EXAMPLES RUNNING FROM EXTERNAL RAM

The following steps should be taken to run the Queens (queenss) example from external RAM. Settings are given for both a multiplexed and a non-multiplexed bus.

DIP-Switch Settings

The correct board switch settings are:

For Multiplexed Bus (MUX):

<table>
<thead>
<tr>
<th>Switch</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>S101</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>On</td>
<td>On</td>
<td>Off</td>
</tr>
<tr>
<td>S102</td>
<td>Off</td>
<td>Off</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>S103</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>S104</td>
<td>On</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>S105</td>
<td>Off</td>
<td>Off</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>On</td>
</tr>
<tr>
<td>S106</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>On</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For Non Multiplexed Bus (MUX):

<table>
<thead>
<tr>
<th>Switch</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>S101</td>
<td>Off</td>
<td>On</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>S102</td>
<td>Off</td>
<td>Off</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>S103</td>
<td>Off</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>S104</td>
<td>On</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>S105</td>
<td>Off</td>
<td>Off</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>On</td>
</tr>
<tr>
<td>S106</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>On</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: the **bold blue** switches mark deviations from the default settings as given in the Infineon XC16x Board Manual (v1.2, Oct. 2002).
### Startup Register Settings

The correct system register settings for the Bus Configuration, External Bus Controller and address selection should be set as follows:

<table>
<thead>
<tr>
<th>Register</th>
<th>Multiplexed Bus</th>
<th>Non Multiplexed Bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYS0</td>
<td>0000h</td>
<td>0000h</td>
</tr>
<tr>
<td>SYS01</td>
<td>0000h</td>
<td>0000h</td>
</tr>
<tr>
<td>VECSEG</td>
<td>0000h</td>
<td>0000h</td>
</tr>
<tr>
<td>CPUCON1</td>
<td>0007h</td>
<td>0007h</td>
</tr>
<tr>
<td>CPUCON2</td>
<td>8FB8h</td>
<td>8FB8h</td>
</tr>
<tr>
<td>EBCMOD0</td>
<td>4022h</td>
<td>6040h</td>
</tr>
<tr>
<td>FCONCS0</td>
<td>0031h</td>
<td>0021h</td>
</tr>
<tr>
<td>TCONCS0</td>
<td>7A68h</td>
<td>6240h</td>
</tr>
</tbody>
</table>

These registers should be set at two places:

1. **In the system startup code**
   The settings are needed to get the application running once it is loaded in the debugger. These settings are done through the EDE as described in the next paragraph.

2. **In the CrossView Pro configuration**
   To start the board and download the application in memory, CrossView Pro needs to set the registers properly. The values of the registers are listed in a so-called configuration file. The appropriate configuration can be selected from EDE before starting CrossView Pro. This is also described in the next paragraph.

### EDE Quick Start

From EDE processor and target board must be selected. The application must be configured so that the register values are set to match the board settings and memory must be configured. The following steps must be taken to achieve these settings and to get a successful debugger connection to the target board.

1. **Open the Queenns project**
   a. Select the **Project** menu
   b. Select **Set Current** and set queenns.pjt as active project
   c. or Right-click on the queenns project in the Project bar at the left
   d. Select **Set as Current Project**

2. **Enable Expert Mode**
   a. Select the **EDE** menu
   b. If there is no tick mark before **Expert Mode**: Select **Expert Mode**

3. **Select the processor**
   a. Select the **EDE** menu
   b. Select **Project Options**...
   c. Select the **CPU** tab
   d. Set **CPU Type** to the XC16x processor that you use
   e. Click on **OK**

4. **Add the system startup code to the project.** This is necessary to allow registers to be set as required:
   a. Select the **EDE** menu
   b. Select **CPU Configuration**...
   c. Select the **Configuration** tab
   d. Enable **Add system startup code to project**
   e. Do not leave this dialog and continue with the next step.
5. Set the register values for CPU configuration
   a. Select the **Advanced** tab
   b. Set the checkbox **Enable direct register setting**
   c. Set registers as follows:
      - CPUCON1 7
      - CPUCON2 8FBBh
      All other registers should not be filled in.
   d. Click on **OK**

