

Operators Manual.

Mk4 Call logging buffer with internal Modem.

Contents

- *Introduction*
- *Rear panel connectors - RS232 pin outs*
- *Buffer memory size*
- *Battery disconnect button*
- *Contact sense inputs*
- *Front panel leds*
- *Opening a unit*
- *Alarm generation*
- *Configuration through the front panel*
- *Configuration through the modem port*
- *The Barriers – BS6301 compliance*
- *Principal features and specification*
- *Setting associated modem*
- *Battery disconnection warning*



Mutek Transcom Ltd.

Farleigh House, Frome Road, Bradford on Avon, Wiltshire. BA15 1LE

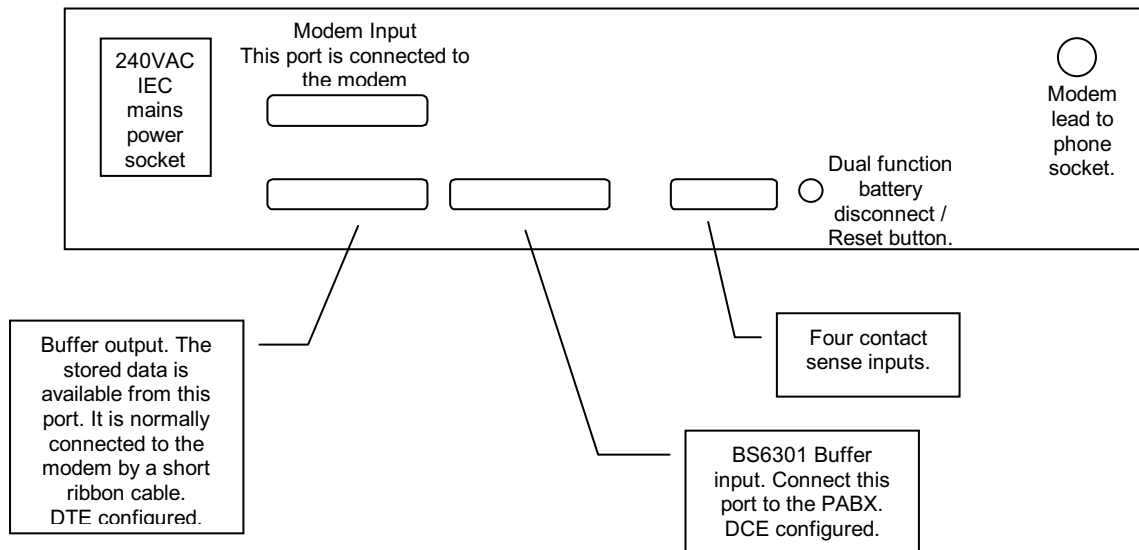
Tel (44) 01225 866501. Fax (44) 0 1225 865083

Email – sales@mutek.co.uk. Web – www.mutek.co.uk

Introduction.

The Mk4 call logging buffer is designed to provide a secure and complete store and forward communications interface between a PABX and a dial up or leased line modem. The Mk4 unit features buffer sizes upto 128Mb, four contact sense inputs, cable connect monitoring and an internal UPS power supply which maintains power on the whole unit, including the modem, in the event of mains failure.

Rear Panel connections.



RS232 port pin outs.

Buffer output port.

This port (JP5) is set as a DTE by the internal links JP7 being set 'side to side'. This allows it to be connected to the modem using a ribbon cable (wired straight through) on the back panel.

Pin	Signal	Direction
1	Safety ground	
2	Tx data	Out of unit
3	Rx data	Into unit
4	RTS	Out of unit
5	CTS	Into unit
7	Signal ground	
8	DCD	Into unit
20	DTR	Out of unit
25	+12V	Out of unit

Buffer input port (PABX port).

This port (JP9), is set as a DTE by the internal links JP4 being set 'side to side'. It is normally connected to the call logging output of a PABX. Note that +12V is presented on pin 25.

<u>Pin</u>	<u>Signal</u>	<u>Direction</u>
1	Safety ground	
2	Rx data	Out of unit
3	Tx data	Into unit
4	CTS	Out of unit
5	RTS	Into unit. Monitored for alarm purposes.
7	Signal ground	
9	'Cable connected' pin	Into unit. Monitored for alarm purposes.
21	0V	Link to pin 9 for cable connect sensing.
25	+12V	Out of unit

Optional ports are linked as DTE.

