi-P-USI (12 I/O) (optional)

16.1 Functioning

The module *I/O interface* is optionally used at the device MFT-L. The I/O Interface is serially connected to the TCC/SBC and provides digital inputs and outputs for communication between the TCC/SBC and functional units in the device or a connected barrier (parallel connection).

16.2 Design and operation

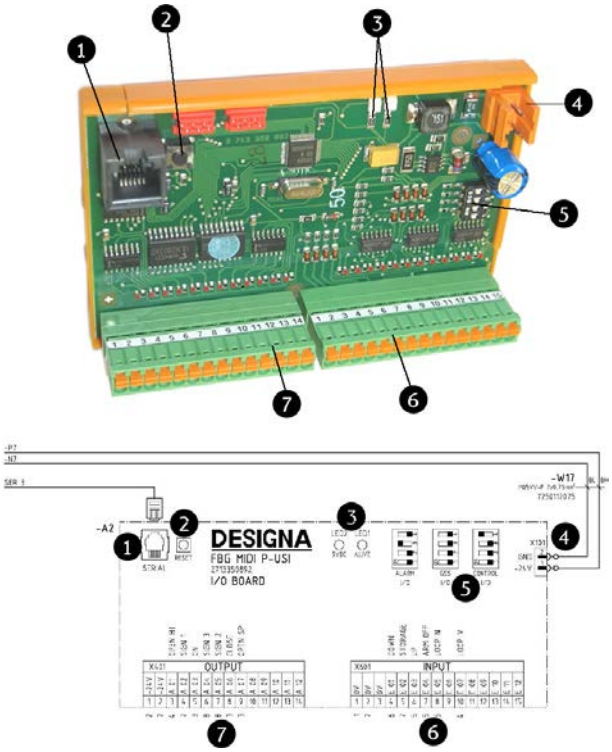


Fig. 41: I/O interface Midi-P-USI (here I/O interface assignment of an entrance control terminal)

1 Serial connection
2 Reset button
3 LED power supply
4 24V power supply
5 Function DIP switch
6 Inputs E1-E12
7 Outputs A1-A12

Serial connection

The TCC/SBC is connected via the *serial connection*.

Reset button

Use the *Reset button* to reset (restart) the program runs of the I/O interface Midi-P-USI).

LED power supply

The two *LEDs power supply* display the correct power supply for the I/O interface Midi-P-USI.

Continuously lit LED 5V (on the left in figure): Logic power supply OK

Continuously lit LED 24V (on the right in figure): Operating power supply OK

24V power supply

The I/O interface Midi-P-USI is supplied with 24V DC via the *24V power supply*.

Function DIP switch

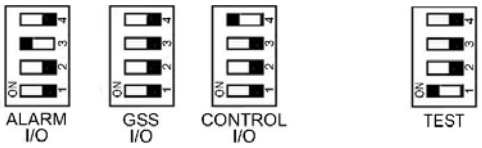


Fig. 42: DIP switch positions

The function with which the I/O interface Midi-P-USI is used at the device MFT-L is set at the *function DIP switch*:

Control I/O — Communication between the TCC/SBC and the functional units in the device

Alarm I/O — The same as *Control I/O*, but with a different configuration of contact E03 and A12.

GSS I/O — Communication between the display and buttons (for optional *TFT display*)

Test mode — The same as *I/O interface 16 I/O (see Technical Service Instructions I/O Interface 16 I/O)*.

⇨ Press the *Reset button* to accept modified DIP switch positions.

Inputs E1-E12

The I/O interface Midi-P-USI has twelve *inputs E1-E12.*

The inputs switch low active.

(The plug of the inputs is equipped with 13 pins to ensure correct insertion.)

Outputs A1-A12

The I/O interface Midi-P-USI has twelve *outputs A1-A12.*

(Not short circuit-proof, up to max. 100mA per circuit, total circuit maximum for all outputs: 300mA).

16.3 Assignment of contacts

The inputs and outputs are assigned as follows depending on the function in the device:

16.3.1 MIDI-P-USI: Digital Inputs

Digital Inputs Low active

PIN	Name	Barrier connected to Midi-P-USI	Midi-P-USI I/O Board
4	E01	Barrier status: closed	Free configurable
5	E02	Free configurable	Free configurable
6	E03	Barrier status: open	Free configurable
7	E04	Barrier arm status: broken	Free configurable
8	E05	Detector N status: occupied	Free configurable
9	E06	Free configurable	Free configurable
10	E07	Detector V status: occupied	Free configurable
11	E08	Free configurable	Free configurable
12	E09	Free configurable	Free configurable
13	E10	Free configurable	Free configurable
14	E11	Free configurable	Free configurable
15	E12	Free configurable	Free configurable

16.3.2 MIDI-P-USI: Digital Outputs

Digital Outputs 0 V switching

PIN	Name	Barrier connected to Midi-P-USI	Midi-P-USI I/O Board
3	A01	Open barrier for short term parker (STP)	Free configurable
4	A02	Free configurable	Free configurable
5	A03	Set barrier in service	Free configurable
6	A04	Free configurable	Free configurable
7	A05	Free configurable	Free configurable
8	A06	Close barrier	Free configurable
9	A07	Open barrier for season parkers 1 (SP 1)	Free configurable
10	A08	Free configurable	Free configurable
11	A09	Free configurable	Free configurable
12	A10	Free configurable	Free configurable
13	A11	Free configurable	Free configurable
14	A12	Free configurable	Free configurable

The necessary inputs and outputs for the operation of a barrier (underlain with grey) are available at the parallel connector barrier. *(see chapter 8.6 Connection barrier (terminal block -X2) on page 53)*.

17 Module Receipt Printer

17.1 Functioning

To be able to issue customers with a receipt of payment processes, a receipt printer is installed in DESIGNA payment devices (automatic pay stations or at the exit with optional **drive&pay**).

Receipt printers at pay stations also issue receipts about the removal of the coin cassette or banknote cassette.

17.2 Design and operation

Basically, the receipt printers in all the DESIGNA devices are designed as shown in the figure below. Even if the installation position or add-ons (e.g. weather protection) vary, functioning and operation of the elements stay the same.

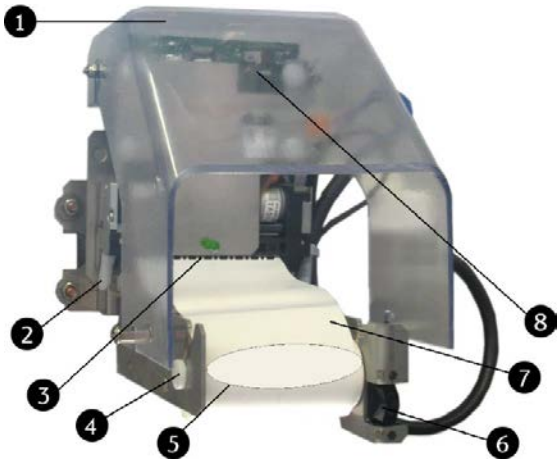


Fig. 43: Receipt printer

1 Weather protection
2 Opening lever (for draw-in device)
3 Draw-in device
4 Paper reel holder
5 Printable surface
6 Reflex light barrier
7 Paper reel
8 PCB receipt printer

Weather protection

The *weather protection* protects the receipt printer if the device is open (not available at Pay 1104).

Opening lever (for draw-in device)

It is possible to lift the print head of the thermal printer with the *opening lever* in order to, e.g., remove an old paper reel, to clean the paper guide with **compressed air** or to insert a new paper reel *(see chapter 17.4.2 Insert new paper reel on page 89)*.

Draw-in device

The paper reel is fed into the receipt printer via the *draw-in device* with the printable surface facing upwards.

Paper reel holder

The paper reel is mounted onto the *paper reel holder*, which is loosely placed into the holding device.

Printable surface

The *printable surface* of thermal paper is easily recognizable as the paper changes colour due to heat generation (e.g. by scratching the surface).

