Manual

OPM-C60
OPP-C60

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1. Purpose

This specification details the integration of the terminal OPP-C60 into vending machines.

2. Scope

Customer, Integrators, Net Provider, (CCV-EW, SA, PM)

3. Terms and Abbreviations

BMP	Bitmap, pre-defined data field
COR	Contactless Only Reader
DK	Deutsche Kreditwirtschaft (formerly ZKA; http://www.die-deutsche-kreditwirtschaft.de/)
OPM	Outdoor Payment Module: This terminal is a multifunctional Terminal. It has no display or keyboard within the machine.
OPP	Outdoor PIN-Pad is a secure multifunctional terminal for installation in machine for indoor and outdoor use.
COR-Bxx	describes the contactless only reader combined with a chip reader
COR-Cxx	describes the contactless only reader
OPP-C60s	OPP-C60$_{\mathbf{s}\text{tandard}}$ with front cut-off 199*140mm (OPP-A40/B50)
OPP-C60c	OPP-C60$_{\mathbf{c}\text{ompact}}$ with front cut-off 141*92mm
OPP-C60m	OPP-C60$_{\mathbf{7000}}$ with front cut-off 196*132mm
PM	Product Management
SA	Sales
SCR	Secure-Card-Reader
TA	Tankautomat (Auto fuel terminal)
TMS	Terminal Configuration Server (Server responsible for software-updates)
TS3	Terminal Supervisor 3
WA	Warenautomat (Vending Machine)
ZKA	Zentraler Kreditausschuss (look at DK)
SAM	Merchant Secure Access Module
RDT/DFÜ	Remote Data Transmission
nWAKE	**n**egative **Wake**up signal (bidirectionally (input *and* output): Each connected MDB device can pull this line low to wakeup all other devices on the bus
EMC	Electromagnetic compatibility

4. Responsibilities

The Product Management group (PM) is accountable for the maintenance of this specification.

5. Characteristics

5.1 Safety Information

- The system handbook should be studied before integrating the product into vending machines, as this contains important information regarding installation.
- Damage resulting from not following the guidelines or from incorrect operation will void the guarantee. No liability will be accepted for any consequential damage.
- No liability will be accepted for damage or injury resulting from incorrect operation or from failure to observe the safety guidelines.
- Integration of the product may only be carried out of qualified by electrical specialists (i.e. electrician), according to the relevant regulations (i.e. VDE, CE).
- If you have no specialist knowledge regarding the installation, do not carry this out yourself. Installation should only be carried out by a qualified specialist.

Never remove the power supply or the card-reader from terminal, whilst this is performing a payment or other active functions (i.e. display indication „please wait...“). Please contact your network provider if such a message appears for a longer period.

- Change the card-reader only if the power supply is disconnected.
- The terminal is certified for cashless payments in various countries, dependent on the network provider / acquirer. Operation outside of Germany is to be agreed in consultation with the relevant trade partner.
- Never try to open the terminal. Unauthorized opening leads to deletion of all secure data, activating the fraud function and setting the terminal out of order. This also voids the warranty.
- Never submerge the terminal in water, throw into fire or expose to high humidity. The device should be cleaned with a soft damp cloth. Do not use chemical cleaners.
- Repairs may only be performed by authorized agents of CCV.
- Do not expose the device to temperatures outside the approved limits.

- Keep sufficient distance to mobile phones and wireless devices because these may cause interference. This is not necessary for devices that are able to perform a contactless transaction (e.g. mobile with NFC interface).
- Please obtain regular information about available and/or necessary updates or product extensions (Hotline of your network operator).
- Following software updates, telephone installation changes, or other changes to the terminal the complete payment operation including closing should be tested.
- Damage to or removal of the identification labels and seals on the equipment will void your warranty.

One mounting screw of the terminal must be connected with the grounding of the local electrical system. The grounding must not be connected to a floating ground or a phase (see chapter Installation Instructions.

5.2 Important information for use

5.2.1 Important integrator co-operation obligations

The installation instructions as described in the system manual must be followed, particularly in view of mechanical, electrical and operational guidelines (ESD-electrical grounding).

- Check the integrity of the Terminal. Check if the Terminal shows damage and manipulation and the seal is unbroken. If you detect damage, tampering or a broken seal do not operate the Terminal. Contact the support at profiline@de.ccv.eu.
- Important! Please ensure that the terminal is connected, configured and tested so as to execute updates via remote maintenance server TMS. Please also ensure possibility that updates can be initiated via the vending machine interface or the network-provider. In installation lacking a network connection where remote maintenance is not possible, it must be ensured that the integrator carries out on-site updates using Terminal Supervisor 3 or USB and that additional costs will occur.
- It must be ensured that software tools (Terminal Supervisor 3, Updatempp, etc.) are regularly updated. The current versions are available from the CCV download server. (https://download.ccv-deutschland.de)
- CCV points out that regular operational and security relevant updates could be required. Not carrying out these updates can lead to loss of approval and/or malfunction. CCV notifies of necessary updates in an appropriate time of period via release-notes. The provision of updates during the guarantee period is free. CCV is not liable for malfunctions or damage caused by lack of maintenance updates or maintenance errors due to the customer.
- CCV supports you during the initial installation of the product into vending- or other machine, and recommends a joint check of your vending-machine/terminal integration on-site prior to piloting, so that

typical problems can be eliminated in advance. Please contact you reseller or CCV directly for details of this.

- Following expiry of the warranty period it is possible to purchase software-updates or a part of a previously contracted software maintenance contract. Necessary updates are documented in the release-notes. Software-updates are generally only available for a fee. Further details are available in consultation with your sales partner.

5.2.2 Cleaning OPP and OPM

Clean the cabinet of the terminals with a slightly damp cloth or an antistatic cloth. Please do not use chemical cleaners. Never use petrol, thinner or other solvents for cleaning the housing, otherwise deformation and discoloration can occur on the housing.

5.2.3 Cleaning Card Reader for smartcards/ magnetic stripe cards

Clean the smartcard/ magnetic stripe reader (for example SCR-C60) regularly with a cleaning card to prevent read errors. The cleaning intervals depend on the frequency of use and on the ambient conditions. Please do not use chemical cleaners. For cleaning the front of the card reader please use a slightly damp cloth or antistatic cloth.

The following intervals should serve as a guideline:
- Indoor device: 1 * weekly
- Outdoor device: 1 * daily

5.2.4 Warranty

Caution

Do not try to repair or to open the terminals card reader. Opening the device will void the warranty. The device will be no longer functional and must be replaced. In case of damage, please contact your service provider.

5.3 System description

The multifunctional OPP-C60 and OPM-C60 are as an evolution of the OPP-B50 tailor-made payment system for vending machines, tank machines, service machines and kiosk, where it is used as a compact and fully

functional terminal. A more compact design is available as the OPP-C60 Compact, which requires a smaller installation footprint with the same functionality.

The multifunctional OPP-C60 consists of a separated card reader and a highly integrated PIN-Pad as the main device of the Systems. Next to the built-in LAN port, diverse communications can be realized via USB connections such as ISDN or GPRS. For this purpose the device does not even to be removed.

Otherwise, no more additional components are required in the machine (besides the card reader and receipt printer) the cost of integration in an automatic system is reduced to a minimum.

The elegant OPP-C60 with is front in vertically brushed stainless steel, a high resolution graphical LCD display and one for the purpose optimally tuned keyboard is based on a forward-looking hardware platform, the highest quality standards sufficient and due to their design offers a high level of security. It is vandal-resistant, weather resistant and can be used in an extended temperature range. The OPP-C60 is beside the Indoor use ideal for Outdoor use. The OPP-C60 Standard requires the same mounting cutout and the same mounting points as the OPP-A40 und OPP-B50. Therefore, it can be used by integrators easily.
The terminals are conforming to the requirements of ZKA TA7.1 trader terminals. As a pioneering hardware platform with extensive storage facilities it offers not only a variety of uses, but can also be updated at any time by a Software-Download to add new software features and functionality
The intelligent software update concept offers maximum reliability. To the very best service concepts (exp. Terminal supervisor and terminal management system TMS) were adopted at this point. Thus, it offers maximum investment security.

5.4 Payment methods

With the terminals following payment methods can be performed:

OPP-C60

- girocard, Maestro, V PAY,
- ELV (Lastschriftverfahren, Debit process)
- Online-Lastschriftverfahren (Online Debit process)
- Credit cards (e.g. Mastercard, VISA, American Express, Diners, JCB)
- Station- and Fleet Cards (optional)
- Various loyalty cards can be added with card profiles
- GeldKarte (optional)
- The processing of various contactless cards is possible in combination with the COR contactless reader.

OPM-C60

- girocard, Maestro, V PAY
- Credit cards (e.g. Mastercard, VISA, American Express, Diners, JCB)
- Several customer chip cards; additional over card profiles
- GeldKarte (optional)

- The processing of various contactless cards is possible in combination with the COR contactless reader
- In combination with the COR-B20 reader several contacted payment applications can be used without PIN.

5.5 User Interface

The user of the OPP-C60 can get along easily with the terminals. The easy to use interface and the textual information on the big graphic display will help with it. The OPM-C60 can be comfortably administrated with the TS3 that can be downloaded for free.
The terminals can be used as unattended terminal (e.g. vending machine or petrol vending machine) and as attended terminal preferably in rough environments (extended temperature range, splash and vandalism).

5.6 Certifications

- ZKA TA7.1 as attended and unattended payment terminal
- EMV Level 1 and Level 2
- PCI-PTS 3.0 (with the SCR-B PCI 3.x)
- PCI-PTS 5.x (via software update for OPP-C60 compact)
- DC-POS 2.5 (also with DC-POS 2.4)

5.7 General technical information

5.7.1 Interfaces for vending machines and ECR

The ECR connection can be established via the LAN, MDB (optional in preparation) or RS232 interface.

- RS232 interface: Maximum transmission speed up to 115.200 Baud and Hardware-Handshake are possible.
- LAN: Ethernet 10Base-T und 100Base-T, full duplex.
- MDB (Multi-Drop-Bus): 9600 Baud interface format for vending machines.

The serial protocol ZVT-ECR interface will mostly be used. The advantage of ZVT-ECR interface that it is supported by almost all automated systems.

Die O.P.I. Interface is can also be used for vending and ticketing machines.
The OPP-C60 is ready to be used with the MDB interface.

The terminals have the special advantage, that the connection to a machine (e.g. vending machine) can be used with different interface transmission speeds (19.200, 38.400, 115.200 Baud).

5.7.2 Keyboard OPP-C60s/m

The PIN pad of the OPP-C60s / m is equipped with a vandal proof, high quality stainless steel keyboard with 20 keys, 4 of soft keys (F1 - F4). The keys are equipped with tactile and audible feedback by sound and embossing according to the specification “EBS100V3 – October 2004” of ECBS.

5.7.3 Keyboard OPP-C60c

The PIN-Pad of the OPP-C60c is equipped with a vandal proof, high-quality stainless steel keyboard with 16 keys. The keys are equipped with tactile and audible feedback by sound and embossing according to the specification „EBS100V3 – October 2004“ of ECBS .

5.7.4 Display

320*240 pixels, full graphics display with adjustable, high contrast and wide viewing angle. No slowdown of the display at low temperatures.

OPP-C60s/m: 3,5“ TFT Color display, Active Size 72,7*54,3mm
OPP-C60c: 2,7“ TFT Color display, Active Size 58,3*43,9mm

5.7.5 Receipt Printer

The receipt will be printed by the machines printer (e.g. vending machine). It is controlled via the machine control system.
The machine (e.g. vending machine) is getting all information from the OPP-C60 / OPM-C60 that is needed to print the receipt either as a complete receipt or as a data message containing all relevant data to generate the receipt.

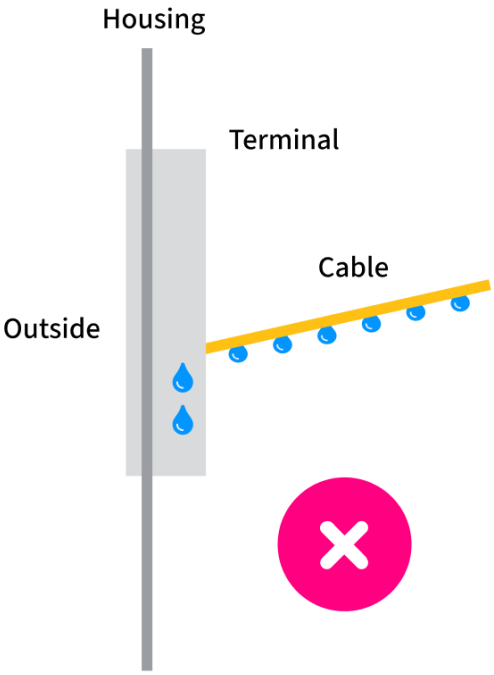
5.7.6 IP/IK-Codes

In the table below there are the IP and IK Codes for the OPP, OPM and the card readers. The IP-Codes are separated in the front side and Rear side of the device. The IK-Codes for the display is different to the keyboard. There for there are two different IK-Codes mentioned in the table. The first is for the keyboard and the second is for the display.

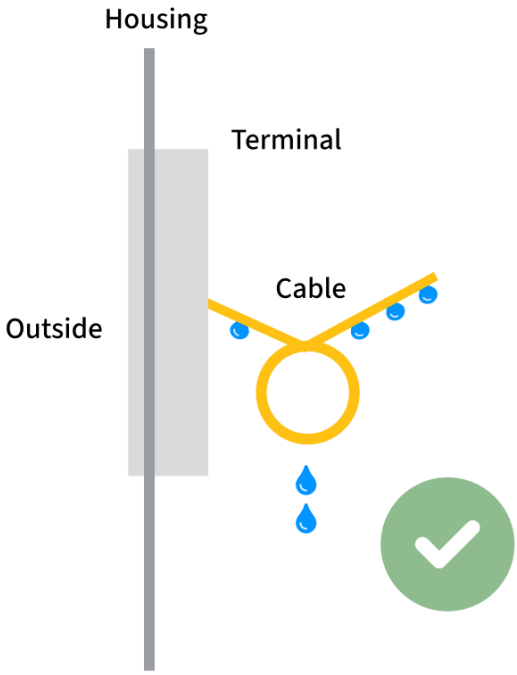
Product	Front side	Rear side
OPP-C60 S/M/C	IP 65 / IK 10 / IK 8	IP 21
OPM-C60	IP 21	IP 21
SCR-B	IP 32 / IK 10	IP 21
SCR-C	IP 32 / IK 10	IP 32
SCR-C NB, NBS	IP 34 / IK 10	IP 32
COR-A10, -A12, -A20	IP 65 / IK 7	IP 20
COR-B20	IP 32 / IK 7	IP 20

5.7.7 Cable feeding to prevent condensate dripping into device

In order to protect the terminal and reader from water, the cables must be attached in such a way that water (e.g. moisture, condensation) cannot flow down the cable from above to the device as a result of gravity.



Condensate is fed directly into terminal



Condensate is fed outside terminal

5.7.8 OPP / OPM Status LED

There are two status LEDs at the rear side of the OPP / OPM, “PWR” (Power) and “STA” (Status), which has the following meanings.

