



Hardwaredescription KBOX V0030

Serial Cash Register Interface for Coffeemachines

Version dated: 17.04.2002
update 05.11.2008





1. Application

KBOX is an Interface between coffeemachines and cash registers. KBOX is the hardwareplatform for the communication between the coffeemachine and the cash register. The commands sent by the coffeemachine are converted by software to the different commands of the cash register. The KBOX thus has two important advantages:

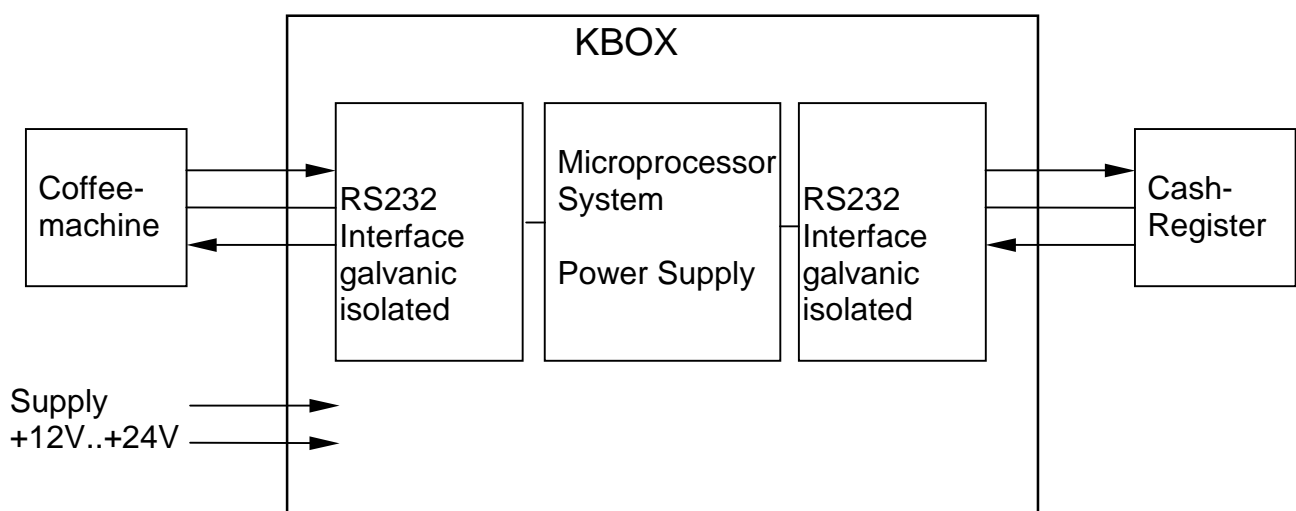
1. Hardware: The RS232-Interfaces are galvanic isolated on both sides coffemachine and cash register. In installations where many components are connected together and supplied with different power outlets, ground loops are avoided. The power for the KBOX normally is supplied by the coffeemachine but the KBOX can be supplied with an independent supply.

Software: No software change is necessary on the coffeemachine. Software is adapted on the KBOX. Different protocols are available.

KBOX has the following key specifications:

- rugged Alucase 110x170mm
- Galvanic isolated Interface to cash register.
- Galvanic isolated CCI-interface to coffeemachine.
- KBOX-Supply either from coffeemachine or external.
- unique connectors to avoid confusion
- possible connection for clerk-key.

2. Overview





3. Connectors and Functions

3.1.1 CCI Connector to Coffeemachine

The coffeemachine is connected to the 9pole male SUB-D9-connector.

PIN	signalname	wirestyle + color
CCI/1	n.c. not connected	
CCI/2	Data from CM (input)	AWG22 Style 1569 red
CCI/3	Data to CM (output)	AWG22 Style 1569 orange
CCI/4	n.c. not connected	
CCI/5	Ground CM-communication	AWG22 Style 1569 green
CCI/6	Supply 24VAC (A)	AWG22 Style 1569 blue
CCI/7	Supply 24VAC (A)	AWG22 Style 1569 violet
CCI/8	Supply plus 24VDC (B)	AWG22 Style 1569 white
CCI/9	Supply GND (B)	AWG22 Style 1569 grey

Header on PCB: DSUB 9pole male, 90 degrees
Connector on cable: DSUB 9pole female

Normally, a standard 9pole computer-cable can be connected.

3.1.2 Signal description of connector CCI1

3.1.2.1 Communication

On CCI/2,3,5 the communication between KBOX and coffeemachine takes place. The communication is galvanic isolated thru an optoisolator from the rest of the circuit. The transmit-signal of the coffeemachine supplies the isolator. With this configuration is is impossible to destroy the communication interface of the coffeemachine.

3.1.2.2 Supply from coffeemachine with alternative current (A)

CCI/6 and 7 are inputs for alternating current ranging from 12VAC to 24VAC. The current consumption is env. 50mA. Over this supply the microprocessor system is powered. Since the galvanic isolation separates power and communication lines, no ground loops exist.





