

# 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

MIT License

Copyright (c) 2018 Peter Milne

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

## Network

1. Configure ethernet to work on 192.168.0.0/24 subnet. If the subnet is not appropriate, it's possible to change it, but best to start here.
2. Set HOST PC address
3. Set Windows hosts file C:\Windows\System32\drivers\etc\hosts \*\*  
\*\* wait until later in the install, sample hosts file available later in install ..
4. 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.
- Mobixterm : 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

## 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](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](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>