BOX-PC/PANE CON-PC
IPC-BX/MSH 3x Series
IPC-PT/xSH 3x Series
Software Manual (for Windows CE .NET)
Copyright

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1. Introduction

This manual covers Windows CE for the IPC-PT/MSH3VW, IPC-PT/SSH3VW, and IPC-BX/MSH3WS (hereafter referred to as the xSH3x series). For information related to xSH3x series’ hardware, refer to the Hardware Manual.

Note!

This manual explains for Windows CE.NET.

Features

Windows CE, as installed on the xSH3x series, provides the following exclusive CONTEC functions:

- VARIETY OF DRIVERS
  As standard equipment, the xSH3x series provides Windows CE drivers for all devices installed on the board. For information about the drivers, see Chapter 3, "Standard Drivers on the xSH3x Series."

- CMOS SETTING FUNCTIONS
  The xSH3x series provides exclusive CMOS setting functions enabling the user to dynamically adjust the configuration to any desired specification. For information about available adjustments, see Chapter 5, "SET CMOS-CONTEC Utility for CMOS."

- CONTEC Manager
  Supplies many remote maintain tools for use the xSH3x series more easily. For the details about functions in “CONTEC Manager”, please refer to “Chapter 6, CONTEC Manager”.

- OBJECT STORE BACKUP FUNCTION
  This function allows user applications to be stored on an on-board Flash ROM. If changes are made to CONTEC supplied modules, this function can be used to modify the module without modifying the Windows CE operating system image (NK.BIN).

- NFDisk function
  The on-board flash ROM (NF) is mounted as a directory called "\NFDisk", which can be accessed directly by all applications. Files saved in the "\NFDisk" are preserved even if the power is off.
- **REGISTRY BACKUP FUNCTION**
  Backs up contents of registry settings.

- **VERSATILE BOOT FUNCTIONS**
  The xSH3x series provides a XIP booting method, which can boot the device very quickly, and three other ways to load the NK.BIN and to boot Windows CE. These functions can be utilized when developing NK.BIN using the CONTEC Platform development environment (CONTEC IDE) or the Microsoft Platform Builder, as well as when restoring a backup copy of NK.BIN. The standard attached NK.bin of the xSH3X series is especially for XIP booting mode. If you want to boot from other device such as network and PCMCIA card, you need to develop the NK.bin by the CONTEC Platform development environment. For information about these boot methods, see Chapter 8, "Booting Functions."

- **WATCH DOG TIMER FUNCTION**
  xSH3Hx series supports watch dog timer function. User application can use watch dog timer by call watchdog timer API. Details about how to use watchdog timer, please refer to the sample program in “CONTEC Platform SDK”.

- **BACK LIGHT FUNCTION**
  xSH3x series supports backlight function. By using this function, the LCD backlight is to switch off when there is no input for a period.

- **Auto-Run function**
  It is possible to start programs when a ATA card or a CF card is inserted into PC card slots. By using this function, many work can be completed automatically, such as file copying, program installation, etc. Details about the usage of auto-run function, please refer to “Chapter 12, Auto RUN Function”

- **Backup Operating System Image File Restore Function**
  In the event of damage to the NK.BIN provided with the xSH3x series, multiple restore functions are provided to return the system to factory settings.

- **BIOS Update Function**
  The xSH3x series uses an exclusive BIOS to provide hardware initialization as well as versatile boot functions. The BIOS is contained on an EEPROM and includes a BIOS update function which allows easy updating for version upgrades. Also included is an emergency boot function as a recovery means in case of failing to write BIOS. Details about the recovery method, please refer to “Chapter 11, Emergency Boot Function”
Limited One-Year Warranty

CONTEC Interface boards are warranted by CONTEC Co., LTD. to be free from defects in material and workmanship for up to one year from the date of purchase by the original purchaser.

Repair will be free of charge only when this device is returned freight prepaid with a copy of the original invoice and a Return Merchandise Authorization to the distributor or the CONTEC group office, from which it was purchased.

This warranty is not applicable for scratches or normal wear, but only for the electronic circuitry and original boards. The warranty is not applicable if the device has been tampered with or damaged through abuse, mistreatment, neglect, or unreasonable use, or if the original invoice is not included, in which case repairs will be considered beyond the warranty policy.

How to Obtain Service

For replacement or repair, return the device freight prepaid, with a copy of the original invoice. Please obtain a Return Merchandise Authorization Number (RMA) from the CONTEC group office where you purchased before returning any product.

* No product will be accepted by CONTEC group without the RMA number.

Liability

The obligation of the warrantor is solely to repair or replace the product. In no event will the warrantor be liable for any incidental or consequential damages due to such defect or consequences that arise from inexperienced usage, misuse, or malfunction of this device.
Introduction

About the Manual

This manual consists of the following chapters:

Chapter 1 Introduction
Chapter 2 Basic operation of xSH3x Series
Chapter 3 Standard Drivers on the xSH3x Series
Chapter 4 On-Board DIP Switch Settings
Chapter 5 SETCMOS-CONTEC Utility for CMOS
Chapter 6 CONTEC Manager
Chapter 7 NFTOY-CONTEC Utility for NFDisk
Chapter 8 Booting functions
Chapter 9 Force Reset Functions
Chapter 10 BIOS Update Processing
Chapter 11 Emergency Boot Function
Chapter 12 Auto RUN Function
Chapter 13 Back light Function
Chapter 14 Appendix
2. Basic operation of xSH3x Series

Run a program

Windows CE.NET supports a Windows XP-like shell. For run a program, you can select a program from the “Programs” menu in the start menu. Or select the “Run…” menu to specify a program to run.

1. Press “Ctrl+Esc” hot key or “Start” button to pop up the start menu. Select the “Run…” menu; the “Run” dialog box pops up.

2. Input the program’s name directly in the “Open” combo box, or press the “Browse…” button to select the program. When the “Browse…” button is pressed, the “Run” browse dialog box pops up, select a program in this dialog box.
3. After you select a program, press the OK button. The selected program’s name is added to the “Run” dialog box’s open combo box.

4. After you decide the program name, press the OK button. The specified program is started.
3. Standard Drivers on the xSH3x Series

Windows CE on the xSH3x series provides the drivers listed below. This chapter describes each of the standard drivers listed.

Table 3.1. Driver List < 1 / 2 >

<table>
<thead>
<tr>
<th>Driver</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphic</td>
<td>- Compatible with Bit BLT accelerator</td>
</tr>
<tr>
<td></td>
<td>- Compatible with hardware cursor</td>
</tr>
<tr>
<td></td>
<td>- LCD output (TFT/STN - QVGA/VGA/SVGA)</td>
</tr>
<tr>
<td></td>
<td>- CRT output (VGA/SVGA)</td>
</tr>
<tr>
<td></td>
<td>- Automatic resolution level recognition when using CONTEC touch panel LCD</td>
</tr>
<tr>
<td></td>
<td>- Specify</td>
</tr>
<tr>
<td>Serial</td>
<td>- Compatible with on-board serial 4-port</td>
</tr>
<tr>
<td></td>
<td>- Compatible with serial port connected on PC-104</td>
</tr>
<tr>
<td></td>
<td>- Compatible with dynamic debugging port function</td>
</tr>
<tr>
<td></td>
<td>- Setting enabled by CMOS</td>
</tr>
<tr>
<td></td>
<td>- Specify effective serial port number</td>
</tr>
<tr>
<td></td>
<td>- Debug</td>
</tr>
<tr>
<td>Touch panel</td>
<td>- CONTEC touch panel LCD driver</td>
</tr>
<tr>
<td></td>
<td>- Uses serial port</td>
</tr>
<tr>
<td></td>
<td>- Setting enabled by CMOS</td>
</tr>
<tr>
<td></td>
<td>- Touch panel used / not used</td>
</tr>
<tr>
<td>Serial mouse</td>
<td>- Uses serial port</td>
</tr>
<tr>
<td></td>
<td>- Setting enabled by CMOS</td>
</tr>
<tr>
<td></td>
<td>- Serial mouse used / not used</td>
</tr>
<tr>
<td></td>
<td>- Serial mouse connection board number</td>
</tr>
<tr>
<td>PS/2 mouse</td>
<td>- PS/2 mouse driver</td>
</tr>
<tr>
<td></td>
<td>- Possible setting in the CMOS</td>
</tr>
<tr>
<td></td>
<td>- PS/2 mouse use/ not use</td>
</tr>
<tr>
<td>PS/2 keyboard</td>
<td>- Driver for 101 / 106 keyboard</td>
</tr>
<tr>
<td></td>
<td>- Setting enabled by CMOS</td>
</tr>
<tr>
<td></td>
<td>- Choice of 101 / 106 keyboard</td>
</tr>
<tr>
<td>PCMCIA</td>
<td>- Driver for PCMCIA 1 slot / CF 1 slot</td>
</tr>
<tr>
<td>ATA flash card</td>
<td>- Driver for PCMCIA , CF</td>
</tr>
<tr>
<td></td>
<td>- Setting enabled by CMOS</td>
</tr>
<tr>
<td></td>
<td>- Specify BOOT priority slot for ATA Boot</td>
</tr>
<tr>
<td></td>
<td>- If NK.BIN is not in priority slot, check next slot</td>
</tr>
<tr>
<td>LAN</td>
<td>- On board 10base LAN driver</td>
</tr>
<tr>
<td>Parallel (printer port)</td>
<td>- Driver for printer connection</td>
</tr>
<tr>
<td></td>
<td>- Setting enabled by CMOS</td>
</tr>
<tr>
<td></td>
<td>- Specify between printer port / PIO port</td>
</tr>
<tr>
<td></td>
<td>[Note]</td>
</tr>
<tr>
<td></td>
<td>- Optional printer connection kit (IPC-SHPRN) required when using as</td>
</tr>
<tr>
<td></td>
<td>- printer port</td>
</tr>
<tr>
<td></td>
<td>- If used as PIO port, printer port is disabled</td>
</tr>
</tbody>
</table>