Reflex light barrier

Fig. 44: Reflex light barrier

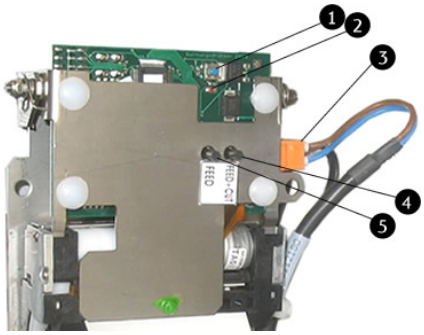
The r*eflex light barrier* ❶ on the *paper reel holder* registers a shortage of paper.
If the diameter of the inserted paper reel is below a certain size, a message is generated at the **TCC/SBC** and sent to the **System server**.

Paper reel

The following *paper reel* is suitable for the receipt printer and can be ordered:

	Automatic pay stations	**Exit control terminals / APS 120 CASHLESS**
DESIGNA Ident. no.	7 232 120 579	7 232 120 580
Paper width	57 mm	57 mm
Paper length	95 m	30 m
Paper strength	75 g/m^2	75 g/m^2

PCB receipt printer



1 Reset button
2 Operating LED
3 Power supply
4 FEED+CUT (Feed/ Cut-off button)
5 FEED (Feed button)
Not shown:
6 Serial connection

Fig. 45: PCB receipt printer

Reset button

Use the *reset button* button to trigger the following functions:

Reset + FEED+CUT

Three sections are printed as test printout separated by partial cuts.

Reset + FEED

The version no. of the receipt printer software, the recent settings of the DIP switches, the recent character set and a test pattern are printed and issued as test printout. The paper strip is cut.

Operating LED

The *operating LED* flashes when a 24V power supply is connected and the required program information has been loaded onto the controller of the *PCB receipt printer*.

Power supply

The receipt printer is supplied with 24V DC via the *power supply* ❸.

FEED+CUT
(Feed/ Cut-off button)

The *FEED+CUT* button feeds approx. 6.5 cm of paper before cutting it off.

FEED
(Feed button)

The *FEED button* feeds the paper by one feed step if the button is pressed once. If the button is kept pressed the paper feeding occurs until the button is released

Serial connection

The receipt printer is connected to the **TCC/SBC** via the *serial connection*.

17.3 Optional receipt printer

When using certain options (e.g. PINPad, fiscal printers), a receipt printer designed for wider paper reels can be installed at the device MFT-L. This receipt printer can print up to 40 characters per line.

The design and operation of the optional receipt printer basically correspond to those of the default receipt printer and are, therefore, not described separately.

Paper reel

The following *paper reel* is suitable for the optional receipt printer and can be ordered:

DESIGNA Ident. no.	7 232 120 581
Paper width	80 mm
Paper length	60 m
Paper strength	75 g/m^2

17.4 Filling and emptying the receipt printer

17.4.1 Safety

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

Filling and emptying are carried out with the device switched on.

When the device is switched on, the power supply (230V) is connected to the following components: Terminal block-X0, mains filter, power supply unit, and to the optional socket, heater and, if necessary, to further optional components *(see chapter Device Description)*.

Contact with live components may result in death.

– Work inside the device should only be carried out by DESIGNA trained operating personnel who are familiar with the operating instructions and safety information.

Hot surface

⚠ CAUTION

Danger of burns!

The surface of the print head and motor may become hot during operation.

Contact with the surface may result in burns.

– Do not touch the print head or motor.

Risk of crushing fingers

⚠ CAUTION

Risk of crushing fingers when closing the casing door and the base door!

Fingers may be crushed when closing the casing door and the base door.

– Keep your fingers out of the danger zone.

17.4.2 Insert new paper reel

NOTICE

Only use the specified thermal paper to ensure a long service life and an excellent printout.

Suitable thermal paper can be ordered from DESIGNA. Lower quality paper can cause inferior printouts, abrasion of the print head and paper jams.

Device switched on.

1. Loosen the print head from the old paper reel by releasing the *opening lever*.

➤ The old paper reel can now be removed.

2. Remove the *paper reel holder* and the old paper reel and place a new paper reel on the holder.
3. Reinsert the *paper reel holder.*
4. Feed the paper into the draw-in device as follows:

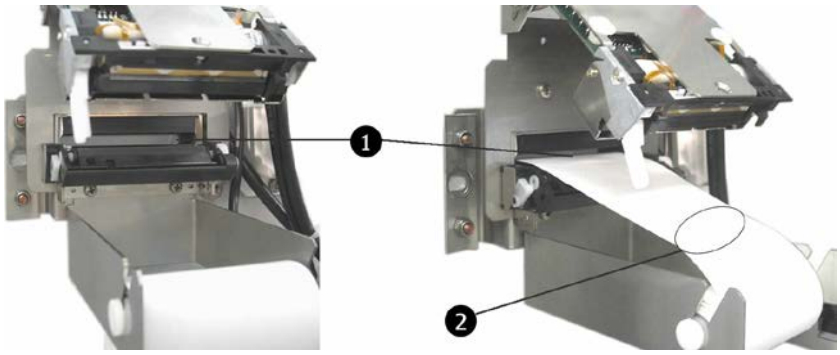


Fig. 46: Feeding paper into the draw-in device

The paper reel is fed into the *draw-in device* with the *printable surface* facing upwards.

5. If the paper reel has been inserted flush and correctly, clamp down again the print head onto the paper reel by carefully folding and pressing the printer unit back into its position until the opening lever locks.

NOTICE

Always carefully close the printer.

6. Press *FEED+CUT*:

➤ The paper is fed approx. 65 mm and then cut off.

17.4.3 Issue test printout

Device switched on.

After inserting a new paper reel:

1. Use the test printout to check whether the paper has been inserted correctly (*printable surface* facing upwards) and whether the receipt printer produces a perfect printout.
2. Press *Reset* + *FEED* ***or*** *Reset* + *FEED+CUT*, depending on which test printout you desire.

➤ The desired test printout is carried out.

17.5 Carrying out maintenance work at the receipt printer

17.5.1 Safety

Electric voltage

⚠ DANGER

Danger of death due to electric voltage!

When the device is switched on, the power supply (230V) connected to the following components Terminal block -X0, mains filter, power supply unit and, if necessary, to further optional components *(see chapter Device Description)*.

- Work inside the device should only be carried out by DESIGNA trained operating personnel who are familiar with the operating instructions and safety information.
- Switch off the device *(see chapter 5.3.7 Terminal block -X0: Voltage connection/ ON/OFF switch on page 28)* unless the work step requires a voltage supply.
- Be aware that the following components remain energized (230V) even when the ON/OFF switch is switched off:
  - ON/OFF switch, primary side
  - Power supply terminal

Inappropriate cleaning with air pistols

⚠ CAUTION

Risk of injury due to inappropriate cleaning with air pistols!

Inappropriate cleaning with air pistols may result in minor injuries or damage to eyes due to flying particles.

- Always wear safety goggles.
- Prevent air penetrating the body through skin injuries.
- Do not aim air pistols at people.
- Only use air pistols with a maximum pressure of 3.5 bar.
- Only use air pistols with a reduced noise level (multi-hole nozzles).

Hot surface

⚠ CAUTION

Danger of burns!

The surface of the print head and motor may become hot during operation.

Contact with the surface may result in burns.

– Do not touch the print head or motor.

Risk of crushing fingers

⚠ CAUTION

Risk of crushing fingers when closing the casing door and the base door!

Fingers may be crushed when closing the casing door and the base door.

– Keep your fingers out of the danger zone.

Inappropriate cleaning

NOTICE

Inappropriate cleaning can result in damage of the receipt printer.

– Always print with inserted, suitable paper.

– Do not touch the print head with pointed or sharp objects.

– Do not use thinners to clean the transport rollers.
Recommended cleanser: DESIGNA cleaning fluid.

