

Technical Manual

PM 100 System

Manual Cash Register HKC 100

Version 1.12

DESIGNA

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History

Version 1.0	08.01.1997	JB	creating this document
Version 1.12	21.06.2000	PC	implementation of the KCC

1 Introduction

With the manual cash register it is possible to collect parking fees and other receipts manually. The terminal is housed in a plastic casing and is composed of a magnetic track reader, keyboard, display, receipt printer, and the TCC (Terminal Control Computer).



Illustration 1.1: Manual cash register HKC 100

An external customer display and a cash register drawer are optional. The use of the HKC 100 at the exit to control the barrier is possible.

2 Terminal Description

The components of the manual cash register are mounted on a mounting plate and are fitted into the plastic casing.

2.1 Internal Structure

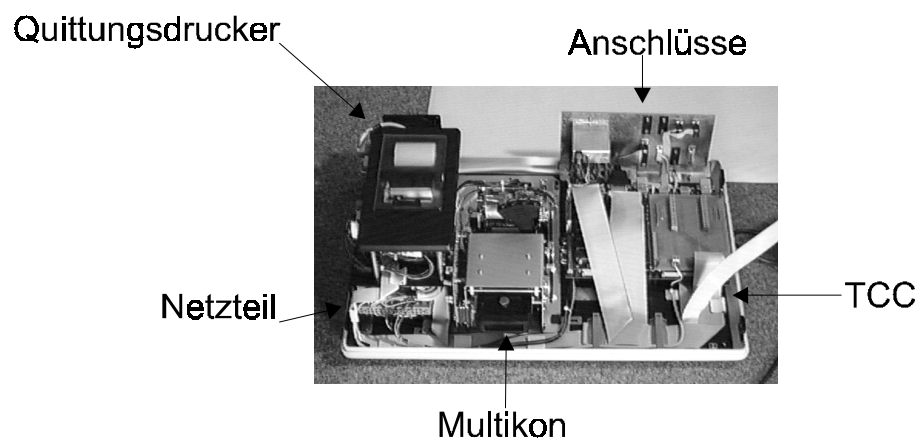


Illustration 2: Interior view of manual cash register

Keyboard and LCD are fixed to the cover of the casing (see Illustration 1.1:). The cover is fixed at the base of the casing laterally with four Phillips screws.

2.2 Power Supply

The power supply supplies 24V for the modules. The cables are connected with plug-in connectors/clamped connectors. The power supply is mounted on a track which makes it easy to exchange quickly.

2.3 Multicon

The magnetic track reader is installed with the ticket printer and with the options ticket slide and/or transport unit (UTBG) 1 or 3 and is called Multicon as generic term.

Depending on the scope of functions the magnetic track reader can be equipped with additional reading heads for the side track according to ISO or for the special track for the discounting function.

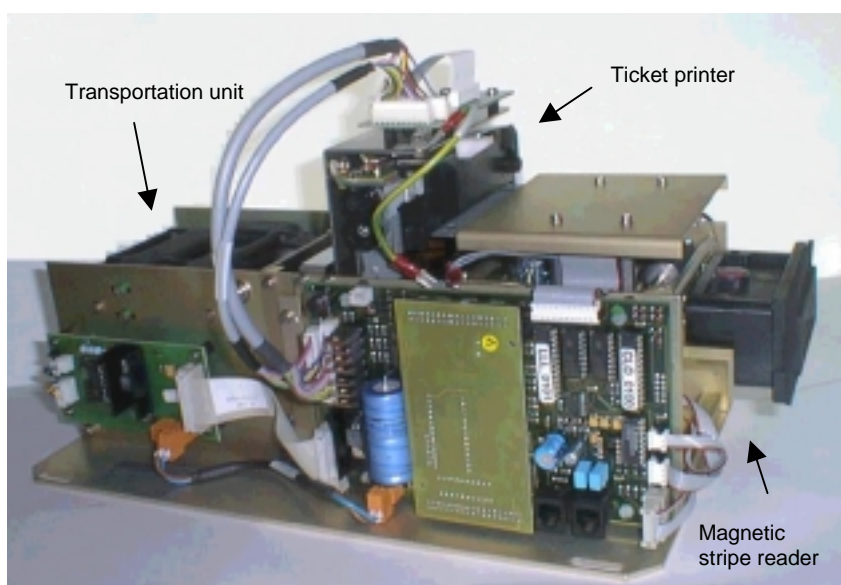


Illustration 2.2 : Multicon

2.3.1 Magnetic Track Reader

The magnetic track reader collects tickets and cards, reads the data and re-codes the altered data on the ticket if needed and returns the ticket or card afterwards.