3.1.2.3 Speisung von Kaffeemaschine mit Gleichstrom (B)

CCI/8 negative and CCI/9 positive are the powersupply pins for direct current ranging from 12VDC to 30VDC. Die Stromaufnahme beträgt ca. 50mA. The current consumption is env. 50mA. Over this supply the microprocessor system is powered. Since the galvanic isolation separates power and communication lines, no ground loops exist.

Attention: The interface only must be supplied with alternative current (A) or direct current (B) not both!

3.2.1 RS1 Connector Cash register

The cash register is connected to the 9pole female SUB-D9-Connector. If the cash register consist of a standard PC with software it can be directly connected. The connection is PC-compatible. The PC can be connected with a 9pole 1:1 cable.

PIN	signalname	wirestyle + color
RS1/1	internal connection with 4 and 6	
RS1/2	data to cash register (output)	
RS1/3	data from cash register (input)	
RS1/4	internal connection with 1 and 6	
RS1/5	ground communication cash register	
RS1/6	internal connection with 1 and 4	
RS1/7	internal connection with 8	
RS1/8	internal connection with 7	
RS1/9	n.c. not connected	

Header on PCB:

SUB D9 female, 90 degrees

Connector on cable:

SUB D9 male





3.2.2 Signal description of connector RS1

3.2.2.1 connector cash register or PC

On this RS232-Interface the cash register or PC is connected. The interface is equipped with galvanic isolation to the other electronics to avoid ground loops. To operate the PC with a 1:1-standardcable, the unused handshake signals are bridged. On Pin 2 data are sent from KBOX to the cash register. On Pin 3 the KBOX receives data from the cash register. Pin 5 is the communication ground. The connection to the cash register only needs three wires RxD, TxD and GND.

3.3.1 WO1 Power supply

PIN	signalname	wirestyle + color
WO1/1	AC1 Power supply	AWG20 Style 1569 red
WO1/2	AC2 Power supply	AWG20 Style 1569 red

Header on PCB: Wago orange 2pol 90 degrees RM 5.08
Connector on cable: Wago connector 2pol 231-302/026-000

3.3.2 description of the power supply connection

3.3.2.1 supply with transformer

To this connector a transformer can be connected if the power comes not from the coffeemachine. The transformer must conform to EN60'742. A transformer with a nominal voltage of 15VAC and a nominal current of 250mA (power env. 4VA) is ideal. If an external transformer is used only tree communication lines must go to the coffeemachine!!!

Attention: If the external power supply via WO1 is used, only three communication wires must go to the coffeemachine!





3.4.1 CM1 connector key switch

PIN	signalname	wirestyle + color
CM1/1	LGND Ground	AWG22 Style 1569 red
CM1/2	SCH key switch input	AWG22 Style 1569 red
CM1/3	LGND Ground	

Header on PCB: AMP CST100 3pol
Connector on cable: AMP MTA100 3pol

3.4.2 signals on connector CM1

3.4.2.1 Key switch

The key switch can be used for free of charge. If there is no connection between CM1/2 and CM1/1, the cash register is active. If CM1/2 and CM1/1 are connected together, the free of charge mode is active. The exact function of the input depends on the software version.

S-TEC can supply an appropriate key switch.





4. LED's

On the side of the RS232-Interface to the cash register there are 3 Indicator LED's . They are useful to determine whether there is a communication over the interface.

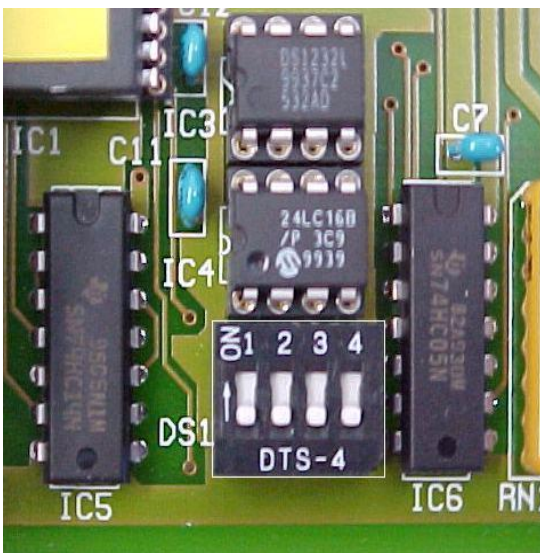


LD1 green
LD2 yellow
LD3 red

KBOX_LED_000817.jpg

The meaning of the LED's is software dependent.

5. DIP-Switch DS1



KBOX_DIPswitch_000817.jpg

On the PCB KBOX is a DIP-Switch installed. The exact function is software dependent please refer to the software documentation.