17.5.2 Cleaning the receipt printer with compressed air

1. Switch off the device.

Fig. 47: Releasing the opening lever to loosen the print head from the paper reel

1 Opening lever
2 Printer unit
3 Print head
4 Paper guide

2. Loosen the *printer unit* from the paper reel by releasing the *opening lever*:
3. Check soiling of *printer unit*, *print head* and *paper guide* (e.g. snippets of paper or similar objects).
   If necessary, clean them with compressed air.
4. Clamp the *print head* back onto the paper reel by carefully folding and pressing the *printer unit* back into its position until the *opening lever* locks.

NOTICE
Always carefully close the printer unit.

5. Switch on the device.

17.5.3 Cleaning the receipt printer using cleaning strips

Switched on device:

1. Remove the paper reel *(see chapter 17.4.2 Insert new paper reel on page 89)*.
2. Guide the cleaning strip through the receipt printer using the FEED button.
3. Repeat this process several times.
4. Remove the cleaning strips and reinsert the paper reel.

18 RFID (Hands-free Identification) (optional)

A convenient entry check is enabled by using a hands-free identification system at the control devices. For the **additional payment** and **renewal** of **RFID** cards antennas can also be mounted to Automatic Pay Stations.

The transmitter-receiver antennas are installed either in the device's monitored area or directly on the device. When **RFID** cards are brought closer to the antennas (if necessary, after occupying loop V), a radio link is created and the antenna receives the relevant card data (min. card number). The antenna signal is processed via a controller in or on the device or directly at the antenna and then transmitted to the **TCC/SBC**. The data is requested at the **System server** and checked for certain parameters.

If the **RFID** card is a valid DESIGNA **type of item** (e.g. **season parker card**) and valid for the car park, the barrier opens. A roller door or similar object can be controlled instead of a barrier.

> **i** With hands-free processes, information for processing is in the **System server**. Thus, actions with RFID cards are **only limited offline compatible**:
> For every process at the devices, information has to be requested via an intact data line.

The following hands-free systems, which allow various reading distances for hands-free operation, can be used in the DESIGNA system:

- Short Range RFID system:
  Legic Proximity System, Mifare Proximity System, ISO 15693 Proximity System
- Long Range RFID systems:
  RFID systems with UHF technology

18.1 Short range RFID systems: Legic/ Mifare/ ISO 15693 Proximity Systems

As further DESIGNA **RFID** systems, the following RFID systems can be used:

- Legic Proximity System (operating frequency: 13.56 MHz)
- Mifare Proximity System (operating frequency: 13.56 MHz)
- ISO 15693 Proximity System (operating frequency: 13.56 MHz)
- HID Proximity System (operating frequency: 125 kHz)
- HID Hybrid card reader (operating frequency: 125 kHz and 13,56 MHz)

The following are required (e.g. from your time recognition system):

- **RFID** cards
- system specific antennas
- system specific card reading devices (in order to allocate the card numbers as **types of tickets**)

18.1.1 RFID cards

Fig. 48: Example Mifare card

The **RFID** cards of the *Legic Proximity System, Mifare Proximity System* and *ISO 15693 Proximity System* are based on flexible identification standards for hands-free applications.

The cards are equipped with a card number (usually a serial number) which can be read by the *system specific antennas* and *reading devices*.

These are passive cards which do not require batteries, the required transmission energy is provided by the antenna.

The cards usually come in a “credit card format” (ID-1 format): 85.60x 53.98 mm.

> **i** Ask your DESIGNA service whether existing DESIGNA system cards (e.g. from your time recognition system) can be used).

18.1.2 System-specific antennas

Fig. 49: Example: Antenna

Antennas in the DESIGNA system are installed behind the reading field cover or directly in the reading device.

Antennas of the *Legic Proximity System, Mifare Proximity System* and *ISO 15693 Proximity System* are short reading-range antennas:

Legic antenna range (passive card):	approx. 4cm
Mifare antenna range (passive card):	approx. 5cm
ISO 15693 antenna range (passive card):	approx. 4cm

18.1.3 System-specific card reading devices

The *system specific card reading devices* are connected to the operating PC **WS 120**.

The devices read the **RFID** card number and relay it to the PC application **WinOperate** when **producing** the card: The card number is registered as a **season parker card** together with the necessary card information in the **System server** *(see the separate operator manual WinOperate).*

18.2 Long Range RFID Systems

As further DESIGNA **RFID** systems, the following Long Range RFID systems can be used for value area recognition:

- Long Range RFID Systems with UHF technology

This requires appropriate reading devices, converters and transponders.

The reading devices are installed in the monitored area of the device MFT-L, e.g. on a mast.

The serial interface converters for connecting the reading device to LCC/SCC are usually installed inside the device MFT-L.

The transponders are equipped with a unique card number (usually a serial number) which can be read by reading devices.

18.2.1 Long Range RFID Systems with UHF Technology

Reader TSU 200

Fig. 50: Reader TSU 200

Long range reading device for hands-free entry check, also through a car window.

- Reading range with passive transponders of up to 4 m
- Dimensions: 200x175x60 mm (WxHxD)
- Operating frequency: 865 MHz to 868 MHz

Passive ISO card transponder

Fig. 51: Passive ISO card transponder

Passive ISO card transponder in credit card format.

- Range: up to 4 m
- Operating temperature: -20 to +50°C
- Dimensions: 85x54x0.84 mm (WxHxD)

Passive windscreen transponder

Fig. 52: Passive windscreen transponder

Passive windscreen transponder for fixing to the inside of a car windscreen.

- Range: up to 4 m
- Operating temperature: -20 to +70°C
- Dimensions: 85x54x1 mm (WxHxD)

Passive transponders do not require batteries, as they are provided with the necessary transmitting energy by the reading device.

Fixing a passive windscreen transponder

⚠ WARNING

Risk of injury due to driver's field of vision being impeded.

If the driver's field of vision is impeded, it may result in serious, life-threatening injuries.

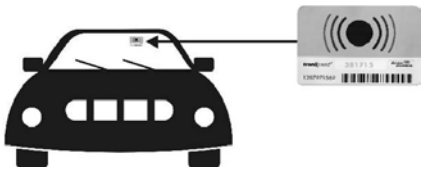
– The transponder must not impede the driver's field of vision.

i To check correct positioning, briefly fix the transponder at the desired position (e.g. with an easy-to-remove adhesive tape) on the inside of the windscreen before fixing it permanently.

The transponders work best if they are fixed at the same position on the windscreen of all vehicles. The best position for the transponder in a typical passenger car is in the middle or slightly on the driver's side at the top of the windscreen; recommended position is at least 4 cm from the edge in the area cleaned by the windscreen wipers. In very high vehicles (e.g. SUVs or delivery vans), the transponder should be fixed at a lower position on the windscreen.

The best position depends on the type of windscreen. We differentiate between the following windscreen types:

Normal windscreen without a vacuum-metallized surface and heater lines

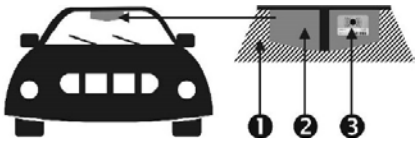


The transponder should be fixed in the middle or slightly on the driver's side at the top of the windscreen (e.g. behind the rear view mirror) in the area cleaned by the windscreen wipers.

Fig. 53: Normal windscreen

The transponder should not be fixed directly at the edge of the windscreen (recommended position is at least 4 cm from the edge).

Windscreen with a partial vacuum-metallized surface



1 Vacuum-metallized surface
2 Non vacuum-metallized surface
3 Transponder

Fig. 54: Windscreen with a partial vacuum-metallized surface

Windscreens with a partial vacuum-metallized surface usually display an area which is not vacuum-metallized ❷ (around the rear view mirror). This area is tinted and thus easily recognizable. If possible, the transponder ❸ should be fixed in the middle of this area. The transponder will ***not*** function correctly behind the vacuum-metallized surface.

