We have a new version of the DDS software, which will work better with Cicero in that we can control the time that each command starts using a TTL pulse. The software "serial\_to\_dds\_gw.exe" has two configuration files that describe the two DDS used by the laser

Slaves

* Configured by **ukus\_dds\_slaves\_conf.txt**
* Drives 2 DDS - one Quad channel (DDS0) for the offset lock for the slave lasers and the DDS Raman (DDS48) for the phase-lock for the Raman laser

AOM

* Configured by **ukus\_dds\_aom\_conf.txt**
* Drives one Quad DDS for AOMs, Microwave antenna and EOM phase modulator

We will have to run a separate instance of this command module for each DDS, for example

**serial\_to\_dds\_gw.exe ukus\_dds\_slaves\_conf.txt comm 19**

    -- here 19 stands for COM19 if you use the Virtual COM pair COM18 <-> COM19

**serial\_to\_dds\_gw.exe ukus\_dds\_aom\_conf.txt comm 21**

    -- here 21 stands for COM21 if you use the Virtual COM pair COM20 <-> COM21

These two can be launched by opening a command prompt and typing ("slave\_dds" or "aom\_dds")

Structuring Messages

Each message can contain multiple commands which are separated by semicolons. These are only interpreted by the software when it receives the newline ('\n') character. The Carriage return + line feed ("\r\n") as given in the Cicero manual is windows specific and not necessary for this software (perhaps this explains the communication issues we had before??)

The first command **set\_dds** selects the DDS to operate on. This is only necessary if the pool has multiple DDS, i.e. the Slave pool.

Once the DDS chosen, you can apply the following commands:

- **set\_freq <CHANNEL\_NAME> FREQ\_HZ** : set the frequency

- **set\_phase <CHANNEL\_NAME> PHASE\_RAD** : set the phase

- **sweep\_to <CHANNEL\_NAME> TO\_FREQ\_HZ DURATION\_SEC** : linear sweep from current to given frequency in given time

- **clear\_chirp : stops a CHIRP** (Raman specific)

- **set\_chirp START\_FREQ\_HZ PHASE\_RAD STEP\_DURATION\_SEC SLOPE\_HZ\_PER\_SEC** : set a chirp (Raman specific)

- **adjust\_phase\_in\_chirp\_mode PHASE\_RAD** : change the phase while chirping (Raman specific)

- **ext\_update** : wait for an external update via a TTL

- **int\_update\_sw\_trig** : issue an internal software trig (no TTL needed)

**<CHANNEL\_NAME>**can be omitted if commands are for single channel DDS. Otherwise, for quad DDS, you must specify the channel name as given in the hardware conf file.

An example of serial message for the Slaves DDS pool:

**"set\_dds ddsq; set\_freq slave0 75e6; set\_freq slave1 75e6; set\_freq slave2 75e6; set\_dds dds\_raman; set\_freq 15e6; ext\_update\n"**

An example of serial message for the AOM DDS pool:

**"set\_freq mphi 75e6; set\_freq antenna 75e6; set\_freq aom\_mot 75e6; set\_freq aom\_raman 75e6;ext\_update\n"**

Only one TTL per pool is required to externally trigger the sequence, which is connected in the following way

- **SUBD\_25:6 (C232\_HM Brown), SUBD\_25:4 (C232\_HM Grey) and SUBD\_25:X (C232\_HM Green) : for the Slaves DDS pool**

    Sorry for the **SUBD\_25:X**, just use the colors of the C232HM I gave you. You don't need the C232HM cable at all anymore

- **SUBD\_25:5 (C232\_HM White) and SUBD\_25:2(C232\_HM Blue) : for the AOM DDS pool**

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