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Technical Note 022

Inverting digital inputs on 580 series Programming for inverted DI function

The 580 series of drives can invert the digital input (DI) signal. This allows the input to function with a normally-closed, or normally-open, style of input. Programming of this function is not accessible from the Primary settings menu and is configured via the drive parameters. The following example illustrates how to program the invert function on DI2.

The application requires the drive to ramp up to a constant frequency to create positive pressure before an isolation damper can open. A drive relay programmed based on frequency supervision is used to control the damper (actuator). The damper end-switch closes to signify that the damper is open. That switch is wired back to DI2 on the drive and performs two functions:
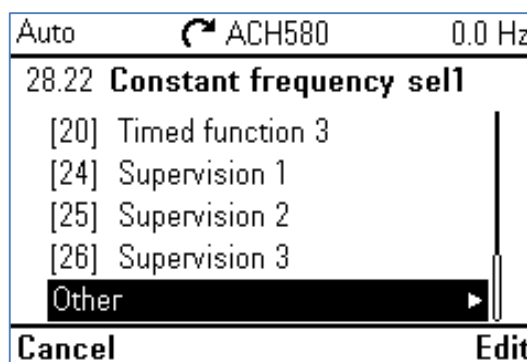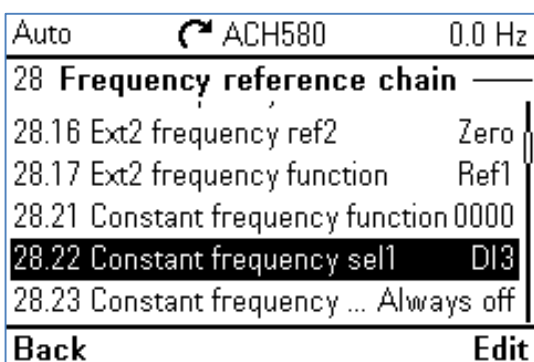
1. With the end switch open, the drive operates at constant frequency 1.
2. When the damper opens, the end-switch closes (at DI2) to turn off the constant speed function. With the damper now open, the motor speed is controlled by the BAS signal.

Both functions assume the drive is in Auto mode and has an active run command from the building automation system.
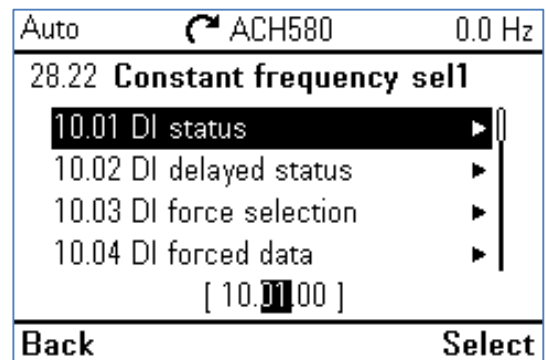
By default, the 580 family is expecting a "closed" digital input to activate a constant frequency. This example requires the digital input to be "open" to activate the constant frequency. The instructions below illustrate how to configure Constant frequency sel1 to an inverted DI.

Selecting an Invert function requires accessing the Parameter mode. The navigation steps are detailed in the following steps:

1. Navigate to the parameters by: Menu → Parameters → Complete List
2. Scroll to Group 28 [Frequency Reference Chain], then select 28.22 [Constant frequency sel1]
3. Navigate to Other and select edit.

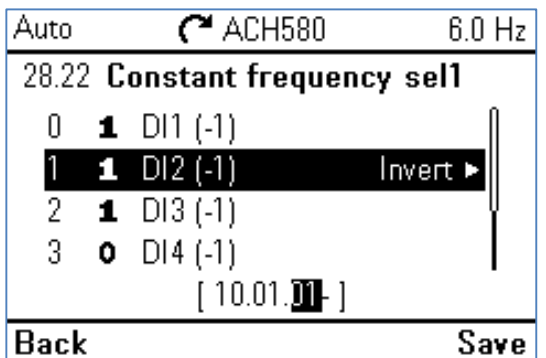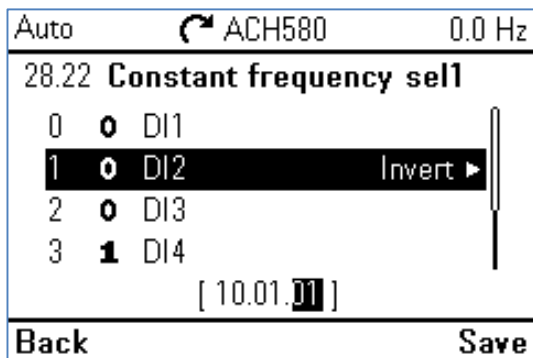4. Scroll to Group 10 [Standard DI, RO], then select 10.01 [DI status].

```
Auto        ↻ ACH580        0.0 Hz
28.22 Constant frequency sel1
  05 Diagnostics                  ▶
  06 Control and status words     ▶
  07 System info                  ▶
  10 Standard DI, RO              ▶
          [ 10 00.00 ]
Back                         Select
```

```
Auto        ↻ ACH580        0.0 Hz
28.22 Constant frequency sel1
  10.01 DI status                 ▶
  10.02 DI delayed status         ▶
  10.03 DI force selection        ▶
  10.04 DI forced data            ▶
          [ 10. 01 00 ]
Back                         Select
```
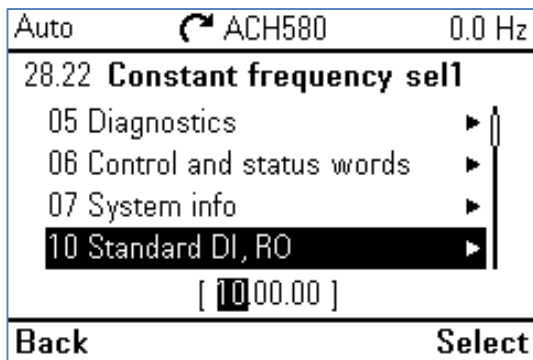
5. Scroll to DI2. Then press the right soft key to Invert the signal; select Save.

```
Auto        ↻ ACH580        0.0 Hz
28.22 Constant frequency sel1
  0   o  DI1
  1   o  DI2              Invert ▶
  2   o  DI3
  3   1  DI4
          [ 10.01. 01 ]
Back                          Save
```

```
Auto        ↻ ACH580        6.0 Hz
28.22 Constant frequency sel1
  0   1  DI1 (-1)
  1   1  DI2 (-1)         Invert ▶
  2   1  DI3 (-1)
  3   o  DI4 (-1)
          [ 10.01. 01 - ]
Back                          Save
```

The last image below shows the final configuration.

```
Auto        ↻ ACH580        6.0 Hz
28 Frequency reference chain ──
28.16 Ext2 frequency ref2       Zero
28.17 Ext2 frequency function   Ref1
28.21 Constant frequency function 0000
28.22 Constant frequency sel1
            10.01.01 DI2-1) (-1)
Back                          Edit
```