Extended functions with MASTERDRIVES MC with F01 sensor changeover

13

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13.1 General

Note

The "sensor changeover" function is available to you from firmware release ≥ 1.41 of MASTERDRIVES MC.

Summary

The sensor changeover is implemented with a BICO data record changeover. See Chapter 13 "Configuring and assigning parameters to the MASTERDRIVES MC (MCT) converter".

The sensor changeover can only be used together with roll feed axes, whereby the motor sensor at sensor evaluation "motor sensor in slot C" is connected, and the machine sensor as "external sensor, not slot C".

If a changeover from the motor sensor to the machine sensor is executed from the user program (activate sensor changeover), the actual value of the machine sensor is taken for the next positioning operation(s).

A sensor changeover can only take place with the axis stationary.

Both actual values are compared during operation; the difference between the actual values can be read out. The difference is monitored for a maximum value. If the maximum is exceeded, the axis is stopped and an error number is output.

Note

The sensor changeover requires extended technology wiring on the MASTERDRIVES MC. This wiring is part of the SIMATIC Motion Control CD as a Simovis script file, configuring package GMC Basic.

13.2 Function parameters

Parameters

The sensor changeover function is programmed with the following parameters:

- Machine data MD1, roll feed variant
- Function parameter FP6 (U504.6), limit value monitoring, sensor changeover

Additional information

A description of the parameters can be found in the chapter entitled "Machine data and parameters of the technology" in the functional description.

13.3 Functional description

Function

To be able to utilize the sensor changeover function, you set the machine data MD1 to the value 3 for roll feed.

To set up the axis, an approach is first made with the motor sensor (in slot C) and a changeover to a machine sensor (external sensor) is executed later.

Both measuring systems are then active during operation. To monitor the two actual value sensors, you assign a parameter to the "limit value monitoring, sensor changeover", FP6.
The difference resulting from actual value of sensor 1 minus actual value of sensor 2 is compared with function parameter FP6. If the difference is greater than function parameter FP6, the drive is stopped and warning no. 139 is issued: "Difference between actual values of sensor 1 and sensor 2 too great". This warning can only be acknowledged by a RESET.
Thus you can determine, for example, whether the acceleration entered by parameter is too great or whether slip has occurred at the machine sensor (of the measuring wheel).

The corresponding actual values can be read out by means of the "actual value output" job, HA3.

Important

A sensor changeover can only be executed with the axis stationary and with checkback signal [FUR] "machining active" at logic zero.

Activate/deactivate sensor changeover

If the prerequisites for the sensor changeover are met, you can initiate the changeover with the "activate/deactivate sensor changeover, input ".

Status of sensor changeover

The status of the sensor changeover can be read out with the "activate/deactivate sensor changeover, output ".

Note

When the drive has been switched on, the sensor changeover is always **inactive.** This means that axis positioning takes place via the motor sensor.

13.4 Control signals

No direct control signals are available for the sensor changeover.

13.5 Checkback signals

Machine sensor active [B359] (software limit switch reaches OTR)

The sensor changeover can only be used in conjunction with roll feed axes. Since a roll feed axis requires no software limit switch, checkback signal OTR "software limit switch reached" [B359] is used to indicate the status of the sensor changeover.

Logic 0: Machine sensor inactive

Logic 1: Machine sensor active

Note

Wiring of the "machine sensor active" checkback signal is taken into account in script file "8_Scriptfile_MCT_sensor_changeover.ssc".

13.6 Configuring and assigning parameters to the MASTERDRIVES MC (MCT) converter

Introduction

Standard software GMC BASIC operates only in conjunction with technology option F01 on the MASTERDRIVES MC. This requires that you release technology option F01. You can check the release by reading parameter n978 (parameter n978=1: released). Additionally, the sensor changeover requires extended technology wiring in the MASTERDRIVES MC.

Please take the technology script file for the sensor changeover, 8_Scriptfile_MCT_sensor_changeover.ssc, from the SIMATIC Motion Control CD.

Hardware requirements

- You need a MASTERDRIVES MC with released technology option F01.
- Sensor evaluation for an external sensor, not slot C.
- Connecting cable PG/PC – MASTERDRIVES MC (USI)

Software requirements

You must have installed the SIMOVIS tool on your PG/PC to load the extended technology wiring. GMC BASIC is not provided with SIMOVIS when supplied.

- PG/PC with SIMOVIS >=V5.3
- Simovis device files for firmware release V1.41

Script file, sensor changeover

A sensor changeover, motor sensor – machine sensor is not possible without additional wiring on the MASTERDRIVES MC.

A prepared Simovis script file is therefore supplied for the sensor changeover. It contains the parameters which you will add, and those which you must not change.

User parameters

User parameters include the configuration of the second sensor, actual value weighting of the second sensor, SBP configuration and the reference speed for the machine sensor.

Note

In the section "A3) SBP-Konfiguration", there is configured a sensor with 5V/RS422 and 5000 pulses/ revolution.

```
REM ************************************************************
REM **   A1) Configuration 2nd sensor [335,336]              **
REM ************************************************************
REM --- xxx1: Enable position detection
REM --- xx0x: No reference point detection
REM --- x0xx: Clockwise rotation of sensor
REM --- 0xxx : Position-feedback scaling factor as decimal fraction in
REM ---              parameter P0152 (to the left of the decimal point) anf P0152
REM ---              (to the right of the decimal point).
WRITE 166  1  0x1

REM ************************************************************
REM **   A2) Actual value weighting 2nd sensor [335]         **
REM ************************************************************
REM --- AVW places preceding decimal point, example = 2
WRITE 152  1  2
REM --- AVW places following decimal point, example = 44140625
WRITE 153  1  44140625
REM --- AVW- numerator, example = 10000um : 4096 pulses/ revolution
REM WRITE 181 1 10000
REM --- AVW- denominator, example = 4096
REM WRITE 181 2 4096

REM ************************************************************
REM **   A3) SBP configuration [250]                         **
REM ************************************************************
REM ---Change to drive settings menu
WRITE 60  0  5
WAIT 60  0  5  5
REM  Input level: example -> TTL
REM  Sensor voltage: example -> 5V/RS422 [255]
WRITE 150  2  0x33
REM ---Sensor pulses: example -> 5000
WRITE 151  2  5000

REM ************************************************************
REM **   A4) Machine reference speed [20,335]                **
REM ************************************************************
REM --- Reference speed for the machine sensor
REM --- Example: 6000 rpm
WRITE 355  0  6000
```

Technology wiring The technology wiring following the user parameters must be adopted without changes and loaded in the drive.