The Multicon processes paper tickets as well as plastic cards with central track and with side track (optionally) (credit cards, bank and eurocheque cards) depending on the type of Multicon.

Caution:

To prevent parking frauds (insertion of 2 tickets) new tickets (EKG, HKC, CE, etc.) are principally coded from below. When inserting ticket, watch out for the position of magnetic track.

The re-coding of tickets is only done on the magnetic track which was read before.

The magnetic track reader is equipped with a printed circuit board (pcb UMSL) which communicate serially with the TCC (interface X10 or X11) and which controls the functions of the magnetic track reader, the needle printer and the transport unit.

See the following illustration for the connection of the pcb.

2.3.2 Ticket Printer

Paper tickets (card board) are printed with optical characters of several lines. Numbers from 0 to 9 and capital letters are used. The number of characters per line is limited to 18.

The needle printer is only used with a magnetic track reader as the reader controls the paper feed of the tickets to the print position.

Depending on the different needs the following optional units can be installed for special functions.

2.3.3 Transport Unit UTBG I (Optional)

The transport unit UTBG 1 feeds the magnetic track reader with paper tickets from the back. The UTBG 1 has a separate driving motor to transport the ticket strip out of the ticket store and of a cutting terminal to cut the tickets from the paper strip.

Information:

If a HKC is used for a serial ticket production, the ticket slot (return slot of Multicon) should be removed and the HKC should be tilted slightly forward. Thus the tickets fall out of the reader automatically and nobody needs to collect them.

2.3.4 Transport unit UTBG III (Optional)

The transport unit UTBG 3 offers three different functions in one unit:

1. Collect and cut a ticket from a strip.

2. Intermediate storage of tickets

A ticket can be transported from the magnetic track reader to and deposited in the UTBG 3. Now the reader can process a credit card or eurocheque card. After returning the credit card, the ticket can be transported back from the store into the reader and can be re-coded and returned.

3. With the installed sorter, tickets can either be transported into the above mentioned ticket storage or collected in a ticket container if you switch the sorter (e.g. value and time cheques)

See the following illustrations for the connections of the UTBG3 pcb.

2.4 TCC (Terminal Control Computer)

The TCC controls all functions of the HKC and is mounted on the interface pcb. On the pcb are all connectors and clamps required for operation.

12 inputs and 12 outputs with 24V control voltage can be directly controlled and monitored via integrated power transistors.

The TCC is battery-buffered ex works.

2.4.1.1 Layout of the TCC

The TCC is capsulated in a box of steel tin, cromatized.

