



ARTEKIT
electronic artists

Ethernet + UDP demo

For the AK-MACHX02-7000





Contents

About this document	3
Revision history	3
Contact information.....	3
Regarding this document.....	3
Copyright information.....	3
UDP Demo	4
General description.....	4
ARTEKIT MACHX02-7000 Evaluation Board	5
Demo contents.....	6
Demo description	6
Step 1: setting PC IP address	6
Step 2:Generate image in .rgb565 or .raw565 format.	8

About this document

Revision history

The table below displays the revision history for the chapters in this manual.

Chapter	Date	Revision	Changes made
All	August 2013	1.0	First publication

Contact information

For the latest news, upgrades and information about Artekit products, visit the Artekit web site at


<http://www.artekit.eu>

For technical support on this product, visit the support page at <http://www.artekit.eu/contact> or use the Artekit forum.

For additional information about Artekit products, consult the sources below.

Information type	Resource
Technical support	support@artekit.eu
Literature	www.artekit.eu
Sales	sales@artekit.eu
Products forum	http://www.artekit.eu/forums/

Regarding this document

 Five Years Out	Prepared:	Document name:	
	Ferrari Fabrizio	UDP demo guide	
	Approved:	Date:	Revision:
	Ferrari Fabrizio	20/05/2013	Preliminary

Copyright information

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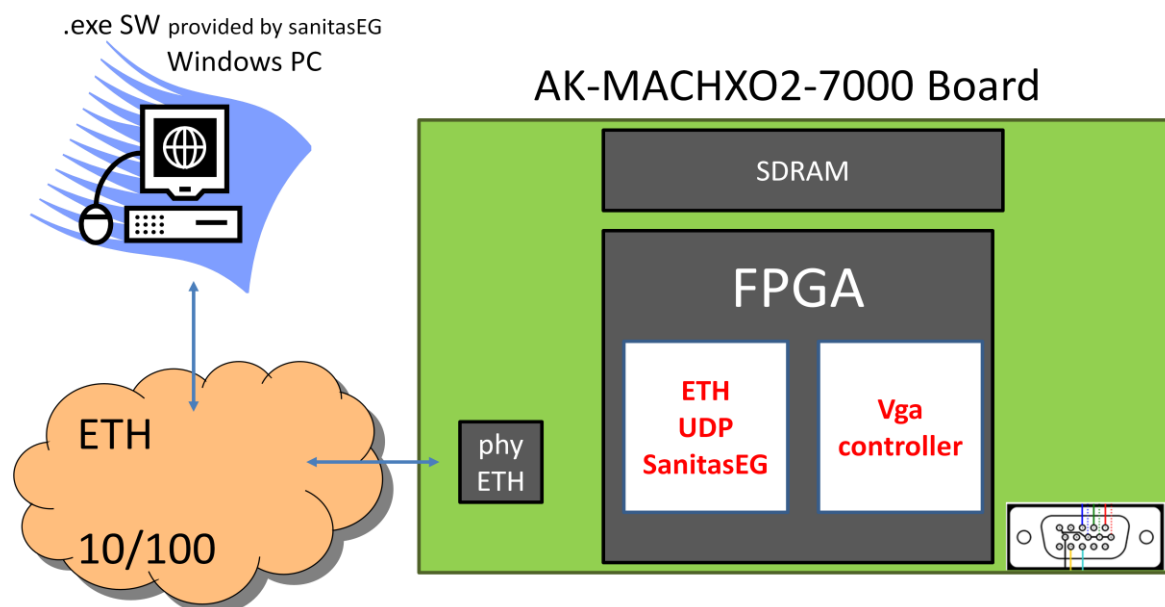
UDP Demo

General description

This document describes how to install and how to use the SanitasEG Ethernet UDP VGA image demo on the AK-MACHX02-7000 board.

The design is based on the VGA controller provided by ArrowEurope (for information contact fferrari@arroweurope.com) and Ethernet/UDP IP provided by SanitasEG (for information contact sandro.pastore@sanitaseg.it)