Windscreen with a full vacuum-metallized surface or combination of vacuum-metallized surface plus heater lines

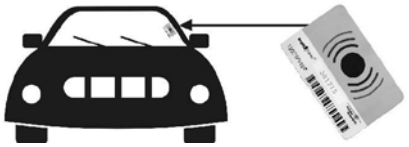
The transponder will ***not*** function correctly behind the vacuum-metallized surface.

Fig. 55: Windscreen with a full vacuum-metallized surface

The transponder cannot be fixed to windscreens with a full vacuum-metallized surface.

In this case, the transponder must be fixed vertically to the side window on the driver's side. This also applies to windscreens with a full vacuum-metallized surface and additional heater lines.

Windscreen with heater lines



The transponder will work directly behind the heater lines, but with a limited range.

Fig. 56: Windscreen with heater lines

Check to see whether the transponder is working correctly at the best position (*see Normal windscreen without a vacuum-metallized surface and heater lines*), or fix the transponder in an area at the edge of the windscreen where there are no heater lines - as high as possible and in the middle between the edge of the windscreen and the heater lines.

18.3 Instructions for RFID cards

- ⇨ Protect RFID cards against extreme cold and heat as well as temperature fluctuations:
  Pay attention to the temperature ranges specified by the card manufacturer.
- ⇨ Make sure the cards are not bent or folded:
  Pay attention to the specifications of the card manufacturer.
- ⇨ Protect the cards against direct sunlight.
  (Sunlight will fade their colour over time, cause the cards to warp or bend and impair the RFID technology).
- ⇨ Protect cards with additional magnetic strips against magnetic fields, e.g. against magnetic print heads and certain electronic devices (such as radios or loudspeakers).
- ⇨ Do not allow the cards to come into contact (plastic becomes brittle) with aggressive solvents (e.g. petroleum ether, methylated spirits, etc.).
- ⇨ Do not keep the cards in soft PVC holders or wallets (risk due to PVC softeners or leather tanning agents).

19 Decommissioning, Disassembly and Disposal

19.1 Safety

Electric voltage

⚠ DANGER

Danger of death due to electric shock!

Contact with live components may result in death.

- Decommissioning and disassembly have to be carried out by electrical technicians or DESIGNA electrical technicians or electrical technicians of DESIGNA trained and authorized dealers and partners.
- Make sure that the power supply is ***externally*** disconnected and that it cannot be switched on.
- Test for absence of voltage.

Heavy weight

⚠ WARNING

Risk of injury when lifting heavy objects alone!

The weight of heavy objects can severely injure a person.

- Never attempt to lift the device on your own.
- Always wear safety shoes.

Occupational safety and environmental protection

⚠ WARNING

Risk of harm to humans and the environment as a result of improper disposal of the device MFT-L or components.

Improper disposal of the device or components can be harmful to human health and the environment.

- Make sure disposal is always be carried out by fully qualified specialists.
- Pay attention to valid country-specific environmental regulations.

Occupational safety and environmental protection

⚠ WARNING

Risk of harm to humans and the environment as a result of improper disposal of rechargeable batteries and batteries.

Improper disposal of rechargeable batteries and batteries can be harmful to human health and the environment.

- Remove batteries and rechargeable batteries from all the components.
- Dispose of the batteries and rechargeable batteries according to valid country-specific environmental regulations.

Risk of crushing fingers

⚠ CAUTION

Risk of crushing fingers when closing the casing door and the base door!

Fingers may be crushed when closing the casing door and the base door.

– Keep your fingers out of the danger zone.

19.2 Decommissioning and disassembly

1. Disconnect the device from all sources of supply MFT-L *(see chapter 8 Connection on page 45)*.
2. Disassemble the device MFT-L in reverse order to assembly *(see chapter 7 Installation on page 36)*.
3. Disassemble the device into its individual parts.

19.3 Disposal

The device MFT-L consists of recyclable materials.

⇨ After correct disassembly, sort the materials back into specific material types and recycle them.

20 Glossary

A

Additional payment

An **additional payment** can be charged for **season parker** or **value cards** or other **items** with special online application.

A **season parker card** is charged an additional payment if the season parker is still in the car park when the card validity runs out. In this case, the tariff is calculated from the end of validity until the time of payment. If not additionally paid for, the season parker card is withdrawn and marked as deleted at the exit. A season parker card also has to be additionally paid for if parking occurs outside **the group time**. On which tariff this additional payment is based in both cases depends on the configuration of the **season parker group**. A short term parker tariff is used if no special charge has been defined as additional payment.

A **value card** is charged an additional payment if the parking fee exceeds the residual value of the value card. The customer has to pay the difference at an automatic or manual payment system or (if possible) at an exit.

Other **items** with special online application are charged an additional payment if the **group time** is exceeded: When the selected parking duration is exceeded, additional payment is due according to the tariff ID for additional payment assigned in the Item details.

The payment device must be **online** to carry out an additional payment in a barcode system.

Advance payments, accepted

A payment which can only be partially paid (example: the customer has insufficient change) can result in this amount being credited to the ticket during cancellation. This part payment is listed as an **accepted advance payment** in the operating report.

The customer can pay the residual fee at a later date at the same or another automatic payment system. The previous accepted advance payment is then booked as an **offset advance payment**.

Crediting during cancellation at an automatic payment system instead of returning the inserted money depends on the device configuration.

Advance payment, offset

If a ticket which has been partially paid (**accepted advance payment**) is fully paid at a later date, the previous accepted advance payment is booked as an **offset advance payment**.

The previous incomplete payment from the accepted advance payment has now been completed. Therefore, offset advance payments are listed in the operating report the same as other payments, accepted advance payments are considered separately.

Alarm message

All the occurrences in the DESIGNA system, e.g. *barrier broken*, *door to the pay station has been opened* etc., are displayed as **alarm messages**. Every possible alarm message is assigned an alarm number.

If something occurs at a device an alarm message is sent from the device to the **System server**, which not only logs the name and number of the alarm message but also the **TCC/SBC no.**, date and time. The alarm messages are registered in a database in the **System server** and can be displayed at the **WinOperate**.

Anonymous

In the DESIGNA system, **season parker cards**, **value cards** and **congress tickets** can be issued as **anonymous** cards. This may be necessary due to data protection provisions, e.g. if the trips of employees should not be recorded.

All the event and receipt information of anonymous cards is recorded without card numbers. This ensures that the cards remain relevant for car park occupancy, turnover etc. However, the history of these cards – i.e. their trips and payments – is thus invisible in the corresponding **WinOperate** functions (e.g. *event details* and *ticket tracking*).

B

Blacklist

Cards which are not desired in the facility can be detected at the devices with the DESIGNA system's **blacklist**. Cards can be put on the blacklist automatically by the system (**card not entered**) or manually. Blacklist cards are, according to the device configuration, either refused, withdrawn and/or deleted.

Blacklist check

The **blacklist check** can be switched on or off for each device. In principle, the blacklist-check should be switched on: the device takes the blacklist entries into account and rejects or withdraws listed cards. If the blacklist-check is switched off the device also accepts blacklisted cards.

C

Card not entered

The DESIGNA system judges a ticket to be a **card not entered** if only a ticket is taken without an actual entry occurring. The taken ticket is registered immediately as a **card not entered** at the **System server** and this message is then transferred from the System server to all the devices; thus if an attempt is made to use the ticket it is rejected as "invalid".

Charging

Charging is a **value card** function. The decision whether value cards should be charged or not is set during the setting of the **item** value card. The "chargeability" of value cards allows the customer to book a new cash amount onto the card when the original value has been used up. A **partial charging** is also possible: subject to a license

NOTE: The item which has been activated with the setting *Use at TCC/SBC* is used when charging cards at automatic pay stations.

The payment device must be **online** to charge barcode value cards.

Compressed air

In order to clean sensitive operating elements in DESIGNA system devices (Multicon or similar devices), it is recommended to use a **compressed air** spray can. By using the spray can, it is possible to remove dust particles, snippets of paper etc. from the device.

NOTICE: When cleaning with compressed air, always make sure that the nozzle of the compressed air equipment is ***not*** aimed inside the device and that snippets of paper do not enter the ticket guides.

