TSHARC™ Win CE Drivers Manual
Windows® CE version 5.0
RS-232, USB & PS/2

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General Notes

This Hampshire Windows CE 5.0 driver was created for CPUs and configurations shipped with CE 5.0. Additional hardware platforms may be made available upon request. Please call Hampshire to compile the drivers for your specific hardware platform.

TSHARC Controller products supported:

Hampshire TSHARC Boards	Hampshire TSHARC Chips
TSHARC-10 Octopus	TSHARC-12s
TSHARC-12 Octopus	TSHARC-10o
TSHARC-12m	TSHARC-12o
TSHARC-12v	TSHARC-8
TSHARC-8	TSHARC-12
TSAHRC-12	

Supported Processors

Hampshire has recompiled the source code for the TSHARC WinCE driver to support the following processors.
ARMV4I
MIPSII
MIPSII_FP
MIPSIV
MIPSIV_FP
SH4
X86

Communications:

RS-232 Specific Information

The driver loads based on the "Port" value entry within the "TSHARCS.reg" file. This value corresponds to the nth available port. For example, if "Port"=dword:1, assigns the port as the first

available port and if "Port" would equal "dword:2" then the second available port would be chosen. All of Hampshire current controllers are configured for 9600 baud.

If you are using a TSHARC-8 or TSHARC-12 Hampshire controller using other than a 9600 baud rate, the baud rate may be changed via the “Baud” registry entry which may also be found in the “TSHARCS.REG” file. In general, you will not have to change the baud rate to anything other than 9600. TSHARC-10o, TSHARC-12o, TSHARC-12v, TSHARC-12m and TSHARC-12s chips and boards are set to 9600 baud rate from the factory.

In the registry COM1 often is set to IRQ 3, IOBase 2F8 which is the base address and IRQ of COM2. This is usually because COM1 is being reserved for debugging purposes. However if the use of COM1 is desired, the following procedure may be followed:

1. Modify the PLATFORM.REG that can be found under the "ParameterView" tab
2. Find the entry [HKEY_LOCAL_MACHINE\Drivers\BuiltIn\Serial]
   The values may currently be set at COM2:
   "Irq"=dword:03
   "IoBase"=dword:02F8
   "IoLen"=dword:8
3. Change these values to the following (assuming COM1 on Irq 4 and Base 3F8):
   "Irq"=dword:04
   "IoBase"=dword:03F8
   "IoLen"=dword:8

Note: Changes on the platform.reg file will be seen on all future Windows CE images generated.

PS/2 Specific Information

The 8042 input driver must be included in the OS Design in order for the TSHARC PS/2 driver to function on CE device.

USB Specific Information

The USB host controller and the UHCI component must be installed in order for USB to function. These components are added automatically after adding the "USB TSHARC Touch Screen Driver" component to the OS Design.

Installing the Windows CE TSHARC Driver

1. Close any open instances of "Platform Builder 5.0".
2. Open Windows Explorer and browse to directory containing TSHARC installation package (MSI file).
3. Double-click on the appropriate TSHARC installation package.
If Serial, double-click on "CE50RS232111.MSI".
If PS2, double-click on "CE50PS2111.MSI".
If USB, double-click on "CE50USB111.MSI".
The TSHARC setup application will now appear.
4. Click on "Next". The license agreement will now appear.
5. Click on "Accept" and then on the "Next" Button.
6. Click on the "Install" button. The TSHARC Driver files will now be copied according to the following:
If Serial, then files are copied to "<WINCEROOT>\PUBLIC\COMMON\OAK\DRIVERS\TSHARCS"
If PS/2, then files are copied to "<WINCEROOT>\PUBLIC\COMMON\OAK\DRIVERS\TSHARCP"

If USB, then files are copied to "<WINCEROOT>\PUBLIC\COMMON\OAK\DRIVERS\TSHARCU"
Also, the TSHARC driver component is added to the Windows CE catalog.
7. Click on "Finish"

Adding a TSHARC Driver Component to an OS Design

1. Launch "Platform Builder 5.0"
2. Open or create your platform workspace. Note: The "Industrial Controller" design template that ships with Windows CE has been tested the most and verified as working correctly with all TSHARC CE drivers. However, other design templates should work as well.
3. From the "Catalog" pane, browse to "Third Party\Device Drivers\Touch"
4. Right-click on TSHARC touch screen component that is to be included in the Windows CE image and then left-click on "Add to OS image". Note: Only one TSHARC component should be included in an OS design at any given time.

