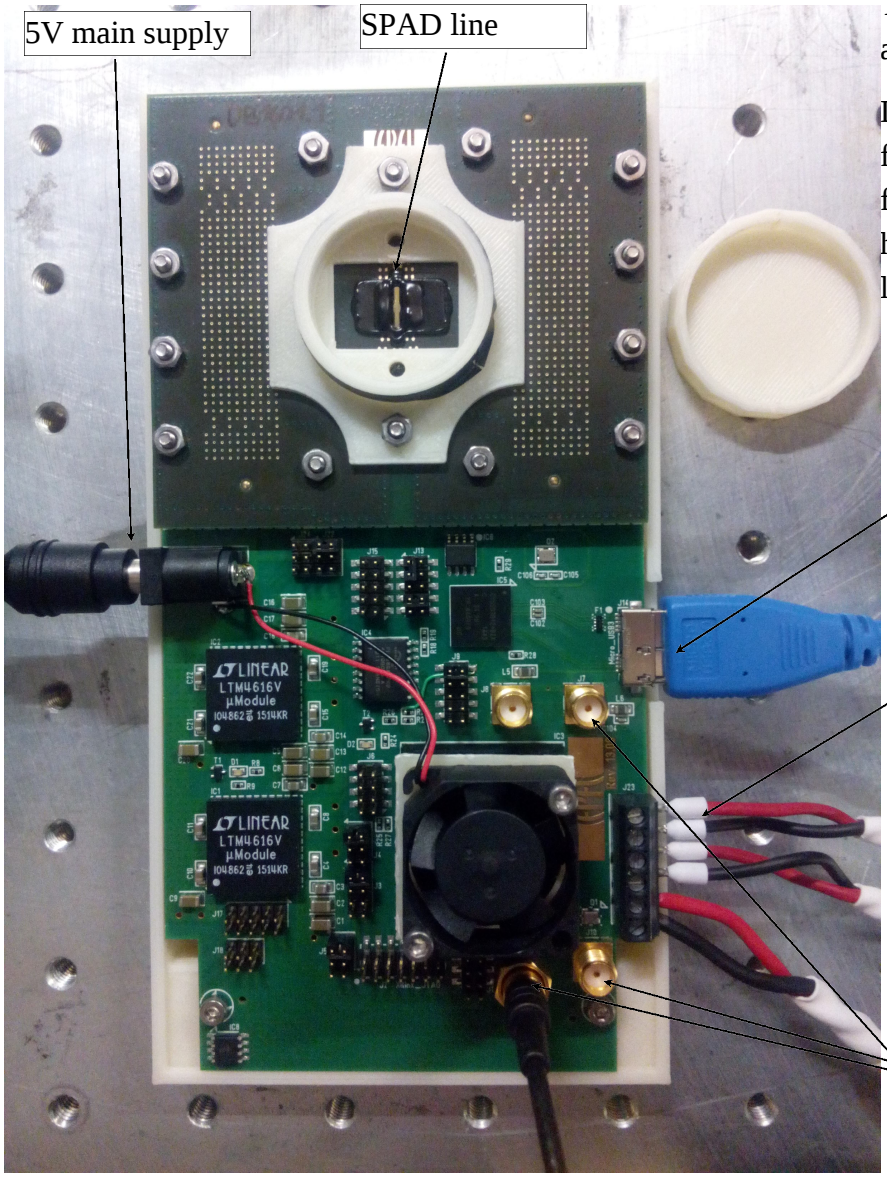
# LinoSPAD Quick-Start-Guide

The LinoSPAD camera is delivered as shown below with the two PCBs connected together and jumpers set for correct operation. J3 selects the FPGA voltage relative to J10 and J11 and should initially be set on pins 1-2 for 3.3V. Refer to the hardware manual for the other jumper descriptions.

The required external connections supply the main board voltage of 5V, the USB connection to the computer and auxiliary voltages to the LinoSPAD sensor. The SMA connectors are used for reference clock and trigger signals on the FPGA.

## Connecting the LinoSPAD camera



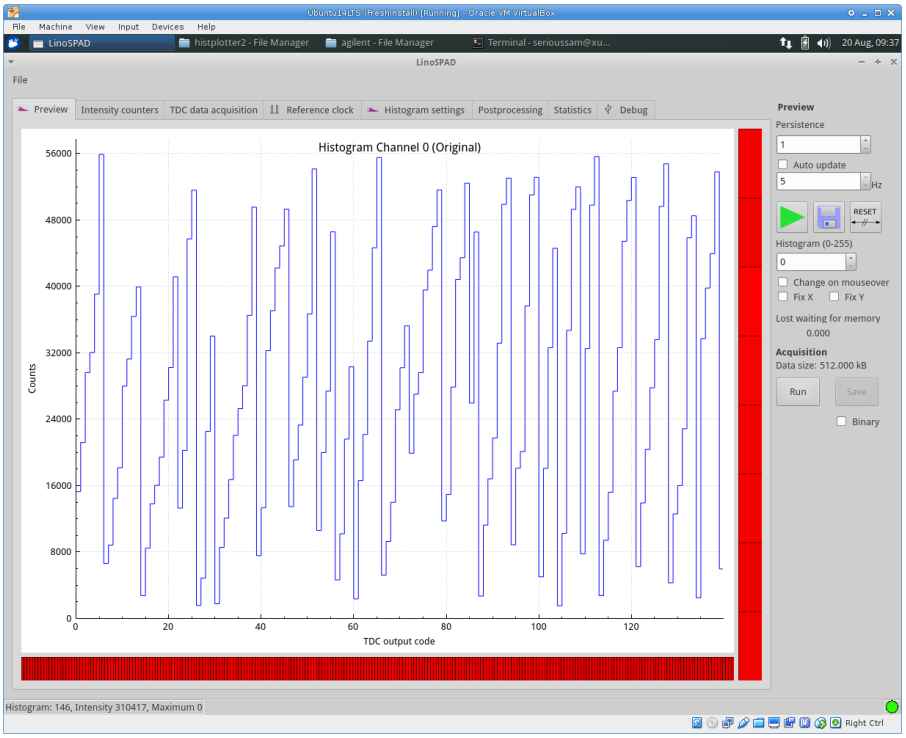

The camera needs to be connected as shown in the image.

Documentation, software, firmware and updates are available from: https://documents.epfl.ch/groups/l/li/linospad/www/index.html

| Pin | Sig | Typ | **Max** |
|---|---|---|---|
| 1 | $V_Q$ | 0.9 V | **2 V** |
| 2 | GND | | **0 V** |
| 3 | $V_{OP}$ | 20.0 V | **25 V** |
| 4 | GND | | **0 V** |
| 5 | $V_{OP\ aux}$ | 20.0 V | **25 V** |
| 6 | GND | | **0 V** |

## Running the software

The software is written in C/C++ using the Qt graphical library for the interface and libusb-1.0 for communication with the camera.




*Preview screen of the LinoSPAD software. (Running in a virtual machine.)*

The camera uses Cypress' vendor ID (0x4b4) with a product ID (0xf1) used for the FX3 USB transceiver development board.

### Linux

On Linux systems the user must have read/write permissions on the LinoSPAD camera. A rules file to be put in /etc/udev/rules.d/ granting access to Cypress devices to all users is provided with the software.

To build the software you need the Qt libraries >= 4.8 and development files for libusb-1.0. Running qmake followed by make in the src directory should then build the firmware.

### Windows

On Windows systems a generic USB driver from Microsoft (WinUSB) needs to be installed to use the camera. A tool to install this driver is available from http://zadig.akeo.ie/.