



PC7302/PC7312 Quick Start Guide v0.2

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PC7302/PC7312 Development Platform – Quick Start Guide
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1. Overview

1.1.Scope

This document describes how to set up the picoChip PC7302 and PC7312 Development Platforms and make sure that everything is working correctly. Any following references to the PC7302 Development Platform apply equally to the PC7312 Development Platform.

This document applies to PC7302 and PC7312 products built using issue 2.0 PCBs and using revision D1 of the PC302 or PC312 device.

This document includes instructions on connecting up the board to a power supply, switching it on and establishing basic communications with a host computer.

This document does not describe how to upgrade a PC7302 development board with new software or how to set up a complete development environment. Both of these aspects are covered in the PC7302 Board Support Package documentation [2].

The PC7302 provides all of the digital hardware for the control and baseband functions of a wireless femtocell base station on a single board. This includes a single PC302 or PC312 device integrating an ARM1176JZ-S processor with a multi-core picoArray. The board includes a network interface using either a 10/100BaseT Ethernet PHY or an MII interface to an external gateway, an RS232 serial debug interface, and a USIM interface. The PC7302 also supports two radio interfaces options: an embedded Maxim radio subsystem comprising a MAX2547 receiver and MAX2599 transmitter, or an external radio subsystem mounted on a mezzanine card using the mezzanine radio connector.

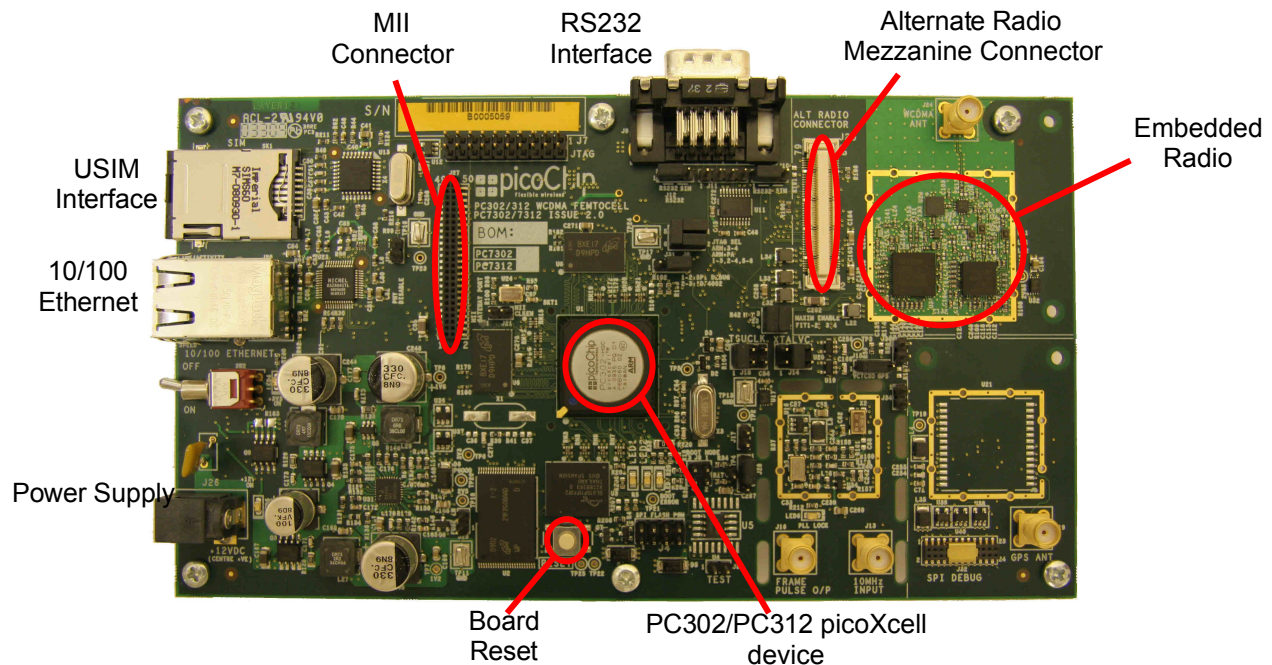


Figure 1: PC7302/PC7312 Development Platform

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1.2. Assumptions

The document assumes the user has access to the internet, in particular picoChip's support site and is using a development PC with a supported Linux operating system. It also assumes the PC7302 hardware is in a suitable laboratory environment with anti-static precautions in place. Once the PC7302 is up and running, it is assumed that the board will be connected by Ethernet to a suitable computer on an internal network.

