

1. Mouse

1.1 A PS/2 or dual-mode (PS/2 and USB), but not a USB mouse may be connected to the interface's PS/2 port, to produce a Kempston mouse compatible output on the following ports:

#FBDF or #1F:	Bits 0-7 = X-coordinate (0-255)
#FFDF or #DF:	Bits 0-7 = Y-coordinate (0-255)
#FADF or #5F	Bit 0 = Right button not pressed Bit 1 = Left button not pressed Bits 2-7 = Not used

1.2 The mouse must be connected only while the interface is not powered. This is a feature of the PS/2 mouse rather than of the interface.

At power-up, and only then, the interface's microcontroller checks for the presence of a mouse and switches the 'M' LED on, if one is found.

1.3 The state of the mouse is indicated by the 'M' LED:

- Off The mouse is not present or is disabled
- On The mouse is enabled as Kempston mouse
- Blinking The mouse is enabled as Kempston joystick.
The LED blinks at half the sampling rate.

1.4 The mouse can be disabled by pressing both buttons simultaneously.

While disabled, the mouse can be enabled as:

- Kempston mouse, by pressing the right button, or as
- Kempston joystick, by pressing the left button.

1.5 While the mouse is enabled, the joystick port is disabled and vice-versa.

The mouse can also be disabled by pressing the joystick button.

1.6 The mouse is, by default enabled in its 'windowed' mode, in which the reported coordinates are contained within a configurable window, but can also function in Kempston mouse 'legacy' mode, with the coordinates wrapping around from 0 to 255 and vice-versa.

1.7 Following strings may be sent to the interface's MCU, using the command CAT 0;"m"+<str>+..+<str>, to configure the mouse driver:

- Enable mouse: "e"
- Disable mouse: "d"
- Legacy mode: "l"
- Windowed mode: "w"
- Set window width: "x"+CHR\$ <x>
<x> = 16 - 255 Window width in pixels
- Set window height: "y"+CHR\$ <y>
<y> = 16 - 192 Window height in pixels
- Mouse as joystick: "j"
- Set sensitivity: "s"+CHR\$ <s>
<s> = 3 - 32 Mouse as joystick sensitivity
- Set rate: "r"+CHR\$ <r>
<r> = 1 - 10 Mouse as joystick sample rate [Hz]

2. Keyboard

2.1 A standard PC keyboard can be connected to the interface's PS/2 port, in place of a mouse.

2.2 The interface's microcontroller firmware processes the scan code sequence produced by the external keyboard and outputs the result on port #FD, as a 'key codes' with the following bit assignment:

bit 0-5	Key number (0-38) or No key (39)
bit 6	Symbol Shift
bit 7	Caps Shift

2.3 The key codes are read, in parallel with the ZX Spectrum's own keyboard, by the patched 'Keyboard Scanning' routine at address #028e in the 'Interface 1bis' BASIC ROM. Therefore, only software that uses the standard ROM keyboard subroutines, which most games don't do, can access the external keyboard and only while the interface is in 'Active Mode'.

2.4 Special key mappings

Keyboard	Spectrum
Esc	BREAK
Tab	EDIT
Caps Lock	CAPS LOCK
Home	TRUE VIDEO
End	INVERSE VIDEO
Insert	GRAPH
Backspace	DELETE
`	Pound symbol
Delete	Copyright symbol
Shift	CAPS SHIFT
Ctrl	SYMBOL SHIFT
Windows	EXTENDED MODE

2.5 Kempston joystick mode

The 'Num Lock' key toggles between normal and 'Joystick Mode', in which the arrow keys together with 'Ctrl', as 'Fire', emulate a Kempston joystick, all other keys maintaining their regular function.

The joystick emulation is operational even while the interface is in 'Inactive Mode'.

2.6 Tokenizer

Any keyword can be entered by typing its first 2-4 characters, only as many as required to avoid ambiguity, while holding the 'Alt' key, and then releasing it.

3. Capturing the output of a server machine's keyboard and mouse

3.1 The keyboard or mouse of a server machine, connected to the 'Interface 1bis' via its USB port, can be used as an input device for the ZX Spectrum, if nothing is plugged into the PS/2 socket.

3.2 The extended BASIC command: CAT 0,"k" turns the 'Server keyboard / mouse' function on and off. When this function is turned on, a new window pops up on the server, to capture the keyboard or mouse input. Pressing the 'Page Down' key in this window turns the function off.

3.3 All features mentioned above in respect of a physical mouse or keyboard apply also to the 'Server keyboard / mouse' function, excepting the 'Mouse as joystick' mode, which is not selectable.

3.4 It is not possible to capture simultaneously mouse and keyboard data. When the mouse is enabled, no keyboard input is available from the server machine and vice-versa.

3.5 The mouse input can be captured even while the interface is in 'Inactive Mode'.