Status	PWR heating off (green, PWR)	PWR heating on (orange, PWR)	STA (rot, controllable)
Boot process	permanently on	permanently on	permanently on
Terminal ready, waiting for login	permanently on	permanently on	2x slowly blinking, 2x fast blinking
Terminal ready, login successful	permanently on	permanently on	off
SecureLink/4eye to reader not active	permanently on	permanently on	1x slowly, 1x fast
Startup lock	permanently on	permanently on	1x slowly, 2x fast
Initialization lock / Diagnosis lock	permanently on	permanently on	1x slowly, 3x fast
Fraud	permanently on	permanently on	fast blinking
Not identified / other error	permanently on	permanently on	slowly blinking

5.7.9 Contacted reader SCR-C

The SCR-C, SCR-C NB (new bezel) and SCR-C NBS (new bezel with shutter) is a hybrid card reader for all common card types.
The integration into tank machines, vending machines as well as further machines in connection with the outdoor-terminal OPP-B50 are the ideal fields of use. The SCR-C has three LEDs for the communication with the user.
Following the technical data and interfaces of the SCR-C are described.

Notice
The SCR-C must be grounded by a grounding wire (min. diameter 2.5 mm^2) at one of the four mounting screws
In case of power disconnection or a software crash, the card can be pulled out of the reader against resistance.

5.7.9.1 Certificates

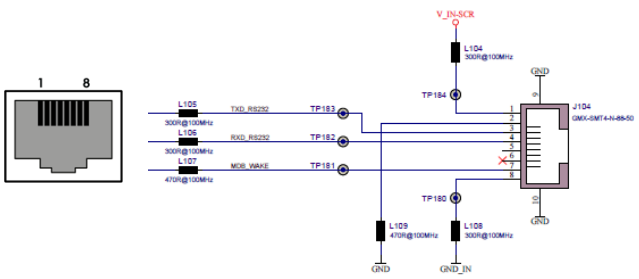
The certificates for pollution control and waste prevention are also listed below.

- ZKA TA 7.1 and DC POS 2.5
- leant to the EVA-CVS specifications for unattended terminals
- PCI 2.1 in connection with the OPP-B50 and PCI 3.1 with the OPP-C60 (expertise by T-Systems)
- EFT-POS C-TAP conform
- PCI+ conform (Dutch domestic)
- eft/pos 2000 conform
- MasterCard TQM Label
- EMVL1 Type Approval
- EMVL2 Type Approval
- CE-Approval
- RoHS compliant
- WEEE

5.7.9.2 Connection

Connection to OPP-C60 / OPM-C60 Connector: RJ45 8-poles, shielded

Pin	Signal
1	power in
2	GND
3	TxD (output)
4	RxD (input)
5	Not connected
6	Not connected
7	Wakeup
8	GND



5.7.9.3 LED status indicators at SCR-C

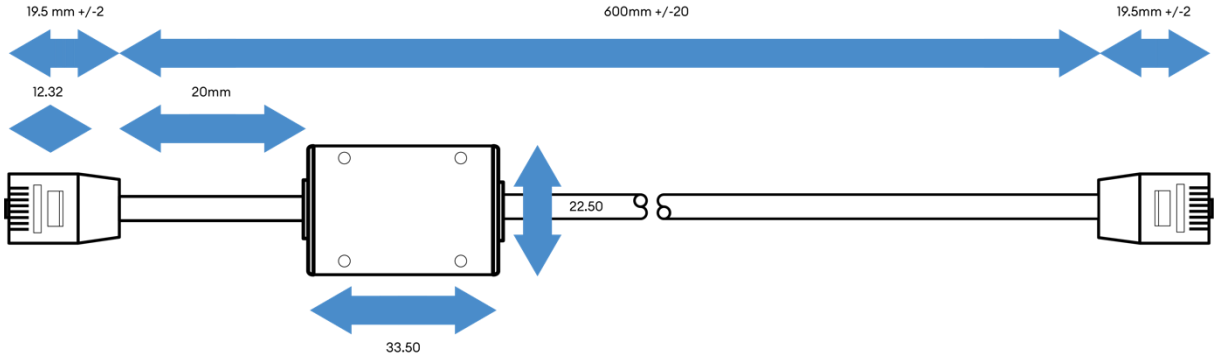
Function	Terminal type	Condition	LED Indicators
Startup SCR-C	All	No	All LED off
Fraud	All	No	Red LED interval blinking, 100ms on, 900ms off
4eye activation needed	All	Card locked	Yellow LED interval blinking, 100ms on, 900ms off
Sleep Mode	All	No	All LED off

5.7.10 Contacless reader COR

COR contactless readers can be used with the OPP-C60 and the OPM-C60. A certification is available for the combination OPP-C60 + COR-A10/12/20 and OPM-C60 + COR-A10/12/20 / COR-B20. **The OPP-C60 must not be used with COR-B20!** The OPM-C60 does **not require** a 4-eye-activation.

COR-A10/12 (contactless only)	COR-A20 (as A10 plus Display)	COR B20 (as A20 plus chip reader)
		

A cable with an infused ferrite can be found in the scope of supply. The following figure is showing the cable from OPP-C60 / OPM-C60 to the COR reader (the ferrite is infused in the cable part to the COR).



a) Description

SN	Designation	Name & Type	Qty
1	Connector	U.S. PLUG 8P8C, Molded Pantone orange 165, Gold Plated 3U	1
2	Cabel	PU Jacket, 28AWG PP*4C, Black Shiny	1
3	Connector	U.S. PLUG 8P8C, Molded Pantone Yellow 107, Gold Plated 3U	1

b) Wire List

P1	Color	PIN OUT DETAILS	P2
1	White	V_IN-OUT	1
2	Black	GND	2
3	Red	<= RS232	3
4	Green	=> RS232	4
7	Blue	Wake UP	7
8	Blue	GND_IN-OUT	8

Note: All cables have to pass electrical test.

5.7.10.1 General information about the COR

The COR provides the following IP protection classes.

- COR-A10, -A12, -A20
  - front panel IP65
  - back panel IP20

- COR-B20
  - back panel IP20
  - front panel IP32
    - 3 = foreign object size > 2.5mm diameter cannot entry
    - 2 = water drops with 15° angle have no effects of damage

Further information for COR-B20

Water can entry to the backside of the COR reader (inside the vending machine) over the card slot. The contacting unit of the COR is opened at the bottom side to let foreign objects fall out or to let invaded water flow out (this is needed to prevent a blockade of the contacting unit).

There should be mounted a drain sheet inside the vending machine under the COR-B20 to shield the electronics under the COR-B20.

The openings at the backside of the COR housing for connector plugs or flexible connectors are mounted above the contacting unit. So there is no possibility for water drops to entry in this area to the COR electronics over the card slot.

Only spray water or hose water could entry over some corners. Depending on the location where the COR is used we recommend to provide a protection board to prevent the device from soiling or spray water.

Information for the contacting unit of the COR-B20

- The contacting unit for the chip card is produced for 10 years in a large quantity. It is sophisticated very solid and is also used for outdoor applications.
- All materials of the contacting unit are water resistant (i.e. synthetics, high-grade steel, gold-plated contacts for contacting the chip and gold-plated contacts at the limit switch).
- There can only be problems with frozen contacts. If the card is put in more times the ice on the contacts will detach. For preventing the contacts of freezing we recommend to use a heating inside of the vending machine.

5.7.10.2 Viewing angle of the COR display

Respecting the tolerances of the hardware components and the mounting tolerances the following max. viewing angle for the COR can be given.

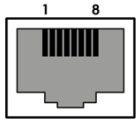
- max. viewing angle from top / bottom about 17° to the display normal
- max. viewing angle from left / right about 50° to the display normal

5.7.10.3 COR Interfaces

a) RS-232 Host Interface

High speed RS232 (default 115.2 kbps, switchable to 230.4, 460.8 or 921.6 kbps); RJ45; 8 pin shielded) without hardware handshake.
The RJ45 Connector is located at the bottom side of the COR and the maximum cable length is 100cm.

Pin	**Signal**
1	Vin (power supply)
2	GND
3	TxD (output)
4	RxD (input)
5	Not connected
6	Not connected
7	nWAKE (input/output)
8	Power GND



b) USB host interface

- USB 2.0 compatible, 12 MBps, USB function (slave)
- connector type: 5-pin Mini-B-Connector
- Power supply via RJ45 connector (VBUS not used for supply)
- Automatic wakeup, if VBUS is present

c) Interface selection

- If VBUS is active (5V): USB interface is selected

- VBUS is inactive (0V): RS232 interface is selected
- Only one interface is active at a time

Note that only the following product combinations are allowed:

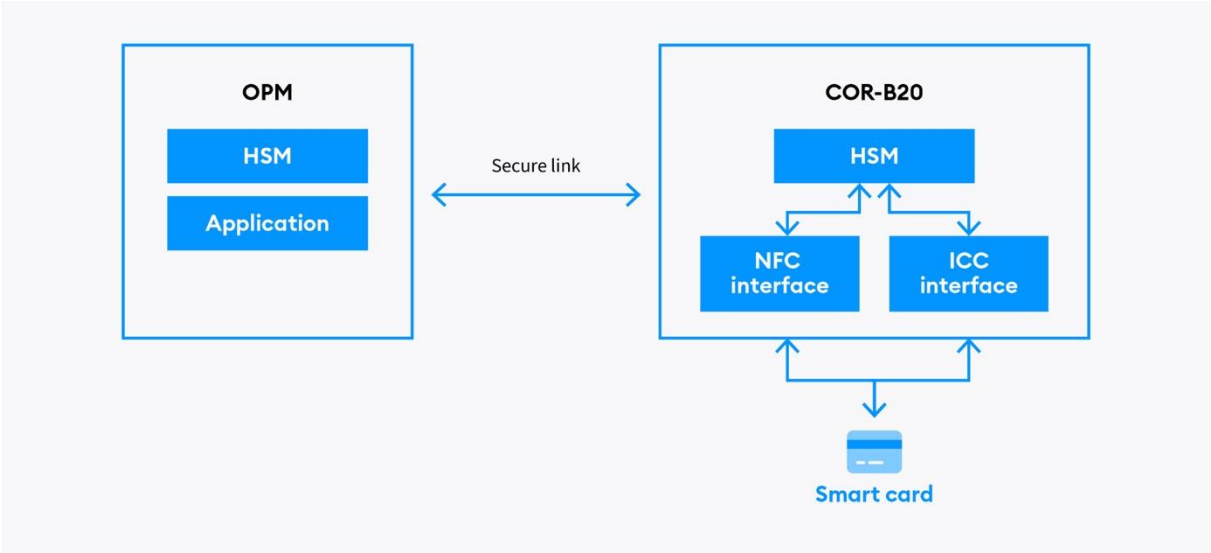
Comb.	Type of use	Master	Card Reader	Ctls Card Reader	PCI-PTS 3.x SRED
1	Full featured Chip&PIN solution with acceptance of magstripe, chip and contactless	OPP-C60	SCR-B SCR-C	COR-A10 or COR-A20	Yes
2	No-PIN solution **for low-value** payments	OPM	SCR-B SCR-C SCR-C NB SCR-C NBS	COR-A10 or COR-A20	Yes
3	No-PIN solution **for low-value** payments without SRED certification with acceptance of chip contact and contactless.	OPM	-	COR-B20	No

5.7.10.4 Security of COR-B20

The product combination #3 is foreseen special for the low-value payment market in segments parking, vending, ticketing. From a security point of view, the product COR-B20 + OPM is fulfilling the PCI-PTS 3.1 SRED requirements on contactless side as well, as on contactless side the card holder data have to be secured from the point of digitalization.

On the contact chip card reader, the COR-B20 is using all security mechanisms as well. In this context the COR-B20 is an non-encapsulated reader. From the point of digitalization all requirements of SRED are fulfilled.
The following picture is explaining this.

- Clear-text PIN requirements are not applicable as the reader never is combined with a PED.
- The security for card holder data is similar to the NFC, where this data are transferred in plain text as well.



5.7.11 4-eye Concep

OPP and reader must be coupled to a PCI compliant operation after installation in the machine with the terminals, so that disassembly of the devices leads to a temporary decommissioning. The devices have to be coupled again after the replacement (or exchange of the two devices). For this, both devices include built-in mounting buttons that signalize if it is mounted or not.

Note: Please perform a 4-eye-activation at the OPP before executing the automatic startup. The OPM-C60 does **not require** a 4-eye-activation.

5.7.12 Merchant SAM Slot

The OPP-C60 can use up to 2 Merchant SAM. For further information about the operating speed see chapter "Technical data").

Please change the merchant SAM in the following steps:

1. Execute reconciliation with closure to transfer all GeldKarte transactions to the host system.
2. Disconnect the device from the supply voltage.
3. Change the merchant SAM.
4. Reconnect the terminal to the power supply.

5.7.13 Communication

For online payment processing and service processes, the terminals are connected over an integrated LAN interface. It is possible to connect an external ISDN modem or GSM/GPRS communication module with the USB port.

The terminals support the following types of communication to the service provider:

- X.25 B-channel
- X.25 D-channel (X.31)
- X.75
- LAN
- Other Protocols on request

5.7.14 Interfaces

For several purposes the OPP-C60 has various interfaces that can be used.

The terminals have following interfaces for connecting external hardware:

- 4 RS-232 Ports:
    1. POS: Connection between terminals and vending machine or ECR.
    2. SCR: Connection between terminals and Secure Card Reader (SCR)
    3. COM: Connection to contactless reader (e.g. COR)
    4. MDB: (Multi-Drop-Bus): prepared for connection of vending machines with MDB-Protocol. Also includes a normal serial port (COM2).
- LAN-Interface: Ethernet, 10/100MBit, Auto MDIX.
  Communication protocol TCP/IP (more available on request) e.g. for Service-PC or Host connection.
- USB 2.0 OTG (High Speed 480MBit/s and Full Speed 12MBit/s) for Host and device connectivity (exp. Updates and. Configuration). USB Mini-B.
- USB 2.0 Host (Full Speed 12MBit/s connection e.g. of USB-to-ISDN Modules or other connections. USB-A Port.

Note: For more information about the interfaces and their pin assignments, please refer to chapter 6 of this.

5.7.15 Protocols

The following protocols are available with OPM-C60 and OPP C60 standard:

a) Interface protocols

- ZVT ECR Protocol
- O.P.I. (for Vending- and Ticketing machine)
- MDB (Multiple Drop Bus)
- Protocol for Terminal-Supervisor 3 und TMS
- TCP/IP

b) Host Protocols

- Poseidon
- Lavego
- CCV Pay

5.7.16 Software

The terminals are using a Linux operating system with the new SECpos EVO software from our company.

5.8 Service

5.8.1 Integration in ECR and vending machine systems

A development checkout with the following components is available to support the adaptation and integration on/in the cash Point:

OPI:

- Proven tools for IFSF / OPI integration with features such as ECR simulation and trace-program socket proxy, with which the interfaces can be monitored.

ZVT:

- Detailed Documentation of the ZVT-Protocols (Download via www.zvt-kassenschnittstelle.de).
- Integrator-Specification OPP-C60 and OPM-C60, with the specifics of the protocol implementation in chapter 6.
- ZVT-Kassensimulation

MDB:

- Detailed Documentation of the MDB-Protocols (Download via https://namanow.org/images/pdfs/technology/mdb_version_4-2.pdf)

5.8.2 Automatic startup

The terminals are supplied with a basic configuration. This is created with the network operator and allows an automatic initiation / startup of the terminal with entering terminal ID and a selection block number.
In this case also necessary dialing prefix automatically detected and subsequently stored in the device.
For special connections (e.g. LAN with VPN or DFÜ over cashier with external modem) can also the necessary setting manually performed.

Note: The degree of independent startup depends on the predetermined basic configuration of the network operator.