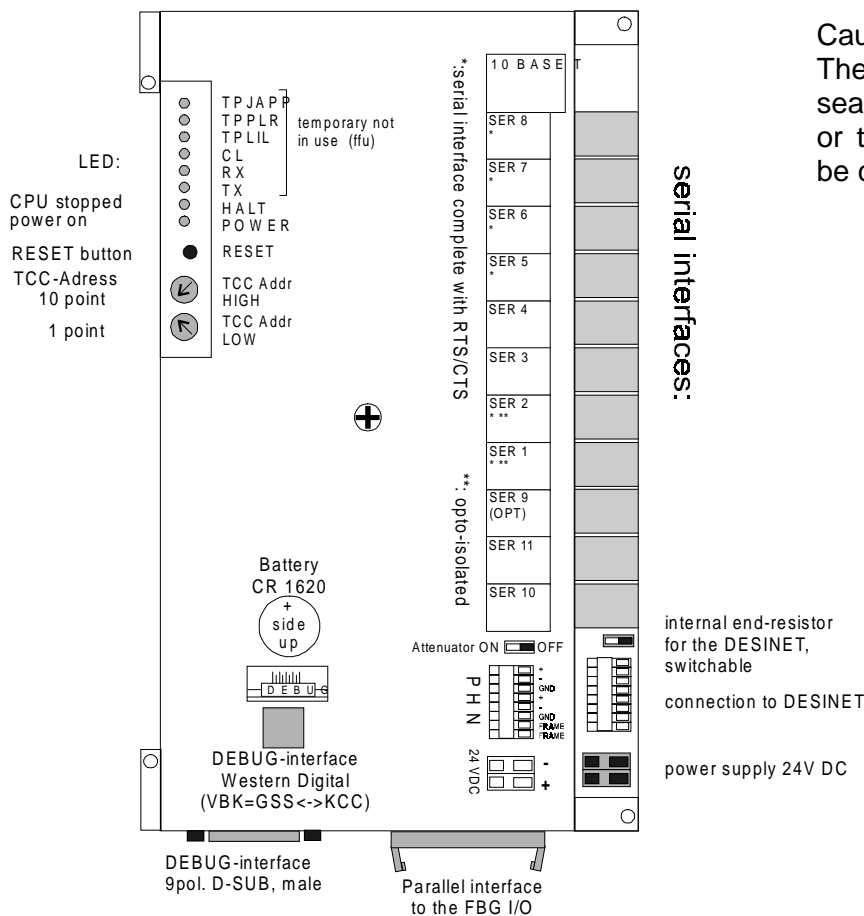


Illustration 2.3: View onto the TCC (Type KCC)

2.4.1.2 Serial interfaces

The serial interfaces of the TCC are connected to the following components.

- Port 1 serial receiptprinter (if any)
- Port 2 serial cashcard reader (if any)
- Port 3 serial speech output (if any)
- Port 4 Chipcoin reader or Multikon
- Port 5 Videosystem or GAC (if any)
- Port 6 Display (2 x 20 char or GSS)

2.4.1.2 Parallel connections

A parallel I/O board is controlled by the integrated power transistors. The I/O board is connected to the TCC with a ribbon cable. The inputs and outputs of the TCC are connected to the clamps. LEDs signalize the status of the different channels.

The following signals are provided at the clamps:

I 1	barrier down	O1	barrier open for short term parkers
I 2	not connected	O2	not connected
I 3	barrier up	O3	barrier in service
I 4	arm broken	O4	n.c.
I 5	closing detector	O5	n.c.
I 6	n.c.	O6	barrier closed
I 7	presence detector	O7	barrier open for season parkers 1
I 8	n.c.	O8	terminal in service
I 9	n.c.	O9	n.c.
I 10	n.c.	O10	n.c.
I 11	n.c.	O11	n.c.
I 12	n.c.	O12	n.c.

2.5 Receipt Printer

The receipt printer in the desk top casing is a fast thermal printer. It prints receipts if requested and a shift report with all the data of payment processes and the cash balance at the end of a shift or a Shift Change. The HKC sends a signal when there is a lack of paper.



Illustration 2.3: Receipt printer

2.6 Display

An LCD is integrated in the casing. It can display 2 x 20 characters with a maximum character height of 8mm. It displays the due parking fee or requests to enter data necessary for the coding of special tickets.

2.7 Keyboard

The manual cash register keyboard is integrated in the casing. It consists of a numeric keypad and a function keyboard. The keys are covered with a transparent cover. They are marked on a foil below this cover. You can change the writing by exchanging these foils or replace them by different letters on very thin paper.

Several functions are assigned to each key of the keyboard due to the multitude of functions. You can adapt or alter the assignment of the keys via configuration at the data control center.

The chapter "Function of Function Keys" from page 17 on explains the different functions and their assignment.

2.8 External Customer Display (Optional)

You can connect an external display to the manual cash register in addition to the integrated one to display the due fee for the customer.

The external display is installed in a plastic casing.

A connector connects the display to the HKC. Switch off the HKC during connection works to avoid damages at the display and the HKC. The display is automatically initialized when switched on.



Illustration 2.4 : Customer display

2.9 Cash Drawer (Optional)

You can connect a cash drawer to the manual cash register as an option by installing a pcb in the HKC. It gives the signals to open the cash drawer auto-matically.

The cash drawer operates either placed on or mounted below a desk. The drawer is divided in compartments for coins and banknotes. You can take out this element (e.g. at the Shift Change). Additional elements are available as an option.

The manual cash register opens the cash drawer automatically after pressing the buttons "Paid" or "Paid/Receipt". You can also open the drawer with a key or with a hidden emergency mechanism.

The locking of the cash drawer is not controlled .



