

# M-S Cash Drawer Corporation

## KC type interface instructions

### Introduction

The KC trigger board and external power supply (AC adapter) enable the cash drawer to be controlled by a serial output port.

### Interfacing

The trigger board requires a pulse >3.5 VDC for at least 100 milliseconds to reliably open the drawer. The preferred and most common way to supply this signal is via a standard serial port on your host operating at 300 BAUD or slower. The higher the baud rate the longer the string of characters needed to produce the required pulse.

### Installation – Dedicated Serial Interface

This method uses a DEDICATED RS-232 serial port on your computer or terminal to send an "open" command to the trigger board in the cash drawer. Any data sent on this port which is a minimum 100 milliseconds will open the cash drawer. If it is necessary to independently operate a printer or other device on the same serial port, the KSI interface type is required. Please refer to the KSI instructions for more information.

Cabling Specifications				
Color	Computer Serial Port		Data Terminal	Definition
	25 pin	9 pin	25 pin	
White	2	3	3	TxD
Black	7	5	7	SG
Jumper 1*	4-5	7-8	4-5	RTS-CTS
Jumper 2*	6-8-20	1-4-6	6-8-20	DSR-DCD-DTR

\* Jumpers simulate serial port handshaking

### Integration

Connect the cash drawer interface cable to the computer's serial port. Plug the AC adapter cable into the mating connector on the back of the cash drawer. Plug the AC adapter into the 115 VAC wall socket. Check to make sure the drawer is unlocked and operates manually with the keylock. Close the drawer. The drawer should now open whenever data is sent to the serial port.

### Testing

Testing the drawer involves configuring the serial port and sending data to the cash drawer. The following test are for IBM PC's and compatibles. The software used with the cash drawer should perform similar functions.

From QBasic:

```
10 OPEN "com1:300,n,8,1,ds" AS #1 ----(configures port)
20 PRINT #1, CHR$(7) ---(sends ASCII(7))
```

*Note: if a higher BAUD rate is used, several characters should be sent. Change line 20 to:*

```
20 PRINT #1, "@@@@@@@@@@@@@@@@@@@@@@" ---(sends 20"@ symbols)
```

From DOS:

```
C:> MODE COM1:300,n,8,1
C:> ECHO > COM1: @@@@@@@@@@@@@@@@@@@@@@
```

*The MODE command configures the serial port. The ECHO command directs data to the serial port.*

## **Troubleshooting**

First, re-check all the steps of the installation.

1. Verify that the AC adapter is plugged into wall power and that the connector is firmly connected to the receptacle on the back of the cash drawer.
2. Verify that the interface connections to the computer are correct and electrically sound. Make sure the connector is firmly plugged into the correct port. If you are communicating to COM1: make sure the connector is plugged into COM1: and not COM2:.
3. Make sure the drawer is unlocked and operates manually with the key. Close the drawer.
4. Use a test program, not the vendor software - to open the cash drawer.

## **Symptoms usually fall into two categories:**

1. An error message appears stating "write fault error". This message indicates that the necessary handshaking between the computer and the cash drawer did not occur. Consult the documentation for your computer to make sure the cash drawer is plugged into the correct port (i.e. COM1:) and that the handshaking is correct. Jumper "Request to Send" (RTS) to "Clear to Send" (CTS) together. Jumper "Data Set Ready" (DSR) to "Carrier Detect" (DCD) to "Data Terminal Ready" (DTR) together. The white wire from the cash drawer must be connected to "Transmit Data" (TxD) and the black wire to "Signal Ground" (SG).

2. Execution of the program proceeds without an error message but the cash drawer does not open. There are several possible causes:
  - A. Consult the documentation for your computer to verify the white wire to the cash drawer is connected to "Transmit Data" (TxD) and the black wire is connected to "Signal Ground" (SG).
  - B. The AC adapter may be defective. Check it with a voltage meter if possible. It should produce 12 VDC to 18 VDC when measured at the connector to the cash drawer. The center conductor should be negative with respect to the outer conductor. (Many replacement adapters available at electrical supply houses are wired oppositely.) If a replacement adapter is being used, it should be rated 12 VDC at 300 mA. to 800 mA. Radio Shack part number 273-1652 is acceptable. However, take care to use the NEGATIVE TIP configuration (meaning negative is on the inside).
  - C. The trigger board may be defective. This can be checked by removing the interface connector from the computer and momentarily connecting a voltage source (a 9 Volt transistor battery or a 6 Volt lantern battery). Connect the white wire to the positive terminal and the black wire to the negative terminal of the battery. (If the polarity is reversed, no harm will be done.) The cash drawer should open. Make sure the AC adapter is still connected normally for the test.

If the cash drawer now opens properly using a test program but fails to open using vendor software for your system, check the following points with the software vendor.

1. The software is sending the data to the correct serial port that the cash drawer is attached to.
2. The BAUD rate is 300 or slower.
3. If the BAUD rate is faster, the number of characters sent must be increased. Twenty quickly repeated open commands will operate the drawer at BAUD rates up to 9600. The best open commands are "@" (ASCII 64), or "BEL" (ASCII 7).

If the software is incompatible, consider changing the software vendor or upgrading the interface to the M-S KSI interface.

### **Installation – Parasite Serial Mode**

KC interfaced cash drawers may be used with a serial printer attached to the same serial port by using a "Y" cable. The cash drawer will open whenever data is sent to the printer. If independent operation of the printer and cash drawer is required, the M-S KSI interface should be used. In this configuration handshaking is done by the printer. The jumpers used in the dedicated serial mode to simulate handshaking are not used. The white and black wires to the cash drawer are connected as described in the

dedicated serial mode section. The installation and check out procedures are also the same. Modify the test programs according to the BAUD rate used by your printer by replacing 300 with this BAUD rate.

Troubleshooting procedures are generally the same as those for the dedicated serial mode except handshaking is performed by the printer. To be on the safe side, disconnect the printer interface to the computer when applying a battery test voltage to test the trigger board. Connect it for the other tests.