6. Technical Data KBOX-PCB

6.1 Electrical data

- 6.1.1 Supply current 24VDC ca. 50mA
- 6.1.2 Isolation Voltage CCI-Interface(CM) \leftrightarrow Supply: 100VAC/DC
- 6.1.3 Isolation Voltage RS232-Interface Cash register \leftrightarrow Supply: 100VAC/DC
- 6.1.4 Isolation Voltage CCI-Interface \leftrightarrow RS232-Interface Cash register: 100V

6.2 Environmental data

- 6.2.1 Operating temperature: 0 °C bis 70 °C
- 6.2.2 Storage temperature: -40 °C bis 85 °C
- 6.2.3 Moisture: 30%rF bis 90%rF, no condensation.

6.3 Mechanical data

- 6.3.1 Dimensions: LxWxH [mm] 170x110x35 in anodized ALU-case
- 6.3.2 Material: PCB FR4, 1.6mm doublecoated with solderresist 35 μ m Cu, Legend print white, HAL
- 6.3.3 Weight: env. 125gr. w/o case
- 6.3.4 Mounting: 4 mounting holes \varnothing 3.3mm (lower left=X=0/Y=0)
mtg. hole position 1: X=5.0 Y=5.0
mtg. hole position 2: X=155.0 Y=5.0
mtg. hole position 3: X=155.0 Y=94.7
mtg. hole position 4: X=5.0 Y=94.7
attention: only mount with Polyamide spacers M3 !
- 6.3.5 Case: Alu-profilecase F4083 LxBxH=167x104x37

6.4 Certifications

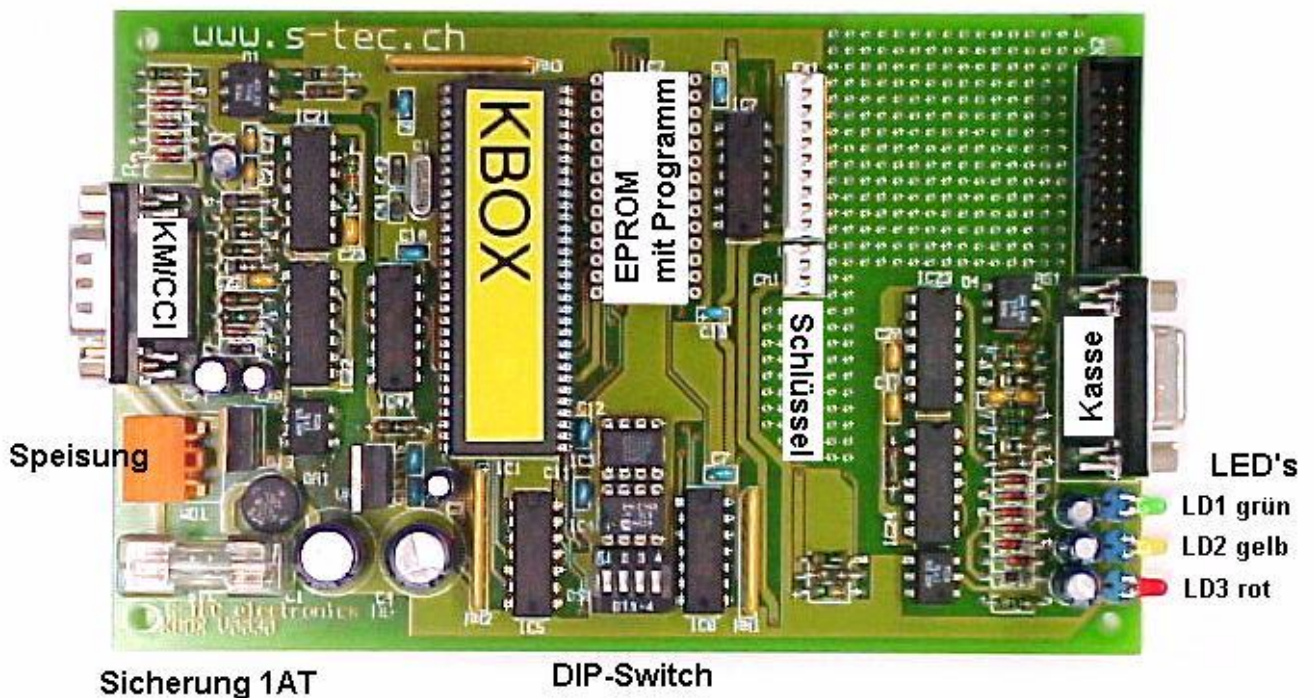
- This appliance must be operated with SELV (savety extra low voltage). Das Gerät beinhaltet keine netzspannungsführenden Komponenten.
- Die Printplatte ist UL-geprüft, aus FR4-Material und hat die Brennbarkeitsklasse UL94V0
- The galvanic isolations of the RS232-Interfaces are only to aviod ground loops and have no security functions.





7. PCB

This picture shows the PCB KBOX V0030 and the position of the connectors.



KBOX_Stecker_000818.jpg

8. Revision

31.08.2006

Page 3 CCI-Connector Supply B corrected. (8 und 9 were interchanged)

