# Tests of **GainControl** Submodule Functionality

The aim is to verify that the submodule is working as expected. The tests are divided into simulation tests and physical tests.

## Intended Functionality

The intended functionality of the GainControl submodule is

1. To respond to a requested gain change by incrementing or decrementing the gain using the GPIOs

## Simulation

Simulation tests are carried out to test the functionality above .

### Simulation 1

This test tests functionality point 1, that the module must respond to gain change by incrementing or decrementing the gain.

Works as intended.

Test script GainControl\_test1.tcl with gain\_control.vhd as top.

### Simulation 2

This test tests the ADCControl submodule along with a single gain\_controller as gain\_controller\_0 in order to verify the interaction between the two.

Works as intended.

Test script GainControl\_test2.tcl with GainControl\_test2.bd as top.

### Simulation 3

Same as simulation 2, but with gain\_controller\_1.

Works as intended.

Test script GainControl\_test3.tcl with GainControl\_test3.bd as top.

### Simulation **4**

Same as simulation 2, but with gain\_controller\_2.

Works as intended.

Test script GainControl\_test4.tcl with GainControl\_test4.bd as top.

### Simulation **5**

Same as simulation 2, but with gain\_controller\_3.

Works as intended.

Test script GainControl\_test5tcl with GainControl\_test5.bd as top.

### Simulation **6**

Testing of the ADCControl body with all four GainControllers, the full GainControl system. Independently control the gain of each magnetometer. Update the sample time based on the highest gain.

Works as intended.

Test script GainControl\_test6.tcl with GainControl\_test6.bd as top.