Optional ports Aux2, and 3 (JP11, 13) are presented as DTE. There are no DTE/DCE configuration links for these ports.

Buffer memory size –

The software supports memory sizes above 8Mb to a maximum of 128Mb but optional input ports cannot be fitted to these units.

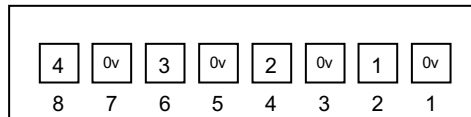
Battery disconnect / Reset button.

This button has two functions – when mains power is present it acts as a reset button. When mains power is lost and the unit is running from the battery, it disconnects the battery and the unit powers down. Note - if the unit runs without AC mains power for an extended period of time a low battery voltage detector automatically disconnects the battery and powers down the unit. This prevents damage to the battery.

Contact sense inputs.

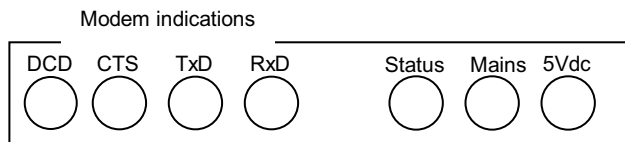
Four contact sense inputs are provided on a two-part screw connector. The pin allocations are as shown-

<u>Pin</u>	<u>Signal</u>
1	Ground
2	Input 1
3	Ground
4	Input 2
5	Ground
6	Input 3
7	Ground
8	Input 4



Front panel LEDs.

There are six LEDs visible through the window on the lower RHS of the membrane switch. They are assigned as shown –



When AC mains power is present the 5Vdc and Mains LEDs are lit. If the mains power fails only the 5Vdc led will be lit.

The status led operation follows the time honoured arrangement: – off = no data; flashing = data present; on = data arriving and/or data being transmitted.

The modem LEDs are wired directly from the modem port.

Opening a unit.

Unplug the mains and all D connectors. Press the battery disconnect button to power down the unit.

Underneath the unit - loosen the four M4 screws holding the rear plastic corners and remove them. Remove the four M4 screws holding the front plastic corners. Remove the two M4 screws in the middle of each long edge. On the two sides of the unit – remove the six M3 screws, one at the front and two at the back on each side. Slide the top cover off.

Alarm generation.

If the alarm centre telephone number is set, the unit will automatically dial out if –

1. Any of the four contact sense inputs changes state.
2. The mains fails
3. The cable to the PABX is unplugged *or*
4. The state of pin 5 on the buffer input changes.

The unit automatically dials the stored alarm centre number. If the number does not answer the unit will retry three times at intervals and then clear the internal state. The alarm message is of the form -

Unit name: WILTSHIRE. Alarm was: 01h is now: 01h Data: 000147k

The alarm byte states are as follows –

Bits 0 to 3 are the states of the four contact sense inputs. A clear bit indicates that the input is held at 0v (ground). A set bit indicates as shown –

01h = input 1 connected to 0v

02h = input 2 connected to 0v

04h = input 3 connected to 0v

08h = input 4 connected to 0v

10h = the link between pins 9 and 21 on the buffer input port is made.

20h = mains failure.

40h = the state of pin 5 into the buffer (from the PABX) has changed.

Alarm delivery failure.

If the unit fails to connect after three attempts an internal counter is incremented. Its value can be seen with the *W command as 'Failed alarm delivery count' which shows values in the range 0 to 9 and then >9. The value is reset to zero whenever the unit makes a successful delivery of alarm status.

Configuration

All the user settings of the unit are saved in non-volatile memory, to ensure that the unit restores the correct configuration every time it is turned on. The user may configure the unit using either the membrane keypad and LCD, or via the modem port. Choose whichever is most appropriate.

Configuring the unit using the front panel.

This is a convenient way to set up a unit because no other equipment is required. If at any time you wish to exit from the configure mode without making any changes, press **ESC**. In general, pressing **ENTER** will select or confirm the current selection, pressing **ESC** will move one stage back through the selection process without altering anything.