5.8.3 Software Update

The terminals offer a complete and reliable software download so that you do not need a technician on site. Automatic software updates can be performed via the terminal server Configuration (TMS).
This makes it very easy to upgrade the equipment with new features/applications and always keep all the stock actual.

The software update can selected either by the following three methods:

- **TMS**: Comfortable with the online connection via Terminal Configurations Server (TMS). The host can set the automatic selection of the terminals at TMS by TKM-command at arbitrary times. The merchant does not perform this operation step by step.
- **TS3**: With the free service software, Terminal Supervisor 3 ' via the service interface of the device - directly via USB or LAN connected to a PC or notebook.
- **Updatempp**: In contrast to TS3 no graphical user interface. Works with scripts through the ECR cash register.

Please do not disconnect the terminal from the power supply while the software activation is running. Otherwise the update could be activated incompletely and the terminal has to be sent in to load it completely new.

5.8.4 Maintenance

5.8.4.1 Tools

For Maintenance and service the following tools and options are available:

1. **TS3**
    - **Single access to one terminal** (direct connection)
    - Local access via LAN or USB
    - Remote access via remote control if the terminal has access to IP and port
    - For details please see TS3 manual
    - TMS maintenance call can be triggered via remote control

2. **Updatempp**
    - **Single access to one terminal**
    - Local access via LAN or USB
    - Remote access with scripts running on ECR cash register
    - In contrast to TS3 no graphical user interface. Works with scripts through the ECR cash register.

3. **TMS**
    - **Central, automated maintenance system for the entire field inventory**
    - **Attention! Terminal software** at least **02.0057.xx.xx or higher is required.** Current software versions automatically and cyclically contact the TMS (so-called **“**hearbeatcall“). Older software versions must be updated accordingly to a current version – this means that there is a cyclical (standard setting every 7 days) heartbeatcall to the TMS.
    - **Attention!** For maintainability, the cash register must regularly send status queries (status polls) to the terminal. This is the only way for the terminal to briefly receive master rights and to establish a connection to the maintenance system.

- Works in separate clients
- Simple and intuitive operation via browser
- Features: software updates, configuration changes, reading logs, loading keys and managing the terminal inventory
- For details pleas see TMS manual

4. **ECR cash register**
    - ZVT, O.P.I. and MDB
    - Limited options for transporting changes via the ECR cash register interface
    - TMS maintenance call can be triggered via the cash register interface
    - **Attention!** For maintainability, the cash register must regularly send status queries (status polls) to the terminal. This is the only way for the terminal to briefly receive master rights and to establish a connection to the maintenance system.
    - For details please see CCV specification of supported commands

5. **Terminal menu**
    - Limited options for changing settings via the terminal menu
    - Rights & rolls – cashier, manager and technician
    - TMS maintenance call can be triggered by menu (Reboot -->press “Info“ button when „menu“ is displayed at the bottom left -->enter PIN -->Service -->maintenance call
    - For details please see menu tree

6. **Network operator**
    - Configuration of the terminal using configuration diagnosis and EMV diagnostics (controls the behavior of the terminal such as possible payment methods)
    - 4 digit host version number is transferred to network operation during initialization and controls the subsequent processes such as extended diagnosis and EMV diagnosis

We recommend setting software updates or configuration changes via a TMS job. Its easy and effective. The processing takes place via the automated heartbeat call, so that no extra trigger is required for the maintenance call.

5.8.4.2 Status query

Please ensure on the part of the cash register that a status poll is carried out regularly. This is the only way for the terminal to briefly receive master rights and to establish a connection to the maintenance system.

5.8.4.3 TMS target

Attention

For the maintainability of the terminal, it is also **essential** to ensure that the **TMS target can be reached** (firewall, VPN...). The TMS target is:

- IP 80.72.137.22
- Port 1260 (without TLS encryption)/ 1270 (with TLS encryption)

Is this not the case, no updates can be carried out remotely via the TMS and laborious and expensive on-site operation may be required. **If the TMS maintenance system cannot be reached, CCV assumes no liability for any costs incurred.**

5.8.4.4 SIM card

If the data connection is established via a corresponding cellular network using a SIM card, it must be ensured that a suitable cost model is selected. SIM cards with a small MB volume are not suitable here, as approx. 25MB data are transferred during a software update.

5.8.5 Terminal Security State (TSS)

The TSS is displayed at the boot sequence and a 4-digit hexadecimal value. The first two digits of the Terminal Security State are for the affected component. The last two digits stand for the state of this component.
The TSS for an operational terminal is “0x0000”. The following table show selected TSS and the resulting actions for the technician.

Terminal Security State	Action
0x0000➔ Terminal ready	No action needed
0x0102 ➔ 4eye activation necessary	4eye activation take through
0x0111 ➔ Frauds in terminal detected	Terminal must be replaced
0x0112 ➔ No keys in terminal stored	Terminal must be replaced
0x0113 ➔ No SCR-C connected	Connect SCR-C
0x0114 ➔ Terminal blocked	Terminal must be replaced
0x0202 ➔ 4eye activation necessary	4eye activation take through
0x0212 ➔ No keys in card reader (SCR-C) stored	SCR-C must be replaced
0x0213 ➔ No SCR-C connected	Connect SCR-C
0x0214 ➔ No key exchange between terminal and card reader possible	SCR-C must be replaced
0x0301 ➔ incorrect configuration	Activate COR in terminal configuration
0x0312 ➔ No keys in COR reader stored	COR must be replaced
0xFF01 ➔ several affected components	Connect card reader (SCR-C and COR)

5.9 Extensions

The advanced hardware platform of the terminals offers a variety of options for expansion and therefore new applications.

The following optional extensions can be offered in addition:

- New payment methods

- Customer cards (Magnetic stripe)
- Custumer cards (Chip)
- Bonus card applications
- Contactless applications

Just talk us about your planned project so that we can check the feasibility.

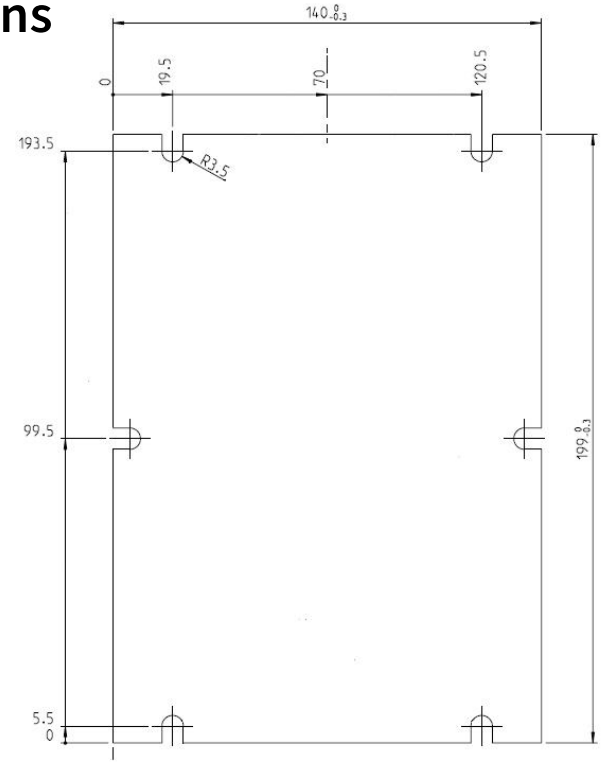
5.10 Certification

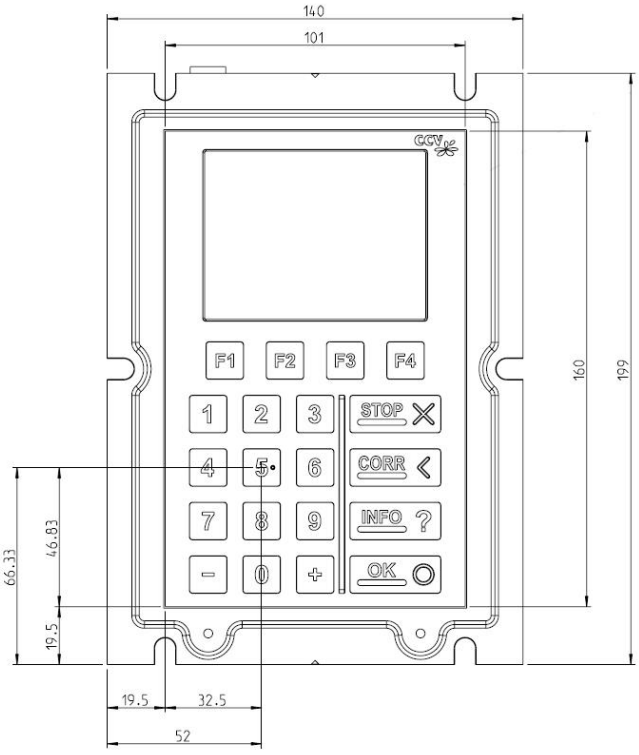
- ZKA TA7.1
- DC-POS 2.5 (also used with DC-POS 2.4)
- EMV2000 (EMV 4.0) Level 1 und Level 2
- PCI version 3.x (in connection with the SCR-B 3.x)
- PCI-PTS 5.x (via software update for OPP-C60 compact)
- CE: Directive 93/68/EWG of the European Parliament and of the Council from 22. July 1993 (CE)
- WEEE: Directive of the European Parliament and of the Council to reduce the electrical drop (WEEE 2002/96/EG)
- RoHS: Directive of the European Parliament and of the Council on the restriction of use of certain dangerous substances in electrical and electronic equipment (RoHS 2002/95/EG)

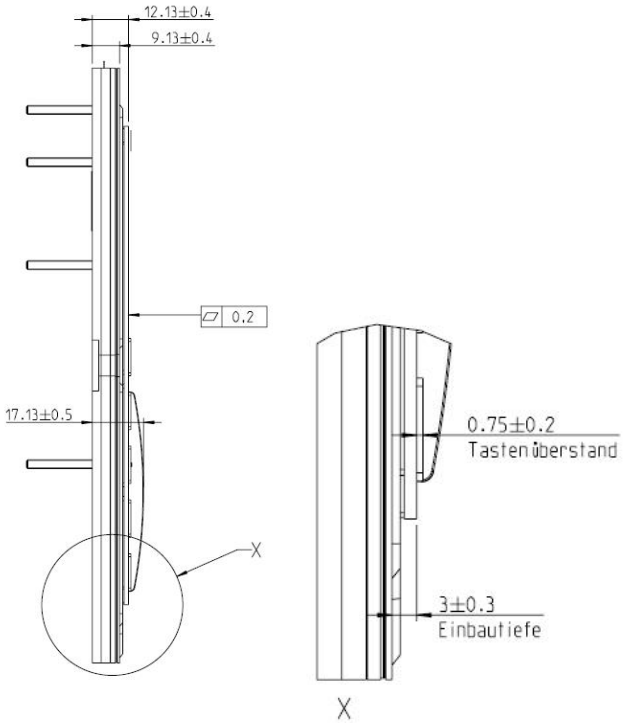
6. Technical Data

6.1 Images and Dimensions

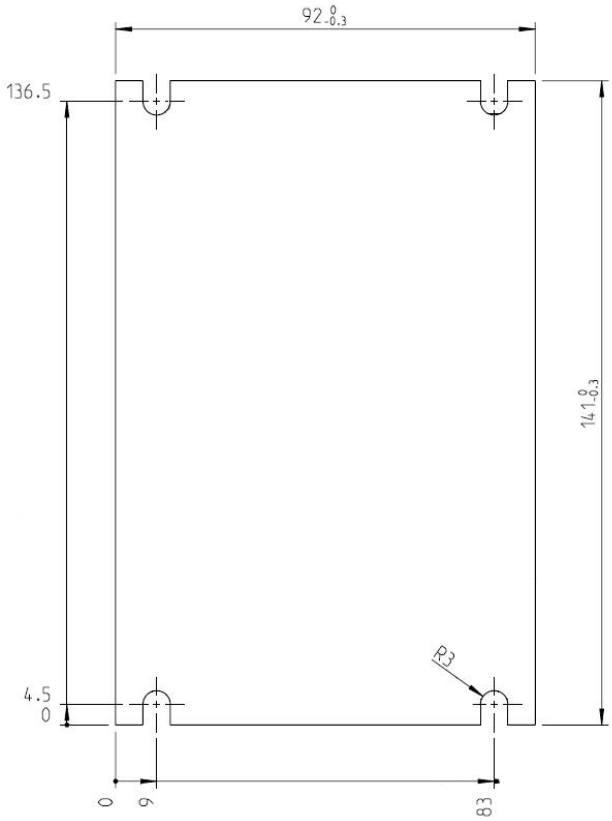
6.1.1 OPP-C60s (Standard)