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Table 3.1. Driver List  < 2 / 2 >

<table>
<thead>
<tr>
<th>Driver</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parallel (PIO port)</td>
<td>- PIO Port Access DLL</td>
</tr>
<tr>
<td></td>
<td>- 8:IN/8:OUT,16:IN,16:OUT switch is possible</td>
</tr>
<tr>
<td></td>
<td>- Possible setting in the CMOS o Printer port/PIO port switch</td>
</tr>
<tr>
<td></td>
<td>[Note]</td>
</tr>
<tr>
<td></td>
<td>- For the how to use switching APIs, refer to the “CONTEC Platform SDK”</td>
</tr>
<tr>
<td></td>
<td>sample program.</td>
</tr>
<tr>
<td></td>
<td>- Printer port and the PIO port cannot be used simultaneously.</td>
</tr>
<tr>
<td>PC/104 General</td>
<td>- Interface board connect to PC/104 access via DLL</td>
</tr>
<tr>
<td>purpose I/O</td>
<td>- Supports memory, I/O, interrupts</td>
</tr>
<tr>
<td></td>
<td>[Note]</td>
</tr>
<tr>
<td></td>
<td>- For functions and their uses, see CONTEC’s Platform SDK sample program</td>
</tr>
<tr>
<td></td>
<td>- DMA is not support</td>
</tr>
<tr>
<td>A/D</td>
<td>- On board A/D access via DLL</td>
</tr>
<tr>
<td></td>
<td>[Note]</td>
</tr>
<tr>
<td></td>
<td>- For functions and their uses, see CONTEC’s Platform SDK sample program</td>
</tr>
<tr>
<td>D/A</td>
<td>- On board D/A access via DLL</td>
</tr>
<tr>
<td></td>
<td>[Note]</td>
</tr>
<tr>
<td></td>
<td>- For functions and their uses, see CONTEC’s Platform SDK sample program</td>
</tr>
<tr>
<td>Sound</td>
<td>- Sound source monophonic output driver</td>
</tr>
<tr>
<td></td>
<td>[Note]</td>
</tr>
<tr>
<td></td>
<td>- If you use the D/A or the A/D driver with the sound driver simultaneously,</td>
</tr>
<tr>
<td></td>
<td>one channel is reduced because it is used by the sound driver.</td>
</tr>
</tbody>
</table>
4. On-Board DIP Switch Settings

The xSH3x series provides three methods to make settings that control its operation: an on-board DIP switch, via CMOS and EEPROM.

This chapter describes how to adjust the on-board DIP switch settings.

To find the DIP switches, remove the top cover of the xSH3x series, and look on the CPU board.

The factory settings are shown below.

![DIP Switches - Factory Setting (SW3)](image)

Figure 4.1. DIP Switches - Factory Setting (SW3)

The above three methods of setting are checked in the following order, and used to determine xSH3x series operation.

![Setting Effectiveness Flowcharts](image)

Figure 4.2. Setting Effectiveness Flowcharts
DIP Swiches and Their Functions

Table 4.1. DIP Switch List

<table>
<thead>
<tr>
<th>Switch #</th>
<th>Description</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW3-1</td>
<td>System reserved (fixed ON)</td>
<td></td>
</tr>
<tr>
<td>SW3-2</td>
<td>System reserved (fixed ON)</td>
<td></td>
</tr>
<tr>
<td>SW3-3</td>
<td>Boot message output switch</td>
<td>No message output (Default) vs Message output</td>
</tr>
<tr>
<td>SW3-4</td>
<td>DIP switch/CMOS, EEPROM setting priority switch</td>
<td>Use DIP switch setting vs Use CMOS/EEPROM priority setting (SW3-8 selects CMOS or EEPROM) (Default)</td>
</tr>
<tr>
<td>SW3-5</td>
<td>Boot device selection</td>
<td></td>
</tr>
<tr>
<td>SW3-6</td>
<td>Valid when boot from storage device (SW3-5) is ON</td>
<td></td>
</tr>
<tr>
<td>SW3-7</td>
<td>Emergency boot setting</td>
<td></td>
</tr>
<tr>
<td>SW3-8</td>
<td>Enable EEPROM setting (enable when SW3-4 OFF)</td>
<td></td>
</tr>
</tbody>
</table>

Note!
Factory default is the EEPROM setting.
Customer should not change this DIP switch setting. Incorrect DIP-Switch settings may cause the unit to malfunction.
5. SETCMOS-CONTEC Utility for CMOS

Windows CE on the xSH3x series provides a CMOS setting area to provide the flexibility to accommodate user requirements. The CMOS setting utility (SetCMOS.exe), a standard feature, allows the user change Windows CE operation dynamically.

Note!

Changes made to CMOS settings become effective after the next time the device is booted.

SetCMOS utility’s executive file name: \Windows\SetCMOS.exe

SetCMOS (Version 2) substitutes the functions of the old tools and, supports both GUI style and command line parameters.

Command Line Usage

SetCMOS’s command line enables user set CMOS of Windows CE device automatically and conveniently. By make use of the new utility “Autorun.exe”, user can set CMOS setting of many devices to same by a single step of inserting a PC Card into devices’ PC Card Slot.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Display GUI Dialog</td>
</tr>
<tr>
<td>V</td>
<td>Display version information.</td>
</tr>
<tr>
<td>H</td>
<td>Display command line help information.</td>
</tr>
<tr>
<td>E</td>
<td>Write CMOS setting to EEPROM. This command is used only with &quot;/CB&quot; command.</td>
</tr>
<tr>
<td>CB:file</td>
<td>Back up CMOS setting to a designated file.</td>
</tr>
<tr>
<td>CR:file</td>
<td>Restore COMS setting from a designated backup file.</td>
</tr>
<tr>
<td>CD:file</td>
<td>Update the CMOS default setting, the setting “file” can be created by /CB command. If you want to delete the default setting, “file” part set to CLEAR (no quotation mark).</td>
</tr>
<tr>
<td>CX:Format</td>
<td>Format the NFDISK physically. The formatting action is performed at the next booting time. When you use this command, please reboot the device. <strong>Note:</strong> When the NFDISK is formatted, all the content in the NFDISK will be erased include the “NK.bin”. Please back up the content in the NFDISK before you format the NFDISK.</td>
</tr>
<tr>
<td>XE:{1,0}</td>
<td>Select whether to boot the device from XIP or from other devices.</td>
</tr>
<tr>
<td>XE:1</td>
<td>Boot the device from XIP</td>
</tr>
<tr>
<td>XE:0</td>
<td>Boot the device from other than the XIP, such as network, PCMCIA card etc.</td>
</tr>
</tbody>
</table>
Command line sample:

(1) Backup CMOS Setting to “\NFDisk\CMOS.csv”
    SetCMOS /CB:\nfdisk\cmos.csv

(2) Restore CMOS Setting from “\Storage card\cmos.csv”
    SetCMOS /CR:\Storage card\cmos.csv

(3) Set the CMOS default setting to the content in the
    “\NFDisk\CMOS.csv” file.
    SetCMOS /CD:\nfdisk\cmos.csv

(4) Clear the CMOS default setting.
    SetCMOS /CD:CLEAR

(5) Not to boot from XIP
    SetCMOS /XE:0

Notes!