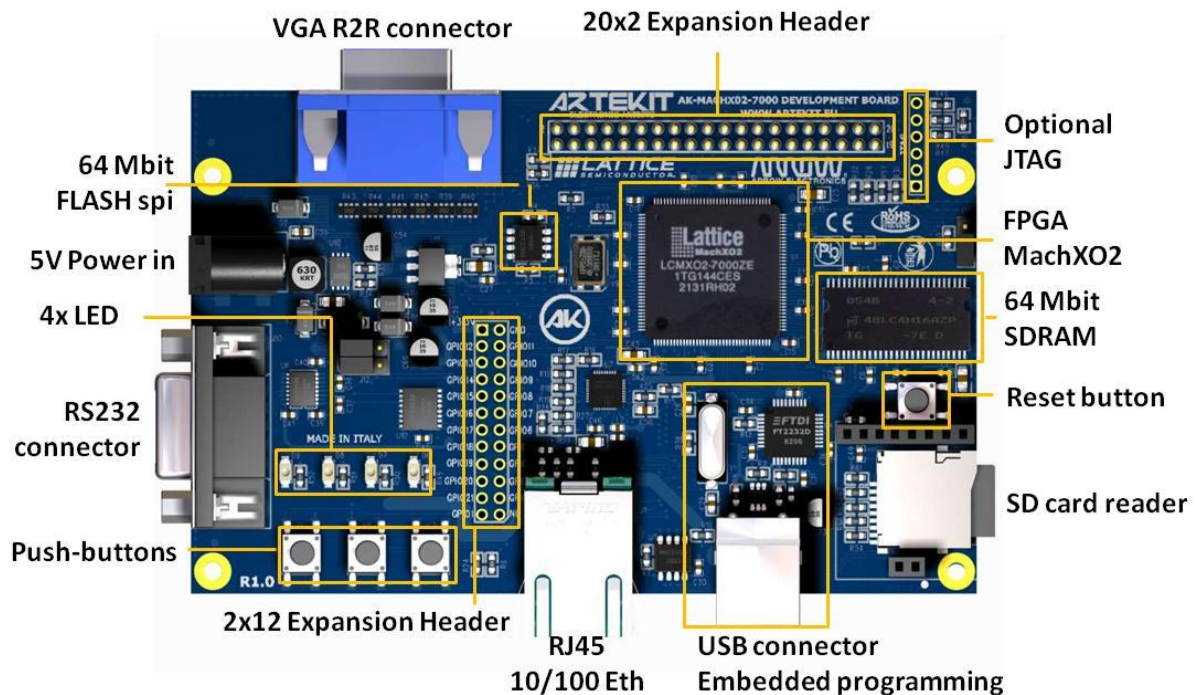
Following the block diagram of the application.



Images are sent to Ethernet using a windows based PC and a sanitasEG propriataty tool (provided as source code with the ETH UDP IP).

The FPGA receives the images, stores it into SDRAM and the VGA controller sends them to the VGA monitor.

ARTEKIT MACHX02-7000 Evaluation Board



The AK-MACHX02-7000 development board is a full-featured hardware platform to evaluate the Lattice MachXO2 PLD Line. The complete schematics of the board are provided and can be download from the Artekit website.

Main components

The AK-MACHX02-7000 Development board features the following components:

- Lattice MACHX02-7000 PLD
- 10/100 Mb Ethernet adapter with link/speed LEDs
- 32Mb (4MB) serial data flash
- 64Mb (8MB) DRAM
- 1 RS232 (TX/RX only)
- VGA output using R2R method
- 2 x expansion connector
- 4 user LED
- 4 user KEY
- Lattice JTAG programmer/debug cable on board
- 25 MHz clock oscillator
- Powered from USB cable or external 5V DC power supply

Demo contents

Demo database contains:

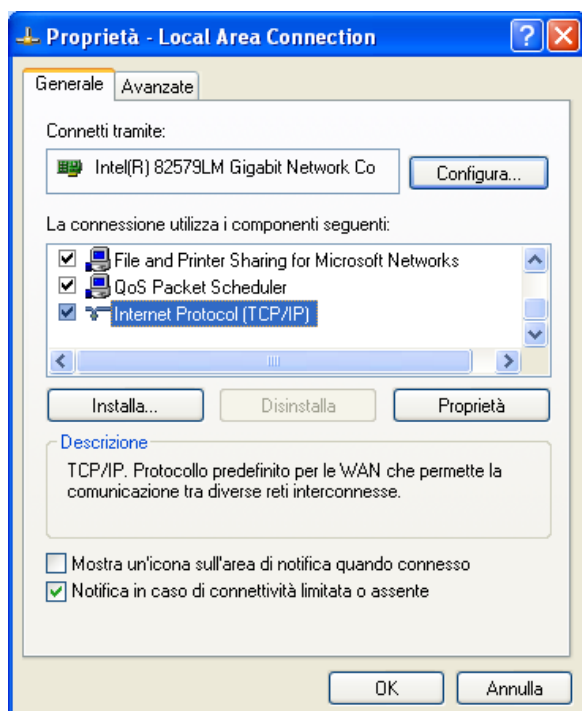
- UDP_demo.jed: FPGA programming file
- Udp_test.exe and rmp.exe : SW provided by SanitasEG for the demo
- Config.txt: configuration file
- Rgb565.dll extension for paint.net to rgb565 format