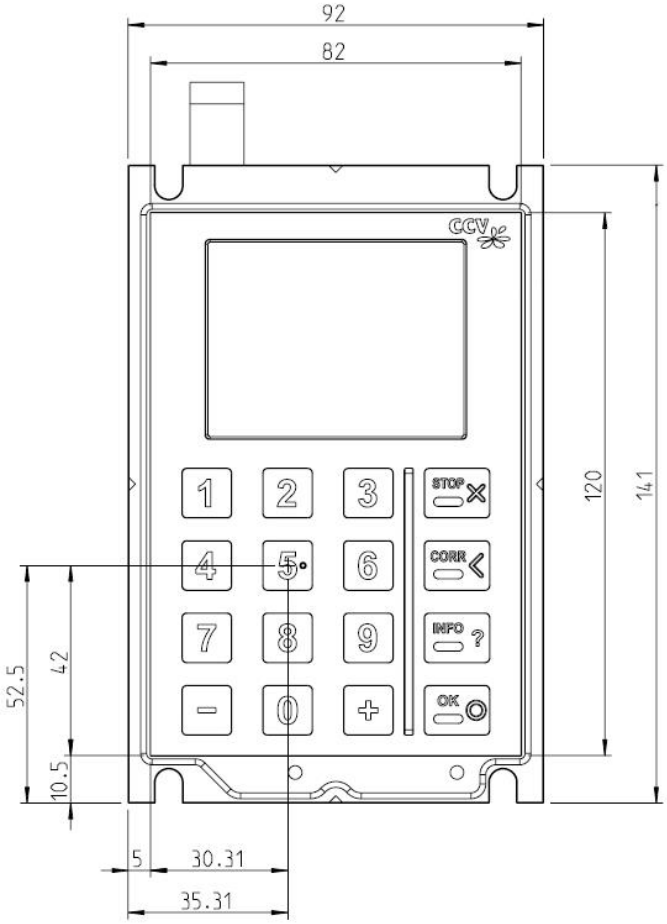


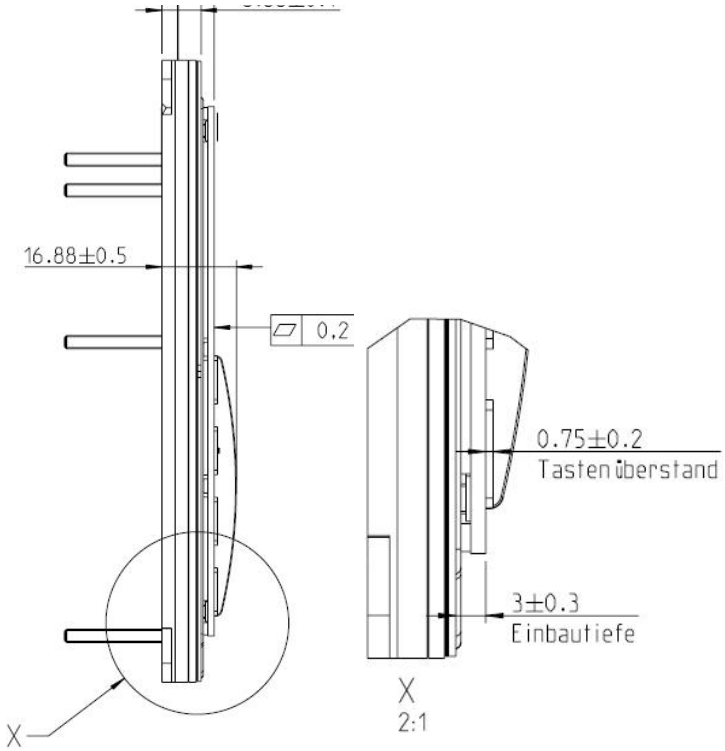




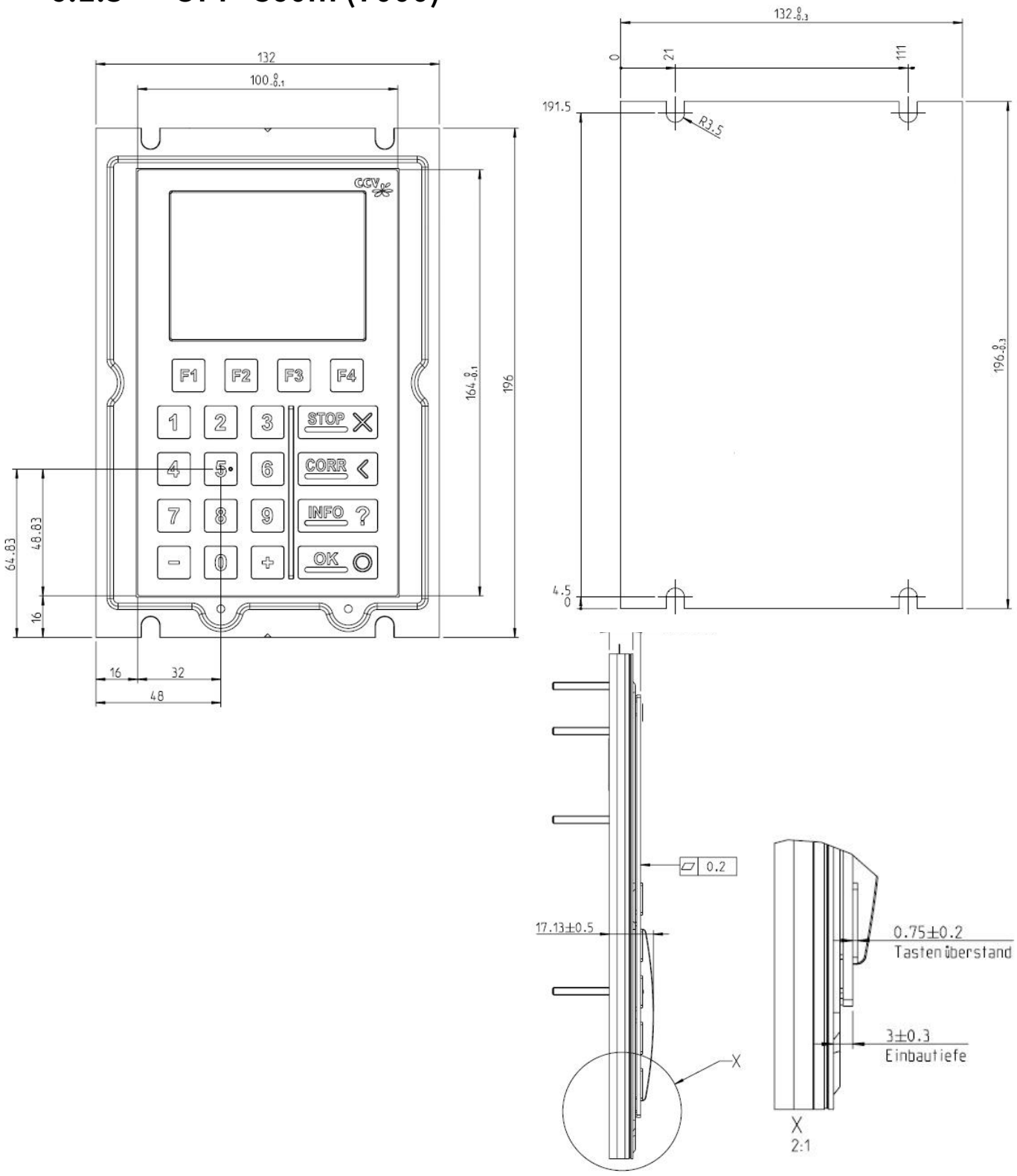
6.1.2 OPP-C60c (Compact)





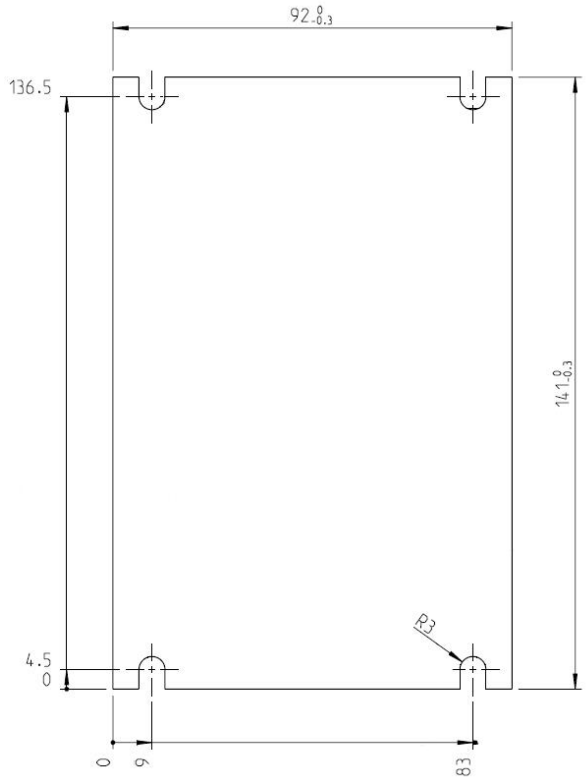


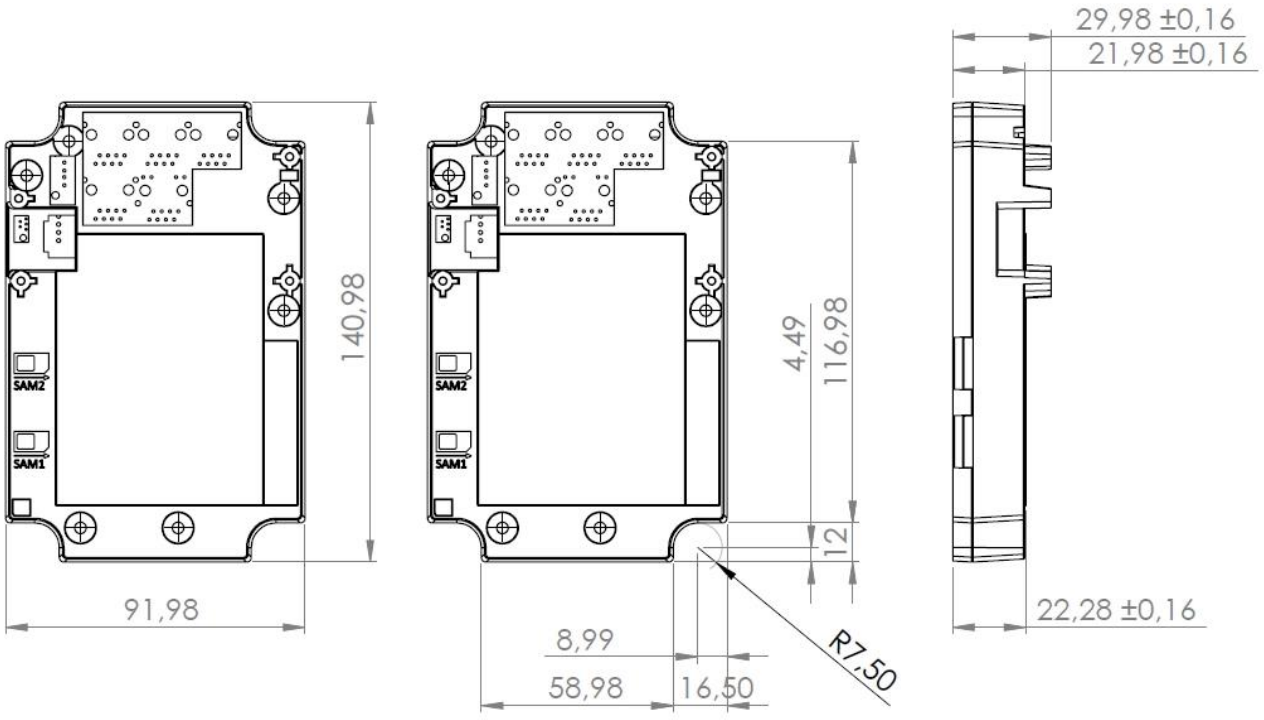
6.1.3 OPP-C60m (7000)



6.1.4 OPM-C60


COM
SCR
POS
MDB
LAN
USB
PWR
Beim Öffnen des Gehäuses
werden alle sicherheitsrelevanten
Daten gelöscht und es erlischt
jeglicher Gewährleistungsanspruch !
SAM2
SAM1


92.0 -0.3
136.5
141.0 -0.3
4.5
0
R3
0
9
83


140,98
91,98
SAM2
SAM1
4,49
116,98
12
8,99
58,98
16,50
R7,50
29,98 ±0,16
21,98 ±0,16
22,28 ±0,16

6.1.5 OPP-C60/OPM-C60 installation notes

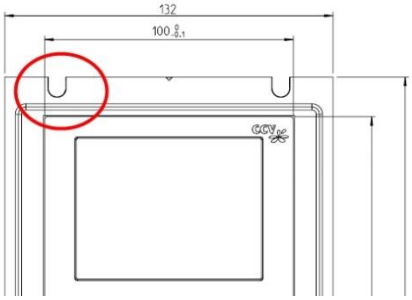
The full front-impermeability (IP-65) can be ensured only by correct installation. For this purpose, the terminal must be connected to four or six points of attachment screwed to the specified torque (screw OPP-C60 with the machines front panel):

- OPP-C60s: Mounting **with 6 Screws (preferred):** **0,8Nm +/-0,2Nm**
  Mounting **with 4 Screws:** **0,8Nm +/-0,2Nm**
  (Should be avoided; 2 Screws in the middle are not used)
- OPP-C60c: Mounting with 4 Screws: **0,8Nm +/-0,2Nm**
- OPP-C60m: Mounting with 4 Screws: **0,8Nm +/-0,2Nm**
- OPM-C60: Mounting with 4 screws **0,8Nm +/-0,2Nm**

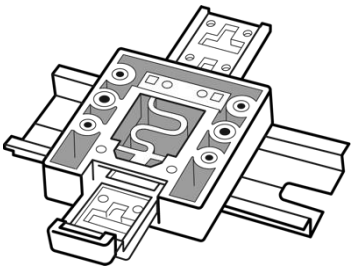
The nuts must be secured with locking compound.

The OPP-C60 must be grounded through a mounting screw (cross-section of the grounding line min. 2,5 mm^2)

At the OPP-C60m (7000) it is relatively tight on site, at the upper left screw to set an adequate mold. We provide you for this attachment point a longer spacer bold as a substitute for the mother. These are available in sizes M4 - M6.
- Model spacer bold M4: 02361-72
- Model spacer bold M5: 02362-72
- Model spacer bold M6: 02363-72

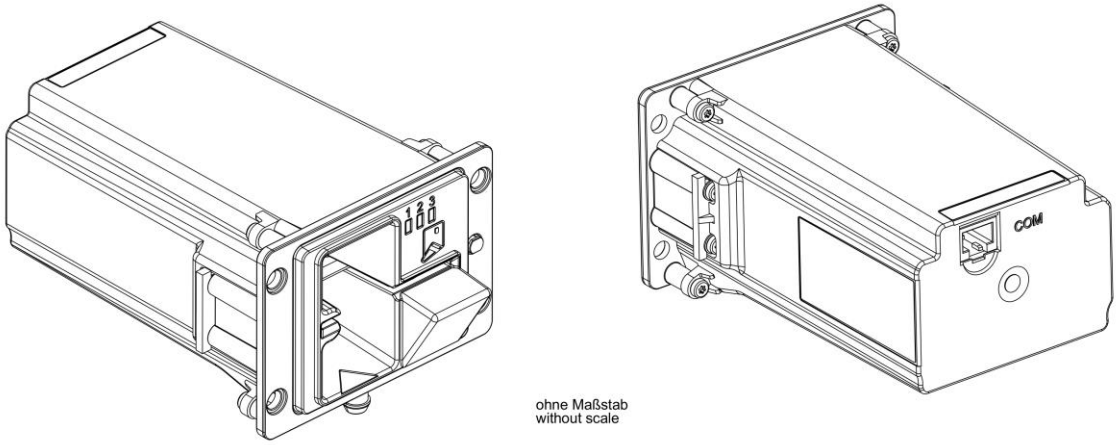


The OPM-C60 can be used with Bopla TSH Tragschienenhalter for mounting on DIN-Hutschienen.