- After you set the CMOS default setting by /CD command, system
  will use this default setting even if you perform a “Force Reset”
  or press the “Default” button in the “SetCMOS” utility. So if you
  made a wrong setting to the default setting, the system may
  unable to boot, in this case, please refer to “Chapter11
  Emergency Boot Function”.

- The standard attached NK.bin of the xSH3x series is especially
  for XIP booting mode. The XIP special NK.bin cannot be used by
  other devices. If you set to boot from devices other than XIP by
  /XE command, you must use the loading type NK.bin. Please refer
  to Chapter 8, “Booting function”.
GUI Dialog Box Usage

The User Interface of SetCMOS tool appears as the following.

![SetCMOS Tool Interface](image)

**Common Buttons**

**“OK” “Close” (“X”) button**
Press these buttons to close this utility program. The changed setting will not be written to CMOS, unless user presses the “Set CMOS Data” button.

**“Default” button**
Set the CMOS setting to system default. Press this button, the default setting will be reflected, but it is not really set to CMOS until the “Set CMOS Data” button is pressed.

**“Set CMOS Data” button**
Press this button, the changed setting is written to CMOS.

**“Write EEPROM” check box**
The default status of this button is the status of the SW3-8. When SW3-8 is on, the box is not checked; otherwise the box is checked. The mean of the SW3-8 is to use EEPROM setting instead of CMOS setting, for the EEPROM is more reliable than CMOS in general. If this button is checked when user press “Set CMOS Data”, the setting is written to CMOS as well as EEPROM.

*Note!*
*After you change the CMOS setting, please reboot the system to make the change to take effect.*
**“Boot” Tab**

The meaning and usage is following:

<table>
<thead>
<tr>
<th>Group</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reset Button</td>
<td>Hot Boot</td>
<td>When the reset button is pushed, the system will be hot booted. The OS Image(NK.bin) will not be reloaded., and the objectstore and registry remain the same after hot boot.</td>
</tr>
<tr>
<td></td>
<td>Cold Boot</td>
<td>When the reset button is pushed, the system will be cold booted. The OS Image(NK.bin) will be reloaded from the designated boot device, and the objectstore and registry will be restored if you checked the “Restore” group option in CMOS Setting.</td>
</tr>
<tr>
<td>Boot Interval</td>
<td>Invalid</td>
<td>Cold boot without delay.</td>
</tr>
<tr>
<td></td>
<td>Auto</td>
<td>The delay interval is determined by MAC Address of the Windows CE device. The delay interval is last byte of the MAC address bit and 0x07 seconds.</td>
</tr>
<tr>
<td></td>
<td>Manual</td>
<td>The delay interval is selected from the combo box.</td>
</tr>
<tr>
<td>Boot From</td>
<td>Network</td>
<td>Determines the device from which Windows CE is booted.</td>
</tr>
<tr>
<td></td>
<td>NFDisk</td>
<td>Determines cold boot delay interval. By using the delay interval, it can reduce network overhead when many Windows CE devices power on at same time.</td>
</tr>
<tr>
<td></td>
<td>PC Card</td>
<td>Determines the preference boot slot when “Boot from” is “PC Card”.</td>
</tr>
<tr>
<td>Slot Prefer</td>
<td>PCMCIA</td>
<td>The card inserted in the PCMCIA slot is preferred.</td>
</tr>
<tr>
<td></td>
<td>CF</td>
<td>The card inserted in the CF slot is preferred.</td>
</tr>
<tr>
<td>Restore</td>
<td>Registry</td>
<td>Determines the demand restore object when system is cold booted.</td>
</tr>
<tr>
<td></td>
<td>ObjectStore</td>
<td>The Object store is need to be restored at cold boot time.</td>
</tr>
</tbody>
</table>
“Device” Tab

![CONTEC Utility for CMOS GUI]

The meaning and usage is following:

<table>
<thead>
<tr>
<th>Group</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid COM Port Select</td>
<td>Select the COM port wanted to use. Check the COM number to select it.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Detector</td>
<td>Determines whether the on-board PIO port is used as a general purpose PIO port or a printer port.</td>
</tr>
<tr>
<td></td>
<td>Printer</td>
<td>The on-board PIO port is used as a printer port. To use the printer port, use must connect the optional printer connection kit (IPS-SHPRN) to the Windows CE device. [Note] A special printer driver is required for a special printer.</td>
</tr>
<tr>
<td></td>
<td>PIO</td>
<td>The on-board PIO port is used as a general purpose PIO port. For usage of the PIO port, please refer to the CONTEC SDK sample program.</td>
</tr>
<tr>
<td>COM Port Mode</td>
<td>Switch the mode of COM3 between RS-232C and RS-485.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RS-232C</td>
<td>Set the COM3 serial port to RS-232C mode.</td>
</tr>
<tr>
<td></td>
<td>RS-485</td>
<td>Set the COM3 serial port to RS-485 mode.</td>
</tr>
<tr>
<td>Duplex</td>
<td>When COM3 is RS-485, determine its duplex mode.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manual</td>
<td>The duplex mode is Manual Mode.</td>
</tr>
<tr>
<td></td>
<td>Half Duplex</td>
<td>The duplex mode is Half Duplex Mode.</td>
</tr>
<tr>
<td></td>
<td>Full Duplex</td>
<td>The duplex mode is Full Duplex Mode.</td>
</tr>
</tbody>
</table>
“I/O Device” Tab

![CONTEC Utility for CMOS](image)

The meaning and usage is following:

<table>
<thead>
<tr>
<th>Group</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
</table>
| Graphic Device | Size | **Auto** | When a CONTEC touch panel LCD is used, select this setting will automatically set proper parameters for the LCD. If any other type of LCD or CRT is used, the default value 'TFT VGA' is set.  
[Caution] Automatic recognition will not function when no touch panel LCD is connected. It is recommended that the user select the resolution explicitly. |
|             |             | **QVGA** | Sets screen resolution to 320 x 240. |
|             |             | **VGA**  | Sets screen resolution to 640 x 480. |
|             |             | **SVGA** | Sets screen resolution to 800 x 600. |
|             |             | **Registry** | The resolution is set by the registry. |
|             | Type        | **CRT/TFT** | Select this setting when a TFT LCD or CRT is used. |
|             |             | **STN**  | Select this setting when a STN LCD is used. |
|             | Color       | Indicates whether the connected LCD is color or monochrome. |
|             | Reverse     | If the LCD is monochrome, indicates whether the binary display is in reversed characters. 'Normal' is used for black characters on a white background, and 'Reverse' for white characters on a black background. |
| Keyboard    | 101         | Indicates that a 101 keyboard (English) is connected. |
|             | 106         | Indicates that a 106 keyboard (Japanese) is connected. |
|             | **NumLock** | The initial status of the “NumLock” key is locked. |
| Touch Panel | Valid       | Indicates that the COM4 serial port is used for the touch panel display. |
|             | Invalid     | The touch panel is not used, so the COM4 port can be used for other purpose. |
| Mouse Device | Invalid     | Not mouse device is used. |
|             | Serial      | When a serial mouse is connected, select this setting and specify the port number.  
"Registry" means that the serial port is determined by the registry. |
|             | **PS/2**    | When a PS/2 mouse is connected, select this setting. |
“Debug” Tab

The meaning and usage is following:

