DOCUMENTATION ISG-kernel

Functional description
Measurement

Short description:
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Contents

List of figures

1 Overview

Task

The Measurement function permits the precise measurement of a workpiece using a measuring probe. Therefore, after the probe is triggered, the current axis position is saved.

In special cases, saving axis positions can also be triggered by other events, such as a PLC signal or the detection of a fixed stop.

Effectiveness

The measuring function is initialised and activated for the axes programmed in the measurement block.

Programming

- G100 and G310 are used to measure a workpiece.
- G101 and G102 include measuring offsets caused by a previous measurement as an additional offset.

Parameterisation

The axis and channel parameter lists must be parameterised accordingly in order to use the measuring function. The drive type must be included.

For more information on this function, see the chapter Parameters [▸ 51].

Mandatory note on references to other documents

For the sake of clarity, links to other documents and parameters are abbreviated, e.g. [PROG] for the Programming Manual or P-AXIS-00001 for an axis parameter.

For technical reasons, these links only function in the Online Help (HTML5, CHM) but not in pdf files since pdfs do not support cross-linking.

2 Description

Measuring with G100, G310

When measurement is executed using the NC command G100/G310, an axis position is saved (latched) after a measurement event occurs and the measuring travel may then be terminated.

By default the current position is latched in the drive hardware; alternatively the state of the measuring probe can be transferred to the CNC over the PLC interface. See [HLI//Control commands of an axis].

The measured results can be queried or included in the calculation in the NC program by means of appropriate variables.

The measurement movement may not be smoothed. If polynomial smoothing is selected, it must be deactivated before the measurement block G100.

Measuring with independent axes

When measurement types 1, 2 or 7 are used, a measurement run can also be executed with independent axes (see [PROG//Independent axes]). The measuring point is latched for each axis involved.

An independent measurement run is also possible in parallel to a path motion of a G100 measurement run.

Programing Example

Measurement with G100

```
%Meas_run
N10 G00 X0 Y0 Z0
N20 X5
N30 G100 X10 Y10 F500
N40 G01 X7
N50 M30
```

The figure shows a representation of the resulting path:

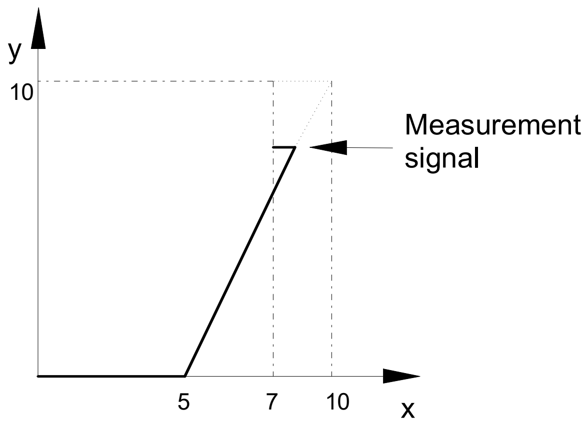


Fig. 1: Resulting path of the measurement run

```
%Independent_measurement_path
N10 G0 X0 Y0
N20 X[INDP_SYN G100 G90 POS100 FEED500] \
    Y[INDP_SYN G100 G90 POS100 FEED1000]
N30 M30
```

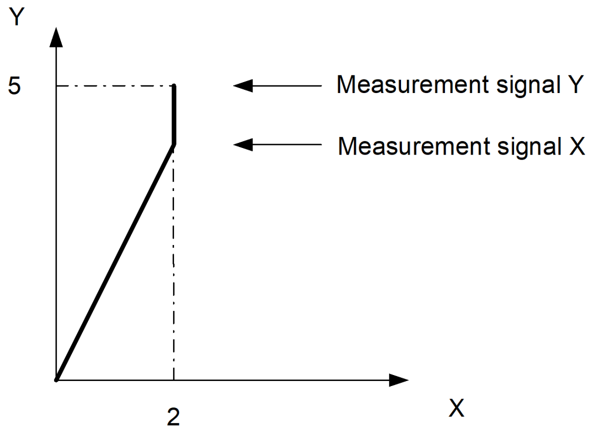


Fig. 2: Resulting axis movements of the independent measurement run

2.1 Dynamics of measurement run

For a measurement run with G100 or G310, the dynamic parameters for a rapid traverse block G00 are used by default.

However, the effective dynamics (accelerations and ramp times) in a measuring block can be influenced by several channel parameters.

The following two tables provide an overview of these parameters and their effectiveness for

- linear and
- non-linear (jerk-limited)

acceleration profile.