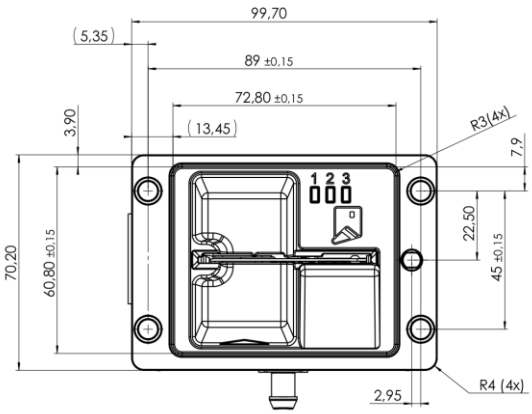


6.1.6 SCR-C

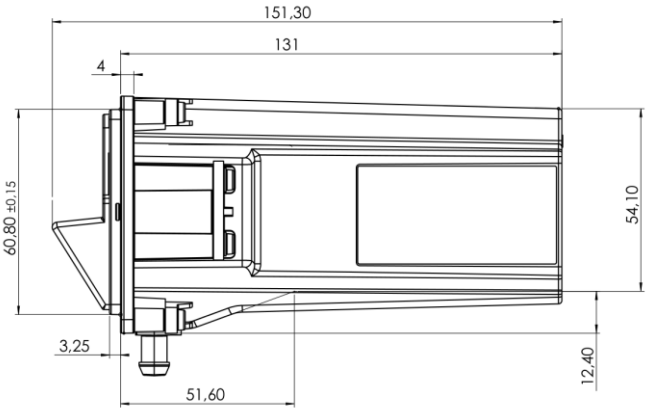
a) Overview



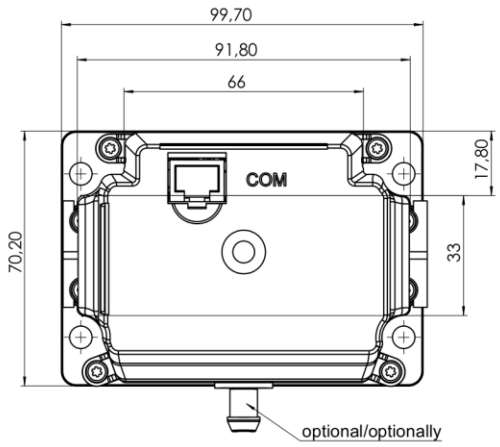
b) Front view



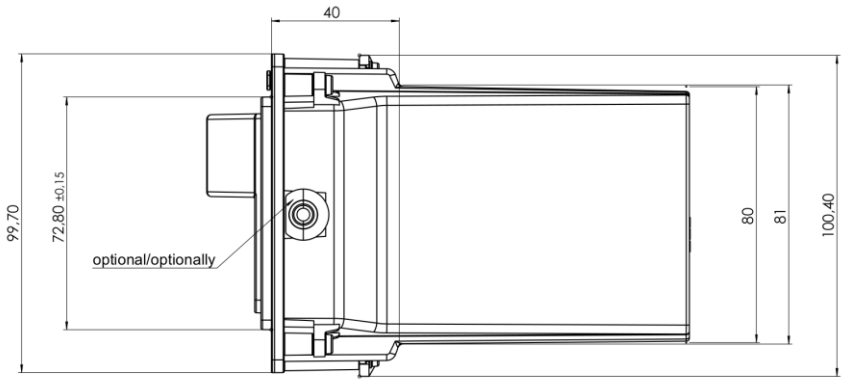
c) Side view



d) Rear view

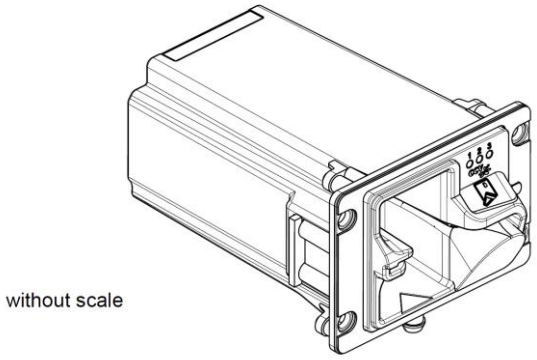


e) Top view

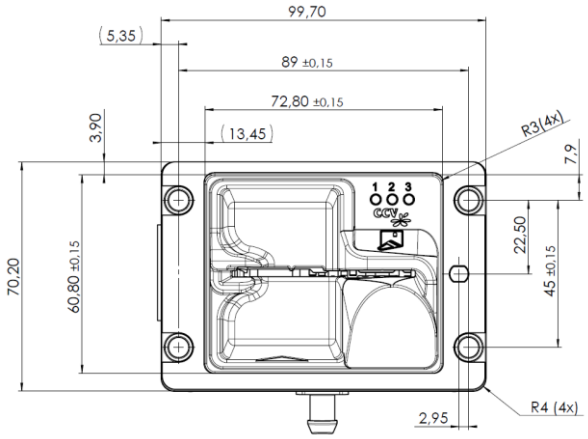


6.1.7 SCR-C NB (new bezel / new bezel with shutter)

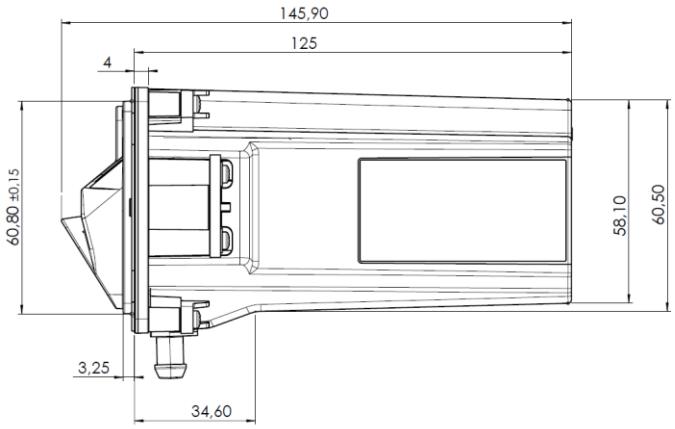
a) Übersicht



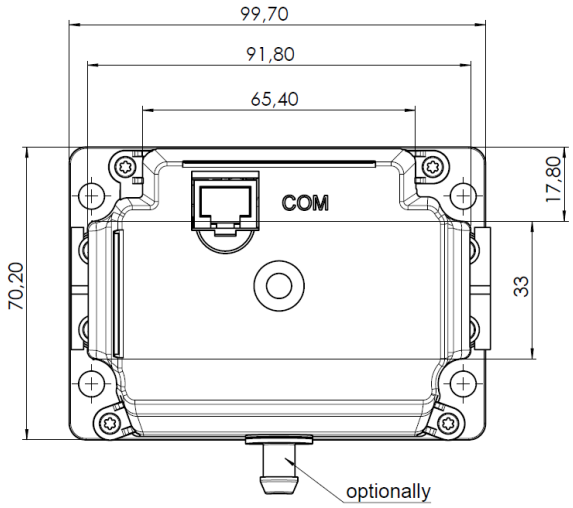
b) Frontansicht



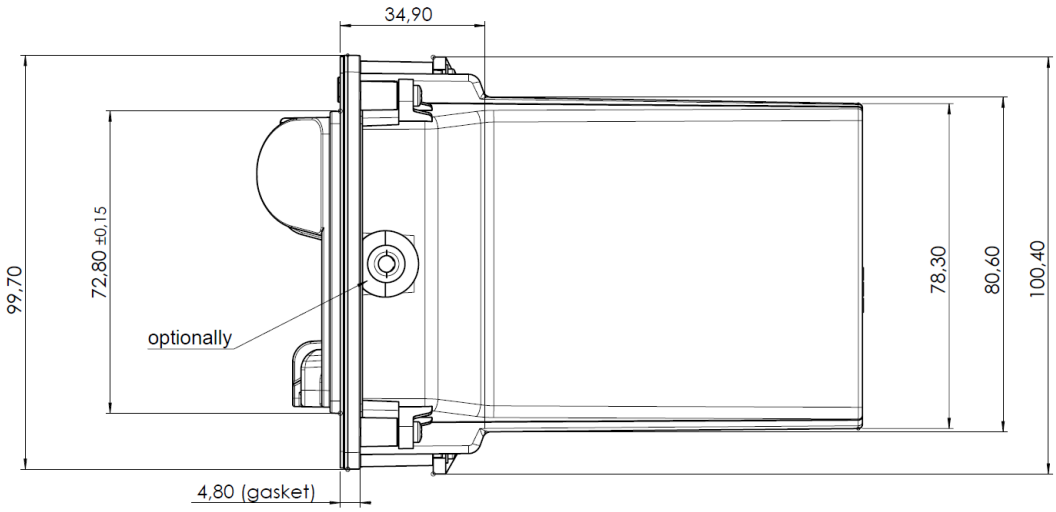
c) Seitenansicht



a) Rückansicht


99,70
91,80
65,40
COM
17,80
33
70,20
optionally

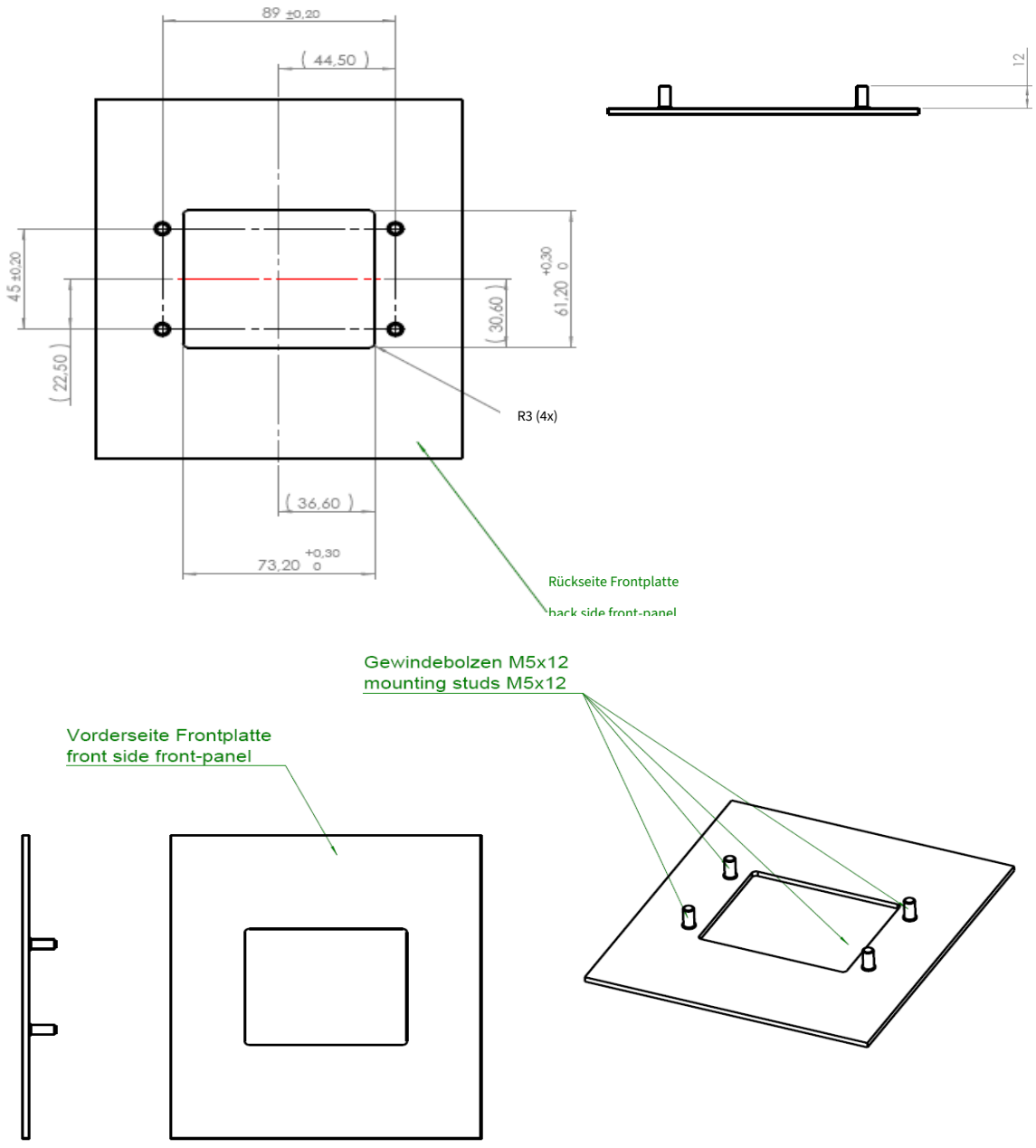
a) Aufsicht


34,90
99,70
72,80 ±0,15
optionally
78,30
80,60
100,40
4,80 (gasket)

6.1.8 Dimensions of SCR-C front cut-out

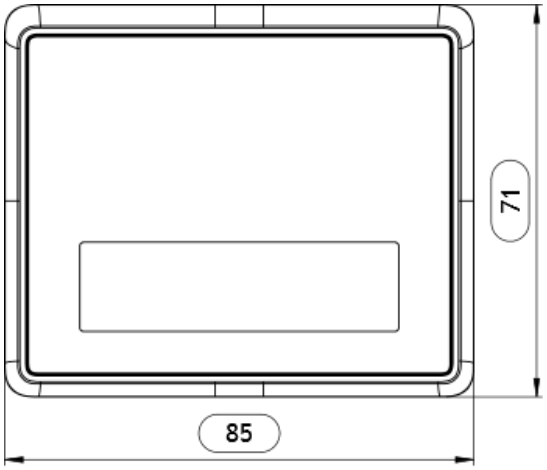
Integration information

SCR-C:	attachment with 4 mounting nuts:	0,8Nm +/-0,2Nm

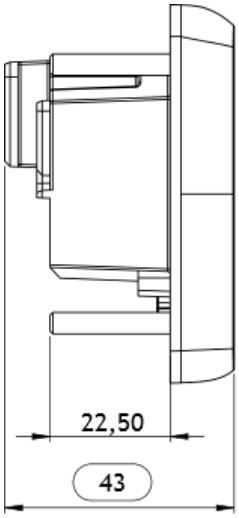


6.1.9 Dimensions of COR-A10 / COR-A20

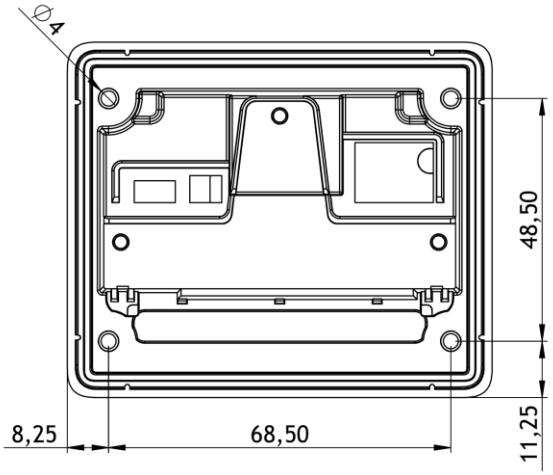
a) Front-view
(COR-A10 / COR-A20)



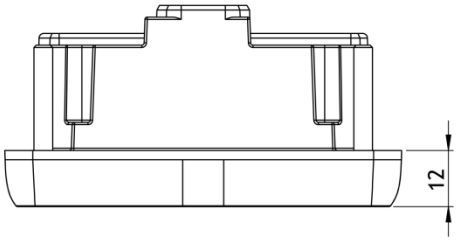
b) Side-view
(COR-A10 / COR-A20)



c) Rear-view of rear housing
(COR-A10 / COR-A20)

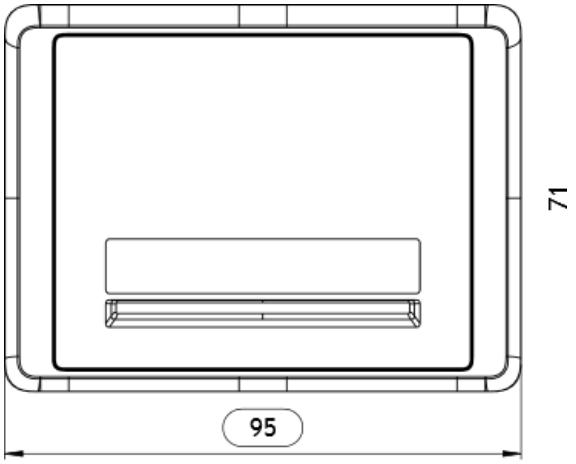


d) Top-view
(COR-A10 / COR-A20)