<table>
<thead>
<tr>
<th>Group</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debug Message</td>
<td>BIOS Output</td>
<td>Check this button, if the debug message in BIOS needs to output. BIOS debug message can be output to an on-board serial port or network card.</td>
</tr>
<tr>
<td></td>
<td>WinCE Output</td>
<td>Check this button, if the debug message in Windows CE kernel, driver and application needs to output. WinCE debug message can be output to an on-board serial port, an extended serial port or a network card. But if “BIOS output” is selected, the “Extend serial” becomes invalid.</td>
</tr>
<tr>
<td></td>
<td>Onboard Serial</td>
<td>Select this radio button if the debug message is output to an on-board serial port. The port number can be selected in the “PortNo” combo box.</td>
</tr>
<tr>
<td></td>
<td>Extend Serial</td>
<td>Select this radio button if the debug message is output to an extended serial port. The port number can be selected in the “PortNo” combo box.</td>
</tr>
<tr>
<td></td>
<td>Network</td>
<td>Now this function is not available.</td>
</tr>
<tr>
<td>Main Memory Size (K Byte) and End Address</td>
<td>Set the RAM memory size used by the Windows CE Operating System. The size includes the total memory size, the object store's size, and the registry's size. Use up key (↑) or down key (↓) to select. Note: This part is not supported in Windows CE 3.0 Version and will not show.</td>
<td></td>
</tr>
<tr>
<td>Message Area from the End (K Byte)</td>
<td>The beginning physical address of the Network Debug Message output area. The size is from the “Main Memory Size and End Address”. Use up key (↑) or down key (↓) to select. Note: This part is not supported in Windows CE 3.0 Version and will not show.</td>
<td></td>
</tr>
<tr>
<td>Message Area Size (K Byte)</td>
<td>The size of the Network Debug Message output area. Use up key (↑) or down key (↓) to select. Note: This part is not supported in Windows CE 3.0 Version and will not show.</td>
<td></td>
</tr>
</tbody>
</table>
“File” Tab

Backup Setting to file
Press the “Backup Setting to file…” button.

A “Backup CMOS to file” open file dialog box is displayed. In the “Backup CMOS to file” dialog box, select a file in file list to overwrite, or input a new file name in the “Name” edit box to create a new backup file, press “Enter” key or “OK” button.

After the backup work is finished, a message dialog box will be displayed to report the backup result.

The backup file is in CSV (Comma Separated Value) format.

Restore Setting from file
Press the “Restore Setting from file…” button.

A “Restore CMOS From File” open file dialog box is displayed. In the “Restore CMOS From File” dialog box, select a backup file in file list, press “Enter” key or “OK” button.

After the restore work is finished, a message dialog box will be displayed to report the restore result.
“Version” Tab

This tab describes the version number and the developer.
6. CONTEC Manager

Introduction

CONTEC Manager is a program that provides management functions, such as scheduling program execution, loading services, managing user information, managing boot action and displaying system information.

Run/Show/Close/Destruct CONTEC Manager

Run CONTEC Manger

CONTEC Manager program is auto-launched at boot time. If it is not auto-launched at boot time, run “wcemngr.exe” to start CONTEC Manager.

Show CONTEC Manger

Normally CONTEC Manager is not shown, it can be brought to foreground by pressing hot key combine “ALT+ESC” or “CTRL+ALT+DEL”, or by running its executive “wcemngr.exe” again.

Close CONTEC Manger

Press “ESC” key or “Enter” key to close the CONTEC Manager.

Destroy CONTEC Manger

CONTEC Manager can be destroyed by running its executive “wcemngr.exe” again with a command line argument “CONTEC”, that is “wcemngr CONTEC”.

If you press “ESC” key or “ENTER” key to close the CONTEC Manager, it is really not destroyed, only hidden.

Note!

If you destroyed the CONTEC Manager, the scheduling function and the loaded services will no longer functioning. Normally please don’t destroy it.
Scheduling Program Execution

Show CONTEC Manager, select the “Schedule” tab.

Add a schedule

Press “Add” button, the “Add Schedule” dialog box is shown. Set up the dialog content by your demand, press “OK” button or “Enter” key to confirm. Details about setting up the dialog refer to “Add Schedule” dialog box.

Delete a schedule

Select the schedule wanted to delete in the schedule list. Press the “Delete” button.

Set property of a schedule

Select the schedule wanted to set up in the schedule list. Press “Property” button, the “Set Schedule” dialog box is shown. Set up the dialog content by your demand, press “OK” button or “Enter” key to confirm. Details about setting up the dialog refer to “Set Schedule” dialog box.
“Add Schedule” and “Set Schedule” dialog box

Set Program and its argument
Press "Browse" button to browse a program, the program name will be set to the "Program and Argument:" edit box. If the program needs arguments, input the arguments directly behind the program name.

Run Timing Modes
There are six timing modes, "Designated", "System Start", "Every Hour", "WeekDay" "Every Week", "Every Month". The meanings of the modes are following.

"Designated" : The program is run only once at designated date and time.

"System Start" : The program is run every time the CONTEC manager is started. For the CONTEC Manager is normally auto-launched at system start, so the setting program is run every time the system starts. If the program’s run timing is set as “System start”, it can be selected to run depend on other programs. When all the dependent programs are started and ended, the program is begun to start.
<table>
<thead>
<tr>
<th>Task Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Every Hour&quot;</td>
<td>The program is run at the designated minute every designated hours. For example, run at every 8:30, 16:30 and 0:30 every day.</td>
</tr>
<tr>
<td>&quot;WeekDay&quot;</td>
<td>The program is run at every designated week day. For example, run at 8:30 every Monday, Wednesday and Friday.</td>
</tr>
<tr>
<td>&quot;Every Week&quot;</td>
<td>The program is run at designated weekday every week. For example, run at 8:30 every Monday.</td>
</tr>
<tr>
<td>&quot;Every Month&quot;</td>
<td>The program is run at designated day and time every month. For example, run at 8:30 o’clock, 15th every month.</td>
</tr>
</tbody>
</table>
Setting "Designated" Mode
Select “Designated” radio button in “Run Timing” group box.

The current date time is displayed in the “Date and Time” edit boxes and combo boxes in the “Start Time” group box.

Input the year number in the year edit box.
Select the month in the month combo box.
Input the date number in the date edit box.
Input time value in the time edit box.
Setting "System Start" Mode

Select "System Start" radio button in “Run Timing” group box.

There are two “System Start” modes.

One is the “Delay” mode, the program is started at a time length after the system is started. The delay time length is designated in the “Start Program After:” edit box. If the time length is “00:00”, then the program is run without delay.

The other is the “Dependent” mode, the program is started depend on other programs’ ending. When all the dependent programs are begun and ended, the program is started. The programs may depend on are listed in the dependent list box. Check the programs wanted to depend on in the list box.
Setting "Every Hour" Mode
Select "Every Hour" radio button in “Run Timing” group box.

Input the start minute in the “Minute” edit box.

Check the hours wanted to set in the hour list box. You can check multiple hours.

For example, if you check “8:”, “16:” and “0:”, and the minute is 30, then the program will be run at every 8:30, 16:30 and 0:30 every day.

“Random Start from *:?? to *:59” function
If you check the “Random Start from *:?? to *:59” check box, the program will be start randomly from ?? minute to 59 minute at designated hour. The “??” part in “Random Start from *:?? to *:59” check box is the minute you input in the minute edit box. The random start function is provided for reducing network overhead when many Windows CE devices do the same action at one time.
Setting "WeekDay" Mode

Select "WeekDay" radio button in “Run Timing” group box.

Select weekday by check weekday name.

Input time in the time edit box.

For example, Check “Monday”, “Wednesday”, and “Friday”, and input time “8:30”, the program will be run at 8:30 every Monday, Wednesday and Friday.
Setting "Every Week" Mode
Select "Every Week" radio button in “Run Timing” group box.

Select a weekday in the weekday combo box.

Input time in the time edit box.

For example, Select “Monday”, and input time “8:30”, the program will be run at 8:30 every Monday.
Setting "Every Month" Mode
Select "Every Month" radio button in “Run Timing” group box.

Input date in the “Day” edit box, and input time in the time edit box.
For example, 15 in the “Day” edit box, input “8:30” in time edit box.
The program will be run at 8:30 o’clock, 15th every month.

“Random Start from ??:?? to ??:59” function
If you check the “Random Start from ??:?? to ??:59” check box, the program will be start randomly “from ??:?? to ??:59”. The “??:??” part in “Random Start from ??:?? to ??:59” check box is the time you input, The ”??:59” part is the 59 minute of the hour you input. The random start function is provided for reducing network overhead when many Windows CE devices do the same action at one time.
Loading services

Show CONTEC Manager, select the “Service” tab.

There are 4 services to load, that is “FTP Server”, “Remote Control Server”, “Auto Run Function”, and “NTP Time Adjust”.

To load “FTP Server” service, check the “Start FTP Server” check box.

If the “FTP Server” is started, the remote FTP client can access the Windows CE file system by FTP protocol. To load “Remote Control Server” service, check the “Start Remote Control Server” check box.

If the “Remote Control Server” is started, the “CONTEC Remote Manager” can control the Windows CE device.