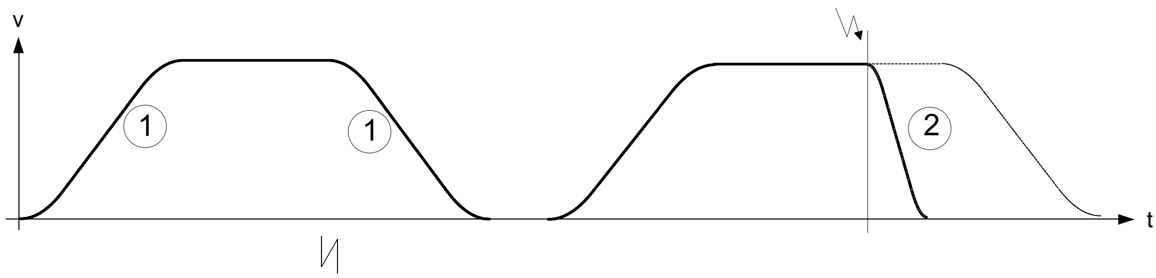


Fig. 3: Active dynamic for measurement run

Overview of parameters used

Parameter number	Name	Overview
P-CHAN-00097 [▸ 54]	use_drive_curr_limit	Valid deceleration ramp at FEEDHOLD
P-CHAN-00214 [▸ 55]	meas_deceleration_mode	Active delay with measuring signal
P-CHAN-00296 [▸ 56]	meas_use_std_dynamic	Active dynamic for measurement run

P-AXIS-00001	getriebe[i].slope_profil.a_beschl	Acceleration at machining feed (non-linear slope)
P-AXIS-00002	getriebe[i].slope_profil.a_brems	Deceleration at machining feed (non-linear slope)
P-AXIS-00004	getriebe[i].slope_profil.a_grenz	Acceleration at rapid movement
P-AXIS-00005	getriebe[i].lslope_profil.a_grenz_stufe_1	Acceleration step 1 in rapid mode
P-AXIS-00006	getriebe[i].lslope_profil.a_grenz_stufe_2	Acceleration step 2 in rapid mode
P-AXIS-00011	getriebe[i].lslope_profil.a_stufe_1	Acceleration of step 1 (linear slope)
P-AXIS-00012	getriebe[i].lslope_profil.a_stufe_2	Acceleration of step 2 (linear slope)
P-AXIS-00024	getriebe[i].lslope_profil.a_feedh	Deceleration for feedhold (linear slope)
P-AXIS-00053	getriebe[i].slope_profil.a_feedh	Deceleration at feedhold (non-linear slope)
P-AXIS-00280	getriebe[i].lslope_profil.d_grenz_stufe_1	Deceleration of step 1 in rapid mode (linear slope)
P-AXIS-00281	getriebe[i].lslope_profil.d_grenz_stufe_2	Deceleration of step 2 in rapid mode (linear slope)
P-AXIS-00282	getriebe[i].lslope_profil.d_stufe_1	Deceleration of step 1 (linear slope)
P-AXIS-00283	getriebe[i].lslope_profil.d_stufe_2	Deceleration of step 2 (linear slope)

Dynamics for measurement travel with non-linear slops

Active dynamic for measurement run P-CHAN-00296 [▸ 56]	Active delay with measuring signal P-CHAN-00214 [▸ 55]	Valid deceleration ramp at FEED-HOLD P-CHAN-00097 [▸ 54]	Profile dynamic (1) (limiting algorithm) measurement signal inactive	Deceleration ramp (2) (limiting algorithm) measurement signal active
0	0	0	Acceleration in rapid traverse P-AXIS-00004	Acceleration in rapid traverse P-AXIS-00004
0	0	1	Acceleration in rapid traverse P-AXIS-00004	Deceleration at feed-hold P-AXIS-00053
0	1	X	Acceleration in rapid traverse P-AXIS-00004	Acceleration in rapid traverse P-AXIS-00004
1	X	X	Acceleration at machining feedrate P-AXIS-00001 or delay at machining feedrate P-AXIS-00002	Deceleration at feed-hold P-AXIS-00053

Dynamics for measurement travel with non-linear slops

Active dynamic for measurement run P-CHAN-00296 [▸ 56]	Active delay with measuring signal P-CHAN-00214 [▸ 55]	Valid deceleration ramp at FEED-HOLD P-CHAN-00097 [▸ 54]	Profile dynamic (1) measurement signal inactive	Deceleration ramp (2) measurement signal active
0	0	0	Acceleration in rapid traverse P-AXIS-00005/ P-AXIS-00006 or delay at machining feedrate P-AXIS-00280/ P-AXIS-00281	Acceleration in rapid traverse P-AXIS-00005/ P-AXIS-00006 or delay at machining feedrate P-AXIS-00280/ P-AXIS-00281
0	0	1	Acceleration in rapid traverse P-AXIS-00005/ P-AXIS-00006 or delay at machining feedrate P-AXIS-00280/ P-AXIS-00281	Deceleration at feed-hold P-AXIS-00024
0	1	X	Acceleration in rapid traverse P-AXIS-00005/ P-AXIS-00006 or delay at machining feedrate P-AXIS-00280/ P-AXIS-00281	Acceleration in rapid traverse P-AXIS-00004
1	X	X	Acceleration at machining feedrate P-AXIS-00011/ P-AXIS-00012 or delay at machining feedrate P-AXIS-00282/ P-AXIS-00283	Deceleration at feed-hold P-AXIS-00024

3 Basic settings

Channel parameters, setting the default measurement type

After controller start-up, the default measurement type is valid; this is specified in the channel parameters via P-CHAN-00057 (measurement type).