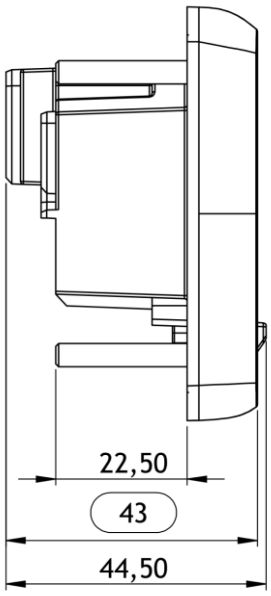


6.1.10 Dimensions of COR-A12

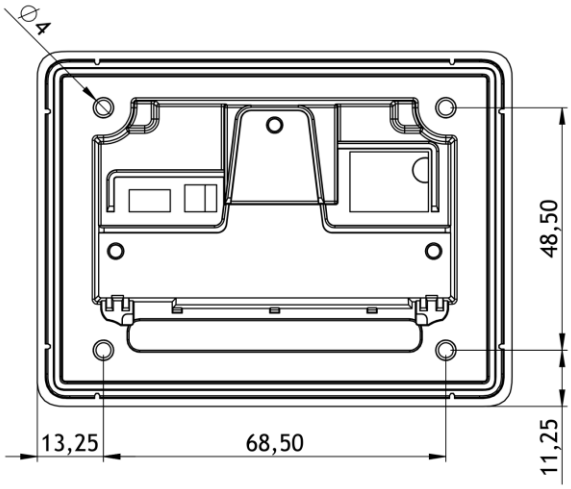
a) Front-view



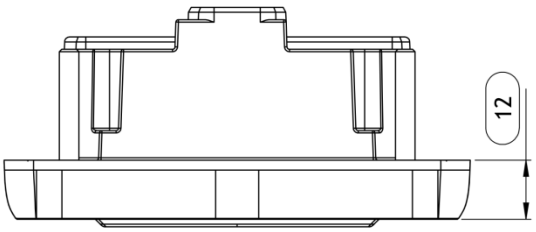
b) Side-view



c) Rear-view of rear housing

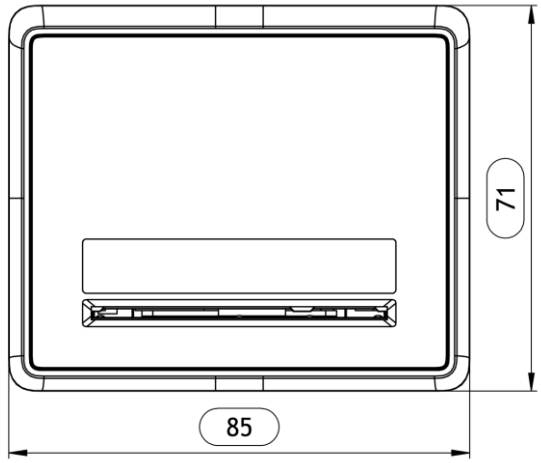


d) Top-view

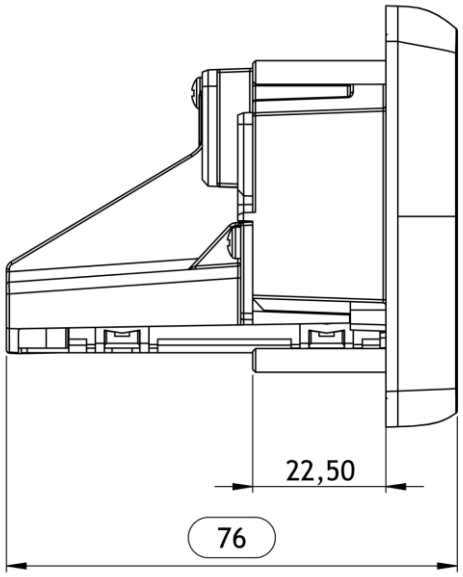


6.1.11 Dimensions of COR-B20

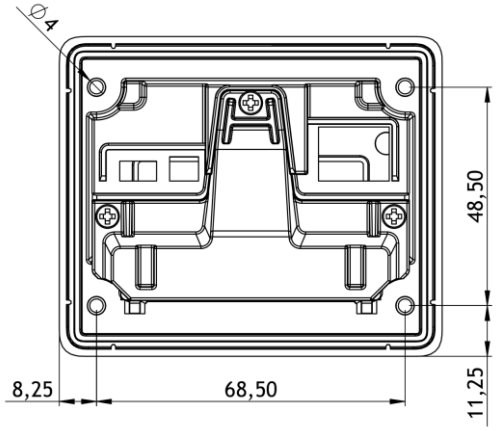
a) Front-view



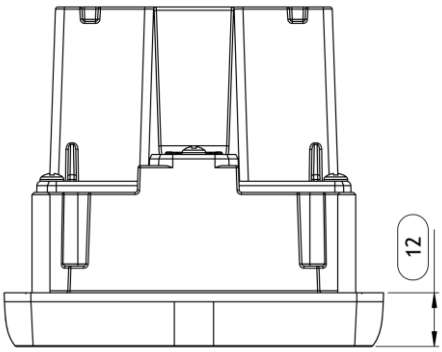
b) Side-view



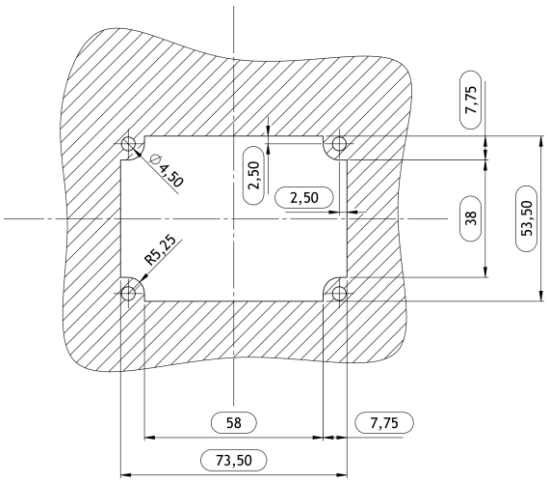
c) Rear-view of rear housing



d) Top-view



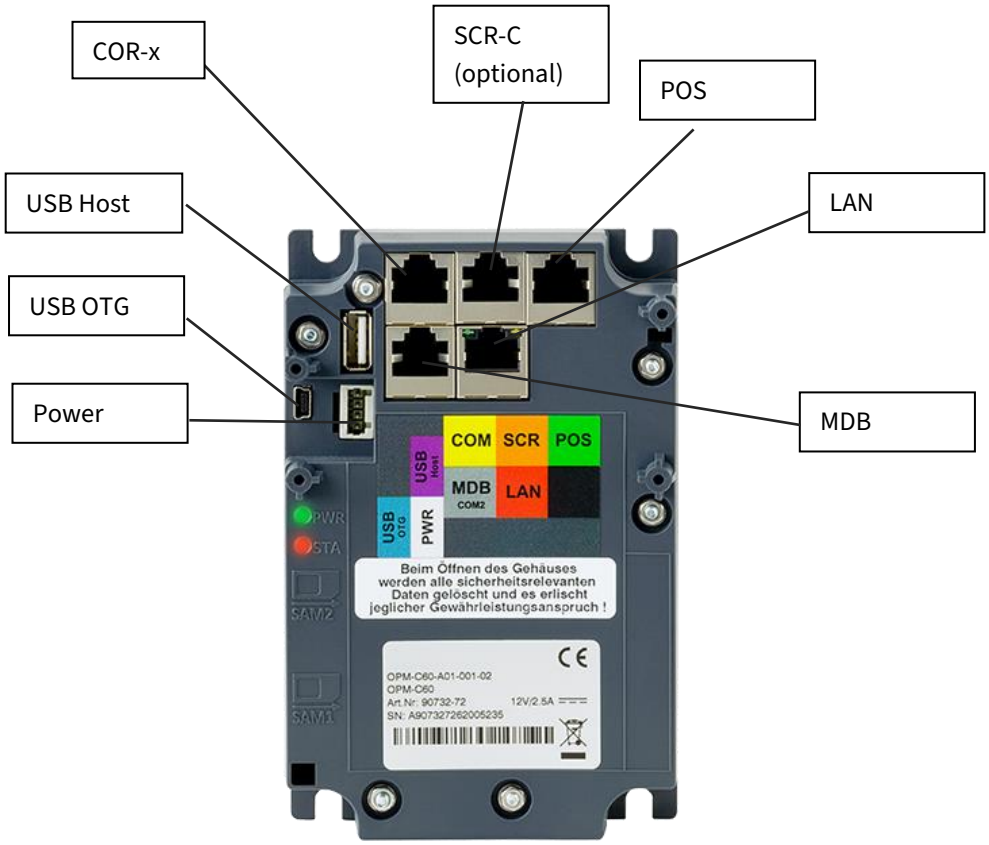
6.1.12 COR mounting cut-out



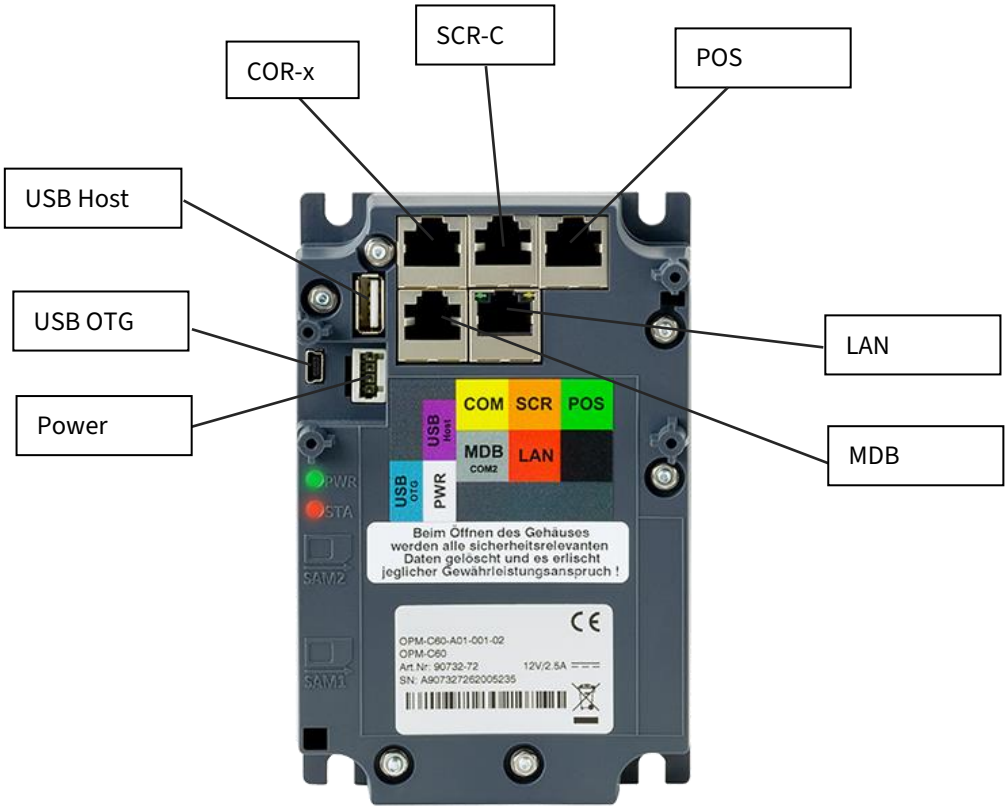
Integration information COR reader attachment with 4 mounting nuts: **0,8Nm +/-0,2Nm**

6.2 Interfaces

Connection: OPM-C60 with COR-x



Connection: OPP-C60 with SCR-C60 and COR-Axx

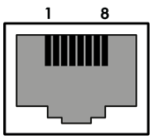


Note
The interfaces described below are not short-circuit proof!

6.2.1 POS (ZVT ERC interface)

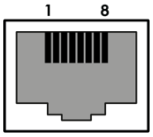
RJ45 8-pin, shielded; **low power 0 and 1 revision** (up J series, incl. L series)

Pin	Signal
1	for int. use; must be free
2	GND
3	RxD
4	TxD
5	Not used
6	Not used
7	Not used
8	Power GND



RJ45 8-pin, shielded; from **low power 2 revision** on (K series and M series or later)

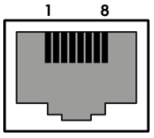
Pin	Signal
1	V_{out} (switched; 9v to 25V)
2	GND
3	RxD
4	TxD
5	RTS
6	CTS
7	MDB_WAKE
8	Power GND



6.2.2 COM

RJ45 8-pin, shielded

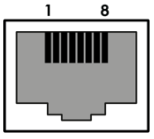
Pin	Signal
1	V_{out} (switched; 9v to 25V)
2	GND
3	RxD
4	TxD
5	RTS
6	CTS
7	MDB_WAKE
8	Power GND



6.2.3 SCR

RJ45 8-pin, shielded

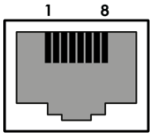
Pin	Signal
1	V_{out} (switched; 9v to 25V)
2	GND
3	RxD
4	TxD
5	Not used
6	Not used
7	MDB_WAKE
8	Power GND



6.2.4 MDB/COM2

RJ45 8-pin, shielded

Pin	Signal
1	V_{in} (9V to 25V)
2	GND
3	RxD-MDB
4	TxD-MDB
5	RxD-COM2
6	TxD-COM2
7	MDB_WAKE
8	Power GND

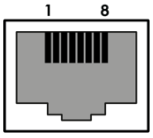


6.2.5 LAN

The power supply for the OPP-C60 / OPM-C60 should not be provided over the LAN interface.

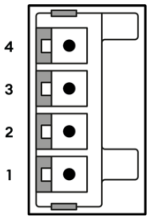
RJ45 8-pin; CAT5

Pin	Signal
1	TX+
2	TX-
3	RX+
4	
5	
6	RX-
7	
8	



6.2.6 PWR (Power supply)

Pin	Signal
1	9V to 25V
2	GND
3	12V Heating
4	24V Heating

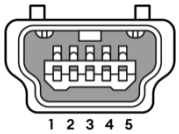


Plug: Wago 733-104
Recommended power supply: GlobTek GT-41132-6012-T3 (12V DC/5A)
CCV Part Nr.: 01380-42
Adapter GlobTek/WAGO: CCV Part Nr.: 01381-42

6.2.7 USB-OTG

Mini-B USB 2.0 Port

USB 2.0 OTG (Host/Device) (High Speed 480MBit/s und Full Speed 12MBit/s):
USB Mini-B; straight connector.
The OPP-C60 operates as a USB Network device.



Pin	Name	Farbe	Signal
1	VCC	Red	+5V
2	D-	White	Data -
3	D+	Green	Data +
4	ID	No	Allows the distinction between micro connectors A and B: - Type A: Ground (OTG Device works as a host) - Type B: not connected (OTG device operates as a periphery)
5	GND	Black	Ground

For using the OTG host mode with the OPP-C60, a special OTG connection cable will be needed.

OTG port as device

- OTG-Port without cable
- Device-cable, not connected
- Device-cable, connected

OTG port as host

- OTG-cable without device connection
- OTG-cable with USB stick
- OTG-cable with self-powered USB hub

6.2.8 USB-A

USB 2.0 Host (Full Speed 12Mbit/s):

USB-A; straight connector (exp. for connecting a USB-to-ISDN adapter, GPRS Dongle, USB memory sticks…)

Pin	Name	Color	Signal
1	VCC	Red	+5V
2	D-	White	Data -
3	D+	Green	Data +

4	ID	Black	Ground

6.2.9 GPRS Dongle (optional)

An optional GPRS Dongle is available for the mobile use of the terminal. The dongle is connected to the terminal over the serial port or USB port. The settings for GPRS can be viewed or changed with the TS3 service tool.

Notes for the GPRS APN
The actual location is shown by the location area identity (LAI = MCC + MNC + LAC). With this the mobile country code (MCC) is used as home country prefix. The home country prefix is used to distinguish the home country from foreign countries.
If international roaming is activated, the home country prefix will not be interpreted.

