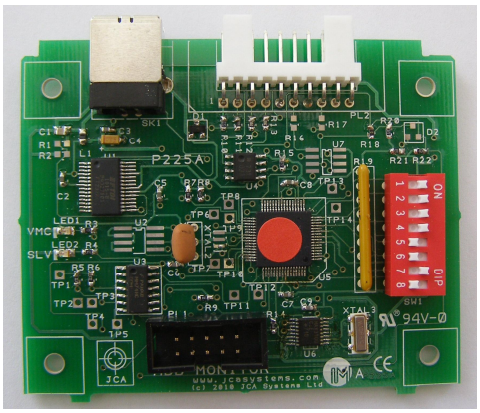
APPLICATIONS INFORMATION P225 MDB Monitor

Issue A Date: 25 October 2010



P225A MDB MONITOR

Change History

Document Issue	Date	Changes
A	25 Oct 2010	Original

1. INTRODUCTION

This circuit board enables the traffic on a vending machine MDB “bus” to be simply monitored on a PC using Hyperterminal or some other test based application.

The connection to the PC is via a USB connection which is also used to power the monitoring circuit board.

DIP switches on the board enable the traffic for certain MDB devices to be specifically included or excluded.

Refer to the MDB Standard (available from NAMA, www.vending.org) for details of the MDB protocol.

A standard loom is available for the connection to the vending machine:

- Loom 208-4 MDB “Y-splitter”

2. USB interface to Card Reader

This interface is via a standard “type B” USB connector. The interface operates as a virtual COM port at 38400 baud, 8 bits, no parity and 1 stop bit . Refer to the www.ftdi.com website for appropriate interface drivers (reference FT232R device).

3. DIP Switch Settings

	Function	OFF	ON
Switch 1	Coin Changegiver (08H)	**Exclude** messages relating to this device	**Include** messages relating to this device
Switch 2	Bill Validator (30H)		
Switch 3	CardReader #1 (10H)		
Switch 4	CardReader #2 (60H)		
Switch 5	Spare		
Switch 6	Spare		
Switch 7	Other MDB devices	Exclude Other messages	Include Other messages
Switch 8	Reprogram mode	Normal operation	Allow new software to be installed. (Special utility software is required to load the encrypted hex file into the P225 via the USB port)

4. Data Format

The serial data to the PC is in the form of a single line of ASCII-HEX data relating to a single command from the vending machine controller (VMC). The line is terminated with a CR character (0DH). To start monitoring an ESC (1BH) character should be sent to the P225 board.

The ASCII-HEX is in two or three parts depending on the type of message.

The first part is the command from the VMC, including the checksum whilst the second part is the response to the VMC from the MDB peripheral which starts with a "**/**" character.

The third part is an Acknowledgement (ACK) from the VMC if the peripheral has sent any data. This starts with a "**:**" character.

Examples for Coin Changegiver :

0808/00	Reset 08H, checksum 08H and ACK 00H
0B0B/0B0B:00	Poll 0BH, checksum 0BH, then response 0BH (Just reset), checksum from Changegiver 0BH and finally 00H which is the ACK from the VMC to the data from the Coin Changegiver
0B0B/00	Poll 0BH, checksum 0BH, then response 00H which is an ACK from the Coin Changegiver indicating noting to report.
0B0B/00	Another poll with nothing to report
0909/030044050200F0010101010102040A14288F:00	Setup command 09H, checksum 09H from VMC. 03H .. 28H configuration response from Coin Changegiver, checksum 8FH and finally 00H which is the ACK from the VMC to the data
0A0A/0000000000001A120C08000040:00	Tube Status command 0AH, checksum 0A from VMC. 0000000000001A120C080000 tube information from Coin Changegiver, checksum 40H and 00H ACK from VMC.
0C003F000F5A/00	Coin Type command 0CH, enabling Coin Types 0 to 5 (003FH) and manual dispense from Coin Types 0 to 3 (000FH), checksum 5AH and ACK (00H) from the coin changegiver.
0B0B/480048:00	Poll (0BH) with response 48H – 00H from the coin changegiver (Coin Type 8 accepted and routed to the cashbox), followed by the VMC ACK (00H).

Any line starting with a "*****" character is to be treated as a comment and ignored. In response to the ESC initialisation command to the P225 the unit will respond with its version number and the state of the DIP Switches :

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*P225 MDB Monitor- Mode:07  v0.1
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Mode:07 indicates that switches 1, 2 and 3 are ON.

Appendix 1 - SPECIFICATION

- ***OPERATING ENVIRONMENT***

  Operating Temperature +5°C to +45°C

  Storage Temperature 0°C to +60°C

  EMC The P225 PCB is supplied as a component with no intrinsic function under the definition of the EMC Directive. The complete machine is subject to EMC conformance. Measures have been taken to minimise EMC effects within the design.

  Safety The P225 PCB is a low voltage device - Note, should a mains power supply be used with the VMC or PC it is recommended that it should conform to a relevant standard such as IEC 950.

- **PC INTERFACE**

  Serial USB virtual COM port (38400 baud, 8 bits, 1 stop bit no parity)

  Power Up to 150mA may be drawn from the USB port

- **MDB VENDING MACHINE INTERFACE**

  Serial Interface (9600 baud)

  Receive and Transmit lines:

Opto isolated Maximum input current (active)	0.5mA
Maximum input current (inactive)	100uA

  Power Input No Power is taken from the MDB connection.

Appendix 2 - Connections

USB Connector (SK1)

Standard “Type B” USB connector

Pinouts

SK1 Pin	Signal
1	+5v (power)
2	USBDM
3	USBDP
4	0v (ground)

MDB (PL2)

Connect as shown below to PL2 using a 10 way Molex Mini KK 6741 Series connector (Molex 22-01-2105 using crimps Molex 08-50-0032)

Pinouts

PL2 Pin	Signal
1	+5v (power)
2	reserved
3	MDB Master RX
4	MDB Master TX
5	MDB Comms Common
6	reserved
7	reserved
8	reserved
9	reserved
10	0v (power)

Appendix 3 – Mechanical Mounting

The P225 Issue A layout is shown below.

The board is 79.6mm by 65.4 mm. There are four mounting holes (3.1mm diameter) at each corner. These are suitable for standard 3.1mm “stand-offs”. The mounting holes are on a 68.0mm by 49.5 mm pitch. A separate dimensional drawing is available on request.

The maximum height of the board is 20mm ; a clearance of at least 5mm is recommended beneath the board.

The P225 can also be supplied in a protective plastic enclosure at additional cost.