SER Mouse

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SERMouse is a software driver to connect a serial PC mouse to one of the serial ports SER1 or SER2 of a QL. Therefore a specially wired cable interface is necessary. The driver exists both, in a 2-button mouse (Microsoft mode compatible) and a 3-button mouse (PC mouse systems compatible) version.

Most 3-button mice without mode switch are switched into 3-button mode by pressing the left button during power-on. Mice switching automatically (by software) between 2-button or 3-button mode may only work in 2-button mode on a QL.

If the serial ports are used for a mouse and a serial printer only, the power for the mouse can be drawn from the QL without any problem.

The mouse is then supplied through pin 6 (pin 9 on a QL with SUB-D9) of the serial port which nominally has +12V. Not more than 10mA should be drawn, as else, through a resistor in the QL, the voltage would fall below +5V.

The negative voltage comes from the receive line (RxD), while the mouse sends data over the send line (TxD).

If the other serial port shall also be connected to a device which draws power from the +12V pin (i.e. a serial to parallel converter), then pin 6 (pin 9 SUB-D9) of each ports should be connected separately through a resistor (680 Ohm) to +12V on the QL board.

Loading the driver

The driver code is loaded residently. New SuperBASIC commands (described below) are initialised and available. If the driver is configured to initialise on startup, it is immediately installed and active, else only after SERMON.

For testing purposes the code can be started as a job too. Then the driver is installed directly, but the SuperBASIC commands are not available. Removing the job will remove the driver automatically.

Function

The mouse is driven at 1200 baud at one of the serial ports SER1 or SER2. The driver receives the signals from the mouse and passes them to the Pointer Interface or the keyboard driver.

Printer

Unfortunately, on a standard QL the baud rate affects both ports. SERMouse saves the actual baud rate before initialisation, then sets the baud rate to 1200. If a channel to the other serial port is opened, the mouse is automatically suspended and the baud rate set back to its previous value.

If the channel is closed again, the mouse is reactivated automatically.

If the old baud rate coincides with the mouse baud rate (i.e. 1200) then the mouse is still working, even if the other port is used.

Cable Connector

Some mice may even require a different wiring!

Mouse with SUB D25	pin name or function	QL SER1 SUB D9	QL SER2 SUB D9	QL SER1 BT	QL SER2 BT
2	TxD	3	2	3	2
3	RxD	2	3	2	3
4	+12V	9	9	6	6
7	GND	7	7	1	1

Mouse with SUB D9	pin name or function	QL SER1 SUB D9	QL SER2 SUB D9	QL SER1 BT	QL SER2 BT
2	TxD	2	3	2	3
3	RxD	3	2	3	2
5	GND	7	7	1	1
7	+12V	9	9	6	6

or

Mouse with SUB D25	pin name or function	QL SER1 SUB D9	QL SER2 SUB D9	QL SER1 BT	QL SER2 BT
1	GND	1	1	1	1
2	TxD	3	2	3	2
3	RxD	2	3	2	3
4	GND	1	1	1	1
7	GND	1	1	1	1
20	+12V	9	9	6	6

Mouse with SUB D9	pin name or function	QL SER1 SUB D9	QL SER2 SUB D9	QL SER1 BT	QL SER2 BT
2	TxD	2	3	2	3
3	RxD	3	2	3	2
4	+12V	9	9	6	6
5	GND	7	7	1	1
7	+12V	9	9	6	6

Focussing

Resolution, speed, acceleration and wake up speed are all configurable through the config block. They can also be controlled through the SuperBASIC commands SERMSPEED and SERMAWS at run-time. SERMSPEED directly alters the data delivered by the mouse, while SERMAWS determines how these are processed by the Pointer Interface.

Hermes

The SERMouse driver is fully compatible with Hermes, the replacement IPC 8749 for the QL. Hermes allows separate baud rates, e.g. the mouse can be driven on SER2 at 1200 Baud, while SER1 can be set to 19200 baud for a printer. The automatic control of the baud rate by the mouse driver as described above is no longer necessary. The SERMouse driver detects Hermes on initialisation if the suspend options in the config block are disabled.

If you have Hermes installed in your QL, then please set:

Set mouse baud rate on initialisation	>	yes
Suspend driver if baud rate changed	>	no
Suspend driver if other serial port open	>	no

Then, and only then, Hermes is detected and only the receive baud rate for the mouse is set. The system baud rate is not changed. Subsequent changes of the system baud rate will not affect the mouse.

Attention: on a QL with a standard 8049 IPC all the above options must be set to yes.