For example, assign the value 1 in the channel parameter list P-CHAN-00057 (measurement type) to execute a measurement run in an NC channel with several axes where the measurement feedrate is programmed via the F word.

The following measurement types are available:

Value	Meaning
1*	Measurement run (G100) with at least one axis, Measurement feed programmable by F word.
2*	Measurement run (G100) with precisely one axis. Measurement feed is specified in the axis data list. An error message is output if the probing signal is missing.
3	Measurement run (G100) with at least one axis, Measurement feed programmable by F word, optionally continue motion up to the target point.
4	Measurement run (G100) only with maximum 3 main axes, Measurement feed programmable by F word.
5	Interruptible measurement run (G210) with at least one axis, Skip GOTO Measurement feed programmable by F word.
6	Interruptible measurement run (G310) with at least one SERCOS axis, jump via GOTO Measurement feed programmable by F word.
7*	Measurement run (G100) by moving to a fixed stop with at least one axis, Measurement feed programmable by F word.

* Measurement run also possible with independent axes.

NC program, switching over the measurement type

In the NC program, use

`Syntax:`

#MEAS MODE [**[**<*expr*>**]**] modal

At any time to select a new measurement type. When #MEAS MODE is programmed without parameters, the default measurement type specified in the channel parameter list is selected.

Axis parameters

The following parameters must be assigned in the axis parameters:

P-AXIS-00118	Axis can be used as measurement axis.
P-AXIS-00086	Measuring probe stroke. Defines the maximum permitted deceleration distance for measurement.
P-AXIS-00215	Measurement feedrate for measuring (only with measurement type 2)
P-AXIS-00467	Permissible distance to target point if measuring probe was not confirmed. (as of CNC Build V2.11.2010.09, old parameter P-AXIS-00114)
P-AXIS-00516	Measuring methods used (as of CNC Build V2.11.2019.15, old parameters P-AXIS-00117, P-AXIS-00116, P-AXIS-00115, P-AXIS-00257, P-AXIS-00269, P-AXIS-00330)
P-AXIS-00517	Number of probing input (as of CNC Build V2.11.2019.15, old parameter P-AXIS-00430)
P-AXIS-00518	Relevant measuring edge (as of CNC Build V2.11.2019.15, old parameter P-AXIS-00113)

Example

Parameterisation example

```
kenngr.messachse                    1
kenngr.hub_messtaster               100000
kenngr.vb_messen                    10000
kenngr.probing_offset               0
kenngr.measure.signal               PLC
kenngr.measure.input                1
kenngr.measure.edge                 POS
```

4 Measure with one / several axes

Enabling axes

All axes in which measurement is to take place or which might be moved by a measurement run, must be enabled for this operation in the axis parameter list by P-AXIS-00118 and the probing signal must be looped to all measurement axes.

Wait for probing signal of moved and released axes

2.5D mode

All axes which are moved and released during the measurement run must send a probing signal (probing position latch). If the axis is not moved by G100, no probing signal is required in this axis.

Programing Example

Waiting for the probing signal in 2.5D mode

```
kopf.achs_nr                        1
kopf.log_achs_name                  X
kenngr.messachse                    1

kopf.achs_nr                        2
kopf.log_achs_name                  Y
kenngr.messachse                    1

%Measurement run standard
N10 G00 X0 Y1 Z0
N20 X5
N30 G100 X10 F500       ;Wait for probing signal from X
N40 G01 Y3
N50 G100 Y10 F500       ;Wait for probing signal from Y
N60 G01 X10 Y5
N70 G100 X15 Y10 F500   ;Wait for probing signal from X & Y
N100 M30
```

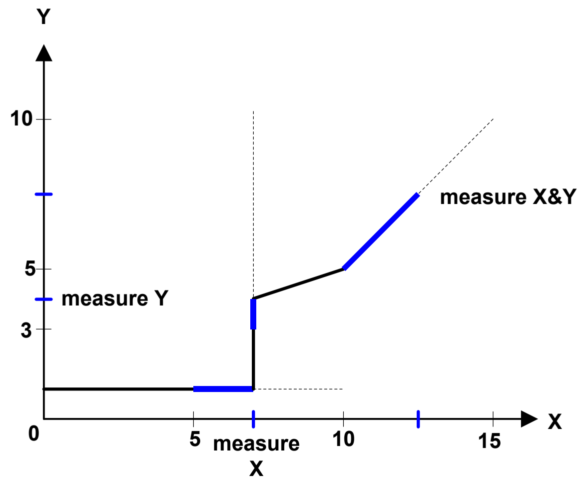


Fig. 4: Programmed path

Cartesian transformation (#CS)

All 3 main axes must be released as measurement axes for measuring while a Cartesian transformation is active. The probing signal must be looped in all measurement axes, irrespective of whether the axis was actually moved or not.

Measured values are latched in all Cartesian transformation axes and mapped in corresponding ACS or PCS values.