Suitable cleaning material: see DESIGNA Consumables Catalogue

Congress ticket

Congress tickets entitle repeated entrances and exits free of charge during a set time period. They can be purchased by an organizer before an event (conferences, trade fairs) at a set price and sent to the participants in advance.

Some item details can only be checked **online** in barcode systems (e.g. validity). Therefore, barcode congress tickets are rejected **offline**.

Credited

Credited groups are groups whose incurred fees, after exceeding the **group time** (**additional payment**), are stored at the **System server** and thus can be invoiced at a later date (see operator manual "WebReport"). A credited group does not have to pay an **additional payment** immediately.

A pre-condition for invoicing additional payments of credited items is that the group has the property *Credited*. Recommended: Furthermore, make sure to enter the correct customer data, e.g. address and bank details, for all customers assigned with items with a credited group to ensure later settlement.

Customer related counting

By using **customer related counting** customers can be issued with several **season parker cards** but admission during one time period can be restricted to a specific number of cards (example: A customer wishes to have 4 car season parker cards but only rents 2 parking spaces).

D

DBS (also **System server):** see **System server**

Detector N/ Detector V

For a standard application with two loops, the loop N is located underneath the barrier arm as a closing loop and the loop V at the control device as a presence loop.

The signal from loop N is evaluated by the **detector N** and the signal from loop V by the **detector V** and relayed to the barrier control unit for processing.

Device configuration

The device properties are set in the **device configuration** when setting up new devices or when changing existing settings. These are device-specific parameters which can vary

according to the installed operating elements and define how the device should "behave" in the DESIGNA system. Device configuration is always carried out by your DESIGNA service.

Drive&pay (also KK-EC as STP)

The function **drive&pay** in the ABACUS system allows customers to enter and ***exit*** the car park with credit and other customer cards or with SmartCards. The entrance and exit times of the cards are recorded in the **System server** (card number) and subsequently invoiced or (with SmartCards) deducted when exiting. Furthermore, the payment of **short term parker tickets** is possible at an exit control terminal with the option Drive&pay.

NOTE: The function drive&pay does **not function offline**, i.e. for it to function there has to be communication with the System server.

Drive-through and usage message (greylist): see **Greylist** and **Usage message**

E

EasyMove

EasyMove is the name of the standard **RFID** system which is used for a hands-free entry check in the DESIGNA system: combined with an EasyMove antenna the EasyMove cards allow a hands-free entry and exit at a distance of up to 1 meter (depending on the antenna used). EasyMove cards, as with **value cards** or **season parker cards**, are a very convenient way of entering or exiting a car park.

Ethernet

Ethernet is a widespread and standardized communication infrastructure for local networks (**LAN**). All devices to be networked have their own IP (Internet Protocol) address, which is used for communication independent of the location. The consistent use of the Ethernet standard for all operating elements enables a diversity of access possibilities and networking types (e.g. fibre optics or wireless **LAN**).

Exit entitlement

Certain data is used to write an **exit entitlement** onto tickets after valid payment (magnetic strip systems: magnetically coded, barcode systems: printed at the ticket printer), or the entitlement is registered in the **System server** (e.g. RFID or credit cards) and checked at an exit control terminal.

F

Flexi cards

In some systems **value cards** are issued as **flexi cards**. Flexi cards, just like value cards, allow customers to utilize (“park”) an existing value without having to pay at an automatic pay station.

The flexi card allows to enter and exit as often as desired during a set time frame. The amount[15] is deducted form the flexi card during the first exit, every further parking process during the set time frame is free of charge.

The fee for using the flexi card depends on the set **payment type** (GID) in the tariff configuration.

Function cards

Function cards initiate certain functions at DESIGNA system devices. These are a set of cards which are obtained from DESIGNA with (pre-coded) functions for your system (see separate instructions “Function cards”) or which can be created at a later date at the **WinOperate**.

G

GID: see. **Payment type**

Greylist

In the DESIGNA system, the **greylist** registers conspicuous cards and reacts to their usage or drive through.

The cards can be allocated the message types **drive-through message** or **usage message**, thus triggering the corresponding **alarm messages** or other set reactions.

Groups, Group details: see **season parker groups** and **group time**

[15] The fee for using the flexi card depends on the set payment type (GID) in the tariff configuration.

Group time

With the help of **groups** it is possible to divide **season parkers** or other **items** with special online application into different groups for which different conditions are valid. This also includes the setting of the **group time**: the length of stay (if necessary, recorded in a contract) for which the customer pays a lump sum.

Thus, a customer who only wishes to use the car park at night can be offered a more reasonable price than a customer who wishes to use the car park 24 hours a day. It is possible to determine whether customers - outside their group time - are either not allowed to enter or are allowed to enter, but then have to pay a fee for the parking times outside the group time (additional payment).

Barcode season parker cards are rejected **offline**, unless configuration of the barcode system allows season parker cards to enter and exit the car park offline. However, the group time will not be checked offline: This means the season parker group is not restricted offline by group times.

H

Hands-free identification

The DESIGNA system supports various systems for the hands-free identification (also see **RFID**) of **season parkers** and **value card** users. The products range from proximity terminals with reading distances of several centimetres to hands-free applications with an operating range of 10 meters. All the systems are completely wear-free since they function without moving parts and electrical contacts.

Hopper

The *change unit* allows change to be given at the automatic payment system. The change unit is equipped with change holders, which are called **hoppers**. The hoppers are "numbered" for **device configuration** (clockwise).

Hotel (as hotel ticket registered cards)

A **hotel ticket** is issued by recoding a short term parker ticket at the manual pay station or at the application PAY manual touch station. After entering the guests' scheduled departure dates they can use the car park as often as desired until the set time.

Hotel tickets are not available for barcode systems.

I

ID medium

Various ID media can be used at the entrance and exit: paper ticket, RFID card, print@home ticket with QR Code (Quick Response Code), smartphone with QR Code, credit card; licence plate recognition, customer card or number code.

I/O check

The **I/O check** (Inside/Outside-Check) checks the **I/O identification** of the ticket: On the basis of the **TCC/SBC no.** it is possible to see at which device last use occurred.

If the ticket was last used at an entrance or pay station it is "inside" and next use, if the I/O check is switched on, has to occur at an exit. If the ticket was last used at an exit next use has to occur at an entrance or pay station.

The I/O-check can thus stop, e.g., several vehicles being taken out of the car park with one **season parker card**, because after using the card at an exit next use has to occur at an entrance or pay station.

If configuration of the barcode system allows season parker cards to enter and exit the car park **offline**, there is no offline I/O check.

I/O identification (wrong)

The last used device (**TCC/SBC no.**) is allocated to the ticket as the **I/O identification**.

If the **I/O check** is switched on the I/O identification is checked and tickets with **wrong I/O identification** are, depending on the **device configuration**, rejected and deleted or withdrawn. An I/O identification is wrong when the logical, alternating ticket pattern of "inside" and "outside" has not been observed (e.g. if two exits, one after the other, are attempted with the same ticket without an entrance having been used in the meantime).

Item

Items are set in order to issue cards of a **type of item** with various properties. The properties depend on the respective type of item.

In order to issue cards in the system, items which can be used at the car park have to at first be defined. Items are allocated to a customer, thus **preparing** a card in the system.

K

Keypad

Optionally, a number code can be used as the **ID medium** for **pre-bookings**. This number code is entered at the entrance via a **keypad**.

KK-EC as STP: see **drive&pay**

L

LAN

A **LAN** (Local Area Network) is a locally limited network under control of the owner. In the DESIGNA system, the **LAN** is the car park network achieved via **Ethernet**. This can include just the car park or also company units or networked partners (e.g. multi-facility centres).

Login group

In order to provide **users** with various user rights for the **WinOperate**, the **system logins** are allocated to various **login groups**. The login group specifies which functions are available for the logged in user. The various login groups are *DESIGNA, Administrator*, *Service personnel, Accounting personnel*, *Operating personnel* and *Staff*.