To load “Auto Run Function”, check the “Start Auto Run Function” check box.

If the AutoRun Function is started, when an ATA card or Compact Flash Card is inserted into the card slot, the AutoRun function will try to find the autorun.inf file in the card. If there exists an autorun.inf, AutoRun will run programs set in the autorun.inf.

To load “NTP Time Adjust” service, check the “Start NTP Time Adjust” check box.
Designate a NTP server IP address in the “NTP Server IP” edit box. If NTP server IP address is not designated, the default NTP server is the DHCP server.

Input time length in the “Adjust Time Every:” edit box in minutes.

If the “NTP Time Adjust” service is started, the NTP client will adjust the system time by the time from a designated NTP server.
Manage the user information

Show CONTEC Manager, select the “UserInfo” tab.

The user information is used in CONTEC services, such as “FTP Server”, “Remote Control Server”, as “Windows CE Terminal Server”. Only the user listed the “User List” can access CONTEC servers. User information includes user name and password. User name and password are 8 characters string.

Add a user

Input user name in the “Name” edit box, input password in the “Password” and “Re-Password” edit box. Press “Add” button.

Update a user’s information

Select a user in the “User list”, Change the user name in the “Name” edit box, or change the password in the “Password” and “Re-Password” edit box. Press “Update” button.

Delete a user

Select the user wanted to delete in the “User List”, Press “Delete” button.
Manage boot action

Show CONTEC Manager, select the “Boot” tab.

Boot action

To Hot Boot the device, press “Hot Boot” button.

When the device is hot boot. The NK.bin OS Image will not be reloaded., the objectstore and registry remain the same after hot boot

To Cold Boot the device, press “Cold Boot” button. When the device is cold boot, the NK.bin OS Image will be reloaded from the designated boot device.. the objectstore and registry will be restored if you checked the related option in CMOS Setting.

“Backup Registry when cold boot” check box: When the CONTEC Manager detected that the settings in itself have been changed. This check box is checked. If you have checked this check box when you cold boot, the CONTEC manager will first backup registry to the “\NFDisk\REG.bin” file, and check the CMOS Registry Restore Setting, and cold boot the device. If you have not checked this check box when you cold boot, the CONTEC manager will not backup the registry, all the changed setting in the CONTEC manager will be lost after the cold boot!!!. If you want to restore the current registry setting after cold boot, please check this check box.
Boot Information

“Boot From Setting” describes the current boot device setting. The device can be “Network”, “NFDisk”, “PCMCIA” and “Emergency”, “Emergency” means current setting is Emergency boot, i.e, the SW3-7 is OFF.

“Boot Delay Time” describes delay time in second when cold boot.

“Restore result” “Object store” describes the Object store restore status.

“Restore result” “Registry” describes the Registry restore status.

restore status:

"Hot Boot, not restored."
-Not restored for the device is hot booted.

"Not Required by CMOS."
-Not restored for restore is not required in the CMOS setting.

"No Backup file."
-Through the restored is required in the CMOS setting, there is no backup file in the “\NFDISK”. Use “NFToy” tool to backup object store or registry first.

"Header Error."
-The backup file in the “\NFDisk” has been destroyed.

"Restore success."
-The restore is succeed at boot time.
Version and system information

Show CONTEC Manager, select the “Version” tab.

The CONTEC Manager’s version, BIOS Version, Kernel Version is displayed here.

The total size of “NFDisk” is displayed here. For example, “NF total size:31.256M”

The total memory size and available memory size is displayed here. For example, “Memory total:6717K, Available: 5259K”

The Ethernet Card MAC address is displayed here. For example “MAC Address:00804cf00601”.
Change the Title of the CONTEC Manager

By default, the title of the CONTEC Manager is “CONTEC”. You can change the content of the title by modifying the registry.

Registry Key and value:

```
[HKEY_LOCAL_MACHINE\Ident]
OEMName REG_SZ Input the wanted title here, for example “DAIFUKU”
```

If you’ve changed the title to “DAIFUKU”, the CONTEC manager will display as following:

![CONTEC Manager Interface]

- Schedule
- Service
- UserInfo
- Boot
- Version
- Program
- Run Time
- Add
- Delete
- Property
7. NFTOY-CONTEC Utility for NFDisk

Introduction

Executive file name: \Windows\NFToy.exe

NFToy substitutes the functions of the old tools, and supports both
GUI style and command line parameters.

NFToy provides following functions:

(1) Object store Backup and Restore.
(2) Registry Backup and Restore.
(3) Update OS image NK.bin to NFDisk.
(4) Support both GUI Dialog box and Command Line Commands.
Command Line Usage

NFToy’s command line enables user setup Windows CE device automatically and conveniently. By make use of the new utility “Autorun.exe”, user can restore the same Object store and registry backup file, and update same OS image to many devices by a single step of inserting a PC Card into devices’ PC Card Slot.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Display GUI Dialog</td>
</tr>
<tr>
<td>/V</td>
<td>Display version information.</td>
</tr>
<tr>
<td>/H</td>
<td>Display command line help information.</td>
</tr>
<tr>
<td>/OA</td>
<td>Back up all the Object Store content. If this parameter is not set, the really used space of the object store is backed up. This command is used only with “/OB” command. Normally, this command is not necessary.</td>
</tr>
<tr>
<td>/OB</td>
<td>Back up the Object Store to “\NFDisk\OBJ.bin” file.</td>
</tr>
<tr>
<td>/RB</td>
<td>Back up the Registry to “\NFDisk\REG.bin” file.</td>
</tr>
</tbody>
</table>
| /OA;0   | Use(1) or not use(0) Object Store Backup in NFDisk. This command is reflected in CMOS setting.
| /OU:1   | -> Restore the Object Store Backup in NFDisk when the device is cold boot. |
| /OU:0   | -> Don’t restore the Object Store Backup in NFDisk when the device is cold boot. |
| /RB;0   | Use(1) or not use(0) Registry Backup in NFDisk. This command is reflected in CMOS setting. |
| /RU:1   | -> Restore the Registry Backup in NFDisk when the device is cold boot. |
| /RU:0   | -> Don’t restore the Registry Backup in NFDisk when the device is cold boot. |
| /OF:file| Back up the Object Store to the designated file. |
| /OR:file| Restore the Object Store from a backup file. The backup file is copied as “\NFDisk\OBJ.bin” file, and a cold-boot is necessary. |
| /RF:file| Back up Registry to the designated file. |
| /RR:file| Restore Registry from backup file. The backup file is copied as “\NFDisk\REG.bin” file, and a cold-boot is necessary. |
| /KU:file| Update OS Image file to “\NFDisk\NK.bin“. |

Note!

/OA, /OB, /OF and /OR functions are valid only on the Windows CE 2.11 installed type.

Command line sample:

1. Backup the Object Store to “\Storage Card\Obj.bin”
   Nftoy /OF:\Storage Card\Obj.bin

2. Restore the Object Store from “\Storage Card\Obj.bin”
   Nftoy /OR:\Storage Card\Obj.bin

3. Restore the Registry from “\Storage Card\reg.bin”
   Nftoy /RR:\Storage Card\reg.bin
GUI Dialog Box Usage

Object store Backup and Restore

Restore ObjectStore

If you want to update drivers, programs and files in the ObjectStore, You can copy these drivers, programs and files to the “\NFDisk\Update” directory. When WindowsCE.NET cold boots, the content (include sub directory) under the “\NFDisk\Update” directory overwrites or copies to the root directory. So the “\NFDisk\Update\Windows” directory is corresponding to the “\Windows” directory.

For example, If you want to update the serial driver (serial.dll), copy the new version of serial driver (serial.dll) to the “\NFDisk\Update\Windows” directory. At the booting time, WindowsCE.NET xSH3x will overwrite the old version of serial.dll in the Object Store’s “\Windows” directory by the new file in the “\NFDisk\Update\Windows” directory.

The content copied to the “\Nfdisk\Update” directory will not be updated to the ObjectStore until the "ObjectStore" check box in SetCMOS.exe is checked and the system carries out a cold boot.

“ObjectStore” Check box in Restore Group of SetCMOS.exe
Check this box if you want to update the object store by the content in the “\NFDisk\Update” directory at the next time the system cold boots, otherwise uncheck this box.
Registry Backup and Restore

Select “Registry” tab, the following dialog box is displayed.

