

Technical instruction

ACS250 micro drives, 110-480 V

Setting up preset speeds



Overview

The ACS250 can be configured to operate with up to a maximum of four preset speeds. This technical instruction shows some of the common configurations for preset speeds. The preset speed parameters allow for both the setting of positive and negative values, allowing for each preset to be individually configured for a forward or reverse direction. Alternatively the forward/reverse selection can be made independently of the preset speed selection giving mirrored preset speeds in the opposite direction.

The method used for enabling preset speeds on the ACS250 and configuring the digital input selection is to select one of the predefined input configurations using the digital input configuration parameter (9902).

Preset speed selection might be performed using logic selector switches or by a controlling PLC. For simplicity this application note shows examples using selector switches to clearly show logic conditions on the digital inputs to the drive.

As preset speed functionality is used predominantly when the drive is in terminal control mode this technical note focuses on the terminal control mode of operation (1103=0). Some options for preset speeds do exist in the other control methods and these are detailed in the product user's manual.

Selecting preset speeds using the digital input selection parameter 9902

The digital input selection parameter 9902 allows predefined digital input configurations to be chosen from a table provided in the user’s manual. The ACS250 has several settings for parameter 9902 that configure some drive preset speed functionality. The predefined preset speed selections in parameter 9902 allow for selection of one, two or four preset speed configurations.

- Preset speed 1 value (commanded speed when preset speed 1 is selected) is set in parameter 1202.
- Preset speed 2 value (commanded speed when preset speed 2 is selected) is set in parameter 1203.
- Preset speed 3 value (commanded speed when preset speed 3 is selected) is set in parameter 1204.
- Preset speed 4 value (commanded speed when preset speed 4 is selected) is set in parameter 1205.

Note that parameter 1205 is located in the long parameter group.

Configurations for four preset speeds use a rotary binary switch that converts each position into a binary number. The four preset speed configurations use a two pole binary switch (using two digital inputs). The truth table (table no. 1) for selection of the preset speed parameters is shown below.

Table no. 1

Input 1 (LSB)	Input 2 (MSB)	Preset speed selcted
Open	Open	Preset 1 – 1202
Closed	Open	Preset 2 – 1203
Open	Closed	Preset 3 – 1204
Closed	Closed	Preset 4 – 1205



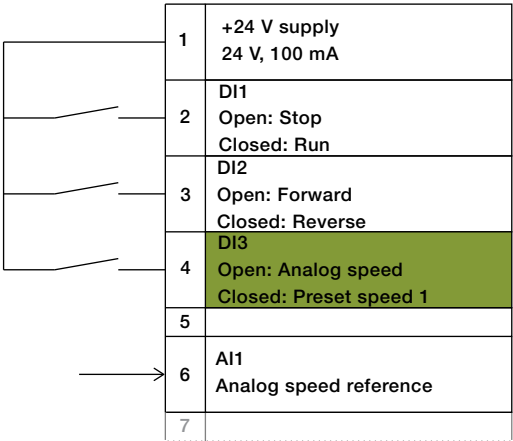
Connection diagrams for the configurations provided by parameter 9902 are shown below.

- Preset speed mode selection
- Preset speed reference selection

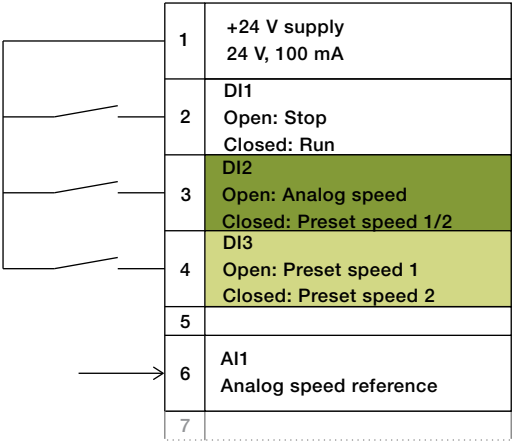
LSB=Least significant bit

MSB=Most significant bit

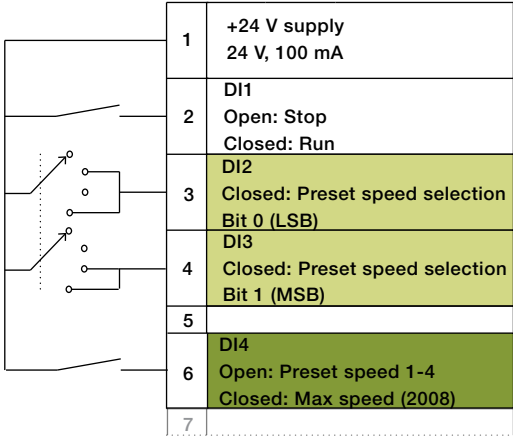
9902=0: 1 Preset speed, run, fwd/rev and analog reference