1.3. Available Information

It is recommended the user first reads this Quick Start Guide in order to connect and setup the PC7302 hardware.

For further information the user should refer to picoChip's support site (<https://support.picochip.com/>) and navigate to the Platforms, PC7302 folder (see below).

picoChip Resource Folder -- General & Evaluation Resource -- Platforms -- PC7302

Documents:

Contains important information a user will need to refer to, in particular:

- PC7302 Development Board Datasheet [1]

Describes the hardware characteristic of the PC7302 board and its use in WCDMA applications.

- PC7302 Board Support Package documentation [2]

This document describes how to install the linux development environment on a developers PC, including the ARM cross compiler, Linux kernel, file system, picomon and picolf, along with required utilities such as nfs and tftp. It is essential reading for anyone intending to develop software on the PC7302 Development Platform.

Board Support Package (BSP):

The BSP contains the platform software, packaged as an archive file which includes an automatic install script. If the PC7302 is being used in conjunction with a picoChip PHY release it is recommended that the user checks the "Dependencies" section of the PHY release notes to verify the BSP version required for the target PHY.

For details as to how to upgrade a development board using this BSP please read the PC7302 Board Support Package documentation, section 2.

The BSP contains:

- Boot loader (U-Boot)
- Linux Kernel & patch for hardware
- File system
- picomon

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- picolf – API library of interfaces to the picoArray
- picoifapp - a picolf command line interface with Lua scripting engine.
- picofuse and libpicofuse - command line application and userspace library for programming of device fuses.
- libpicogpio - a userspace library for accessing PC302 GPIO lines.

Development Board (BRD)

The BRD contains information about the hardware platform

BOM:

Provides details of the Bill of Materials for the board

Schematics:

Details of the PC7302 Development Platform schematics and Orcad files

Layout:

Details of the PC7302 Development Platform board PCB layout, including Gerber files

Mechanical:

Details of boards mechanical drawings

Tools & Utilities

This section contains useful tools such as the ARM compiler and scripts for re-loading the boot loader using a Lauterbach ICD.

Additional Reading

In addition to the above the following will also prove useful reading:

- [picoTools Manual \[3\]](#)
Describes how to use picoTools and may be found on the support site under:
picoChip Resource Folder – General & Evaluation Resource -- picoTools
- [The PC302/PC312 Programmers Guide \[4\]](#)
Describes how to program the PC302 and PC312 picoXcell devices, including the ARM processor and may be found on the support site under:
picoChip Resource Folder – General & Evaluation Resource – Processors – PC302 – PC302/PC312 Programmers Guide
- [PC302/PC312 Datasheet \[5\]](#)
Provides details of the PC302 and PC312 picoXcell devices and may be found on the support site under:
picoChip Resource Folder – General & Evaluation Resource – Processors – PC302/PC312 – PC302/PC312 Datasheet

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2. Quick Start

This section gets the developer up and running with the PC7302, from plugging it in to basic communications with a host computer to establish that everything is working.

2.1. Package Contents

Table 1 lists everything that is supplied with a PC7302 or PC7312.

Table 1: PC7302 or PC7312 package contents

#	Item	Description	Qty
1	PC7302 or PC7312 board	Boxed single board Hardware Development Platform configured with a single P302 or PC312 device	1
2	Power adaptor	Multi-voltage mains power supply with integral DC power cable	1
3	Power cord	To connect the power adaptor to a power source	1
4	RS232 cable	To provide a serial communications link with the board	1
5	Ethernet cable	To interface with a computer network	1
7	PC7302/PC7312 Quick Start Guide	This document	1

All other items including documentation, schematics, software etc should be obtained from picoChip's support site (<https://support.picochip.com>).

2.2. System Requirements

As summarized in Table 2, the minimum requirement to set up and establish the correct operation of the PC7302 is a terminal interface on a host computer connected via RS232. To establish an Ethernet connection, the PC7302 should also be connected to a computer network.

The hardware and software requirements for code development on the picoArray and ARM1176 are covered separately [3-4].