The TSHARC component should now appear under projects in the "FileView" tab and also under "Device Drivers\Touch" under the "OSDesignView" tab.

Removing the TSHARC Driver Component from an OS Design

1. Click on the "OSDesignView" tab.
2. Browse to "Device Drivers->Input Devices".
3. Right-click on the appropriate TSHARC component:

If Serial, right-click on "Serial TSHARC Touch Screen Driver"
If PS/2, right-click on "PS/2 TSHARC Touch Screen Driver"
If USB, right-click on "USB TSHARC Touch Screen Driver"

4. Left-click "Delete".

Removing TSHARC Driver Component(s) from the Catalog

1. Open the Windows Control Panel.
2. Select the appropriate TSHARC Driver Installation:

If Serial, select "Serial Driver 1.11 for TSHARC Touch Screen Controller"
If PS/2, select "PS/2 Driver 1.11 for TSHARC Touch Screen Controller"
If USB, select "USB Driver 1.11 for TSHARC Touch Screen Controller"

3. Click on the "Remove" Button.

The corresponding files will be removed and the TSHARC component removed from the Windows CE catalog.

Calibrating the Windows CE Driver on Windows CE Device

1. Select the Start menu
2. Under the “Programs” group select “TSHARC Calibration”
3. Touch all targets for at least a couple seconds each.

Note: The point calibration used is determined by registry entries.

Windows CE Registry Entries

Calibration parameters are created by Hcecal after calibration and are stored in the registry under the following key:

[HKEY_LOCAL_MACHINE\SOFTWARE\Hampshire\CurrentVersion\Global]

The following values are stored by hwincal.exe: (All types are REG_BINARY)

Name	Size
FlipFlag	- UCHAR
xmulL	- WORD
xmin	- WORD
xminC	- WORD
xminCy	- WORD
xmulC	- WORD

xmulR - WORD
xmaxC - WORD
xmaxCy - WORD
xmax - WORD
ymulL - WORD
ymin - WORD
yminC - WORD
yminCy - WORD
ymulC - WORD
ymulR - WORD
ymaxC - WORD
ymaxCy - WORD
ymax - WORD

Upon boot, if the registry entries are not located, the driver defaults to a default uncalibrated state.

Enabling Right-Click Emulation

1. In "Platform Builder 5.0", click on the FileView tab
2. Double click on the appropriate registry file:

If Serial, double-click "Projects->TSHARCS->Parameter files->TSHARCS.reg"
If PS/2, double-click "Projects->TSHARCS->Parameter files->TSHARCP.reg"
If USB, double-click "Projects->TSHARCS->Parameter files->TSHARCU.reg"

3. Remove the semi-colons (uncomment) from the last four lines of the file.
4. Rebuild and recreate run-time image.

Configuring Right-Click Emulation

There are three entries that can be configured for right-click emulation, which are "xEventArea", "yEventArea" and "RightClickTime". The "RightClickTime" is the time elapsed (measured in clock ticks) on a touch that is within an area on the screen (the event area) before a right-click event is sent. The "xEventArea" and "yEventArea" entries are horizontal and vertical components of the area that a touch remains in for a time specified by "RightClickTime" before a right-click event is sent. The Values for "xEventArea" and "yEventArea" entries can range from between 0x0000 and 0xFFFF. The "xEventArea" and "yEventArea" are relative to the touch screen coordinates rather than the screen coordinates.

To determine the values for xEventArea and yEventArea, the following formula may be used:
xEventArea = 65535 * (desired_event_area_width / width_of_touchscreen)
yEventArea = 65535 * (desired_event_area_height / height_of_touchscreen)
These values must then be converted to hexadecimal.

Changing the Calibration Type

1. In "Platform Builder 5.0", click on the FileView tab
2. Double click on the appropriate registry file:

If Serial, double-click "Projects->TSHARCS->Parameter files->TSHARCS.reg"
If PS/2, double-click "Projects->TSHARCS->Parameter files->TSHARCP.reg"
If USB, double-click "Projects->TSHARCS->Parameter files->TSHARCU.reg"

3. Change the value of "CalType" appropriately:

For 3-point calibration, set value to "dword:3"
For 4-point calibration, set value to "dword:4"
For 7-point calibration, set value to "dword:7"
For 20-point calibration, set value to "dword:14"

4. Rebuild and recreate run-time image.