![CONTEC Utility for NFDisk](image)

**Backup Registry**
Press the “Backup Registry” button.

The backup operation begins, a progress bar is displayed to indicate that the backup is processing. After the backup work is finished, a message dialog box will be displayed to report the backup result, and the “Use Registry Backup” check box is checked automatically.

**Backup Registry to file**
Press the “Backup Registry to file…” button.

A “Backup Registry” open file dialog box is displayed. In the “Backup Registry” dialog box, select a file in file list to overwrite, or input a new file name in the “Name” edit box to create a new backup file, press “Enter” key or “OK” button.

The backup operation begins, a progress bar is displayed to indicate that the backup is processing. After the backup work is finished, a message dialog box will be displayed to report the backup result.
**Restore Registry from Backup file**

Press the “Restore Registry from backup file…” button.

A “Restore Registry” open file dialog box is displayed. In the “Restore Registry” dialog box, select a backup file in file list, press “Enter” key or “OK” button.

The Restore operation begins, a progress bar is displayed to indicate that the restore is processing. After the restore work is finished, a message dialog box will be displayed to report the restore result.

The registry is not restored immediately, the operation only copies the designated file to “\NFDisk\REG.bin” file. The Registry will be restored at the next time the system is cold booted.

**Update OS image NK.bin to NFDisk**

Select “OS Image” tab, the following dialog box is displayed.

Press the “Update OS Image NK.bin…” button.

A “Update NK.bin” open file dialog box is displayed. In the “Update NK.bin” dialog box, select an OS Image file in file list, press “Enter” key or “OK” button.

The operation copy a designated Os image file as “\NFDisk\NK.bin” file.

If user wanted to boot from NFDisk, the CMOS setting (“SetCmos” tool \ “Boot” Tab \ “Boot from” Group \ “NFDisk” radio button) must be selected.
View Version Information

Select “Version” tab, the following dialog box is displayed.

![Version Information Dialog Box]

CONTEC Utility for NFDisk
Version 2.0
Copyright (C) 2000, CONTEC
Device Engineering Dept.
8. Booting Functions

The xSH3x series BIOS supports a variety of boot sequences.

These functions can be used effectively in the Windows CE operating system images (NK.BIN) development.

For example, during NK.BIN development it is possible to load the NK.BIN, while being built, from the development machine over a network for smooth debugging. (The servers can use BOOTP/TFTP etc. protocols, however the CONTEC Network BOOT Management Server provided with the CONTEC IDE Platform Development Environment (sold separately) makes this service easily available.)

**Note!**

- **The standard attached NK.bin of the xSH3X series is especially for XIP booting mode. The XIP special NK.bin cannot be used by other devices. If you want to boot from devices other than XIP, you must develop a loading type NK.bin.**
- **To develop NK.BIN for the xSH3x series requires purchasing the CONTEC Platform Development Environment CONTEC IDE, and the Microsoft Platform Builder.**

For information about boot functions of the xSH3x series, see the following table.

### Table 8.1. Boot Functions

<table>
<thead>
<tr>
<th>Boot Method</th>
<th>NK.bin Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-board NF boot</td>
<td>Loading</td>
<td>Boots from the on-board flash ROM (NF) built into the MSH3x series. This is the default setting.</td>
</tr>
<tr>
<td>PC card boot</td>
<td>Loading</td>
<td>When developing an NK.BIN for the MSH3x series or otherwise executing a built NK.BIN on the MSH3x series, the NK.BIN is copied from a PCMCIA ATA flash card or compact flash (CF) card and the system is booted from that card.</td>
</tr>
<tr>
<td>Network boot</td>
<td>Loading</td>
<td>When developing an NK.BIN for the MSH3x series or otherwise executing a built NK.BIN on the MSH3x series, the NK.BIN is loaded from a network to boot the system.</td>
</tr>
<tr>
<td>XIP Boot (Default)</td>
<td>XIP Type</td>
<td>Boot from the XIP ROM carried on the xSH3x series.. This booting mode is supplied to end user by default.</td>
</tr>
</tbody>
</table>
Booting Functions

Loading type NK.BIN can be used commonly for "On-board NF boot", "PC card boot", and "Network boot", while XIP type NK.bin can only be used for "XIP boot".

For boot function settings, see Chapter 4, "CMOS Settings."

*Note!*

*Please be sure to use XIP boot in actual project, for using loading type boot (PC card boot or network boot) breaks the license contract with Microsoft.*
9. Force Reset Functions

When the system cannot be boot, either by the mistaken setting in CMOS, or damaging of the NFdisk. The system could be restored to default status by executing a force reset.

To perform a force reset, switch the power on while push the “Reset” button of the xSH3x, and release the “Reset” button while the "ACCESS" LED (the yellow LED) is lighting.

The “Reset” button and the “ACCESS” LED are on the side of the xSH3x series.

Note!

If a force reset is performed, the CMOS setting will be return to the default setting; the registry and object store will not be restored.

But, if the EEPROM setting is been using, the CMOS setting will be overwritten the next time the system is booted. So you must change the CMOS setting to proper value by the SetCMOS utility.
10. BIOS Update Processing

A rewritable EEPROM is provided to handle BIOS updates caused by hardware initialization as well as a variety of boot processing methods. This also enables the system to handle future version upgrades.

Command Line Usage

By using command line, user can update BIOS and change the logo bitmap displayed when the system is booting.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Start the dialog box mode.</td>
</tr>
<tr>
<td>/V</td>
<td>Display the version information.</td>
</tr>
<tr>
<td>/H</td>
<td>Display the help information.</td>
</tr>
<tr>
<td>/UB:file</td>
<td>Update the BIOS by the designated BIOS ROM file.</td>
</tr>
<tr>
<td>/UO:file</td>
<td>Designate a bitmap as the OEM logo bitmap displayed while the system is booting. If the file name is CLEAR (without quotation mark), the OEM logo bitmap is cleared. The bitmap must meet following conditions: less than 128k bytes, 256 colors, and un-compressed. Note: You must designate the display device's screen resolution expressly in the SetCMOS utility's &quot;I/O Device&quot; TAB. If you use &quot;AUTO&quot;, the logo bitmap will not be displayed.</td>
</tr>
</tbody>
</table>

Command line usage sample:

(1) Update the BIOS by the file “\Storage card\sh3bios.rom”:
   BIOSVUP /UB: \Storage card\sh3bios.rom

(2) Set OEM booting logo by the bitmap file “\Storage card\logo.bmp”:
   BIOSVUP /UO: \Storage card\logo.bmp

(3) Clear the booting logo
   BIOSVUP /UO: CLEAR
BIOS Updating Method

Reading and updating BIOS data provided by CONTEC involves the use of the biosvup.exe application on Windows CE.

1. Run the biosvup.exe to start BIOS Updating Utility.

2. After the BIOS update utility has started, designate a BIOS ROM file in the “BIOS ROM File” edit box, or press “Browse” button to select a BIOS ROM File.

3. After a BIOS file is designated, the “Write” button is enabled.

4. Press the "Write" button to start reading and writing BIOS. When the BIOS is being updated, the display likes the following:
(5) After the BIOS is updated, the display likes the following. Press “Exit” button to complete BIOS updating.

![BIOS Update Utility](image)

(6) The BIOS update is now completed. Restart the xSH3x series and confirm the BIOS version upgrade from the CONTEC Manager’s Version information TAB. In case that the system does not restart, perform an emergency boot.

**Caution!**

*Improper operation of BIOS update may cause a problem. This function should be used only when new BIOS version is available or in case of malfunction of the unit.*
11. Emergency Boot Function

If the BIOS updating failed, there is a risk that the system cannot boot. To evade this problem, there are two kinds of BIOS; one is the normal BIOS, another is the emergency BIOS. When the normal BIOS cannot boot, the system can be booted by the emergency BIOS.

To perform a force reset, switch the power on while push the "Reset" button of the xSH3x, and release the "Reset" button while the "ACCESS" LED (the yellow LED) is lighting.

If user also wants to format the NFDisk forcedly while performing the emergency boot, open the upper cover of the xSH3x series, and switch the SW3-7 to off. This time, the OS image (NK.bin) in the NFDisk will be erased; user must make a bootable ATA card by copy the NK.bin in the attached CD_ROM to the ATA card. The booting device will be changed to from the bootable ATA card. After boot, don’t forget to switch the SW3-7 to ON.

Note!

Ensure that the power supply remains uninterrupted and do not press the reset button during the restoration process.
12. Auto RUN Function

When the user want to setup many machine to same setting, or to perform same action automatically, the Auto-Run function is useful.