Programing Example

Waiting for the probing signal with Cartesian transformation (#CS)

```
#Konfiguration
kopf.achs_nr                    1
kopf.log_achs_name              X
kenngr.messachse                1

kopf.achs_nr                    2
kopf.log_achs_name              Y
kenngr.messachse                1

kopf.achs_nr                    3
kopf.log_achs_name              Z
kenngr.messachse                1

%Measurement run CS
N10 G00 X0 Y1 Z0

N20 #CS ON[0,0,0,0,0,45]
N30 G100 X10 F500      ;Wait for probing signal from X & Y & Z
N40 #CS OFF

N50 #CS ON[0,0,0,0,0,90]
N60 G100 X10 F500      ;Wait for probing signal from X & Y & Z
N70 #CS OFF

N100 M30
```

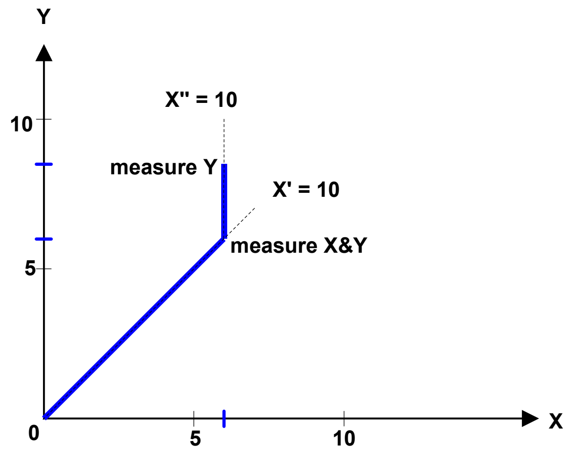


Fig. 5: Programmed path 2

Kinematic transformation (#TRAFO)

All kinematic axes must be released as measurement axes for measuring while a Cartesian transformation is active. The probing signal must be looped in all measurement axes, irrespective of whether the axis was actually moved or not.

Measured values are latched in all Cartesian transformation axes and mapped in corresponding ACS or PCS values.

5 Programming

Measurement results, V.A.MESS.<*axis*> V.A.MERF.<*axis*> V.A.MOFFS.<*axis*> V.A.MEIN.<*axis*>

When a measurement is executed by the NC command G100/G310, an axis position is stored after a measuring probe is triggered. After the measurement interrupt is triggered, the current position is stored (latched) and the measurement run may then be ended.

The positions recorded by the measurement process can be used in the NC program by G101/ G102 (calculation of the measurement offset) and special axis-specific variables.

Examples:

V.A.MESS.X	Measured value of axis X in the coordinate system in which the measurement took place, including all offsets.
V.A.MERF.X	Measurement terminated (TRUE/FALSE). Indicates whether the measurement interrupt is received before the target position is reached.
V.A.MOFFS.X	Distance between probing position and programmed target position.
V.A.MEIN.X	The current measurement offset of the X axis including the calculation by G101. This acts as an additive offset of the programmed position: $PCS' = PCS + \text{measurement offset}_{G101}$
V.G.MEAS_TYPE	Value of currently active measuring type **[as of V2.11.2022.03]** For further information on the measurement function, refer to the program manual [PROG// section Measurement functions].

V.A.MEAS.ACS.VALUE.<*axis*> **V.A.MEAS.PCS.VALUE.**<*axis*>	As of Build **V2.11.2020.07,** the axis-specific variables **V.A.MEAS.ACS.VALUE** and **V.A.MEAS.PCS.VALUE** supplement the variable **V.A.MESS**. The additional variables supply the measured value both in the axis coordinate system including all offsets as well as the measured value in the programming coordinate system.

Examples:

V.A.MEAS.ACS.VALUE.X	Measured value of axis X in the axis coordinate system (ACS). The value contains all offsets.
V.A.MEAS.PCS.VALUE.X	Measured value of axis X in the program coordinate system (PCS). The value does **not** contain any offsets. The ball radius of the measuring probe includes the tool radius specification in the calculation of the PCS value (see example below). The inclusion of the ball radius in the calculation is controlled in the channel parameter P-CHAN-00311.

Programing Example

Measuring with a measuring probe tool of 2mm radius

```
%meas_example
:
;Measuring probe tool
;with radius 2 mm
D1
:
G0 X150 Z200
G100 Z20
:
M30
```