Illustration 2.5 : Cash drawer

3 Technical Data

Power supply:	110/230V AC , 60/50c/s
Power consumption: Electronics	170VA max.
Control voltage:	24V DC , 1 A max.
Control inputs/outputs: Outputs	0V active 5A max.
Temperature: Storage Operation	-25 to +80 °C -20 to +50 °C
Protection:	IP21 mains voltage unprotected in interior
Noise:	< 70 dB(A)
Mass: Desk-top terminal	approx. 30 kg
Dimensions:	

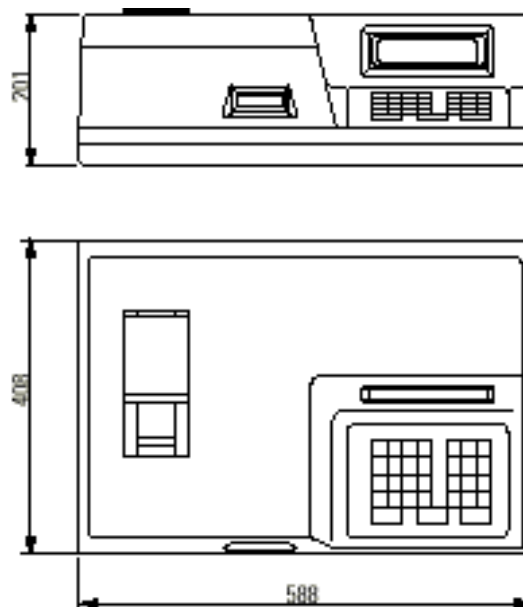


Illustration 3.1 : Dimensions

4 Set Up and Connection

4.1 Set Up

Choose an adequate place to set up the manual cash register. Install a minimum of 4 SCHUKO outlets (230V) and lay the DESINET line to this work station. It is best to place the DESINET lines in a permanently installed distribution box.

Do not set up the manual cash register until construction of the site where it is placed is finished. Otherwise the installed fan might suck dust and humidity into the terminal which could reduce the life of the terminal.

The terminal is placed at its designed position once unwrapped. Afterwards the electrical connections are made.

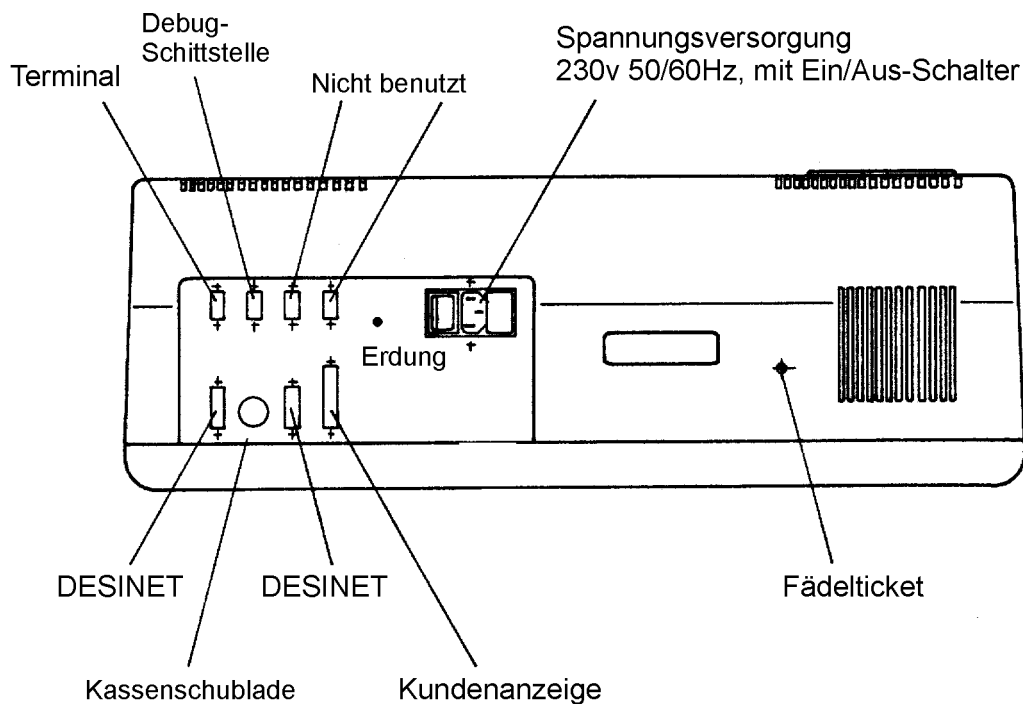


Illustration 4.1: rear view HKC 100

4.2 Connection of HKC 100

All connection works must be carried out while the terminal is switched off. The electronics can be damaged otherwise.