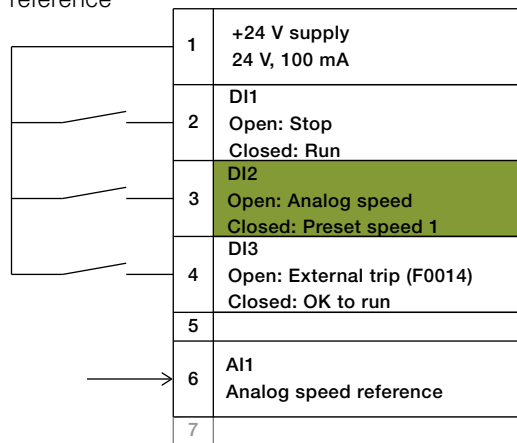
9902=1: 2 Preset speeds, run, and analog reference



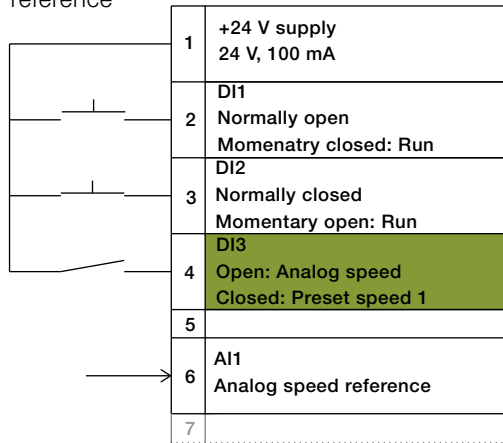
9902=2: 4 Preset speeds, run, max speed (5th preset)



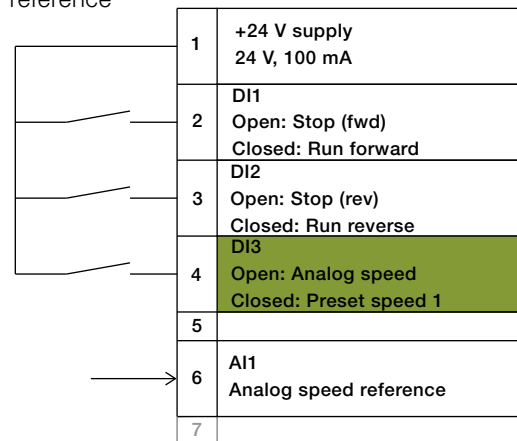
9902=3: 1 Preset speed, run, external trip and analog reference



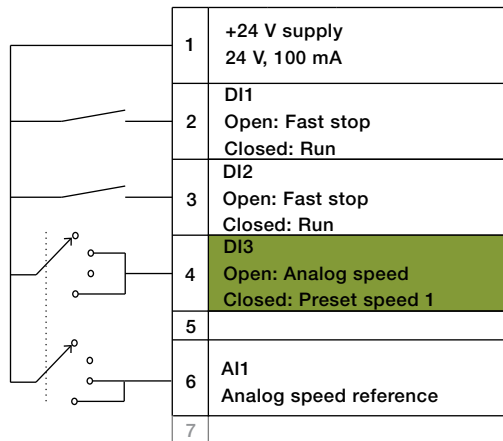
9902=10: 1 Preset speed, momentary run/stop and analog reference



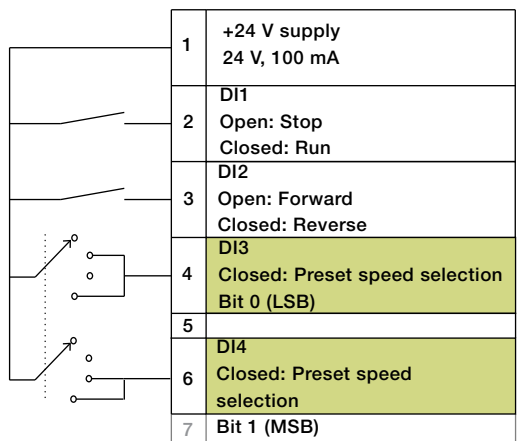
9902=5: 1 Preset speed, run fwd, run rev, and analog reference



