

ARTIQ induction - Core devices

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1 Core devices

The Sinara hardware supplied with ARTIQ is powerful, flexible and tightly integrated into the ARTIQ system. In this module, we will explore some of the most common hardware modules.

It will help if you are already somewhat familiar with SPI. If not, I suggest you read about it e.g. [here](#).

1.1 Urukuls

1. Use “urukul_to_scope” to output a 10 MHz sine wave to the oscilloscope (this is also connected to the spectrum analyser which can also be connected to remotely).
2. Allow the user to configure the amplitude and RF switch status
3. Use the RF switch to turn the RF on and off every 1ms.
4. Synchronise the “ttl_output_to_scope” line with the triggering of the RF switch and use this to measure the additional propagation delay of the RF switch.
5. Make a sequence which steps the phase of the Urukul by $\pm\pi$ every 1 ms, synchronised with a TTL pulse on “ttl_output_to_scope”. Use this to trigger the scope and confirm that the phase step has worked.
6. (*advanced*) Use the AD9910’s SPI interface to configure a ramping frequency using the internal Digital Ramp Generator (DRG - see the AD9910’s datasheet).

1.2 Sampler

7. Connect sampler channel 2 to another DDS output (use a new channel for the DDS and for the Sampler and add this to the aliases list in device_db). You’ll need a new SMA cable too!
8. Use the Sampler to repeat the phase step measurement that you performed in ex. 5, but measure the signal on the Sampler instead.
9. Set the DDS attenuation to 30dB and the amplitude to 0.1. Repeat the previous measurement but use the Sampler’s gain settings to reduce the noise.

1.3 Fastino / Zotino

TODO: Charles to write

1.4 SUServo

TODO: Charles to write