The login group "DESIGNA" has been set solely for your DESIGNA Service for service and remote maintenance purposes.

Lost ticket

A **lost ticket** can be issued to customers who claim to have lost their ticket. To avoid abuse of this function a price is usually charged which corresponds to the per diem rate.

Lost tickets can be issued with the function *Produce lost ticket* at the **WinOperate** or as a special function via a *Lost Ticket* push button at the automatic pay station. For this function an appropriate **Multicon** is necessary.

LPR

LPR (Licence Plate Recognition) is an image-processing technology used to identify vehicles by their licence plates. This technology is used in various security and traffic applications, such as access-control systems.

While the vehicle approaches the barrier, the LPR unit automatically reads and registers the licence plate. In the ABACUS system this licence plate data is used as ticket and receipt reference (in some countries required by tax authorities), or can be used for access authorization. In this case the data is compared to predefined lists: The system denies entry if e.g. the Card/ Vehicle allocation does not match or the barrier can open automatically for predefined VIP cards.

M

MAC address

The **MAC address** (Media Access Control address) is the hardware address of each individual **TCC/SBC** that is used for permanent identification of the device in the system. The MAC address is permanently assigned to the device and displayed on a sticker affixed to the TCC/SBC (also referred to as the "Ethernet ID" or "physical address").

Media change

A **media change** involves changing to a different **ID medium** at the entrance control terminal. The car park customer is identified, e.g. via a QR Code (Quick Response Code), and is issued a paper ticket directly at the terminal.

Multicon

The devices' (write/)read unit is known as **Multicon**. According to the desired function range and used technology (magnetic strip or barcode), it is necessary to have different versions of the Multicon:

For example, in order to offer the function "**lost ticket**" at the automatic payment system a Multicon with ticket insertion from the rear is necessary, or for credit card payments a Multicon with a "parking position" is necessary.

O

Offline

If a device is **offline** there is no communication between the **System server** and **TCC/SBC**, i.e. DESIGNA system’s data transmission is interrupted and no data exchange can occur.

Offline, capable of functioning offline

The ABACUS system is **capable of functioning offline** for standard functions: The devices carry on functioning in "stand-alone" operation in spite of the interrupted data line. All the accrued data at the device is accumulated in the TCC/SBC and transferred to the **System server** when online-standby is back on.

There is only a limited offline capability for barcode technology: Barcode tickets contain only partial information for processing.

Some of the other functions (RFID, credit card processing) are not capable of functioning offline: An intact data transmission between **TCC/SBC** and System server is needed[16].

One-use ticket

One-use tickets are issued at the MPS 120 and permit one exit: For example, a short term parker ticket used to enter the car park can be exchanged for a one-use ticket and the car park can be exited free of charge (also recommended: use of the function null ticket at MPS 120) or at a fixed price.

Some item details can only be checked **online** in barcode systems (e.g. validity). Therefore, barcode one-use tickets are rejected **offline**.

Online

If a device is **online** there is communication between the **System server** and **TCC/SBC**, i.e. the DESIGNA system's data transmission via **Ethernet** is intact and an exchange of data can take place.

Overpayment

Overpayment occurs if the parking fee is smaller than the inserted sum of money and no change can be returned at the automatic payment system (e.g. parking fee= EUR 2.30/ inserted amount= EUR 4.00 with 2x EUR 2.- coins; no change available. Overpayment= EUR 1.70).

P

Park app

The term **park app** is the abbreviation for car park application. Application refers to an application program installed on a smartphone or a tablet computer. A **park app** can be used to carry out **pre-bookings**.

Park cheque

Park cheques allocate parking entitlement with various temporal conditions. The parking entitlement information is coded onto a park cheque, which can then be used as an additional insert card with a **short term parker ticket** at the automatic or manual payment system (if necessary, also at the entrance control device when without a *recoding fee*). The short term parker ticket is recoded accordingly and, depending on the temporal conditions of the park cheque, allows the customer to enter and exit the car park.

Park cheques are not available for barcode systems.

Parking swindler: s. **Card not entered**

Partial charging

Partial charging is a function for **value cards**. The decision whether value cards should be partially charged or not is taken during the setting of **item** value card. The partial charging of value cards enables customers to book a new amount of money onto the card when the old value has run out (has been parked). This new amount can be fixed by the customer and can be less than the amount for a (full) **charging**. For this, the value is calculated with the price at a ratio of one to one. The possible issuing of discounts due to a favourable price/value ratio is not taken into consideration.

NOTE: The function partial charging is subject to a license.

The payment device must be **online** to carry out partial charging in a barcode system.

Payment type (GID)

Payment types are for example the standard tariff which is incurred, certain **types of item** or any functions for which further alternative tariffs have to be accessed (e.g. additional payment of **season parker cards**).

[16] Credit card payments (up to 7) can be accepted if the device is offline (actions are saved in the TCC/SBC). Recommended: Only accept credit card actions if the device is online (standard).

All the **payment types** which are possible in the DESIGNA are allocated a number (GID: Group Identification) and are set in the tariff configuration.

PiP

A **PiP** is "a car park within a car park" in the ABACUS system: An additional marked off area (e.g. using SPT 120 and a barrier) where the entrance is controlled.

Pre-booking

If the pre-booking option is available in the ABACUS system, car park customers can carry out **pre-bookings**: A planned stay in a car park can be booked and paid for in advance via a web application, e.g. at the car park operator's website, or via a smartphone **park app**. The **pre-booking** functions are subject to a licence and require customer-specific implementation.

Prepaid ticket

A **prepaid ticket** is issued for a set price and is valid until a pre-set exit time on the day of ticket issue. The short term parker tariff can also be the basic rate for a prepayment with a prepaid ticket.

Prepare cards

In order to issue cards in the system, **items** which you wish to offer in your car park have to at first be defined. Items are subsequently allocated to a customer, thus **preparing** a card in the system. To finally issue a prepared card to a customer, it has to be **produced**.

The cards are **prepared** in the function *Prepare cards* of the **WinOperate**, i.e. you allocate a previously defined **Item** to a customer.

Produce cards

In order to issue cards in the system, **items** are at first defined and subsequently **prepared** in the system. To finally issue a prepared card to a customer, it has to be **produced**, if necessary at a later date.

The cards are **produced** in the function *Produce cards* of the **WinOperate**, i.e. the data record from **prepare cards** is written onto a paper ticket or allocated to a card at the **System server** (e.g. plastic barcode cards and RFID). From this moment onwards the card is available as a "real" card and can be issued to the customer.

Promotional Codes

In the ABACUS system, promotional codes allow customers to use an **ID medium** (e.g. a barcode or a number code) more than once to enter the car park during a specified time period. Promotional codes can therefore be used for temporary special offers (e.g. specially priced parking due to a barcode published in a newspaper).

Promotional codes are defined with specific properties (e.g. valid period, car park and max. issue amount) and are stored in the system as **season parker cards**. The preparation of various **season parker groups** allows the assignment of numerous tariffs for a car park.

R

Renew

Renewing is a function for **season parker cards**. If a renewing is allowed *Before expiry, After expiry* or *Still allowed* for the item, the car park customers can renew their cards at the automatic pay station themselves during these times; before and after the validity of their cards expires.

The payment device must be **online** to carry out renewing in a barcode system.

Replacement ticket/ Manual replacement ticket

A **replacement ticket** is issued as an identical copy of a ticket which is no longer readable (magnetic strip or barcode no longer readable by the **Multicon**). The replacement ticket is based on the data of the original **short term parker ticket**.

For this, the data of the original short term parker ticket is entered at the WinOperate or at the MPS in order to retrieve it from the **system server**: At the MPS this is done according to the ticket's **serial no**. At the WinOperate this is done according to the ticket's serial no., its LPR identification (only optional **LPR**) or according to it's receipt no. This way a replacement is issued for the previously issued ticket. Usually, the replacement ticket has to be paid at a pay station before exiting (Exception: a replacement ticket is issued for a just paid short term parker ticket).