6.3 Technical Data

6.3.1 OPP-C60/OPM-C60

Processor	ARM11 Processor, 532MHz Core, 266MHz DDRII Operating system : embedded Linux
Front plate	OPP-C60s: vandalism resistant, 3mm thick, Neckline: (101mm * 160mm) INOX, IP65 IK10 (20J) for keypad (border and keys) IK08 (5J) for display glass OPP-C60c: vandalism resistant, 3mm thick, Neckline: (82mm * 120mm) INOX, IP65 IK10 (20J) for keypad (border and keys) IK08 (5J) for display glass OPP-C60m: vandalism resistant, 3mm thick, Neckline: (100mm * 164mm) INOX, IP65 IK10 (20J) for keypad (border and keys) IK08 (5J) for display glass
Memory	Basic equipment: 64 kByte SRAM - 128MByte DDRII DRAM - 128MB NAND Flash
Display	OPP-C60s/m: 3,5“ TFT Color-Display 320*240px (Window size 72,7*543,3mm) OPP-C60c: 2,8“ TFT Color-Display 320*240px (Window size 58,3*43,9mm)
Tastatur	OPP-C60s/m: 20 keys, 4 Softkeys (F1-F4) OPP-C60c: 16 keys (no Softkeys) Vandalism resistant Keys with tactile and acoustic feedback
Environmental conditions	Operating temperature: -20°C to +70°C Storage temperature: -25°C to +70°C Humidity: 10% - 90% without condensation

	The electronics are varnished in critical areas to protect against condensation.
Interfaces	Hardware interfaces a) Four RS-232 interface: • POS: connection to the machine or to cashier • SCR: connection to the Secure or to card reader. • COM: more devices, for example contactless reader • MDB: optional ERC interface with Multi-Drop-Bus b) LAN-Interface: Ethernet, 10Base-T und 100Base-T (auto and manual selection) Communication protocol TCP/IP (more on request) e.g. for Host or Service-PC. c) Two USB Interfaces: • USB-A: Host connection via ISDN or GPRS Dongle • OTG-USB: (Mini-USB) for TS3 Protocols: a) Interface protocol • ZVT ECR protocol • IFSF/OPI • Protocol for Terminal-Supervisor and TMS • MDB – Multi-Drop-Bus • TCP/IP b) Host Protocol • Poseidon • Lavego More protocols on request.
Internal reader for Merchant SAM	Basic equipment = 2 SAM, Format ID0, T=0 und T=1, 3V- and 5V-Card, synchronous and asynchronous Card, 107kBaud at 10 MHz, compatible with ISO 7816
Power supply	Terminal: 9-25V (Protect against reverse polarity) Current drain OPP-C60 without/with LAN: ~150mA/~180mA at 12V Current drain OPM-C60 without LAN: ~130mA at 12V Heating: (automatic flash activation if necessary): 12V DC, 920mA oder 24V, 460mA Standby: Current drain OPP-C60/OPM-C60 with SCR-C and COR-x: ~10mA at 12V **Note**: The power supply (Starterkit) is only for test purpose in lab and must not use for productive purpose.
Backup battery	Built-in lithium battery for backup of SRAM and clock. Life cycle: up to 8 years when stored at 25°C and power supply of at least 50% of this time.
Size	Depending on type (see 6.1)
Certifications / Approvals	Developed for the actual requirements: ZKA TA7.0

	DC POS2.5 EMV2000 (EMV 4.0) Level 1 und Level 2 PCI Version 3.x (in connection with SCR-B 3.x) PCI-PTS 5.x (via software update for OPP-C60 compact) CE (CE 93/68/EWG) WEEE (WEEE 2002/96/EG) RoHS (RoHS 2002/95/EG)

Note on the lithium battery

The terminal OPP-C60 contains a lithium battery for data preservation, clock function and safety switch. The battery is not removable without opening the housing. The battery lifetime is approximately 8 years, if the device is 50% of the time supplied with voltage. The environmental conditions for storage and operation must be in the limits specified in this manual. The change of the battery can be done only by the manufacturer CCV GmbH.

Please note, do not get the lithium battery in the normal trash but disposed of properly.
It's very important to protect Lithium Battery from damages. In special cases they may have strong reactions with water or air.

Calculate examples for the battery lifetime:

Max. capacitiy	1000	mAh
Self-discharge (10 years from -40°C … to +30°C):	100	mAh
Self-discharge for a storage time for 2 years	262	mAh
Option 1: Self-discharge with 0% external Power supply: 4 years.	524	mAh
Option 2: Self-discharge with 50% external Power supply: 8 years.	524	mAh
Option 3: Self-discharge with 62,5% external Power supply: 10 years.	524	mAh
Minimum Reserve	114	mAh

6.3.2 SCR-C

Processor	ARM 32-bit Cortex™-M3
Temperature conditions	temperature conditions - operating:-20°C to 65°C (without heating) - storage: -25°C to 75°C humidity conditions: - operating: 5% - 85% RH (non-condensing) - storage: 5% - 95% RH (non-condensing) - Emission: according EN50081-1, CLASS B - Immunity: according EN50022
Interfaces	RS-232 interface: connection to OPP-C60, including power supply for the SCR-C

Vibration and shock	Impacts and shocks to the card reader should be avoided. The max. valid shock / impact influence should be less than the influence of the executed tests (18 shocks, 6 per layer, 3 per direction with 11ms and 100m/s^2.
Dimensions	- Installation depth in VM: 131mm - Total depth (incl. anti-skimming bezel): 151mm - VM inside: 100.4mm x 70.2mm (L x W) - Cut-out: EVA PTS conform: 74.0mm x 62.0mm (L x W)
Bezel	- Material: zinc die casting - Cut-out: 73.2mm x 61.2mm - Dimensions: 99.7mm x 70.2mm (W x H)
Other	- Foreign objects can be removed very simple in secure environment - Dripping protection optional available

6.3.3 COR

Temperature and environment (Operating, storage)	**Temperature conditions:** • operating: -25°C to +70°C (w/o heating) • storage: -30°C to +80°C • For long-time storage: +10°C to +30°C **Heating**: If heating is needed, the vending/ticket machine has to provide the power supply for it. **Humidity conditions**: operating: 5% - 90% RH (non-condensing) storage: 20% - 70% RH (non-condensing) **Electronic devices are coated** (w/o connectors)
Power consumption	- Active mode with no card (Irms current) 55mA@12VDC, 26°C - Active mode with card communication 200mA@12VDC, 26°C - Vin = 9 … 25V DC (via host connector), max. ripple ± 0.3 V - COR max. 500mA @ 12V (Current peaks at contactless communication!)
Vibration & Shock	**Vibration Test (DIN EN 60068-2-6; IEC 68-2-6):** 2Hz bis 9Hz/ 9Hz bis 200Hz; 10m/s^2; 20 cycle in each direction (x, y, z); no damage **Shock Test (DIN EN 60068-2-27; IEC 68-2-27):** 18 Shock with 11ms pulse duration; max. acceleration 100m/s^2, (6 Shock in both directions); no damage
Power Management	**Low power design with wakeup:** - Wakeup by token presentation (capacitive proximity switch)

	- Wakeup by insertion of contacted card (COR-B20 only) - Wakeup by host (e.g. OPP, SCR, OPM): Bi-directionally wakeup line nWAKE via RS232 host connector: MDB compatible, COR output is a bipolar transistor with open collector (< 1V @ 10mA). COR input is active low (< 1V @ -1mA). External pull-up, e.g. 100kOhm to vending machine supply voltage (9…45V), so nWAKE must withstand 45V. - Wakeup by USB interface (VBUS) Power-up time < 0.3s (measured from wakeup to 1st host command)
Min. Time BF	Min. 50.000h
Power Supply	Vin = 9 …25 V DC (via host connector), max. ripple ± 0.3 V
Certificates	• EMVCo L1 contactless type approval • EMVCo L1 contact type approval (COR-B20 only) • PayPass™, payWave™ compatible • VISA contactless reader implementation notes • CE approval (compliant to R&TTE directive) • RoHS compliant • WEEE compliant

6.4 ECR protocols

6.4.1 ZVT

6.4.1.1 ZVT Spezification

The base of the implementation of the ZVT ECR protocol is the specification that is available on our website www.zvt-kassenschnittstelle.de for download. CCV does not guaranty the completeness of the ZVT-specification.

6.4.1.2 Terminal startup with ZVT

This chapter should explain the terminal startup with the ZVT ECR protocol in single steps. Actions like the EMV configuration after an initialization have to be initiated by the vending machine.

Requirements

- Correct initial configuration with correct IP address, Terminal ID and PU number. These parameters can be set by using the ZVT command “Change Configuration (08 13)”. The correctness of the used parameter entries will not be verified, so this has to be done before.
- The terminal will give the status “Inbetriebnahme erforderlich” (initialization needed) (status enquiry, tag 1F55: 40 00).

Startup

1. OPM + COR will be mounted
2. Terminal lock “Inbetriebnahme erforderlich” (initialization needed) (status enquiry, tag 1F55: 40 00)
3. Vending machine is executing the startup (08 13)
4. Vending machine is executing the initialization
5. Vending machine is executing the configuration diagnosis
6. Vending machine is executing the EMV configuration diagnosis
7. Vending machine is ready

Following there should be given some information about the error handling while executing the startup.

Initialization failed

- The PU number and the connection data will not be safed, only the Terminal ID will be taken over.
- The terminal is sending an abort “06 1E 01 7D”
- Vending machine is executing a status enquiry.
- The terminal is sending the terminal lock “Initialisierung erforderlich” (initialization needed) (Status Abfrage, Tag 1F55: 02 00).

Needed Actions

- Check hardware and the wires
- Check parameters of the startup command 08 13 (Terminal ID, PU number): Are the values conform to the init-configuration.
- Vending machine is executing the startup once more (08 13)

Initialization or diagnosis failed

- The terminal is sending an abort “06 1E 01 FF”.

Needed Actions

- Check Host return code (on the receipt)
- Resume action initialization or diagnosis.

TLV Tags

The following TLV tags can be used when executing a startup with ZVT.

Tag	Description
0x20	TLV_TAG_CCV_TERMINAL_INITIATION TLV Container for ZVT startup, is defined by the tags 0x01 – 0x06
0x01	TLV_TAG_CCV_TERMINAL_ID Terminal ID Format: Latin1 encoded String
0x02	TLV_TAG_CCV_PU PU number that should be used Format: 1 Byte, 0x00 – 0xFF

0x03	TLV_TAG_CCV_IP_ADDRESS Terminal IP address Format: Latin1 encoded String
0x04	TLV_TAG_CCV_IP_SUBNET_MASK Subnet Mask for the used network Format: Latin1 encoded String
0x05	TLV_TAG_CCV_IP_GATEWAY Gateway address of the network Format: Latin1 encoded String
0x06	TLV_TAG_CCV_IP_DHCP_FLAG DHCP on / off Format: 1 Byte, Boolean, Default = false

Example for a ZVT startup

```
08 13   4B                                  // Command 08 13
06 49                                       // TLV Container
2D 47                                       // Tag 2D
1C 45                                       // Tag 1C
20 43                                       // Tag 20
01 08   3132333435363738                    // TID "12345678"
02 01   01                                  // PU 1
03 0F   3132332E3033322E3130332E303032      // IP Address 123.032.103.002
04 0F   3235352E3235352E3030302E303030      // Subnet Address 255.255.000.000
05 0F   3030302E3235352E3032302E313233      // Gateway 003.255.020.123
06 01   01
```

6.4.1.3 Cyclic poll of terminal status

The status of the terminal must be required with the ZVT-commands "status inquiry" at certain intervals (recommended: at least every 3 seconds) for this reasons:

1. It can be detected if communication problems have occurred with the terminal.
2. The lock states of the terminal can be detected and maybe resolved.
3. Automatic actions of the terminal as maintenance calls, updates, etc. will only be started.

If the terminal is not able to perform card payments at the moment, this can be immediately displayed to the customer. In this case the customer will not start a card payment since it will be aborted with an error.
The different states are described in the product specific instruction in chapter „terminal status“.
Since the terminal cannot give reactions on the ECR interface for a longer time while performing an update, the status poll may not be used in this case. The vending machine has to send status polls with reduced cycle rate to the terminal.

6.4.1.4 Reconciliation with closure

The reconciliation must be started by the vending machine. This must be done at least if the status „$B1_{hex}/177_{dez}$ Memory full“ has been detected.

6.4.1.5 Receipt printing

Preferably at a transaction the receipt which is send via “Line print” or “Block print” command to the vending machine should be printed.
If the service of the terminal with the command "service mode switch" is called, it is possible for some menu items that document information is transmitted to the vending machine (e.g. Diagnosis receipt). The vending machine should be able to process them. The number of printed lines can be very high by sending the final command or by exit the menu. This depends on the activities which the technician is performing in the menu. The machine should be able to process a very large number of print lines. If there are not enough buffers for the print data at the machine, this could possibly be applied as a cyclic buffer.

6.4.1.6 Off-states of Terminals

The various off-states of the terminal are transmitted in addition to other information in the status request. It is not possible to perform a transaction during an off-state of the terminal. These locks can occur during operation due to various influences. If an off-state is recognized while performing a status poll, the user should be informed about it.

Ideally the lock status should be fixed directly by the recommended procedures as described in the product specific instruction “ZVT ECR Interface” in chapter “Terminal Status”.

Example:
If the terminal responds to a status request with the status 81 "initialization required" then this terminal off-state can be solved directly with the ZVT-command "Initialization". If this would be not done, the terminal would not be able to perform more card payments.

Of course it is also possible that a technician fixes the off state on site with the “Service-Menu” described below. If the off-states at the terminal occur often then the procedures described above are highly recommended.

6.4.1.7 Service-Menü

This is a terminal configuration Menu. It can be activated by the command „turn on service mode“.
Please note that print lines are sent to the machine during the service menu operation.
Alternatively, you can activate the service menu after booting.
After the boot process the terminal shows the information for pushing the “Info” key to enter the menu together with a progress bar on the display. After pressing the "Info" button, the technician PIN is asked.

6.4.1.8 Time controlled actions of the terminal

See chapter „Time controlled actions of Terminal“ in the manual product specific instruction „ZVT-ECR interface“.

Such actions will be started at OPP and OPM only at status polls before closure. This guarantees that the terminal is the master of the communication. This is important especially for remote data transmission via ZVT-Protocol and the transmission of receipts, otherwise collisions may occur.

6.4.1.9 Autorisation with existing Card data

If an authorization with existing card data is performed (card data is read with the “card read” command before), it is possible to choose the payment method at time of the authorization. The payment method will be determined by the terminal via the adjusted limits, if the payment method was not explicitly transferred from the machine.

6.4.1.10 Notes for privacy shield by PINPads

The terminal must be integrated into the complete device in a way that it satisfies the following criterias.

- DK Criteria: „Privacy shielding for PIN entry, EPC343-08, Version 1.4, 30.09.2009“
- PCI Criteria: “Payment Card Industry (PCI) POS Transaction Security (PTS) Point of Interaction (POI) Modular Detailed Test Procedures, PCI Security Standards Council LLC, Version 3.1, August 2011”

6.4.1.11 Notes of the printer stand

The machine must check the printer status before payment and transmit the value 0x04 of the BMP 0x19 in bits to the terminal.

If the printer has a failure before the issue of the goods, the payment must be canceled by a negative acknowledgment of the status of the payment record (an auto cancelation occurs). A goods issue is not allowed.

If the printer has a failure after the issue of the goods, the machine must save the data and retransmit it with the command receipt repetition if the printer is available again. Other transactions may not be initiated until the printer is ready again, or they will be rejected by the terminal.

6.4.1.12 Interpretation of interim state Information

The DK requirements to the second customer display must be observed with the implementation of the interim status codes at the display texts at the display of the vending machine.