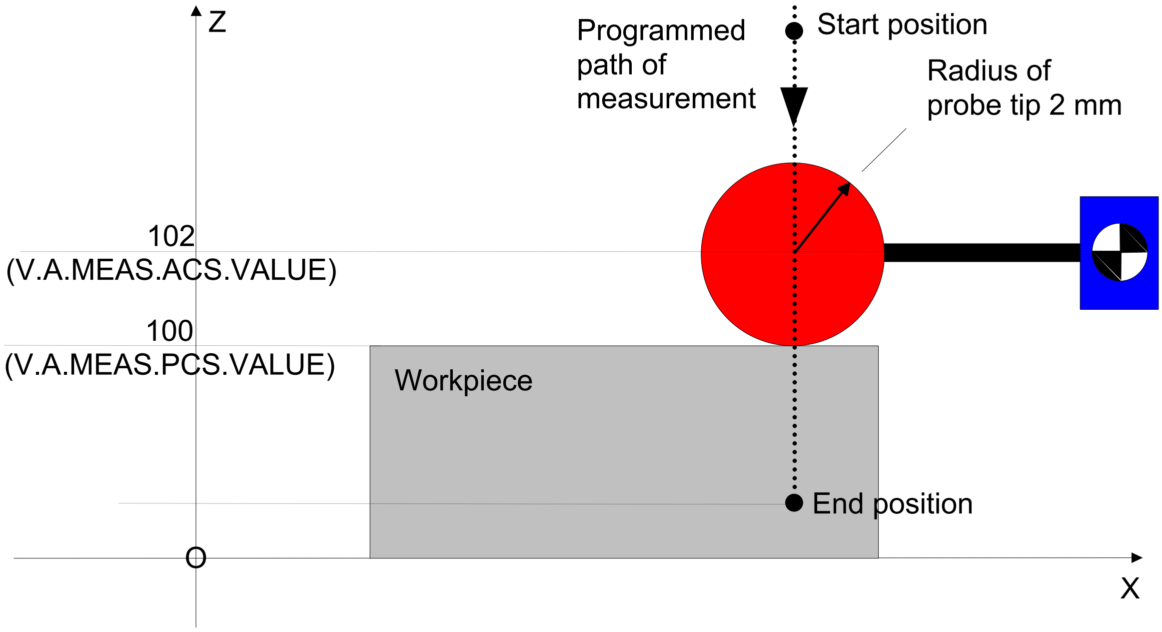


Fig. 6: Measuring with a measuring probe tool of 2mm radius

Include the measurement offset in calculations with G101, G102

In the NC program, use

```
Syntax:
```

G101 *<axis_name><fact>* { *<axis_name><fact>* } non-modal

may include an offset.

The measurement offset is the distance between the recorded probing position and the programmed target position. It is calculated as follows:

Measurement offset = measuring point – target point

For the programmed coordinates, the measuring offset determined from the measured values is included in the calculation of an additional offset between programmed and absolute coordinates. An error message is output if no measured values were detected beforehand. The numeral after the axis designation represents the inclusion factor.

The offset caused by the measurement offset is valid until it is deselected by G102.

```
Syntax:
```

G102 { *<axis_name><dummy_expr>* } non-modal

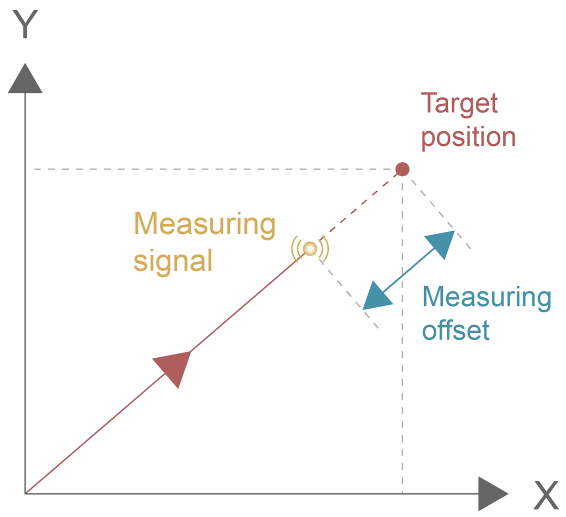


Fig. 7: Measurement offset

Notice

If several measurement runs are programmed in sequence, the axis-specific variable *V.A.MERF* when used considers that the values from the previous measurement are retained for non-programmed axes.

The following relationships apply to the calculation of V.A.MESS.*, V.A.MEAS.* and V.A.MOFFS.* (example for X axis):

V.A.	Without transformation (2.5D)	With Cartesian transformation #CS ON	With kinematic transformation #TRAFO ON
MESS.X	ACS position (includes all offsets)	Conversion of ACS position into active co-ordinate system (PCS) including offsets	Conversion of ACS position into active co-ordinate system (PCS) including offsets
MEAS.ACS.VALUE.X	ACS position (includes all offsets)	ACS position (includes all offsets)	ACS position (includes all offsets)
MEAS.PCS.VALUE.X	ACS position (without offsets)	Conversion of ACS position into active co-ordinate system (PCS) without offsets	Conversion of ACS position into active co-ordinate system (PCS) without offsets
MOFFS.X	= V.A.MESS.X – V.A.PROG.X – Zero Shifts – Tool Offset	= V.A.MESS.X – V.A.PROG.X – Zero Shifts – Tool Offset	= V.A.MESS.X – V.A.PROG.X – Zero Shifts

Programing Example

Measure in ACS without offsets.

The programming examples below assume an ideal measuring probe with a ball radius of 0 mm.