Entering Configure mode -

To enter configure mode, press either < or >. These buttons move you through five windows described -

— **Set Ports 1-3** - viewing and changing port configurations -

Press the key and then press **ENTER**. You will see -

P1	Xon
9600 8 N 1	CON-0

Use the and keys to 'tab' from setting to setting and use ^ and v keys to select different values. Initially displayed are the settings of port 1, the data buffer input port, which of course is set to output to the modem port. To see a different port, use the up and down keys. The values available and their meanings are explained over -

Setting	Values	Meaning	Default
P (port)	1 to 3	Port number whose values are displayed.	1
Flow control	Xon CTS	Xon / Xoff flow control. Flow controlled by hardware control signal.	Xon
Speed	300 – 38k4	User port baud rate.	19k2
Data bits	7 and 8	Number of data bits per byte.	8
Parity	N, O, E	None, Odd or Even parity.	N
Stop bits	1 and 2	Number of stop bits appended after parity bit.	1
Connection	0 to 3	Which port the displayed port will output to.	n/a

To leave the configure mode and save settings press **ENTER**, to leave without saving press **ESC**.

— **Set modem port** - set the modem port configuration (port 0) -

Press the key twice and then press **ENTER**. You will see a window as shown -

Modem Port
9600 8 N 1

Setting	Values	Meaning	Default
Speed	300 – 38k4	Modem port baud rate.	19K2
Data bits	7 and 8	Number of data bits per byte.	8
Parity	N, O, E	None, Odd or Even parity.	N
Stop bits	1 and 2	Number of stop bits appended after parity bit.	1

To leave the configure mode and save settings press **ENTER** , to leave without saving press **ESC**.

— **Reset modem** - send the reset sequence to the modem port -

Press the key three times and then press **ENTER** . A modem reset sequence, stored in non-volatile memory and changeable by configuration through the modem port, is sent to the modem port (port 0). Typically this reset sequence is a series of Hayes AT commands although any sequence up to 64 characters can be stored.

— **Restore factory defaults** - reset all reconfigurable variables to a known state -

Press until **FACTORY DEFAULTS** is displayed and then press **ENTER** .

All six ports are restored to their default settings of -

- 19k2 baud, 8 data bits, No parity, 1 stop bit and Xon/Xoff flow control.
- Port 1, the buffer input defaults to output to port 0, the modem port.
- ports 2 and 3 point to themselves.
- ACD discard is disabled.
- Null stripping is disabled
- Modem reset string is ATZ 0Dh

— **Start up mode** - set the modem port start up state -

Press **ENTER** when **START UP MODE** is displayed and the current setting will be shown -

MODE _OFFLINE

Use the up and down arrow keys toggle the state from Off-line to On-line.

In Off-line mode - the modem port assumes it is in Xoff state on start-up, so data arriving into port 1 is stored in the data logging buffer and is not sent to the modem. To retrieve the data from the buffer, the modem port DCD and CTS signals must be in the true state, i.e. a call must be made to the modem, and an Xon must be sent. Normally the host system will send an Xoff once all data is received. However, as a safeguard, if DCD drops before the Xoff is received by the unit, it will put itself back into the Xoffed state.

In On-line mode - the modem port assumes it is in the Xon state on start-up. To retrieve the data from the buffer, the modem port DCD and CTS signals must be true but an Xon is not necessary.

- ***Display buffer status*** – display amount of data in the buffer.

To exit this mode press **ESC**.

- ***Set ACD discard*** - enable / disable discard of certain record types -

The unwanted ACD records output by certain types of PABX can be discarded by setting this feature on. Press **ENTER** when SET ACD DISCARD is displayed and the current setting will be shown. Use the up and down arrow keys to toggle it between ON and OFF and press **ENTER** to save the new value. To leave without saving press **ESC**.

- ***Display unit status*** – send unit configuration to port 0 (modem port).

To use this feature press **ENTER** when the LCD display ‘SEND CONFIG TO 0’ is displayed.

- ***Null character discard*** - enable / disable discard of null characters -

Null characters can be discarded before they enter the buffer by turning this feature on. Press **ENTER** when ‘DISCARD NULLS is displayed and the current setting will be shown. Use the up and down arrow keys to toggle it between ON and OFF and press **ENTER** to save the new value. To leave without saving press **ESC**.

Setting up the unit through the modem port.

The unit allows set up of all the parameters described above and some others via a menu system. Unplug the short ribbon cable linking the buffer output to the modem and connect a terminal to the buffer output port.

Typing *H will display some or all of the menu items shown here -

Command list –

- *A... ACD discard
- *D...Download new operating firmware
- *E...Edit telephone number
- *F...Set Start-up mode
- *H...This screen
- *K..Strip all nulls
- *M...Modify port settings
- *N...Name the unit
- *P...Change password
- *R...Reset the modem
- *S...Enter modem reset string
- *W...View current configuration

Caution - Typing Ctrl-S in certain modes may unload the buffer.