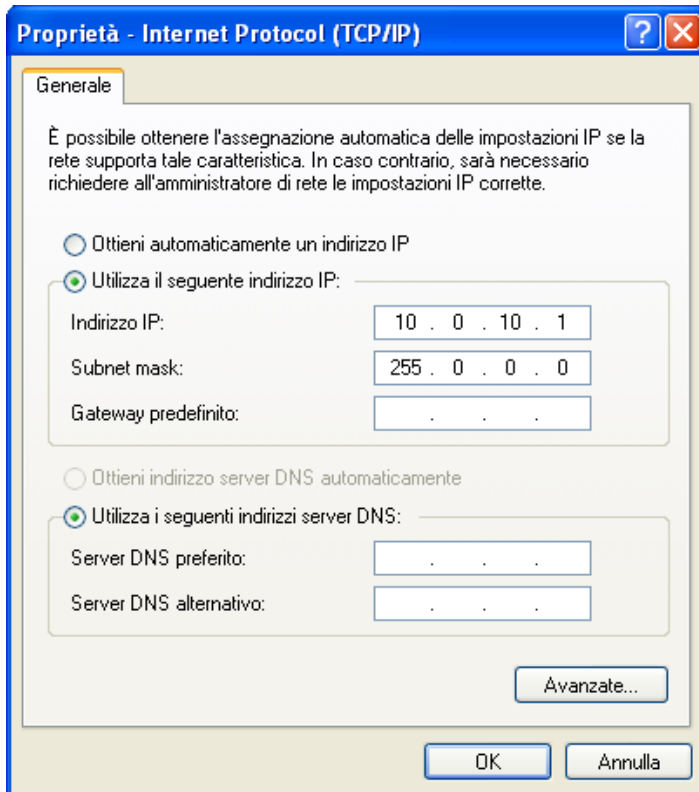
Demo description

Step 1: setting PC IP address

On the demo it is not present a DHCP engine.

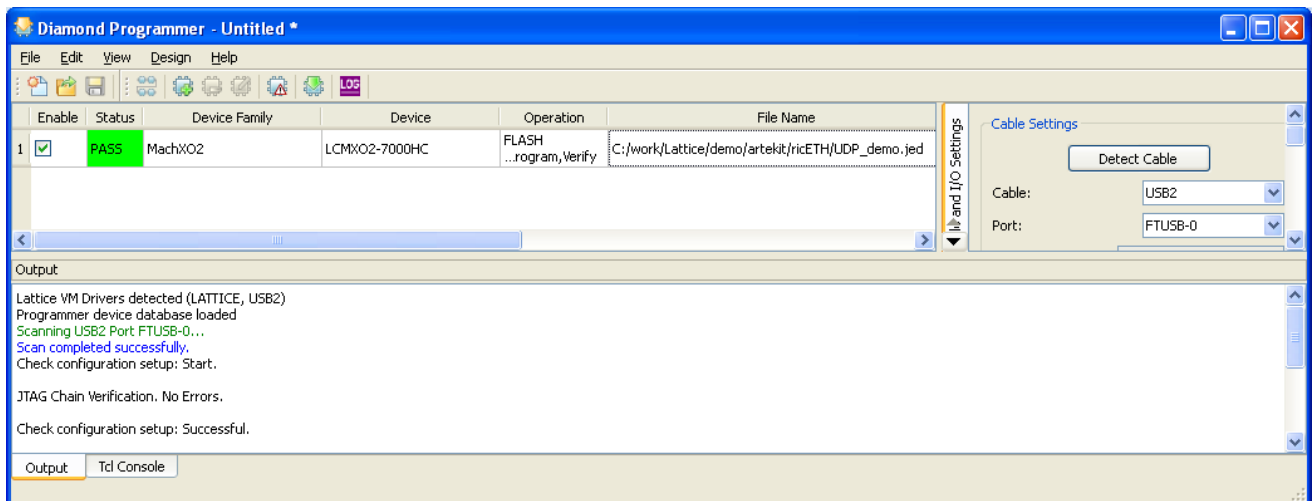
It is necessary to set the PC IP Address to 10.0.10.1 Subnet mask 255.0.0.0





Step 1.2: Program the FPGA

Using the Diamond Programmer, program UDP_demo.jed into the FPGA.