Assuming: Measuring probe is triggered at ACS position Z=100.

```
%meas1
N05 #MEAS MODE[1]
N10 G01 G90 Z200 F2000
N20 G100 Z20 F2000
N30 #MSG SYN["V.A.MESS.Z=%f", V.A.MESS.Z]
                            -> V.A.MESS.Z = 100.0
N31 #MSG SYN["V.A.MEAS.ACS.VALUE.Z=%f",
                               V.A.MEAS.ACS.VALUE.Z]
                            -> V.A.MEAS.ACS.VALUE.Z = 100.0
N32 #MSG SYN["V.A.MEAS.PCS.VALUE.Z=%f",
                               V.A.MEAS.PCS.VALUE.Z]
                            -> V.A.MEAS.PCS.VALUE.Z = 100.0
N40 #MSG SYN["V.A.MOFFS.Z=%f", V.A.MOFFS.Z]
                            -> V.A.MOFFS.Z = 80.0
N50 #MSG SYN["V.A.MEIN.Z=%f", V.A.MEIN.Z]
                           -> V.A.MEIN.Z = 0.0
N60 G101 Z1
N70 #MSG SYN["V.A.MEIN.Z=%f", V.A.MEIN.Z]
                           -> V.A.MEIN.Z = 80.0
N80 G01 Z100 F1000
N90 #MSG SYN["V.A.ABS.Z=%f", V.A.ABS.Z]
                          -> V.A.ABS.Z = 180.0
N100 G102 Z1
N110 #MSG SYN["V.A.MEIN.Z=%f", V.A.MEIN.Z]
                            -> V.A.MEIN.Z = 0.0
N120 G01 Z100 F1000
N130 #MSG SYN["V.A.ABS.Z=%f", V.A.ABS.Z]
                           -> V.A.ABS.Z = 100.0
N140 M30
```

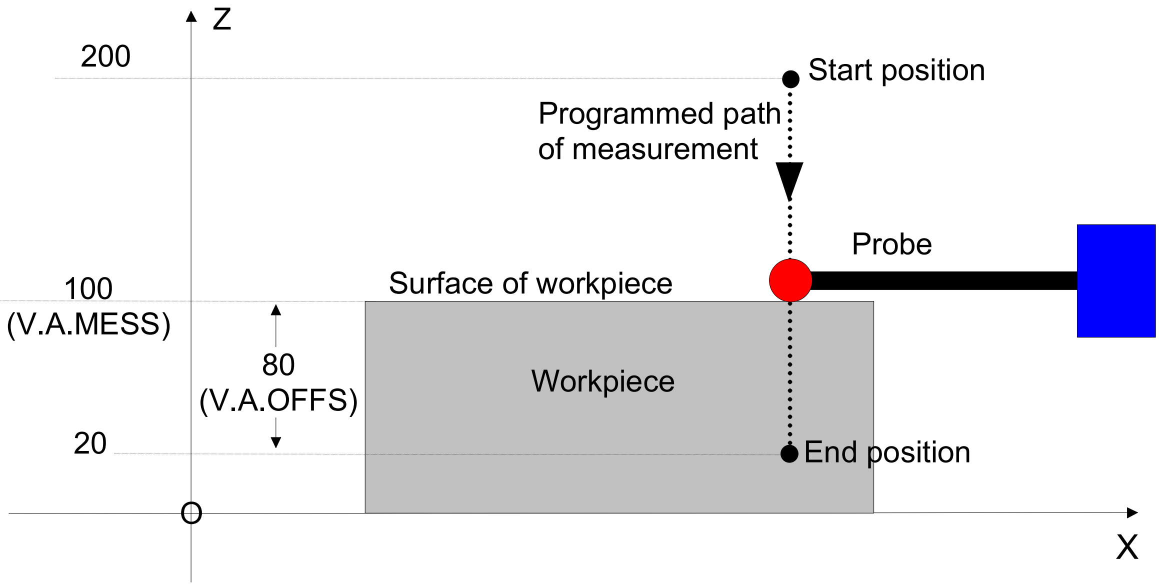


Fig. 8: Measure without offsets

Programing Example

Measure in the ACS with reference point offset

Measure with reference point offset, G92

Assuming: Measuring probe is triggered at ACS position Z=100.

```
%meas2
N05 #MEAS MODE[1]
N10 G92 Z33
N20 G01 G90 Z200 F2000
N30 G100 Z20 F2000
N40 #MSG SYN["V.A.MESS.Z=%f", V.A.MESS.Z]
                           -> V.A.MESS.Z = 100.0
N41 #MSG SYN["V.A.MEAS.ACS.VALUE.Z=%f",
                            V.A.MEAS.ACS.VALUE.Z]
                         -> V.A.MEAS.ACS.VALUE.Z = 100.0
N42 #MSG SYN["V.A.MEAS.PCS.VALUE.Z=%f",
                            V.A.MEAS.PCS.VALUE.Z]
                         -> V.A.MEAS.PCS.VALUE.Z = 67.0
N50 #MSG SYN["V.A.MOFFS.Z=%f",
                            V.A.MOFFS.Z]
                         -> V.A.MOFFS.Z = 47.0
N60 #MSG SYN["V.A.MEIN.Z=%f", V.A.MEIN.Z]
                           -> V.A.MEIN.Z = 0.0
N70 G101 Z1
N80 #MSG SYN["V.A.MEIN.Z=%f", V.A.MEIN.Z]
                           -> V.A.MEIN.Z = 47.0
N90 G01 Z100 F1000
N100 #MSG SYN["V.A.ABS.Z=%f", V.A.ABS.Z]
                           -> V.A.ABS.Z = 180.0
N110 G102 Z1
N120 #MSG SYN["V.A.MEIN.Z=%f", V.A.MEIN.Z]
                            -> V.A.MEIN.Z = 0.0
N130 G01 Z100 F1000
N140 #MSG SYN["V.A.ABS.Z=%f", V.A.ABS.Z]
                           -> V.A.ABS.Z = 133.0
N150 M30
```