A **manual replacement ticket** can be issued at the WinOperate: For this, the **user** defines the desired data for producing a **replacement ticket**.

The data is created as for an entrance of a short term parker ticket (date, TCC/SBC and time). This way, a new, unpaid ticket is issued, whose entered entrance data will be valid for its subsequent payment. The manual replacement ticket has to be paid at a pay station before

exiting or it can be issued in a way that payment occurs immediately during **production** (at the pay station).

Reservation, With (diverse types of item)

The DESIGNA system provides **items with** and **without reservation**:

A certain number of parking spaces are reserved for items **with reservation** in order to guarantee a free parking space (e.g. specially marked spaces). Items **with reservation** are counted separately and can still enter the car park even if all the short term spaces are full and short term parkers and items **without reservation** are denied.

The **types of item season parker card**, **value card** and **congress ticket** can be assigned with reservation. This is done in *Manage items* of the **WinOperate**.

Reservation, Without (diverse types of item)

The DESIGNA system provides **items with** and **without reservation**:

Items without reservation are counted as **short term parkers** by the car park counters, i.e. in a car park occupied with short term parkers all subsequent cards without a reservation are refused entrance. The message "Car park occupied" appears on the display at the entrance.

Reset

In principle, there is a differentiation made between the following types of **resets** which produce different effects at the devices and in the system communication. A reset is selected from 6 various types of **Reset**.

- Reset 0
  Reset 0 causes a type of "cancellation": A current payment at an automatic payment system can be
  cancelled from **WinOperate**.
- Reset 1:
  Reset 1 puts some TCC/SBC processes in a basic condition.
  NOTE: This can cause operating irregularities as device component processes are not put in a basic condition. For this reason Reset 1 is not used in normal operation.
- Reset 2:
  Reset 2 causes the respective device to be switched on and off like during a "manual" restart. Recommendable for clearing smaller operating faults.
- Reset 3:
  Reset 3 causes configuration data to be transferred from the **System server** to the TCC/SBC
  Part of this configuration data is, e.g., price or group data.
- Reset 4:
  Reset 4 transfers the executing program for the individual control of a device to the TCC/SBC.
  NOTE: A Reset 4 deletes all the existing alarm messages in the TCC/SBC which have not been transferred to the System server.
  Before carrying out a Reset 4 use Reset 2 to make sure that all the alarm messages have been transferred (approx. 2 min in advance).
- Reset 8:
  Reset 8 is only used for service purposes during the new configuration of a TCC/SBC.

Resin-Free Oil

Only use **resin-free oil** to lubricate moving parts.

(Recommended: Ballistol oil spray, DESIGNA Ident. no. 8 815 057 000)

RFID

Radio Frequency Identification (**RFID**) enables the hands-free data registration and customer identification. RFID enables rapid processing (also of various systems, e.g. time recognition and entrance) and is maintenance-free.

An RFID system always consists of data media (**RFID** cards with chip and antenna) and a reading device (antenna and decoder/controller).

Magnetic or electromagnetic fields are used for data transmission.

S

SBC

A **SBC** is used in the DESIGNA system. The SBC manages and controls the device functions with the individual program of a device.

The SBC is centrally controlled by the **System server** and identified and addressed via IP addresses. Possible signal conversion for parallel device components (i.e. barriers) takes place via the optional module *I/O interface*.

Season parker (also SP)

Season parkers are customers who wish to use the car park over a longer period and usually pay the incurred fee as a lump sum in advance. They are neither fixed to a certain number of parking processes nor to a set parking duration.

Season parker cards

Season parker cards are issued with certain properties (price, validity, **group time**, with or without **reservation**) in order to offer the DESIGNA system's **season parkers** different conditions.

This is defined by creating various types of items **season parker card** and various **season parker groups**. These are then written onto the season parker card when **producing** (or allocated to a card at the **System server**).

Some item details can only be checked **online** in barcode systems (e.g. validity). Therefore, barcode season parker cards are rejected **offline**, unless configuration of the barcode system allows season parker cards to enter and exit the car park offline. However, this results in certain item details not being checked offline (e.g. validity, **group time** or **I/O identification**).

Season parker groups / Groups / Group details

Groups are usually set for **season parker cards** (**season parker groups**). Additionally, setting groups might also be necessary for other **types of item**, i.e. for their *special online application* (from version x15).

All the season parkers within the DESIGNA system can be divided into different groups (**season parker groups**) for which different conditions are set. For example, a season parker group can be restricted to parking at night. A maximum of 14 season parker groups with different properties can be active for each car park.

The different properties are summarized as **group details** and the group number is allocated to the **season parker card** (or to the other **types of item** with *special online application*).

Season parker with reservation/ without reservation: see **reservation**

Serial no.

Each ticket and each card produced in the system is allocated a precise **serial no.**. The serial no. can be used as successive numbers or in 3 blocks.

For **short term parker tickets** the serial no. is made up of the system no., TCC/SBC no. and the ticket no. It is allocated and printed onto the ticket at the entrance. The serial no. is requested in several functions to locate data sets (e.g. issuing of **replacement tickets** at the MPS or ticket tracking and issuing of replacement tickets at the **WinOperate**). In magnetic strip systems the serial no. is printed in line 1 of the printed ticket information (standard printing line for the entrance information) or can, according to the (Multicon) **configuration**, be printed in line 8 (extended ticket imprint of the entrance) (also see document “MC 120 TICKETS“ (specification of the tickets and their printed areas)). In barcode systems the ticket no. is not numbered consecutively and the serial no. needs to be set as printed in its own line in the Multicon configuration.

For **season parker cards**, **value cards** and **congress** tickets the serial no. is made up of the system no., TCC/SBC no. and the card no. which has been assigned when **preparing** the card. The serial no. of these **types of item** is only printed onto the tickets and cards if this is set accordingly at the WinOperate (*Manage items*) (***never*** print onto plastic cards).

Short term parker (also STP)

Short term parkers are customers who request a **short term parker ticket** at the entrance and enter the car park with this ticket. After paying the fee (at an automatic pay station or MPS as well as at an exit, see **drive&pay**) the customer can exit the car park. The fee depends on the parking duration and parking time.

Short term parker ticket

The **short term parker ticket** is issued to the user upon request when entering the car park (express entrance: automatically). The parking fee is calculated on the basis of the ticket's entrance data. The fee has to be paid prior to (or while) exiting.

Special income

Special incomes in the ABACUS system do not relate to parking fees but to other types of incomes, e.g. services such as car washing, car park security etc.

System login

Before **WinOperate** can be opened, thus allowing access to the DESIGNA system, the **user** has to provide identification. This occurs via the so-called **system login**, a combination of user name and password: A login window in which ID can be entered appears prior to the start. Menu items and functions can be switched off depending on the **login group**.

System server

The **System server** is the PC or the server platform for controlling, monitoring and administrating the parking system ABACUS.

The operating interface **WinOperate** is installed at the DESIGNA operating work station **WS 120** and communicates via **Ethernet** with the System server. The application WinOperate is located on the actual System server (DBS COMPACT and COMPACT PLUS) for smaller car park systems.

System times

In the DESIGNA system it is possible to define times as **system times**. These times influence the tariff calculation for each facility: e.g. *grace time* (time period by which a tariff step can be exceeded before the next tariff step is calculated), *lag time* (maximum length of stay in the facility after payment) or *free passing time* (a customer's maximum length of stay in the facility before payment is due at an exit device).

T

TCC

A **TCC** of type SCC or LCC is used in the DESIGNA system. The TCC with Linux operating system manages and controls the device functions with the individual program of a device.

All TCC are centrally controlled by the **System server** and identified and addressed via IP addresses. The internal device communication takes place via serial connections. Possible signal conversion for parallel device components (i.e. barriers) takes place via the optional module *I/O interface*.

TCC/SBC address/ TCC/SBC no.