The terminal into which the base terminal `OPP-C´ is integrated, shall ensure at the second customer display the display texts in accordance with Chapter of the Technical Annex. The correct implementation of the specification `ERC interface ZVT-Protocol' from CCV Deutschland GmbH must be guaranteed by the manufacturer.

The terminals send the text to be used in the TLV containers if the use is activated.

6.4.1.13 BMP 3C Formats

The use of BMP 3C by OPP-C is not coupled to the host system. Both formats (format 1 and 3) can be used for each host. The terminals ensure the conversion to the host interface.

6.4.1.14 Reconciliation with closure

If reconciliation with closure using the ZVT-command "Reconciliation with closure" should be performed, it is absolutely necessary to query if there are still open pre-authorizations / reservations in the terminal using the command "query for existing pre-authorizations". With reconciliation with closure via ZVT-command they are otherwise deleted before performing it without confirmation.
If a pre-authorization could not be finished with a partial reversal or book total at the payment provider, the vending machine or ECR has to stop performing further payments. After a manual clarification reconciliation could be processed to empty the transaction memory.

If reconciliation with closure from the service menu of the terminal is executed, the service technician is informed there are still open pre-authorizations /reservations in the terminal and will be asked if the reconciliation should be performed.

6.4.1.15 Supported fleet cards and station cards

This chapter is giving a list about the supported fleet and stations cards and furthermore an overview about the used key slots.

Fleet cards
PIN-Check is supported for the following fleet cards.

- LOMO
- BayWa
- BFT
- UTA
- DKV Selection
- WEAT
- Westfalen
- Eurotrafic
- Routex
- Avia

- EuroShell
- GAZ / Roadrunner
- TOTAL ServiceCard
- Total Profi Card
- GULF Card

Station Cards

PIN-check is supported for the following station cards.

- Proeda station card
- Hectronic station card
- Huth station card
- Scheidt&Bachmann
- Wayne-Dresser
- Ratio
- Task
- Tokheim
- BICA

With the command 06 E3 it's possible, with aid of Bitmap D0 (Algorithmkey) and Bitmap D3 (Key slot), to use the following combinations (all values are decimal, track positions will be counted with start symbol = 1):

Key slot (BMP D3)	PIN-Data (BMP D1)	Algorithm key (BMP D0)	Card
1	8 Byte binary	0	Hectronic
2	8 Byte binary	0	Proeda
3	8 Byte BCD: Track 2 Pos 3-17, number 0, 2 Byte BCD: Track 2 Pos 27-30	2	UTA
4	8 Byte BCD: Track 2 Pos 3-18, 2 Byte BCD: Track 2 Pos 30-33	70	DKV Selection Card
5	8 Byte BCD: Track 2 Pos 5-20, 2 Byte BCD: Track 2 Pos 27-30	2	BFT
6	8 Byte binary	0	Huth
7	8 Byte BCD: Track 2 Pos 2-7, 11-19, die Ziffer 0, 2 Byte BCD: Track 2 Pos 31-34	2	LOMO
8	8 Byte BCD: Track 2 Pos 3-18, 2 Byte 0	70	BayWa-Card
9	8 Byte BCD: Track 2 Pos 3-18, 2 Byte BCD: Track 2 Pos 28-31	70	WEAT-Card
10	8 Byte BCD: Track 2 Pos 3-18, 2 Byte BCD: Track 2 Pos 27-30	2	Westfalen-Card
11	8 Byte BCD: Track 2 Pos 3-13, Track 2 Pos 32 = 1 or 2: Track 2 Pos 15-18, Track 2 Pos 32 = 3: Track 2 Pos 5-8, Track 2 Pos 32 = 4: 4-digit drivers code, number 0, 2 Byte BCD: Track 2 Pos 28-31	2	Routex

Key slot (BMP D3)	PIN-Data (BMP D1)	Algorithm key (BMP D0)	Card
12	8 Byte binary, 2 Byte PIN-Offset BCD	2	Scheidt&Bachmann Track 2
22	8 Byte binary	0	Scheidt&Bachmann Track 3
13	19 Bytes BCD: Track 2 Pos 2-38, Ziffer F. If Track 2 Pos 30 = 4: additional 2 Bytes BCD: 4-digit drivers code.	11	Eurotraffic - Fina; Total; TotalProfi; TotalDirekt
14			reserved for Eurotrafic
15	8 Byte PIN-Block	0	Ratio
16	8 Byte BCD: Track 2 Pos 4 –7, S1-6, K1-6 under W-D Spec., 2 Byte BCD: PIN-Offset Track 2 Pos 29-32	2	Wayne-Dresser
17	6 Byte BCD: Track 2 Pos 8-19, 2 Byte BCD Track 2 Pos 22-25, 2 Byte BCD Track 2 Pos 29-32	2	Avia
18	Unknown		Tokheim
19	Unknown		Task
20	18 Byte BCD: Track 2 Pos 5-20, 30-33,22-25,34,6,7,26,11-14, number 0, Track 2 Pos 36-38	37	EuroShell
21			reserved for Euroshell
22	8 Byte binary	0	EL_ME Key
23	8 Byte BCD: Track 2 Pos 5-20, 2 Byte BCD: Track 2 Pos 28-31	2	GAZ
24	8 Byte BCD: Track 3 Pos 4-19, 3 Byte BCD: Track3 Pos 46-51	3	BICA
26	8 Byte binary, 2 Byte PIN-Offset BCD	2	Minera
27	8 Byte BCD: Track 2 Pos 3-18, 2 Byte BCD: Track 2 Pos 27-30	2	TOTAL-Servicecard

BMP D3 can also be used for implementation of new fleet or station cards without changing the software. The only requirement is that the used algorithm has been implemented. An insertion of the new key will last to use the card.

Certain fleet cards (Routex, Euroshell) are using a Bonus / Malus system, which is forcing an initialization to the host in error cases. Until this has been performed, PIN-checks will be denied for this card type.

6.4.1.16 ZVT supported commands

For detailed information for each command of the ZVT ECR protocols please see the ZVT ECR protocol specification that can be downloaded under www.zvt-kassenschnittstelle.de.

Direction	Comm.	Name	Features
→ A	04 0F	Status information	

Direction	Comm.	Name	Features
→ A	04 FF	Intermediate status	
→ T	05 01	Status poll	From the optional BMP 03 "Service byte" only Bit 1 (Value 2, SW-Version not in the final command to send) is evaluated.
→ T	06 00	Registration	An existing TLV-container is not evaluated, but only used to unlock the TLV-container functionality.
→ T	06 01	Authorization	
→ T	06 02	Log-Off	
→ A	06 0F	Completion	
→ T	06 12	Print Turnover receipts	
→ T	06 1B	Set / Reset Terminal ID	
→ A	06 1E	Abort (from Terminal)	
→ T	06 20	Repeat receipt	The optional BMP 03 "service byte" is not evaluated by OPP-C60.
→ T	06 22	Pre-authorization / Reservation	
→ T	06 23	Partial-Reversal of a Pre-Authorization / Booking of a Reservation	
→ T	06 24	Book total	
→ T	06 25	Pre-Authorization Reversal	
→ T	06 30	Reversal	only possible with attended terminal types
→ T	06 31	Refund	BMP 0E< expiration date>, 22<Card number>, 2D<Trace 1 Data, 24<Trace 3 Data>, 06<TLV-Container> will be evaluated by the OPP-C60, if the evaluation of the TLV Container was activated with the login.
→ T	06 50	End-of-Day	
→ T	06 70	Diagnosis	
→ T	06 93	Initialization	
→ T	06 B0	Abort	
→ T	06 C0	Read card	
→ A	06 D1	Print line	
→ A	06 D3	Print text block	
→ A	06 D8	Dial-up	
→ A	06 D9	Transmit Data via Dial-Up	
→ A	06 DA	RFU	
→ A	06 DB	Hang up	
→ T	06 E0	Display text	

Direction	Comm.	Name	Features
→ T	06 E1	Display Text with Function-Key Input	
→ T	06 E2	Display Text with numerical input	
→ T	06 E3	PIN-Verification for Customer-Card	see separate Specification PAxxPxxx
→ T	08 01	Activate service-mode	
→ T	08 10	Software Update	Starts a service call to the TMS server
→ T	08 30	Select language	German or English
→ T	08 40	Change Baud rate	9600, 19200, 57600 o. 115200 Baud
→ A	08 50	Activate Card Reader	deletes all the “old” card data
→ A	80 00	Positive acknowledgement	
→ A	84 00	Positive acknowledgement	
→ A	84 xx	negative acknowledgment	xx !=00

6.4.1.17 06 01 Authorization

BMP 04 <Amount> must be present at the terminals.
BMP 06<TLV-Container>, 0B<trace number>, 3B<AID>, 0E<Date of expiry> and 22<Card number> are not evaluated by the terminals.
If a payment method was determined by the cashier that is locked due to the limit the terminal responds with 06 1E “cancel”.
At communication errors (command 06 D1 "print line" or 04 FF "between status") after the positive confirmation of the status information (04 0F), the transaction will **not** be canceled!
The terminals send the status information and the receipt lines only if a successful transaction or goods issue has occured.

6.4.1.18 06 22 Pre-Authorisation / Reservation

The payment method cash card and ELV are not available by tank machine.
Die BMP 04 <amount> must be present by the terminals.
Die BMP 06<TLV-Container>, 0B<Trace number>, 3B<AID>, 0E< Date of expiry > und 22<Card number> are not evaluated by the terminals.
If a payment was determined by the cash register, which is blocked due to the limit, the terminals respond with 06 1E "cancel".
In case of a communication error (at the 04FF command "intermediate state") after the positive confirmation of the status information (04 0F) the transaction will be **not** canceled!
The terminals send the status information in this case too.

6.4.1.19 06 23 Partial-Reversal of a Pre-Authorisation/Booking of a Reservation

If the BMP 04 <amount> is missing, the amount is considered to 0.
BMP 06<TLV-Container>, 0B<trace number> and 3B<AID> are not evaluated by the terminals.
The terminals recognize in the original transaction which transaction method is necessary to the host (partial reversal or book total). So there is no need to respect the transaction type of the original transaction.
The terminals send the status information and the receipt only when the transaction has been successful.
The transaction will **not** be canceled in cases of a communication error (at the command 06 D1 „Print line“ or 04 FF "intermediate status") after the positive confirmation of the status information!
Das terminals send the status information in this case too.

6.4.1.20 06 24 Book total

The amount is considered to 0 if the BMP 04 <Amount> is missing.
BMP 19<Payment method>, 06<TLV-Container>, 0B<Trace number> and 3B<AID> are not evaluated by the terminals.
The terminals recognize in the original transaction which transaction method is necessary to the host (partial reversal or book total or reversal of a pre-authorization). So there is no need to respect the transaction type of the original transaction.
The machine does not have to know the amount of the original transaction at the book total. Therefore all original transactions can be processed with the command “book total” without knowing the amount. Especially the distinction between book total and the reversal of a pre-authorization with amount 0 at processing credit or fleet cards is not necessary.
The terminals send the status information and the document lines only when a successful transaction is done.
The transaction will **not** be canceled in case of communication error (by Command 06 D1 „Print line“ or 04 FF "intermediate status") after the positive confirmation of the status information (04 0F)!
The terminals send the status information in this case too.

6.4.1.21 LED indicators at SCR-C

Function	Terminal type	Condition	LED Indicators
ZVT Abort 06 B0	Fuel vending	Reader ready	Only yellow LED
ZVT status request 05 01	Fuel vending	Reader ready	Only yellow LED
ZVT activate card reader 08 50	Fuel vending	Activate command KL (Bitmap FA not exists or FA=00)	Only green LED

ZVT activate card reader 08 50	Fuel vending	Deactivate command KL (Bitmap FA exists and content not 00)	Only yellow LED
ZVT read card 06 C0	Fuel vending	No	At beginning only green LED, after reading card, Abort or Timeout only yellow LED
Startup OPP	Fuel vending	No	Only yellow LED
Idle mode	All	“Ready info at customer display” active; terminal ready (no terminal locks, keys loader and initialization has been executed)	Only green LED
Idle mode	All	“Ready info at customer display” active; terminal not ready (terminal locked, no keys loaded or initialization against host needed)	Only red LED

General remarks:

- “Ready info at customer display” is usually not active at fuel vending terminals
- The indicators at fuel vending terminals are based on the following customer ideas:
  - Red LED = Device not ready
  - Yellow LED = Device ready, but actually no card read
  - Green LED = Device ready, customer should insert card

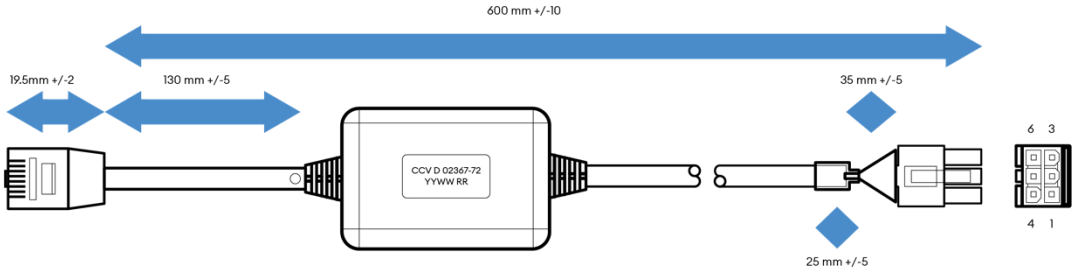
6.4.2 O.P.I.

The specification „PA77S001 – CCV O.P.I. Interface“ is used as basis of the implementation from O.P.I. interface. It is available on request.

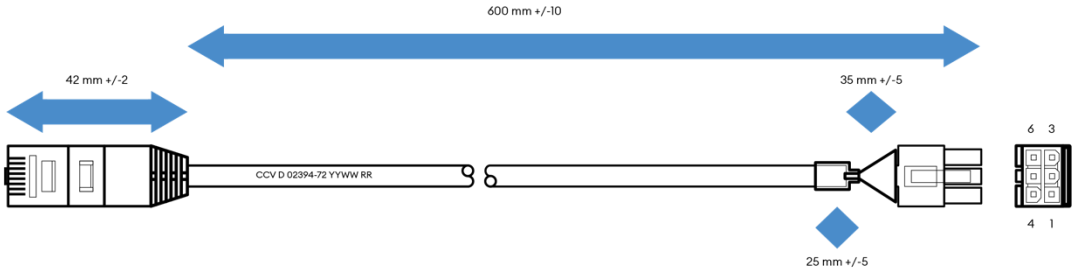
6.4.3 MDB

The implementation of MDB is based on the MDB specification 4.2 from February 2011.
A special MDB cable for the relevant MDB voltages is available.

- MDB cable full power, 17V – 42.5V with MDB female connector



- MDB cable for MDB voltage 9V – 25V with MDB female connector



7. MTBF statistics

Product	MTBF values
SCR-C, SCR-C NB, SCR-C NBS	500.000 cycle of operation
OPM	500.000h, the OPM has no mechanical interface to the customer

OPP-C60	- Display lifetime: >50.000h
	- Keypad (under DIN 42115):
	  ○ Designed for 2.000.000 actuations with 10N
	  ○ 200.000 actuations with 100N

COR-A10	ca. 500.000h

8. CE Declation of Conformity

Please find CE Declaration Of Conformity at CCV download bar:
https://www.ccv.eu/de/service-support/businesspartner/download-bar/

9. EMV Certificates

To get the latest certifications please ask your CCV support.

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