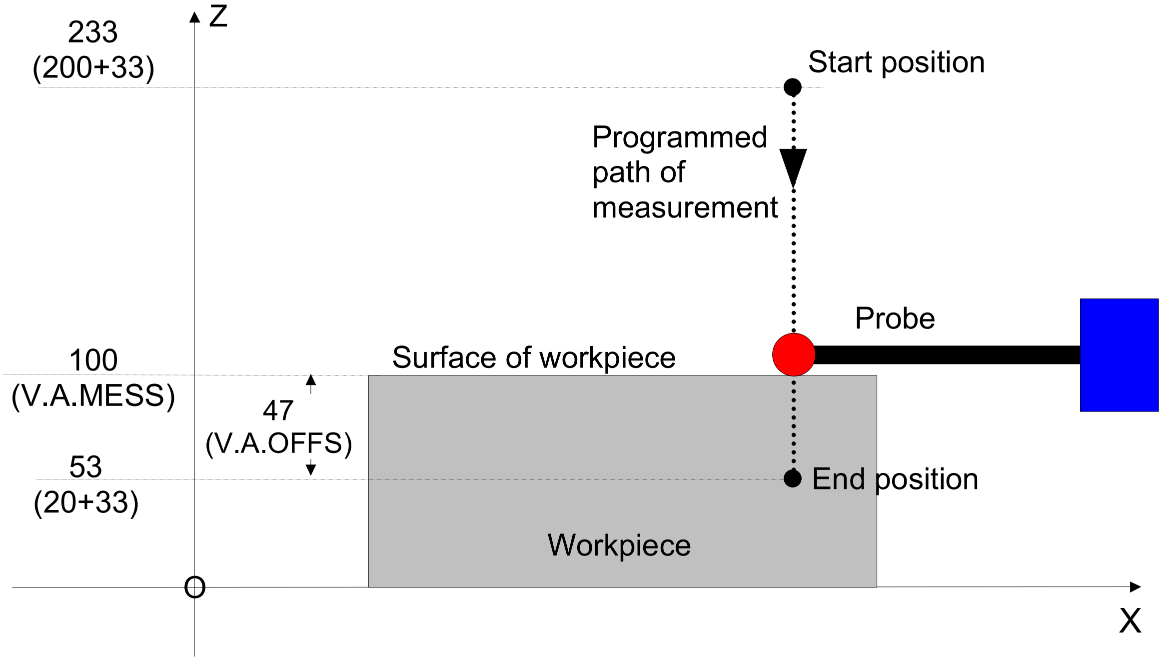


Fig. 9: Measure with reference point offset

Programing Example

Measure with CS, offset only

Measure with machining coordinate system CS, offset.

Assuming: Measuring probe is triggered at ACS position Z=100.

```
%meas3
N05 #MEAS MODE[1]
N10 #CS ON[0,0,33,0,0,0]
N20 G01 G90 Z200 F2000
N30 G100 Z20 F2000
N40 #MSG SYN["V.A.MESS.Z=%f", V.A.MESS.Z]
                           -> V.A.MESS.Z = 67.0
N41 #MSG SYN["V.A.MEAS.ACS.VALUE.Z=%f",
                         V.A.MEAS.ACS.VALUE.Z]
                      -> V.A.MEAS.ACS.VALUE.Z = 100.0
N42 #MSG SYN["V.A.MEAS.PCS.VALUE.Z=%f",
                         V.A.MEAS.PCS.VALUE.Z]
                      -> V.A.MEAS.PCS.VALUE.Z = 67.0
N50 #MSG SYN["V.A.MOFFS.Z=%f", V.A.MOFFS.Z]
                            -> V.A.MOFFS.Z = 47.0
N60 #MSG SYN["V.A.MEIN.Z=%f", V.A.MEIN.Z]
                           -> V.A.MEIN.Z = 0.0
N70 G101 Z1
N80 #MSG SYN["V.A.MEIN.Z=%f", V.A.MEIN.Z]
                           -> V.A.MEIN.Z = 47.0
N90 G01 Z100 F1000
N100 #MSG SYN["V.A.ABS.Z=%f", V.A.ABS.Z]
                           -> V.A.ABS.Z = 147.0
N110 G102 Z1
N120 #MSG SYN["V.A.MEIN.Z=%f", V.A.MEIN.Z]
                            -> V.A.MEIN.Z = 0.0
N130 G01 Z100 F1000
N140 #MSG SYN["V.A.ABS.Z=%f", V.A.ABS.Z]
                           -> V.A.ABS.Z = 100.0
N150 #CS OFF
N160 M30
```