- Plug the rubber connector into the terminal and connect the cable to the main voltage.
- Connect to DESINET.
Connect the HKC to the DESINET cabling of the car park via one of the available 15 pol. Sub-D plugs. The proper connectors are shipped with the terminal. The connectors are connected as follows:

Pin 2 = Data +
Pin 9 = Data -

Please use a fairly flexible cable for the connection DESINET manual cash register. You can extend these cables with a thinner cable (LIYCY2x2x0,25 or 0,5mm²) if the DESINET line laid in the car park cannot be soldered directly to the connectors. The extensions should not be longer than 1m.

Connect the incoming DESINET line to the outgoing DESINET line only at the connector of the HKC. You can also use one of the connectors as "input" and a second one as "output". The connection of the connectors is identical.

Be careful with the polarity of the lines when soldering the wires. Terminals with confused poles cannot go on-line and have an impact on the whole DESINET.

Note that the lines are connected perfectly when soldered! Rosin connections have the same effect in DESINET as insulators or high-valued resistors! The whole DESINET can be affected by rosin connections.



- If there is a cash drawer, it is slipped onto the round DIN-plug. The plug is equipped with a "Bayonet" lock, that means that the plug is secured by a quarter turn of the locking ring.
- If you have a customer display, the connection cable is connected to the 25 pole sub-D plug of the manual cash register and the plug is fixed (secured) with the screws. Position the customer display in such a way that the customer can read it easily.

- Open the HKC casing if you want to connect a manual cash register to a barrier. The control line is connected to the I/O pcb at the inside of the HKC (the pcb is installed above the TCC). In the table below check which signal is connected to which terminal:

Terminal HKC	Signal	LS 100 BASIC Terminal 7 (left plug)
E1	barrier down	8
E2		
E3	barrier up	7
E4	barrier arm break	6
E5	detector N	9
E6	cancellation	
E7	detector V	10
E8		
E9		
E10		
E11		
E12		
A1	barrier open	4
A2	cash drawer open	
A3	barrier on	3
A4		
A5		
A6	barrier closed	5
A7	SP open	4
A8	HKC in operation	
A9		
A10		
A11		
A12		

The reference voltages for the inputs/outputs are available at the clamps marked with 0V and +24V.

Use an additional terminal called "2 Terminals at 1 LS" (identification number 2 721 250 039) if you want to operate the manual cash register together with an exit control terminal.

5 Receipt Printer Printouts

5.1 Receipt Print

The HKC prints a payment receipt on request. The customer can request a printout pressing the "Paid Receipt" button when paying or inserting the paid ticket into the magnetic track reader again. The following receipt is printed:

```

      DESIGNA
    CAR PARK SYSTEMS

HKC:           3
RECEIPT:       25
STAFF:         31
CASH PAYMENT
KVZ: 12.12.96 07:59
EFZ: 11.12.96 07:43
BEZ: 11.12.96 07:43
LOST TICKET
FEE:           12.00 DM
PAID:          20.00 DM
RETURN:        8.00 DM
-----
NET:           10.43 DM
15% SALES TAX:
1.57 DM
  
```

Terminal name
 Receipt number
 Staff number of shift operator of HKC
 Type of payment, also CREDIT CARD, CHEQUE, TOKEN
 End of validity of card
 Entry time according to ticket, in case of lost tickets time of issue
 Payment time
 Type of paid ticket, also SHORT TERM PARKER TICKET etc.
 Due fee
 Amount paid by customer
 Change given

 Net sum of parking fee
 sales tax on parking fee

5.2 Shift Report

The shift report is printed at the end of a shift. If several car parks are connected (parking and payment interconnection) a report is printed for the car park where the manual cash register is actuated and then a printout for all the networked car parks.

The report can be much shorter than shown below if the configuration of the HKC was made for lines with zero values.