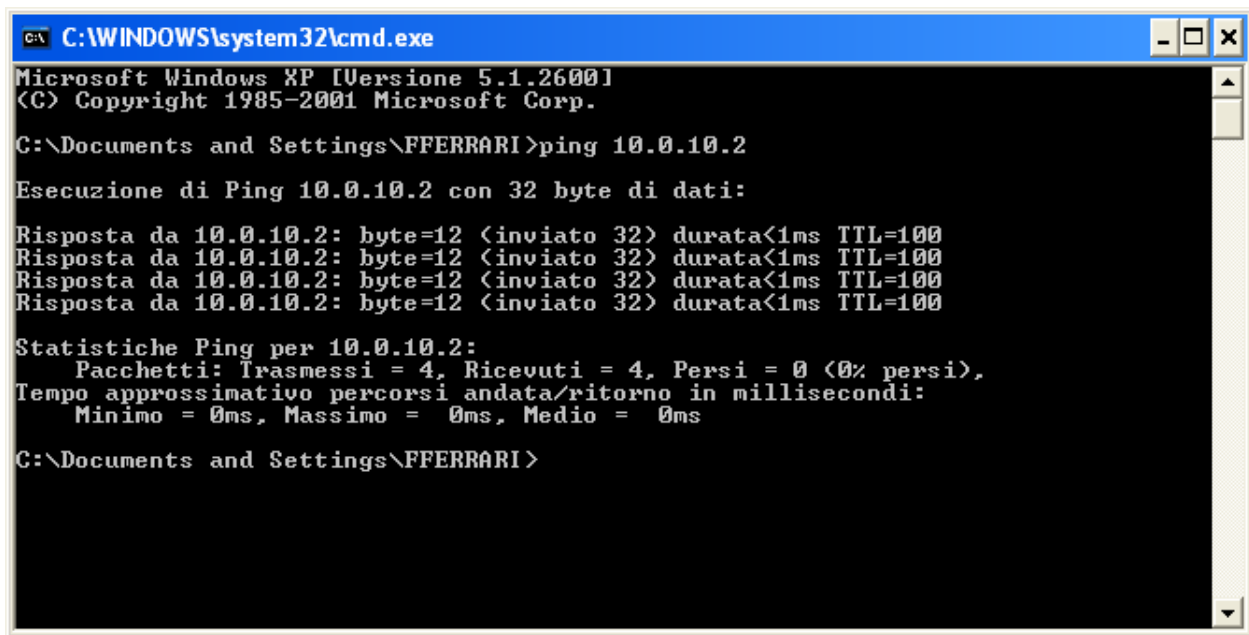


Step 1.3: connect RJ45 cable

Connect the PC to the board with a Ethernet Cable (also a Switch/hub is allowed).

Step 1.4: verify the connection

You can verify the connection using the ping tool. Artekit board IP address is 10.0.10.2



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Versione 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\FERRARI>ping 10.0.10.2

Esecuzione di Ping 10.0.10.2 con 32 byte di dati:

Risposta da 10.0.10.2: byte=12 <inviato 32> durata<1ms TTL=100
Risposta da 10.0.10.2: byte=12 <inviato 32> durata<1ms TTL=100
Risposta da 10.0.10.2: byte=12 <inviato 32> durata<1ms TTL=100
Risposta da 10.0.10.2: byte=12 <inviato 32> durata<1ms TTL=100

Statistiche Ping per 10.0.10.2:
    Pacchetti: Trasmessi = 4, Ricevuti = 4, Persi = 0 (0% persi),
Tempo approssimativo percorsi andata/ritorno in millisecondi:
    Minimo = 0ms, Massimo = 0ms, Medio = 0ms

C:\Documents and Settings\FERRARI>
```

Now the board is communicating with the PC through Ethernet.
Following the instruction in order to generate, to download and to view the images on the VGA Monitor.

Step 2: generate the image in .rgb565 or .raw565 format

It is suggested to use paint.net with rgb565 extension DLL (copy rgb565.dll into C:\Program Files\Paint.NET\FileTypes)

Open a 800x600 image (any format) in Paint.NET and save it in .rgb565 format.

Step 2.2: setting up environment

Place into the same directory: Udp_test.exe, rmp.exe, Config.txt and the rgb565 to be displayed.
Navigate the a DOS shell into this directory.

Step 2.2: sending image

Using udp_test.exe you can send Image into SDRAM.

Syntax:

udp_test.exe <filename> <value[0-1-2-3...]; destination page>