To execute an Auto-Run task, user must prepare an AutoRun.inf file in an ATA card. When an ATA card has an AutoRun.inf file in root directory is inserted in to a PC card slot, the tasks described in the AutoRun.inf file are executed automatically.

Usage of Auto-Run function

If user wants to use Auto-Run function, the “Start AutoRun Function” check box in “Service” tab of “CONTEC Manager” must be checked.

Note!

*If status of the “Start AutoRun Function” check box in “Service” tab of “CONTEC Manager” is changed, it will be take effect at the next the system is booted.*
Method to set AutoRun.inf

For using auto-run function, the AutoRun.inf file must be described in following formation.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#wait</td>
<td>Wait for value designated time period. The unit is millisecond. For example, to wait for a second, set 1000.</td>
</tr>
<tr>
<td>depend</td>
<td>If “Depend” is set, this command is started until the previous command is ended.</td>
</tr>
<tr>
<td>;</td>
<td>If “;” is set, this line is regarded as a comment line.</td>
</tr>
</tbody>
</table>

Sample:

; AutoRUN.inf sample file
; for Example INF File Format
; Run test1.exe in the “\storage card” directory. If the file name includes blank,
; include the file name between two quotation marks.
   "\storage card\test1.exe" "a /b /c"
; “#wait depend” command, wait for the previous command to end
   #wait depend
; Run test2.exe in the “\Windows” directory.
; If the file name does not include blank, the quotation marks are not necessary.
   \windows\test2.exe
; “#wait value” command, Wait for value designated time period in milliseconds.
   #wait 1000

; Run test3.exe, If the program’s path is not designated, the program in the PC card, 
; where the AutoRUN.inf exists, is started.
   test3.exe
13. Back Light Function

By using this function, it is possible to switch off the back light when there is no input for a period. The input events are the inputs from keyboard, mouse and touch panel. For setting this function, double click the “Back Light” icon as following, in Control Panel.

![Back Light Icon]

If the “Back Light” icon is double clicked, the following “Back Light Properties” dialog box is displayed.

![Back Light Properties Dialog]

**Screen Saving Tab**

In this tab, it is determined whether the back light is automatically switch off, and how long in minutes it takes to switch the back light off.

**Darken Backlight automatically:**

If this item is checked, the back light is switched off after no input for a designated period. The input events are the inputs from keyboard, mouse and touch panel.

**Darken after idle time:**

Designate how long it takes to switch the back light off. During this time, if there is no input, the back light is switched off.
Back Light Function

Backlight Tab

Adjust the brightness of the LCD.

*Note!*

*If the LCD does not support brightness adjusting, this function is invalid.*

*The current version does not support this function.*
Appendix

14. Appendix

How to Develop Applications for Windows CE

Development Environment

To develop WindowsCE application for the xSH3x series, requires the following hardware and software. For debugging the WindowsCE application is performed by remote debug method, a LAN environment is also necessary.

Hardware Requirements
- x86 based PC (with Windows 2000 or XP)
- Network Interface Card
- Network Accessories such as UTP Cable and HUB (10BASE-T)

Software Development Requirements
- Windows 2000 Professional SP2 or later *1, or WindowsXP Professional
- eMbedded Visual C++ 4.0
- SDK for CONTEC Platforms
- abbreviated as 'CONTEC SDK' in following article

*1 The TCP/IP protocol must be installed. You can use DHCP or fixed IP address. The IP address of the development machine is necessary for the target device to connect to the development machine.

Development Machine Software Installation

You should install the development machine software in the following order:

1. Windows 2000 Professional or Windows XP Professional
2. When Windows 2000 Professional is installed, install the service pack of the Windows 2000 service pack
3. eMbedded Visual C++ 4.0
4. CONTEC SDK
If you want to uninstall the above software, uninstall each software in the reverse order. If any files remain after uninstall, please delete them manually.
Set Target Machine IP Address

If there is a DHCP server on the network, you do not need to set the IP address. If not, you have to set a fixed IP address to the development machine and to the target machine.

The following shows how to set the target machine IP address.

2. 1. Start the control.exe according to method described in chapter 2 "Basic Operation of xSH3x Series."

3. Start [Network and Dial-up Connection] at the control panel.

   Double click on the “SH20001” icon.

![SH2000 Driver Settings](image)

4. Close the “Network and Dial-up Connection” window.

5. Close the control panel.

6. The IP address has been changed by now; if you want to remember the change even you re-boot the device. Please follow the next steps.

7. Press “CTRL+ALT+DEL” hot key to pop up “CONTEC Manager”, check the “Backup Registry when cold boot” checkbox, and press “Cold boot” button to reboot the device.

8. After the device is booted. The IP address is set to the specified setting.
Checking the Connection between the Development and Target Machines

1. Start eMbedded Visual C++ (eVC++) on the development machine.
2. Select “Tool” → “Configure Platform Manager” menu in eVC++.
4. The [Device Properties] dialog box pops up.
Appendix


![TCP/IP Transport Configuration dialog box](image)


![Manual Server - Action dialog box](image)
7. Start the connect.exe in the target Windows CE Device.

8. [Connect to Platform Manager for TCP/IP] dialog box is displayed. Type IP address of the development machine into [Host IP Address and Port Number]. Type port number into [Port Number] that you entered in procedure 5.

![](image)

(If the [Exit] button is pushed, the IP address and port number will be saved to the registry, and the connect.exe will be end.

If the IP address or the port number is empty, you will unable to exit. If you really want to exit push the “X” button on the right-top corner.)


11. Test the connection between the development machine and the target machine starts.
12. If the test result is successful, the message [Connection to device established] is displayed on [Testing Device Connection] dialog box in the development machine. Select [OK].

13. This completes the connecting test.

14. If the test result fails, the message [Establishing platform manager connection to device] will be displayed in [Testing Device Connection] dialog box in the development machine. Select [Cancel]. Check all the previous steps again. Check network equipment and so on. Retry this test procedure.
15. If the development machine and the target device are still unable to connect to each other, even if the step 14 is done. Please uninstall the development software in the development machine and reinstall the software again. For uninstalling the software, please refer to the uninstall steps described in the Chapter 14 “Appendix: Development Machine Software Installation“.

Developing Applications by eMbedded Visual C++4.0

Windows CE applications are developed by using eMbedded Visual C++ 4.0’s Application Wizard.

Note!

Some APIs and MFC classes are not supported by Windows CE.

Please use eVC4.0 only when you are developing applications for WindowsCE.NET.

1. Start eVC++4.0 on the development machine.
3. Input [Project name], and select [Location].

4. Select WCExxxx (Leading character is 'WCE') as project type. And select [Win32 (WCE SH3)] at [Platforms], press OK button. And do later selection along the Wizard.

5. Select [xSH3V400R1] and [xSH3V400 R1 Device] at WCE Configuration Toolbar.

![Configuration Toolbar](image)

**Download application**

In eMbedded Visual C++4.0 (eVC++4.0) after the application is built, it is automatically downloaded to the target machine by the default setting.

If [Manual Server - Action] dialog box is displayed while downloading, please connect the development machine to the target machine by following the steps starting at step 7) of "Check Connection between Development Machine and Target Machine". In the Step 8, please type '5000' in [Port Number] at [Connect to Platform Manager for TCP/IP] dialog box of the target machine.

After building the application you can also download the application file manually. The following is the manual download operation.


2. If [Manual Server - Action] dialog box is displayed while downloading, please connect the development machine to the target machine by following the steps starting at step 7) of "Check Connection between Development Machine and Target Machine".
Debug Application

Windows CE debugging is done remotely. You can debug applications by using the integrated debugger of the eVC++4.0. The debug method is just the same as that of the MS Visual Studio 6.0.

1. Build the application, and download it to the target machine.
2. Start the application by pushing the [F5] key (Run) or the [F11] key (Step In).

Embedding the application

Following is the method for embedding applications to the target machine.

Copy the developed application into “\NFDisk”*1 directory of the xSH3x series. There are following 3 methods to copy application to “\NFDisk”.

1. Use xSH3x series’ FTP server to copy applications by network.
2. Use CONTEC Remote Manger (WinRemote.exe) attached in CONTEC SDK to copy application, in this case, the FTP server is used.
3. Use ATA Flash card or CF card to copy application to NFDisk.