DESIGNA CAR PARK SYSTEMS			
HKC		3	Manual cash register number

SHIFT REPORT			Type of report
11.12.96 19:59			Date and time
LAST REPORT			
10.12.95 19:00			Date and time of last shift
NO.		66*	Receipt number, if with *, it is a sum shift report
CAR PARK NO.:		10	Car park number of "ALL CAR PARKS"
PAYMENT TRANSACTIONS			List of all payment transactions by
TYPE	NUMBER	DM	type, number and value in respective currency

STP :	6	12.50	Sum of short term parker receipts
NKG:	2	3.80	Sum of additionally paid congress cards
NSP:	0	0.00	Sum of additionally paid season parker cards
NWT:	2	6.00	Sum of additionally paid value cards
SE1:	0	0.00	Sum of extra receipts type 1
SE2:	0	0.00	
SE3:	0	0.00	
SE4:	0	0.00	
SE5:	0	0.00	
SE6:	0	0.00	
SE7:	0	0.00	
SE8:	0	0.00	
CODE TRANSACTIONS			List of transactions for coded tickets by
TYPE	NUMBER	DM	type of ticket, number, and sum in cash value

VV :	1	3.00	Advance sale ticket
VT :	2	20.00	Lost ticket
DP :	0	0.00	Season parker ticket
WT :	0	0.00	Value ticket
STP :	0	0.00	Short term parker ticket
KG :	0	0.00	Congress card
ET :	0	0.00	Ticket single use
FT :	0		Function cards
EMT:	0	0.00	Issued tickets for single use
WZS:	0	0.00	Value and time cheques

TOTAL:	13	45.30	Number and total sum of coded tickets
DISCOUNTS			List of discounts granted by
LEVEL	NUMBER	DM	discount level, number, and sum in cash value

NKL1:	0	0.00	Short term parker discount 0
NKL2:	0	0.00	Short term parker discount 1
NKL3:	0	0.00	Short term parker discount 2

NST1:	0	0.00	Granted discounts according to special rate 0
NST2:	0	0.00	Granted discounts according to special rate 1
NST2:	0	0.00	Granted discounts according to special rate 2
NST4:	0	0.00	Granted discounts according to special rate 3
NST5:	0	0.00	Granted discounts according to special rate 4
NST6:	0	0.00	Granted discounts according to special rate 5
NST7:	0	0.00	Granted discounts according to special rate 6
NST8:	0	0.00	Granted discounts according to special rate 7
NT :	0	0.00	Issued ticket single uses without value

DTOTAL:	0	0.00	Number and total sum of discounts
DISCOUNTS:		0.00	Total of all discounts granted
CASH :		20.50	Sum of cash receipts
TOKENS :		0.00	Sum of received tokens
CREDITC.:		23.80	Sum of credit card payment transactions
VALUECH.:		1.00	Sum of received value cheques
CHEQUES :		0.00	Sum of received eurocheques
S-NET :		39.39	Sum net of shift receipts
SALES TAX:		5.91	Sales tax on shift receipts

S-TURNOVER:		45.30	Shift turnover
TOTAL NET:		1505.17	Total net turnover of manual cash register since putting into operation
SALES TAX:		225.63	Sales tax on total turnover

T-TURNOVER.....		729.80	Total gross turnover of manual cash register since putting into operation

6 Function of Function Keys

6.1 Keyboard Structure

Normally 2 functions are assigned to each function key of the keyboard. The lettering on the keys describes their function briefly.

Call the lower function marked on the key pressing the key. You activate the function marked at the top by pressing the "SHIFT" key together with the function key.