Table 2: Minimum additional PC7302/PC7312 requirements for initial configuration

#	Item	Description
1	Host computer	A general-purpose PC supporting a terminal interface to the PC7302 with an RS232 connection
2	Computer network	To establish an Ethernet connection with the PC7302

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2.3. Setting up



Warning! ESD sensitive device

Electrostatic charges on operators and equipment can discharge without detection, and may cause permanent damage to devices on the development platform. ESD precautions are recommended to avoid performance degradation or loss of functionality.

Setting up the PC7302 is as follows (with reference to the PC7302 Development Board datasheet [1]):

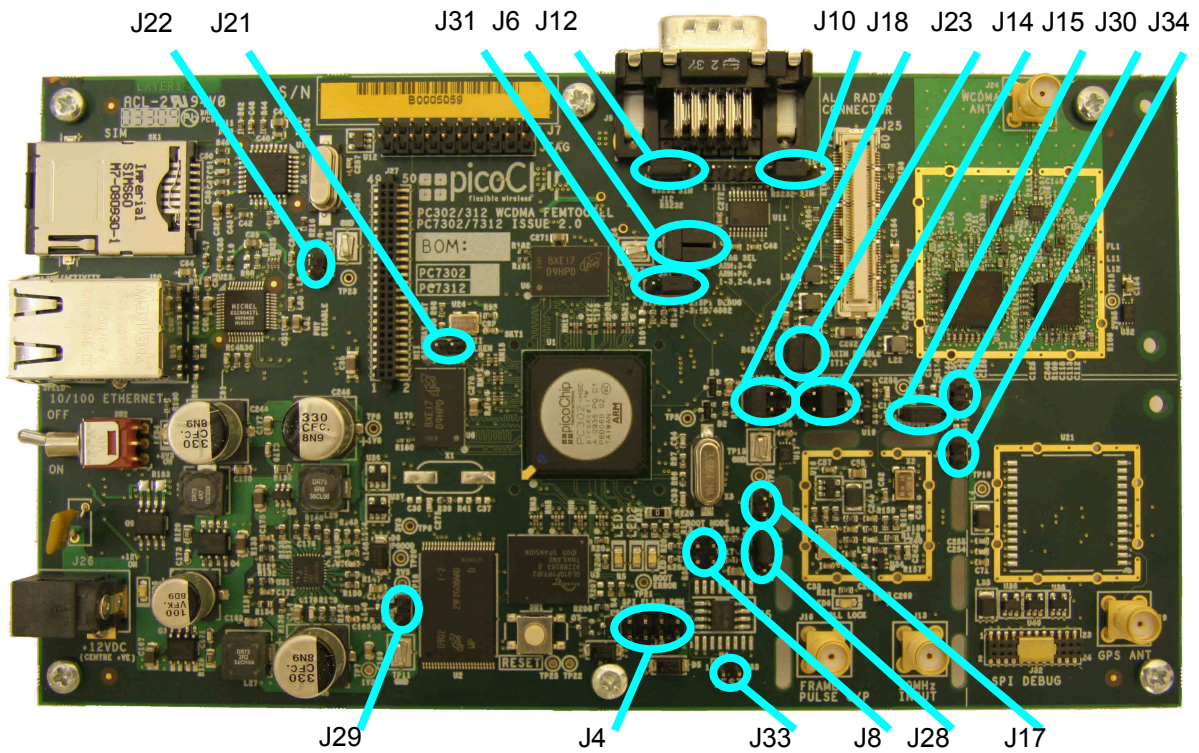
- Remove the PC7302 board from all packaging and place on a firm flat surface
- Check the jumpers are as defined in Table 3
- Remove the PC7302 power supply from all packaging
- Make sure that the power supply switch (SW2) is in the “OFF” position
- Connect the integral DC power cable to the PC7302 +12V DC input (Barrel connector, J26)
- The mains input to the power supply should be between 110 and 240V AC, 50 to 60Hz
- Connect the power supply unit to a standard mains outlet
- Connect the RS232 cable between a host computer serial port and the PC7302 COM1 port (9-way D-Type, J9)
- Run a terminal program on the host computer with the serial port configured as in Table 4
- Connect the PC7302 to the computer network with the Ethernet cable (RJ45 connector, J20)