*1: The ”\NFDisk” directory is mounted on the onboard NAND Flash Disk of the xSH3x series. Files stored in this directory will not disappear even if the power is shut down.
Using Remote Tools

Microsoft development environments such as eVC++4.0, eVC++, and eVB, provide convenient tools such as the ‘Remote Registry Editor.’ This allows the user to manipulate the registry of Windows CE when a Windows CE machine is connected to a development machine. The xSH3x series also supplies these tools.

Connecting the Development and Target Machines

To use remote tools it is necessary to connect the development machine to the target machine, as in debugging. This process uses the same procedure described in Chapter 10 of this manual "Appendix: Application Development Procedures," with the 'Windows CE Platform Manager Configuration' selected for each tool from the remote side.

Normally the 'Windows CE Platform Manager Configuration' for each remote tool is shown on the Connection menu.

![Remote Registry Editor](image)

Figure 14.1. Connecting to Remote Tools

After the development machine and target machine have been connected, each of the tools is ready to use.

For information on the use of tools, refer to the Help menu.
Usage of Backup Areas

By using the NFDisk management utility -NFToy, user can backup the Object store, the Registry and update the OS image file NK.bin.

Object Store Backup

By using this function, user can backup the all the content in the object store as a file into the “\NFDisk”, and restore the object store by the backup file at booting time.

If a file in the OS image (NK.bin) is overwritten, the new file is copied into the object store. When the file name is opened, the really opened file is the new file exists in the object store.

By using the object store’s backup and restore function, user can substitute files in the original OS image NK.bin. It is no necessary to reconstruct a new NK.bin.

![Figure 14.2. Operation with NK.BIN File Overwriting](image)

ABC.EXE

ABC.EXE

NK.BIN

ABC.EXE

ABC.EXE

When overwritten with the same file name ABC.EXE, this file will be called after the next startup.
The Object store’s backup method is different according to the install OS.

If you want to update drivers, programs and files embedded in the NK.bin, or add new drivers, programs and files. You only need to copy these files into the “\NFDisk\Update” directory. Next time WindowsCE.NET cold boots, the content (include sub directory) under the “\NFDisk\Update” directory overwrites or copies to the Windows CE’s root directory. So the “\NFDisk\Update\Windows” directory is corresponding to the “\Windows” directory.

You need not to rebuild an OS image if some drivers and applications have been changed. The only thing to do is use this function to substitute the changed files.

**Registry Backup**

By using NFToy, user can backup the Registry as a file into the “\NFDisk”, and restore the backup file as Registry at booting time.

By making use of this function, user application’s setting, and Windows CE’s environment setting in the Registry can be backed up, and restored at the next time the device is booting, even if the device’s power is off.
FAQ
Operating Edition

Q. Is it possible to make a beep sound when the touch panel is touched?

A. Yes, if you are using a liquid crystal display (LCD) with a touch panel made by CONTEC, by add a following key in the registry, it will beep when LCD panel is touched.
\HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\TOUCH
BeepMode=dword:1

If the key does not exist, or the value is 0, it will not beep.

Q. Is it possible to make a sound when there is an operation on the touch panel or the keyboard?

A. In xSH3x series, the sound function at the time of touching on the touch panel and pushing a key on the keyboard is canceled by default. By modifying the keys in the registry like following, the sound function can be validated.
\HKEY_CURRENT_USER\ControlPanel\Volume
Key=dword:10002
Screen=dword:10002

If you want to output sound by IPC-BX/MSH3x series, the optional sound outputting interface is necessary. For the details, please refer to the manual. If you want to output sound by IPC-PT/SSH3x series, use the connector on the main board directly. The DA0CH (D/A converter output channel 0) is used to output the sound. Please refer to the hardware manual for the connector.
**Q. Is there a watch dog timer can be used by user application?**

A. xSH3x series supports watch dog timer function. User application can use watch dog timer by call watch dog timer APIs. Details about how to use watch dog timer, please refer to the sample program in “CONTEC Platform SDK”.

**Q. I would like to use a PS/2 mouse. How can I do?**

A. By changing the CMOS setting in the SetCMOS tool, a PS/2 mouse can be used. But, a special cable is necessary. The cable supplies two PS/2 connectors, one is for the PS/2 keyboard, and another is for the PS/2 mouse.

**Q. I'd like to use a touch panel display.**

A. The touch panel driver is provided as standard equipment. You will need to purchase the optional LCD connection kit (IPC-SHCL-2T) and use a CONTEC touch panel LCD display. (Note that the IPC-BX/MSH3P type cannot be used with this device.)

**Q. How can I use a printer?**

A. A printer port driver and PCL printer driver are provided as standard equipment. You will need to purchase the optional printer connection kit (IPC-SHPRN). Also if your are not using a PCL printer, you will need to provide the appropriate printer driver.
Q. I want to run applications automatically. Is this possible?

A. This can be done by making an entry in the Windows CE registry.

\HKEY_LOCAL_MACHINE\initKey

<table>
<thead>
<tr>
<th>Item</th>
<th>Data type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Launchxx</td>
<td>REG_SZ</td>
<td>Enter the application name to run. &quot;xx&quot; is the ID number.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Note] Full path name cannot be used for the application name.</td>
</tr>
<tr>
<td>Dependxx</td>
<td>REG_BINARY</td>
<td>If the running order of applications has dependence relation, specify the relation by ID numbers.</td>
</tr>
</tbody>
</table>

Example:
Launch10 : "shell.exe"
Launch30 : "myProg.exe"
Depend30: 0a, 00

The above example shows a dependent relationship in which myProg.exe will be started after shell.exe is executed.

Also, by making use of the schedule function in “CONTEC Manager”, program can be started in a more complicated timing. Details please refer to the manual of “CONTEC Manager”.

Q. Can an analog RGB inputting flat panel display be used for IPC-BX/MSH3x series?

A. It can be used. However, only the following types can use the analog RGB inputting flat panel display: IPC-DT/M20V(PC) T, IPC-DT/L20S(PC) T, and IPC-X[DT/H20] (PC) T.

When IPC-X[DT/H20] (PC) T, whose screen resolution is 1024x768 pixels, is used, if the input screen’s resolution is lower than 1024x768 pixels, the screen will be enlarged to fit the display.

When a touch-panel is used, the following setup is necessary:

(Here we suppose that the touch panel is connected to the COM2 port of xSH3x series.)

[Setup of the analog RGB inputting flat panel display]
(1) Please set the "TOUCHPANEL MODE" to "DOS" at the screen setup. For the setting method, please refer to the manual of the analog RGB inputting flat panel display.

[Setup of the IPC-BX/MSH3x series]

(1) Modify or add the following registry key by the registry editor (RegEdit.exe):

[HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\TOUCH]

Port REG_SZ COM2
AutoEnable REG_DWORD 0

(2) Ensure that the power supply of the analog RGB inputting flat panel display is turned on.

(3) Press CTRL_ALT_DEL hotkey, be sure that the “Backup Registry when boot” check box is checked in the CONTEC manager’s [boot] tab, press the [Cold Boot] button to perform a cold boot.

Development Edition

Q. I want to create an application for the xSH3x series. What is required?

A. The following are required for application development:

- eMbedded Visual C++ 4.0
- CONTEC Platform SDK
  (This is the standard attachment of the xSH3x series devices with WindowsCE.NET Installed)

For information on development, see the "Application Development Procedure" in this document.
Q. I want to use CE service and ActiveSync. How can I do this?

A. In Windows CE.NET, connection by ActiveSync is possible. When use ActiveSync, if the partner relationship is first established by serial connection, then it also becomes possible to connect by LAN.

ActiveSync can be downloaded from Web site of Microsoft. URL : http://www.microsoft.com/windows/embedded/

The circuit of the Serial Cross Cable for using ActiveSync
Q. **Is there any way to debug a driver I have created?**
A. The xSH3x series provides a CMOS setting that allows you to use a port for debugging. You can use this arrangement to build in a RETAILMSG into the drivers you create. Use this for debugging so that the message is displayed in terminal software etc.

Q. **I have placed some proprietary hardware on the PC/104 bus. Can I develop a driver for it?**
A. The xSH3x series provides a general-purpose I/O driver (BusIO.DLL) as standard equipment, and this can be used for easy access to resources on the PC/104 bus (interrupt, memory access, I/O access). You access resources directly from applications without the need to develop drivers. However, if high speeds are required, you may find it preferable to develop particular drivers.

*Note!*

_The xSH3x series PC/104 bus does not support DMA._