Configuration

The SERMouse driver can be configured with the standard config program of the Pointer Environment. Before you make changes to the preset values, you should try to find out the best values with the SuperBASIC commands SERMSPEED, SERMAWS and BLS. The configuration is widely self-explaining. Here are the recommended default values:

Baud rate		1200
Set baud rate on initialisation		yes
Port		ser2
Suspend driver if baud rate changed without	Hermes	yes
	with Hermes	no
Suspend driver if other serial port open	without Hermes	yes
	with Hermes	no
Pointer Speedup		0
Pointer Slowdown		0
Acceleration Mouse		4
Acceleration Pointer Interface		6
Cursor Speedup		1
Cursor Slowdown		1
Double click delay (50=1 sec)		10
Double HIT=DO?		no
Time to blank screen		5
Initialise on		startup
Save working copy as		file

(A working copy of the SERMouse driver is saved to the given file. This copy does contain the configured data only but not the configuration block with the descriptive text.)

Mouse Buttons

All mouse buttons are configurable. Therefore three separate config blocks are present. Changing the mouse buttons should be done with great care. It is possible to assign any control code and SPACE to a button ($00 - $20 and $E8 - $FF). Some codes can not be entered through the keyboard (e.g. ENTER and ESC), but a translate option exists:

Button:	NULL	HIT	DO	Cancel	SPACE	ENTER	ESC	ALT
Number:	0	1	2	3	6	7	8	9

When such a number was entered, the corresponding key is shown immediately in MenuConfig, while the standard config program shows the keys on a second run only.

Please notice: the IPC reset is performed from the code 255=$FF=ALT (type number 9) - (all three buttons pressed simultaneously by default).

The mouse hotkey is performed from the code 254=$FE=SHIFT ENTER (left and right button pressed simultaneously by default).

The Pointer Interface cancel (code 3) does work in pointer programs only and does not generate an ESC in other programs! On the other hand, an ESC character (27=$1B) is translated by the Pointer Interface to a cancel (code 3) and always works. Therefore we have set an ESC for the middle button. The 3-button reset can be switched off easily by setting another code (e.g. NULL) to do nothing.

BASIC Commands

BAUDRATE%

bd%=**BAUDRATE**
returns the actual baud rate of the system.

BLS

BLS time%
        time% 0   off
        time% 1-20   minutes
        time% 21-59 seconds

The screen is blanked after the time elapsed if no key was pressed on the keyboard and the mouse was not moved. Any keypress or mouse movement will bring the screen contents back.

SERMAWS

SERMAWS acc%,wup%
        acc%   0-9   mouse acceleration (Pointer Interface)

Sets the mouse acceleration and wakeup speed as processed by the Pointer Interface. These are the same values as in Sysdef of QPAC2. They take global effect, i.e. for all programs. See configuration.

SERMCUR SERMPTR

SERMCUR switches to cursor mode if the driver is in the pointer mode and the cursor is visible (waiting for keyboard input). In cursor mode the cursor can be moved with the mouse. The cursor speed can be set through the configuration and can be altered with the SERMSPEED parameters at runtime.

If a program waiting for keyboard input, the driver can also be switched to cursor mode by a double-click on the left button.

SERMPTR resets to pointer mode if the driver is in cursor mode. The driver can also be switched back to pointer mode from cursor mode with a double click on the left button. The driver is automatically switched to pointer mode if a job reading the pointer is picked on top.

SERMOFF
Removes the SERMouse driver.

SERMON
Installs and activates (or re-activates after SERMWAIT) the SERMouse driver.

SERMRESET
Resets the coprocessor (IPC 8049) which controls the serial ports. To be used if the internal buffer of the coprocessor is desynchronised (uncontrolled mouse movements).

SERMSPEED

SERMSPEED mul%,div%,acc%[,cursormul%,cursordiv%]
        mul%   0-127 Speedup factor 0=off
        div%   0-127 Slowdown factor   0=off
        acc%   0-8   Acceleration factor   0=off
        cursormul%   0-127 Cursor mode speedup factor
        cursordiv%   0-127 Cursor mode slowdown factor

The step rate sent by the mouse is multiplied with the speedup and divided through the slowdown factor. This changes the mouse resolution linearly. The recommended values have the effect that only two third of the step rate is passed to the Pointer Interface, i.e. the physical resolution of the mouse is decreased slightly.

The accelerator factor determines a progressive speed up, i.e. on a slow movement nothing is changed, but the faster the mouse is moved, it is accelerated more and more. See configuration.

The recommend values (see configuration) should only be changed if changing the mouse acceleration factor of the Pointer Interface (see SERMAWS or Sysdef in QPAC2) does not lead to a satisfactory mouse movement.

The alternative parameters cursormul% and cursordiv% take effect in cursor mode only.

SERMWAIT
Suspends the SERMouse driver. See SERMON