In order to add the ISA serial ports manually in Linux, please follow the below steps

**Note:** These steps are followed in Ubuntu-12.04 and it will be mostly same in other Linux flavors except installing the required tool

**Prerequisites:**

- “setserial” tool is used for adding the serial ports manually
- Check whether the tool is available or not by typing the command in terminal as follows

```
ami@ami-VirtualBox:$ setserial
The program 'setserial' is currently not installed. You can install it by typing:
sudo apt-get install setserial
ami@ami-VirtualBox:$ sudo apt-get install setserial
```

- If the tool is not available, then install it by using following command
  
  $sudo apt-get install setserial
Dummy serial device:

First we need to find out dummy serial devices which are available in Linux OS under /dev directory and the same dummy device we can use it for our ISA serial ports. To find out the dummy serial devices, please follow the below steps

- Execute following command in terminal

```
$setserial -g /dev/ttys*
```

- The above command lists configuration of all serial port devices available in the mother board which includes dummy as well as proper serial port devices.

- Let us consider the serial port device /dev/ttyS0 and its configuration as follows

  UART type = 16550A
  Port base address = 0x3F8
  IRQ number = 4
- The other devices except ttyS1, ttyS2 and ttyS3 are called as dummy device since it is not assigned with any configuration. So we can select any of those dummy devices and configure it for our serial ports.

**Configure serial ports:**

We have to provide proper base address and IRQ number in “setserial” command to configure it. The base address and IRQ values to configure ISA serial ports are known, i.e. these values are static values which can be found from Jumper configuration of the board.

- Let us choose the devices ttyS10, ttyS11, ttyS12, ttyS13 for our four serial ports (e.g. EMM-DIO4M-XT board)
- To configure the ISA serial ports, please follows the steps as shown in the picture

```
root@mracspx-8620:~/home/diamond# setserial /dev/ttyS10 port 0x7e48 irq 5 uart 16654 Baud_base 115200
root@mracspx-8620:~/home/diamond# setserial /dev/ttyS11 port 0x7e48 irq 5 uart 16654 Baud_base 115200
root@mracspx-8620:~/home/diamond# setserial /dev/ttyS12 port 0x7e260 irq 5 uart 16654 Baud_base 115200
root@mracspx-8620:~/home/diamond# setserial /dev/ttyS13 port 0x7e260 irq 5 uart 16654 Baud_base 115200
```

**Note:** Mandatorily Provide Baud_base value as 115200 or 9600. If the Baud_base argument is skipped, it will throw an error “Cannot set serial info : invalid argument”