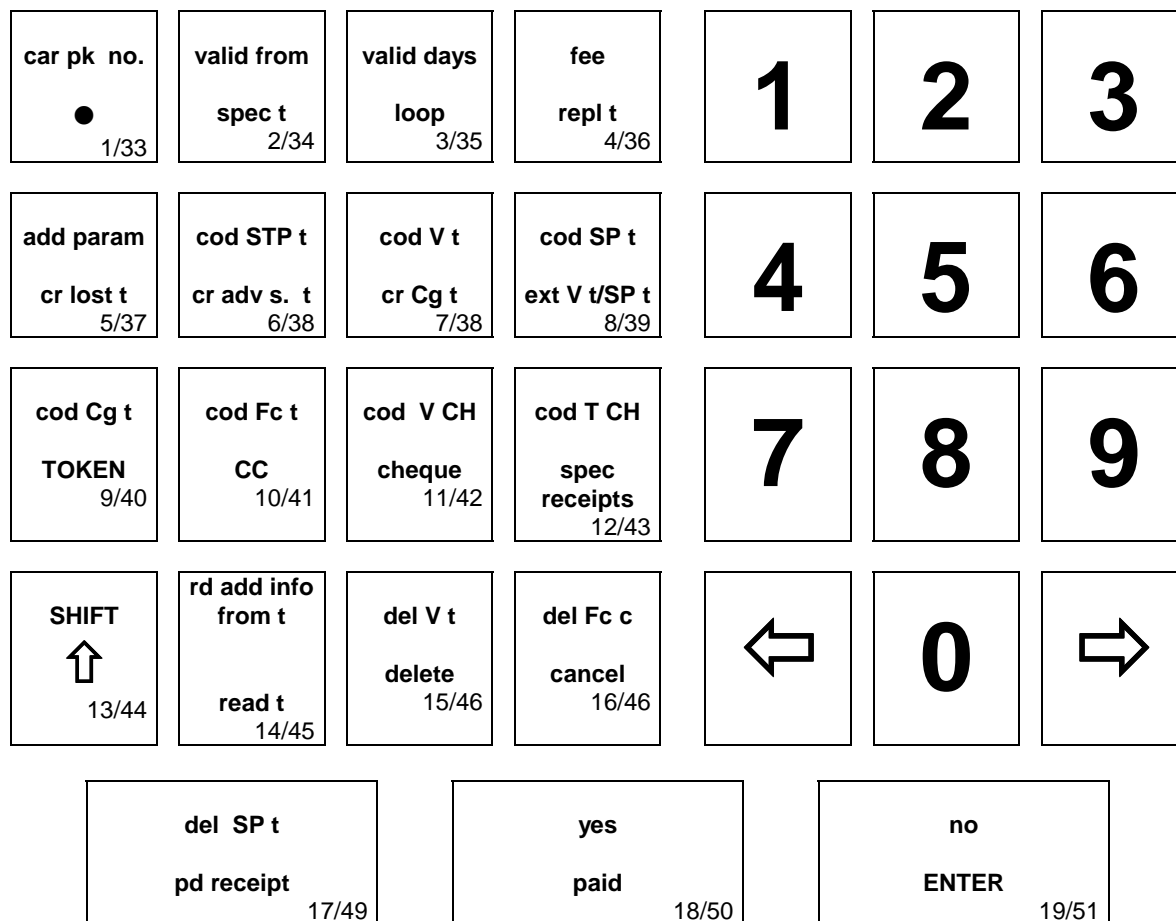


Illustration 6.2 : Sample keyboard

The numbers represented at the bottom right are the numbers of the keys in normal function and in "SHIFT" function.

The authorization to use certain function keys can be determined with the different shift levels (level 0-2). You can assign different functions to the keys or even block some keys completely. You cannot alter the assignment of functions to the keys in level 0.

6.2 Assignment of Functions to Keys (Standard)

This description starts with the upper left key, with the standard function and afterwards describes the standard additional function defined by DESIGNA. One of the following chapters explains how to alter the assignment of the keys.

- This key has two functions:
 - ⇒ this key releases a paper feed at the receipt printer. If you press the key longer the paper is skipped some lines quickly until you release the key.
 - ⇒ this key places a full stop between Mark and Pfennig if you want to enter an amount of money, e.g. in case of payment of a parking fee.

car pk no.	Adjustment of car park number issuing tickets and cards
valid from	Determination of the beginning of validity issuing tickets and cards
special t	Special ticket = manually granted discounts, up to 8 different rates are possible. You have to select the number of the special rate (1-8) with the numeric keypad once you have pressed this key. The special rates have to be determined in the short term parker rate data record. You have to activate "Special rate with rate request" during configuration.
valid days	Determination of validity period in days when creating tickets and cards
loop	You can switch the connected presence loop to occupied or vacant with this key. You can switch the loop to occupied if no vehicle is on the loop and you can switch it to vacant, if it is in fact occupied.
fee	Fee to be entered manually when issuing tickets and cards.
repl t.	With this key you can create a replacement ticket. A replacement ticket is created if a customer can present a ticket which cannot be read anymore. At the cash register the data printed on the ticket are used to issue a new ticket.
add param	This function adds the respective parameter to the card to be issued.

Please note the basic difference between the keys described below. With the key function "create" you can adjust values. The keys with the function "Code" automatically and exclusively use the values adjusted in the season parker rate data record.