In general, selecting a menu item will provide a set of choices or the opportunity to enable or disable a feature. Follow the prompts to select the function or press escape to discard the changes. Press *H to return to the option menu.

— *A... *Set ACD discard (optional)* -

This feature allows certain types of call record to be discarded according to a preloaded algorithm. In this case it refers to ACD call records from exchanges. Choose Y to enable this feature. Choose N to disable the feature. Press return to save the setting.

— *D... *Download new operating firmware.*

This function can be used to issue updates of the units operating firmware via the modem. The download protocol is rugged and secure to prevent the unit being left in an insecure or unknown state. The PC software to send new firmware to the unit is available on request..

Enter *D - the units prompts for its password. The factory default is "TEST". If the correct password is entered the unit issues a warning message and waits for a 'Y' to confirm that you wish to proceed. If this is received the unit now waits for new firmware in the form of a sequence of Intel format hex records. Each record is checked and either ACKed or NAKed by the internal firmware. This process continues until all records are received. The unit then checksums the whole of the new firmware and sends a message confirming a good download and the new 16 bit checksum, (which can be verified against the value issued with the new firmware), or

sends a "download failed" message. The unit then prompts the user if to proceed with the reprogramming of the internal program storage chip. WARNING - once this step is confirmed it must be allowed to complete. The progress of the reprogramming cycle is indicated with a series of full stops and once complete the unit restarts and runs the new firmware. Check by typing *W and confirm that the software revision is correct.

— ***E... Edit telephone number (diasable alarms) -**

If the unit is required to generate alarm messages this menu item allows the alarm centre telephone number to be entered. The units prompts for a number up to twenty characters in length. Press return to save it after changes. Disable alarms by pressing return in response to the request for a telephone number.

— ***F... Set start-up mode -** asks you to choose "N=Online, F=Offline, (ESC=exit)".

In Off-line (dial up) mode - the modem port assumes it is in Xoff state on start-up, so data entering the buffer is stored. To retrieve the data from the buffer make a modem link. Once the internal modem DCD and CTS signals become true the buffer is primed to output. To retrieve the stored data send an Xon. When the buffer is empty (even momentarily) it will stop outputting for 45 seconds to allow the call centre to clear down the link without losing data. As a safeguard, if DCD drops unexpectedly the unit will put itself back into the Xoffed state.

In On-line (leased line) mode - the modem port assumes it is in the Xon state on start-up. To retrieve the data from the buffer, the modem port DCD and CTS signals must be true but an Xon is not necessary. Choose "N" or "F" or escape. Press enter to save the setting. Enter *H again to make more changes.

— ***H... This screen -** returns to the menu display screen -

Use this command at any time to see the configuration menu.

— ***K... Strip all nulls (optional) -**

this function causes all null characters (ASCII 00) to be deleted from the data stream before being stored in the buffer. Choose "Y" to enable this feature. Choose "N" to disable it. Press enter to save the setting. Enter *H again to make more changes.

— ***M... Modify port set-up.**

Allows the user to configure speeds, parity etc. for ports 1 through 5. Initially a display shows the current configuration -

Port:	Is:	Outputs to:	Baud	Parity	Data	Stop	Flow
0	Modem	1	19k2	N	8	1	X
1	Call/Log	0	19k2	N	8	1	X

Enter port to be modified (1-3. ESC=Exit)

Enter the port number you wish to change. Note that the option to change the modem port is not allowed.

The unit then guides you through a series of sub-menus which prompt for entry of baud rate, parity, data bits, stop bits and flow control. As soon as the last value is entered, all the values are saved in non-volatile memory. Press ESC to exit without making any changes.

— ***N... *Name the unit.***

This allows the user to enter a local 20 character unit name, often the name of the location where the unit is sited.

— ***P... *Change the password.***

The unit first prompts for the old password. Once this is correctly entered a new password up to ten characters long may be entered.

— ***R ... *Reset the modem***

The character string saved in the modem reset string (see below) is sent to the modem.

— ***S... *Set the modem reset string.***

The unit prompts for a string of up to forty characters, typically a series of Hayes AT commands, which are sent to the modem port when the unit is powered up and may also be sent at any time by using the *R command. The factory default is ATZ.

