Configure TETRA 64 ch ADC on HOST PC WIN10

Equipment required on site.

1. HOST PC, Windows 10, dual screen, gigabit ethernet.
2. Ideally, it has two gigabit ethernet ports, one for the ACQ, one for the site network, otherwise it's possible to use one port for both, perhaps with an alias.
3. FUNCTION GENERATOR FG: Function and Sync outputs. burst mode.
   a. D-TACQ recommend Agilent 33210A.
4. Appropriate desk space for the workstation and monitors.
5. Ideally, the digitizers are located in an area that is cool and clean.The devices are aircooled, excessive dust will reduce operating life.
6. Fast Internet connection needed for at least initial install.

Hardware Configuration

1. Unbox 4 x ACQ1014 and stack in descending serial number order
2. Connect all Gig Ethernet RJ45 to switch supplied.
3. Connect 12V DC on 4 boxes to power bricks and wall jacks
4. Connect HDMI timing highway from M to S1 S2 S3 as shown

Test Signal Configuration.

1. FG Function -> BNC, to front panel 8 connectors, in pattern shown
2. FG SYNC -> BNC, to front panel TRG input.

Software Configuration

License

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Network

1. DAQ Subnet: Configure ethernet to work on 192.168.0.0/24 subnet.
2. It's likely that the HOST PC will have TWO ip addresses, one for the DAQ Subnet and one (DHCP) from the main campus subnet.
3. Set HOST PC address
4. Set Windows hosts file C:\Windows\System32\drivers\etc\hosts **
   ** wait until later in the install, sample hosts file available later in install ..
5. Check it's possible to ping all UUT's

Third Party Software

See appendix for detail.
- Git-bash : for delivery and update of D-TACQ software
- Python: well known portable programming environment.
- Cs-studio : 3rd party control/GUI environment
- KST2 : 3rd party power plotting tool.
- Mobaxterm : optional for maintenance of the hardware.

D-TACQ Software

Create a new user acq400, make it admin user.w

D-TACQ software is delivered from git, this makes it easy to deliver updates and to see any local changes.

Run git-bash

Run this: git clone https://github.com/D-TACQ/TETRA.git

Copy TETRA/hosts to C:\Windows\System32\drivers\etc

Then run : ./TETRA/acq400_install

Run cs-studio, set workspace to /C:/Users/acq400/TETRA/CSSWS
Run a shot
Upload
Run KST2, load saved settings from   /C:/Users/acq400/TETRA/

C:\Users\acq400\Documents\KFUPM	Uploaded data appears here
C:\Users\acq400\TETRA	Project specific configuration here
C:\Users\acq400\TETRA\CSSWS	Project specific GUI configuration here
C:\Users\acq400\TETRA\KST2	Project specific KST Plot configuration here
C:\Users\acq400\PROJECTS\\ACQ400\OPI	Cs-studio opi project
C:\Users\acq400\PROJECTS\ACQ400\HAPI	Python control files

HOSTS

Assume HOSTPC is at 192.168.0.1

```
192.168.0.1    hostpc
192.168.0.24 acq1001_280
192.168.0.25 acq1001_281
192.168.0.26 acq1001_282
192.168.0.27 acq1001_283
192.168.0.46 acq1001_302
192.168.0.47 acq1001_303
192.168.0.48 acq1001_304
192.168.0.49 acq1001_305
```

Running the test

1. Load the cs-studio workspace as shown.
2. Press Configure 1M
3. Press Run
4. Trigger from FG
5. Observe rapid capture data in plot window.
6. Press Upload
7. Run KST, load KST saved config
8. Show plotted data.
9. Zoom to a fast edge, show data is simultaneous

Uploaded Data Format

Data is stored in C:\Users\acq400\Documents\KFPM*,
One file per channel
Raw Binary data: c-shorts or Matlab int16's.
This is intel-style little endian data, so for Labview use, you'd have to byte swap it.
Files are named in canonical style

ACQ1001_nnn_CH0c   :
    where nnn is the serial number of the source unit and c is the channel number 1..8

Data encoding: standard int16 :
- 0x7FFc   : full scale 14 bit
- 0x0000   : 0V, 0 is zero
- 0x8000   : negative full scale.

NB: this does NOT claim to be a data archive system, only the current data is uploaded.
It's the user's responsibility to archive valuable data before the next shot.
An example of a data archive system is MDSplus, D-TACQ hardware supports this natively.
http://www.mdsplus.org/index.php/Introduction

Appendix: 3rd Party Software

Python:

Download Python from:
https://www.python.org/downloads/
Download Python 2.7.14

Type "python" on the command line and check it works.

Download and run get-pip.py from (Only if pip is not already available):
https://packaging.python.org/tutorials/installing-packages/
With some versions of python it is available by default, check by entering "pip" on the command line)

Once Pip is installed use the following commands:
pip install numpy
pip install matplotlib

Check it works

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

PS C:\Users\acq400> python -version
Unknown option: -e
usage: C:\Python27\python.exe [option] ... [-c cmd | -m mod | file | -] [arg] ...
Try `python -h' for more information.
PS C:\Users\acq400> python
Python 2.7.12 (v2.7.12:d33e0cf91556, Jun 27 2016, 15:24:40) [MSC v.1500 64 bit (AMD64)]
on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import numpy
>>>exit()
```

Git Bash:

https://git-scm.com/download/win

Cs-studio:

https://ics-web.sns.ornl.gov/css/products.html

Chose "Basic Epics" eg
https://ics-web.sns.ornl.gov/css/updates/apps/basic-epics-4.5.0-win32.win32.x86_64.zip

Unzip to C:\\CSS\basic-epics-4.50*
Make a short cut from css to the desktop

KST2:

https://kst-plot.kde.org/download/binary_packages.php

Unfortunately the latest build doesn't include the "Dirfile" data source plugin we require, so we recommend using this older version, available here:
  http://www.d-tacq.com/swrel/Kst-2.0.7-win32-Installer.exe

Simply run the installer.

ssh: MOBAXTERM

console: MOBAXTERM (data rate = 115200).
Should be included in this folder. If not working then Download:
https://mobaxterm.mobatek.net/download.html