- cr lost t There are two ways to create a "lost ticket" (lost t).
⇒ If a vehicle is on the presence loop (HKC at exit) a lost ticket is created without the magnetic track reader actually issuing a ticket. Once the ticket is paid, the connected barrier opens and the lost ticket is entered into the shift report.
⇒ If no vehicle is on the loop (or if the key "loop" is pressed while a vehicle is on the loop) the magnetic track reader issues a normal lost ticket as a paper ticket.
- cod STP t Code short term parker ticket
- cr adv s. t Create advance sale ticket
- cod V t Code value card
- cr Cg t Create congress card
- cod SP t Code season parker card
- ext V t/SP t You can recharge season parker cards or value tickets with this function. You need the respective card to enter the card number manually. The extension of the validity of the season parker card or the recharging of the value card is done according to the data determined in the rate.
- code Cg t Code congress card
- TOKEN This key reports to the HKC that a customer used a token (value coin) for payment. When you press this key, the total amount due is booked as paid. The receipt shows "TOKEN" as type of payment.
- cod Fc t Code function card
- CC This key reports to the HKC that a fee was paid by credit card. The line "CREDIT CARD" appears on the receipt. When you press this key the total amount due is booked as paid.
- cod V CH Code value cheque

cheque	This key reports to the HKC that the due fee is paid by cheque. ⇒ The cheque is now printed if a cheque printer is connected. The whole fee is paid by cheque if no receipt printer is connected. The word "cheque" is printed on the receipt (if the key "pd/receipt" was pressed).
cod T CH	Code time cheque
spec receipts	Special receipts = up to 8 different permanently determined special receipts are possible (e.g. for services rendered by the staff). You have to select the number of the special receipts (1-8) via the numeric keypad once you have pressed this key. The special receipts have to be determined in the rate data record. The "Special receipts with rate request" needs to be activated for configuration.
SHIFT	This key switches between the different functions of the key. As long as this key is pressed together with a function key, the second function of the function key (the upper shift character) is carried out.
↑	See "SHIFT"
rd add from t.	You can get additional information while the card is inserted in the reader during the function "read card". No additional information can be given while reading value and time cheques. The number of uses is displayed in the additional information when reading a congress ticket.
read t	You can read tickets and cards at the manual cash register pressing the key "read t". Thus you can check all relevant card data at the manual cash register. If data for a certain type of card are not available a zero value appears (e.g. Gr/Fk/Fh reading a STP ticket).
del V t	Delete value ticket
delete	No function at the moment
del Fc c	Delete function card
cancel	Stops all actual payments or entries. A cancellation is reported at the data control center and it is recorded with the canceled amount.
del SP t	Delete season parker card
pd receipt	Pressing this key payment of the due parking fee is confirmed. The cash drawer (if present) and also the barrier open. A receipt is printed.
yes	Confirms stopping the shift. No shift report is printed then.
paid	Pressing this key confirms payment of the calculated parking fee or of a manually entered sum. The cash drawer (if present) and a connected barrier open. <u>No</u> receipt is printed. Afterwards the customer can request a receipt inserting the paid ticket again.
no	Request for a shift break. It means NO if you take the card "Shift Change „ out of the reader, the shift is ended, and a shift report printed.

ENTER This key confirms entries (e.g. rate for lost ticket) displayed on screen.

7 Function Cards at HKC

7.1 Function Card "Shift Change"

When inserting the Shift Change card, the operator is asked whether he really wants to end the shift. The shift is ended when the card is retracted. "NO" is entered on the keyboard or if nothing is entered.

If you press the "YES" key while the card is still in the reader the manual cash register changes to the state "Shift break". You can end this state inserting a Shift Change card.

If you use the same card as for the shift break, the shift is resumed. With a different card the shift is interrupted, a shift report is printed, and a new shift is started.

The actual state of the shift can be displayed at the management computer with the function "Display terminal status" in the column "On/Off".

- If a manual cash register is out of operation, nothing is displayed in the column "On" []. In this case a defect, a function card, or a command from the data control center put the HKC out of operation or the HKC already was out of operation (if the latter is the case also in the column "ON-LINE" nothing is entered).
- A star [*] is displayed in the column "On" if a shift is active.
- A plus sign [+] is displayed in the column "On" if the shift is stopped.
- A minus sign [-] is displayed in the column "On" if the manual cash register is switched on without a shift.