— ***W... *View configuration***

The unit displays the unit configuration. For example –

Unit name WILTSHIRE

Port	Type	Outputs to:	Baud	Parity	Data	Stop	Flow	In buffer
0	Modem	1	9600	N	8	1	X	
1	Call/Log	0	9600	N	8	1	X	000000k

Software revision: R4.00

Buffer size: 128Mb

Line mode: DIAL UP. Modem reset string: ATZ 0Dh

Alarm centre Tel no: 01234787525

Alarm byte current state is 00h. Failed alarm delivery count is 0

Record processing options: ACD: OFF. Strip nulls: OFF

The Barriers

There are 3 distinct barriers in the Mk4 MultiLog unit.

- The connection to a telephone line has a barrier between the line and the low voltage area. This barrier consists of a line transformer and optocouplers.
- The modem power supply has a barrier between the mains and the low voltage area. This is the transformer in the plugtop style PSU.
- The MultiLog board contains a barrier between the mains and the low voltage area. This consists of the mains transformer and the Mk4 PCB upon which it is mounted. This barrier also includes the insulation, creepage and clearance requirements that apply to the mains wiring inside the unit.

V24 Port BS6301 Compliance

This is achieved in the following manner. The V24 ports are connected to the low voltage area in the unit as a whole. Barriers from this area to the mains and the telephone line are used, and these are shown to be to a standard equal to or better than the requirements of BS6301. As all the barriers meet this standard, the V24 port will comply with the requirements of BS6301.

When the product is used as supplied, the Mk4 MultiLog unit V24 ports will comply with the requirements of BS6301. The product will cease to comply with BS6301 on the both V24 ports if an item that does not comply with BS6301 is connected to one of them.

Principal features and specification.

Software features and options -

- Call logging data capture selectable for on-line or polled operation.
- Capture alarms and auto-dial out to alarm management centre
- Connect to MMI ports without disturbing call log data capture or alarms.
- On the fly call record filtering including selective record discards, dialled digit removal etc.

RS232 call logging input port -

- Speeds from 300 to 38K4 baud.
- Xon / Xoff or RTS / CTS flow control.
- 7 or 8 bit data, odd, even or no parity, 1 or 2 stop bits.
- Data stored in battery backed memory of 1Mb to 128Mb.
- Presented as a DCE on D25F. DTE link option.

Modem output port -

- Internal V90 modem whose RS232 port is brought out to the back panel on a D25 socket with female locking posts.
- Speeds to 38k4 baud. In band and hardware flow control.

Up to 2 further RS232 ports -

- Use as MMI port, Alarm capture port or to control other equipment's.
- Each has port has dynamically allocated buffer memory.
- Speeds from 300 to 38K4 baud. Xon / Xoff or RTS / CTS flow control.
- .7 or 8 bit data, odd, even or no parity, 1 or 2 stop bits

Four contact sense inputs –

- Use to generate alarms from the local site e.g 'door open'.

Management -

- Front panel LCD and push buttons allows menu configuration of unit.
- Remote management by dial up allows secure monitoring and control of functions including download of new operating software.

No break Power supply -

- The unit has internal battery backup to allow complete operation during mains failure.
- Unpowered operation for 4 Hours. Internal intelligent battery recharge.

Physical -

Power 240vAC 15 VA (other voltages available)
Metal enclosure. Size - LxWxH 355mm x 260mm x 70mm (1.5U).
Weight - 5Kg.
0°C to 40°C ambient, 5 - 95% humidity (non-condensing).
Rack mount, table top and vertical stacking configurations available.

Setting a modem in answer mode for use with the buffer.

The modem must be Hayes compatible and set for auto answer mode, reliable communications and certain other requirements. The list below shows typical settings, which may vary from modem to modem, but provides a guide.

Connect a terminal set for 9600 baud, 8 data, no parity and 1 stop bit to the modem port and enter the commands under the 'internal' column (note that the terminal speed determines the line speed with these settings) -

Setting	Meaning
ATZ	Restore factory defaults
AT&C1	DCD led and pin follows carrier
AT&D2	React to DTR normally
AT&I0&H1	Use CTS flow control
AT&N6	Constant speed interface at 9600 baud.
ATQ1	Quiet mode
ATS0=1	Auto answer after 1 ring
AT&M4	Set error correction
AT&K1	Auto compression
AT&W	Save all settings

Warning –

The MK4 Call logging buffer has the internal battery permanently connected. If mains power is removed the unit will continue to run on battery power .

Power down by pressing the battery disconnect button on the back panel .

The unit will otherwise remain powered until the low battery trip circuit automatically turns the unit off.

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