TCC/SBC addresses are used in the DESIGNA system in order to enable a purposeful transfer of commands and programs and an identifiable data exchange between the device and the **System server**. These are configured according to the device features and are programmed at the **TCC** (the device and TCC/SBC **configuration** is usually carried out before delivery or by your DESIGNA Service).

The TCC/SBC address set at the TCC/SBC and configured in the System server corresponds to the **TCC/SBC no.** requested in many functions.

Theatre tariff

The **theatre tariff** allows you to charge a separate price at automatic pay stations[17] for **short term parker tickets** which enter the car park during a certain period, if the payment also occurs in this time period. Customers pay according to a defined price calculation (payment type (GID)) up until the specified exit time.

This ensures that payment can be carried out in advance, e.g. to prevent queues at pay stations after events.

The short term parker tickets can exit the car park until a specified time in the future. If a customer exits the car park after this specified time, the short term parker tariff is charged as additional payment.

Ticket medium

In the DESIGNA system, the **ticket medium** stands for the "carrier material" that transports unique data records. The unique data records (card ID) consist of a) the respective authorisation (e.g. event ticket, weekly ticket, staff card) and b) the user of this authorisation (e.g. customer, event, company, employee).

The ticket medium is linked to a unique ticket ID in the system.
Depending on the medium used by the car park customer for identification at the entrance, automatic pay station or exit, a corresponding system comparison is made to the authorisation assigned to the ticket medium. This can be, for example, the **serial number** of a ticket/card produced, the hash code of a credit card, the QR code content, the UIDs of RFID cards or the licence plate (for VIP or Ticketless).

[17] Depending on the device configuration, the theatre tariff can, e.g., be activated at just one pay station of a car park or by selecting it via the lost ticket button.

Time cheque: see **value and time cheque**

Time slot

Time slots help to statistically analyse parking processes in the DESIGNA system. They are used to divide and record the parked times into ranges. The parking durations can then be displayed with the *time slot statistic* of the **WebReport** application (e.g.: How many short term parkers use 2 or 4 hours as a parking duration?). Up to 50 time slots can be defined.

Token

Token are coins to which a certain value is allocated. The coin validator recognizes certain features of a token the same as it does with coins. Tokens are valued and processed as coins at the automatic pay station (not intended as change).

Tokens can be configured as *value tokens* or as *free tokens* (**device configuration**): A *value token* is allocated with a certain cash value. The value of a *free token* is set at the automatic pay station to the same amount as the incurred parking fee, thus allowing free parking.

Traffic jam detection

For **traffic jam detection** at the exits, the system monitors how well the lag time can be observed. This is achieved by continuously determining the average time required by car park customers from the pay station to the exit. If this average time and the lag time converge at an exit, the **alarm message** “Traffic jam at the exit" is generated (when the difference between the average time of the last 10 car park customers and the set lag time is less than 60 seconds).

It is possible to react to this alarm message by increasing the lag time by 20% at the affected exit via **WinOperate** or it can also be increased automatically by the system: There is a reduced risk of paid tickets losing their **exit entitlement**, resulting in further payments due to the jam.

If the average time and the already increased lag time also converge, the alarm message is regenerated and the lag time can be increased by another 20% at the affected exit via WinOperate or automatically by the system.

The increased lag time remains active at this exit until it is reset to the original lag time at WinOperate or automatically by the system.

Type of customer

Types of customer can be used in the DESIGNA system to divide the master data in *Manage customers* (**WinOperate**) into categories. This ensures that functions can only be available with assigned types of customer for certain **users**.

Type of item

The DESIGNA system provides numerous **types of item** (e.g. **season parker cards**, **value cards** and **function cards**) in order to cope with the needs of the car park customers.

U

Usage message and **drive-through message (greylist)**

In the DESIGNA system, the **greylist** registers conspicuous cards and reacts to their usage or drive through.

The cards can be allocated the message types **drive-through message** or **usage message**, thus triggering the corresponding **alarm messages** or other set reactions (*Manage cards/ Comments tab, Blacklist & Greylist* in **WinOperate**).

Cards or licence plates (only optional **LPR**) entered in the system with the **usage message** trigger the alarm message no. 213 or set reactions when ***used*** at any device (card insertion at the device or an **RFID** card request).

Cards or licence plates (only optional **LPR**) entered in the system with the **drive-through message** trigger the alarm message no. 186 or set reactions when ***driving through*** an entrance or exit.

These alarm messages (no. 213 and no. 186) are also individually set to ensure that usage or drive through of the card (or e.g. the entrance of a licence plate) is displayed as desired (*Set alarm messages* in **WinOperate**).

User

To ensure that only authorized personnel operate the system operating personnel have to register and deregister as a **user** prior to and after working at the **WinOperate**.

Users are registered as customers in *Manage customers* at the WinOperate and are allocated a **system login**. Menu items and functions can be switched off depending on the **login group**.

V

Valet Parking

Valet Parking refers to the parking of vehicles by an employee. The vehicle and the key are left with parking authorized staff (jockeys) at a central drop-off point. A jockey then parks the car on behalf of the owner and, when requested, returns it to the pick-up area. This parking service is offered, e.g., by hotels and airports.

Value and time cheque

Value cheques are tickets which are used as means of payment in the ABACUS system. A certain money value is assigned to the ticket which can be used as payment at the pay stations and some exits (only **drive& pay**).

In contrast to value cheques, a time value instead of a money value is coded onto **time cheque**. They can also be used as means of payment by reducing the incurred parking duration at the pay station or at an exit.

Value/Time cheques can be allocated to, e.g., participating shops by the facility operator in order for these shops to offer their customers reduced parking costs in the interest of customer retention. There are two different ways of charging the participating shops (or similar) for the value/time cheques:

- The assigned money/ time value is charged 100% when issuing or
- only the actual amount of money/time used by the customer is charged (e.g. for **overpayment** with value/time cheques).

The **device configuration** specifies whether just ***one*** value/time cheque can be used as a payment medium at the device or any number of cheques.

Some item details can only be checked **online** in the barcode system (e.g. validity). Therefore, barcode value cheques are rejected **offline**.

Value cards

Value cards are coded with a certain value (amount of money or time) and subsequently sold to the customers at a set price. The incurred parking fee or time is deducted from the value card when exiting. This has the advantage that the customer does not have to pay at the automatic pay station. The residual value of the card is shown on the display when entering and exiting. In addition to this, the value card can be used to offer the customer a concession by choosing a price which is less than the coded value.

Different properties can be issued for value cards: for example, the validity of the card can be set, a favourable value/price ratio issued or a later **charging** of the value card provided for if the value has run out.

Some item details can only be checked **online** in barcode systems (e.g. validity). Therefore, barcode value cards are rejected **offline**.

W

WebReport

WebReport enables professional statistical reporting of parking data in the DESIGNA system. Statistical values are analyzed rapidly, precisely and clearly.

Reporting of:

Time slot statistics, throughput statistics, occupancy statistics, turnover statistics, alarm statistics, operating report, cash book, value card balance, tariff switch card report, value cheques/ time cheque settlement, park cheque report, card lists, customer lists

WinOperate

The **WinOperate** is an easy-to-use graphical Windows® interface which allows the user to check, monitor and control processes in ABACUS as well as manage system data and present business figures.

The operating interface WinOperate is installed at a DESIGNA operating work station **WS 120**, which communicates via Ethernet with the **System server**. The application WinOperate is located on the System server DBS COMPACT and COMPACT PLUS for smaller car park systems.

WS 120 (also work station, operating PC)

The **WS 120** is the operating work station of the ABACUS parking system which communicates with the **System server** via **Ethernet**. In connection with WinOperate the WS 120 provides extensive monitoring, controlling, administrating and reporting functions. Several WS 120s can be networked and access the data and control of one car park.

The application WinOperate is located on the actual System server (DBS COMPACT and COMPACT PLUS) for smaller car park systems, a separate PC WS 120 operating work station is then not required.

21 Index

22 Version overview

Version 1.00, 10/2021 (SU)	Creation of the document