Table 3: Default jumper settings

Jumper	Function	Setting	Note
J4	SPI in-circuit programming	All open	This header setting different from Rev 1 PCB
J6	JTAG loop select	Link 1-3 Link 2-4 Link 5-6	ARM and pA in JTAG chain
J8	Boot mode	Open 1-2 Open 3-4	EBI parallel boot mode selected
J10	UART1 device select : Tx	Link 1-2	RS232 port selected
J12	UART1 device select : Rx	Link 1-2	RS232 port selected
J14	VCTCXO control voltage selection	Link 5-6	Frac-N (SD_GPIO[0]) connected to VCTCXO Link 3-4 when using ADF4002

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J15	RF reference source select	Link 1-2	Radio clocked from VCTCXO
J17	ADF4002 disable	Open	ADF4002 enabled
J18	TSU clock source select	Link 1-2	TSU clocked from VCTCXO
J21	50MHz RMII clock enable	RMII : Fit MII : Open	Do not fit for MII population
J22	PHY disable	Open	PHY enabled
J23	Maxim radio enable	Link 1-2 Link 3-4	SPI control to Maxim radio enabled
J28	Frame pulse select	Link 1-2	40ms frame pulse o/p on J16
J29	Fuse program enable	Open	Disabled
J30	SPI debug enable	Open	SPI debug port disabled
J31	SPI select for ADF4002 / SPI debug	Link 2-3	ADF4002 selected
J33	General purpose test input	Open	Not used
J34	SigNav GPS module power	Open	GPS module not fitted



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Table 4: RS232 settings

Parameter	Setting
Baud rate	115200
Number of data bits	8
Parity	None
Stop bits	1
Flow control	None

The final configuration is shown in Figure 2 below.

Figure 2: PC7302/PC7312 hardware setup

2.4. Switching on

If not already powered up, switch on the mains power supply – LED5 (green) should be lit indicating presence of 12V at the input connector.

Switch on power to the PC7302 by setting SW2 to “ON” – LED4 (green) should be lit indicating presence of 3.3V at the output of the on-board power supply.

Once the board has booted successfully, LED3 (red) should be off indicating that the PC302 is configured correctly. If LED3 remains on, check the installation of the J8 boot mode jumpers.

2.5. Initialization

As already discussed, the PC7302 comes fully configured to support code development for the PC302. This requires a development computer connected to the same sub-net with the picoTools installed [3]. To set the IP address of the PC7302:

Reboot the board by pressing the reset switch (SW1)

Stop the PC7302 booting into Linux by pressing any key, resulting in the U-Boot prompt.

Type the following at the U-Boot command prompt to change the IP address (where xxx.xxx.xxx.xxx is the new address)¹:

```
set ipaddr xxx.xxx.xxx.xxx
```

To write the address back into Flash, type the following at the U-Boot command prompt:

```
saveenv
```

The network mask can be set in a similar manner:

```
set netmask xxx.xxx.xxx.xxx
```

¹ Default address is 172.17.9.nnn.

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```
saveenv
```

Note that modification of the IP address and/or netmask results in an update of U-Boot environment variables.

Reboot the PC7302 by pressing the reset switch (SW1).

The settings of the IP address and network mask can be confirmed after boot by typing the following at the U-Boot prompt:

```
Printenv
```

Following any re-configuration, re-boot into Linux using the following credentials:

```
User: root  
Password: picohdp
```

2.6. Ethernet Connection

To check that the Ethernet connection is working correctly, ping a valid IP address in the terminal window from the U-Boot command prompt (after halting the boot by pressing any key when requested). It is not possible to ping in to the board from an external source while U-Boot is running; once the Linux kernel has been loaded and is running external sources can ping the board.

1 Troubleshooting

For any problems setting up and initialising the PC7302, please contact the picoChip applications team on support@picochip.com.

2 References

1. PC7302 Development Board Datasheet
2. PC7302 Board Support Package documentation
3. picoTools Documentation.
4. The PC302/PC312 Programmers Guide.
5. PC302/PC312 Datasheet

3 Glossary

BOM	Bill of Materials
EEPROM	Electrically Erasable Programmable Read-Only Memory
GPIO	General Purpose Input Output
LED	Light Emitting Diode
IP	Internet Protocol

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picoArray™ picoChip Designs Limited proprietary array processing architecture
U-Boot The boot loader used on the PC7302