9902=12: 1 Preset speed, fast stop, and analog reference



9902=8: 4 Preset speeds, run, and fwd/rev



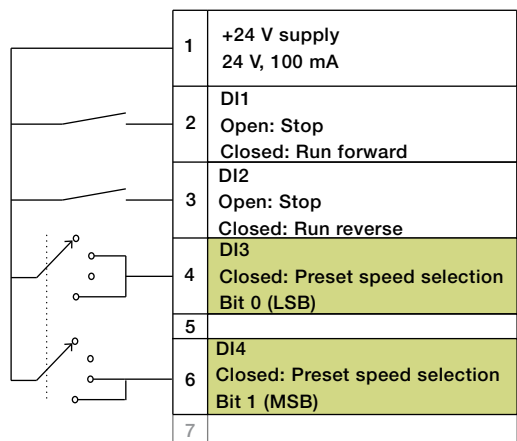
Example set up for parameter 9902

The following application requires four preset speeds of the following values:

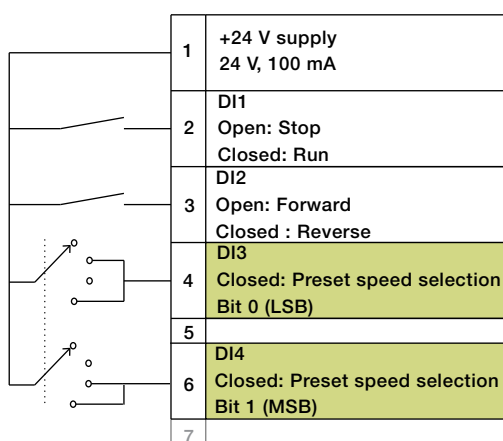
- Preset speed 1, 25 Hz
- Preset speed 2, 33 Hz
- Preset speed 3, 42 Hz
- Preset speed 4, 50 Hz

These are selected by two digital inputs. All four preset speeds need to be available on both the forward and reverse directions via a third digital input. There should be a run/stop input to start and stop the drive. The connection diagram for the drive is shown below.

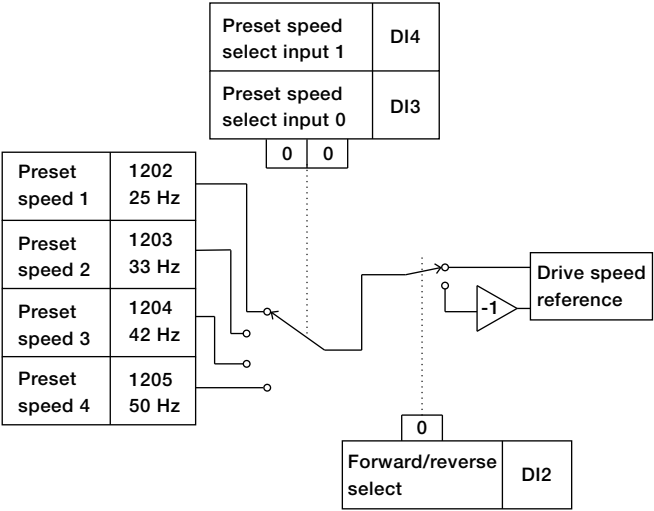
9902=9: 4 Preset speed, run forward, and run reverse



9902=8: 4 Preset speeds, run, and fwd/rev



Below is a parameter map showing the selection and values of the preset speeds.



The following setting (table no. 2) should be made to the drive.

The parameter settings listed are required following a default of the drive to factory setting. This should be performed prior to any programming to ensure all necessary default parameters are restored. Parameter listed in green is a default value (do not require setting) but is listed in the table for clarity.

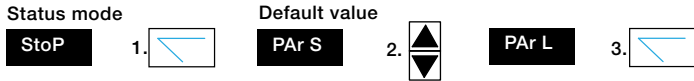
When a run reverse input is provided to the drive and a negative preset speed is selected it will result in the drive running in the forward direction. It is recommended, to avoid confusion, that reverse speeds are selected from a single source, either by setting negative preset speeds or by having a dedicated reverse input to the drive.

Table no. 2

Par	Description	Value	Notes
1103	Primary command source	0	Operate drive in terminal control mode.
9902	Digital input function select	8	Set digital input configuration to match application requirements.
1202	Preset speed 1	25	Speed reference value when preset speed 1 is selected.
1203	Preset speed 2	33	Speed reference value when preset speed 2 is selected.
1204	Preset speed 3	42	Speed reference value when preset speed 3 is selected.
1205	Preset speed 4	50	Speed reference value when preset speed 4 is selected. Navigate to the long parameter group.

How to access the long parameter group

- 1. Press for >1 sec to enter “long parameter group selection mode”.
- 2. Use to select long parameter group “PAr L”.
- 3. Press to exit “long parameter group selection mode” and save selection.



For more information please contact your local ABB representative or visit:

www.abb.com/drives

© Copyright 2014 ABB. All rights reserved.
Specifications subject to change without notice.