6. Set the register values for bus configuration
   a. Select the **EDE** menu
   b. Select **Bus Configuration…**
   c. Select the **Advanced…** tab
   d. If you want to use a multiplexed bus, set the registers as follows:
      - FCONCS0 31h
      - TCONCS0 7A68h
      If you want to use a non-multiplexed bus, set the registers as follows:
      - FCONCS0 21h
      - TCONCS0 6240h
   e. Select the **…Advanced** tab
   f. If you want to use a multiplexed bus, set EBCMOD0 to 4022h
      If you want to use a non-multiplexed bus, set EBCMOD0 to 6040h
   g. Click on **OK**

7. Specify ROM and RAM ranges
   a. Select **EDE** menu
   b. Select **Linker/Locator Options…**
   c. Select the **Memory** tab
   d. Set the **ROM area(s)** to: 0-69FFh
   e. Set the **RAM area(s)** to: 6A00h-7FFFh, 0C000h-0CFFFh, RANGEP(4)
   f. Select the **Small Model** tab
   g. Select **Paged: 48k paged near data in any 3 pages and 16k in page 3**
   h. Fill in the page numbers:
      - Page number for DPP0: 0
      - Page number for DPP1: 1
      - Page number for DPP2: 4
   i. Click on **OK**

8. Select CrossView Pro configuration
   a. Select **EDE** menu
   b. Select **CrossView Pro Options…**
   c. Select the **Debugger** tab
   d. Select **OCDS**
   e. Select the target configuration you are using from the **Target** popup list. For each Infineon XC16x board a configuration for multiplexed bus (MUX) and non-multiplexed bus (DEMUX) is available.
   f. Click on **OK**

9. Rebuild the application
   a. Select the **Project** menu
   b. Select **Rebuild**

10. You can now start debugging with CrossView Pro.
    a. Select the **Project** menu
    b. Select **Debug**
HARDWARE AND SOFTWARE BREAKPOINTS

In versions of the C166/ST10 product older than v7.5r5, only Hardware breakpoints are operable. Ask for the latest OCDS debug instrument DLL when you want to use software breakpoints and you are using a version older than v7.5r5.

The OCDS only has four hardware breakpoints available, which is often too limited for debugging an application. With software breakpoints this limitation does not exist. The usage of OCDS software breakpoints is limited to 64k breakpoints. A software breakpoint is set by injecting DEBUG instructions into the memory, so this is only possible within RAM. For debugging code in EEPROM or FLASH memory only hardware breakpoints can be used.

From CrossView Pro you can configure the use of hardware and software breakpoints:
   a. Select Breakpoints menu
   b. Select Breakpoints…
   c. Click on Preferences…
   d. You will now see the dialog from which you can configure the use of breakpoints.
   e. If your application is allocated in FLASH memory, select Hardware breakpoints only
      If your application is allocated in RAM, select First hardware breakpoints then software
   f. Click OK
   g. Click OK

TROUBLE SHOOTING

1. CrossView Pro issues the following error: 
   GdiInitIO(): OCDS module can’t be enabled (connect cable or correct jumper setting)
   Solution: Set JP501 off -> on

2. CrossView Pro issues the following error: 
   GdiInitIO(): No valid JTAG cable found (target could be in Bootstrap mode)
   Solution: Set S103.4 on -> off

3. Check the TASKING support web: www.tasking.com/support/C166-ST10

NOTE

By default the peripherals will not be stopped upon a breakpoint. To make peripherals also stop on breakpoints, a modification in the target configuration file is needed. Target configuration files are located in the etc directory of the installed product. Open the inf_xc16*.cfg file, matching your configuration, in a text editor. Add the following line to this file:

PeripheralStop: 1

When starting CrossView Pro again peripherals will be stopped when hitting a breakpoint.

NOTE

The OCDS has a limited number of hardware breakpoints:
   - 4 code or data write breakpoints, of which one can be used for a code range or data range read or write breakpoint
   - or 1 value write breakpoint

NOTE

For data breakpoints, CrossView Pro will always use hardware breakpoints.