

# Configuring position trigger outputs on NanoScan NPC-D-6000 Series controllers

## Overview

Position trigger outputs use the “step” output from the “step and direction” pair of digital outputs to create a digital pulse at a user defined interval as the stage completes a commanded positional move.

**Note:** this guide assumes the direction of the commanded movement is predefined and subsequently the “direction” digital output is ignored.

When position trigger outputs are used for triggering external equipment the interval of the pulses must be greater than the noise floor of the stage mechanism (mechanical and electrical). If the interval is set too low the noise can produce extra pulses forwards and backwards.

External equipment should be configured to ignore position trigger pulses outside of a commanded move.

## Configuring the stage/controller settings

Please refer to the latest NanoBench 6000 User Manual as necessary.

Run Queensgate NanoBench PC application, and ensure the “Lock status” is set to “Superuser”.

Digital outputs are configured using the “Custom commands” tab using the following commands, where <channel> should be replaced with the controller channel number to be configured. (As most controllers are single channel, this will typically be set to 1.)

### Select the step-and-direction mode for digital outputs by entering the commands:

```
stage.stepped.output.is-quadrature.set <channel> 0  
stage.stepped.output.step-direction.hold-time.set <channel> 0  
stage.stepped.output.step-direction.is-rising-edge.set <channel> 1
```

### Set the duration of pulse required:

Typically 0.1ms (1e-4 seconds) works for most equipment.

```
stage.stepped.output.step-direction.settle-time.set <channel> 100e-6
```

### Set the interval (distance) between pulses:

```
stage.stepped.output.step-size.set <channel> <distance in pm>
```

### Enable this output:

```
stage.stepped.output.select.set <channel> 1
```

### Outputs can be disabled by setting:

```
stage.stepped.output.select.set <channel> 0
```

### The default state (and logic sense) of the pulse output can be changed by setting:

```
stage.stepped.output.step-direction.is-rising-edge.set <channel> 0
```

## Storing configuration

These settings can be saved in a stage preset for future use. Different stage presets may have different intervals between pulses if required.

To save this to a stage preset, go to the “Main” tab in NanoBench, select a customer preset (Customer 1-5) from the “Preset” drop-down list, and click “Store preset”.

If this preset is to be loaded at startup with the outputs enabled, click “Set current setup as default”.

**Note:** it is not possible to change factory presets.

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