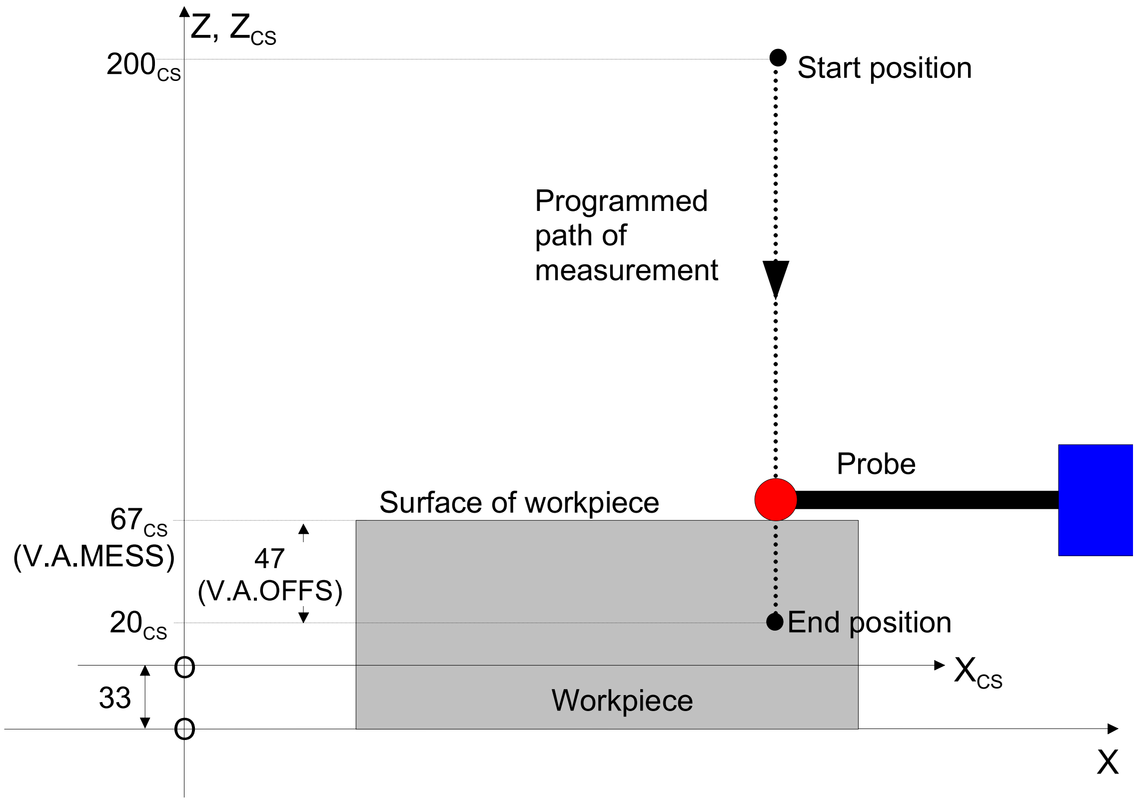


Fig. 10: Measure with CS, offset only

Programing Example

Measure with CS, offset and rotation

Measure with machining coordinate system CS, offset and rotation.

Assuming: Measuring probe is triggered at Z ACS position 55.5mm.

```
%meas4
N05 #MEAS MODE[1]
N10 #CS ON[0,0,75,0,15,0]
N20 G01 G90 X150 Z100 F2000
N30 G100 Z-10 F1000
N40 #MSG SYN["V.A.MESS.Z=%f", V.A.MESS.Z]
                           -> V.A.MESS.Z = 20.0
N41 #MSG SYN["V.A.MEAS.ACS.VALUE.Z=%f",
                              V.A.MEAS.ACS.VALUE.Z]
                           -> V.A.MEAS.ACS.VALUE.Z = 55.5
N42 #MSG SYN["V.A.MEAS.PCS.VALUE.Z=%f",
                              V.A.MEAS.PCS.VALUE.Z]
                           -> V.A.MEAS.PCS.VALUE.Z = 20.0
N50 #MSG SYN["V.A.MOFFS.Z=%f", V.A.MOFFS.Z]
                            -> V.A.MOFFS.Z = 30.0
N60 #MSG SYN["V.A.MEIN.Z=%f", V.A.MEIN.Z]
                           -> V.A.MEIN.Z = 0.0
N70 G101 Z1
N80 #MSG SYN["V.A.MEIN.Z=%f", V.A.MEIN.Z]
                           -> V.A.MEIN.Z = 30.0
N90 G01 Z50 F1000
N100 #MSG SYN["V.A.ABS.Z=%f", V.A.ABS.Z]
                           -> V.A.ABS.Z = 80.0
N110 G102 Z1
N120 #MSG SYN["V.A.MEIN.Z=%f", V.A.MEIN.Z]
                            -> V.A.MEIN.Z = 0.0
N130 G01 Z50 F1000
N140 #MSG SYN["V.A.ABS.Z=%f", V.A.ABS.Z]
                           -> V.A.ABS.Z = 50.0
N150 #CS OFF
N160 M30
```

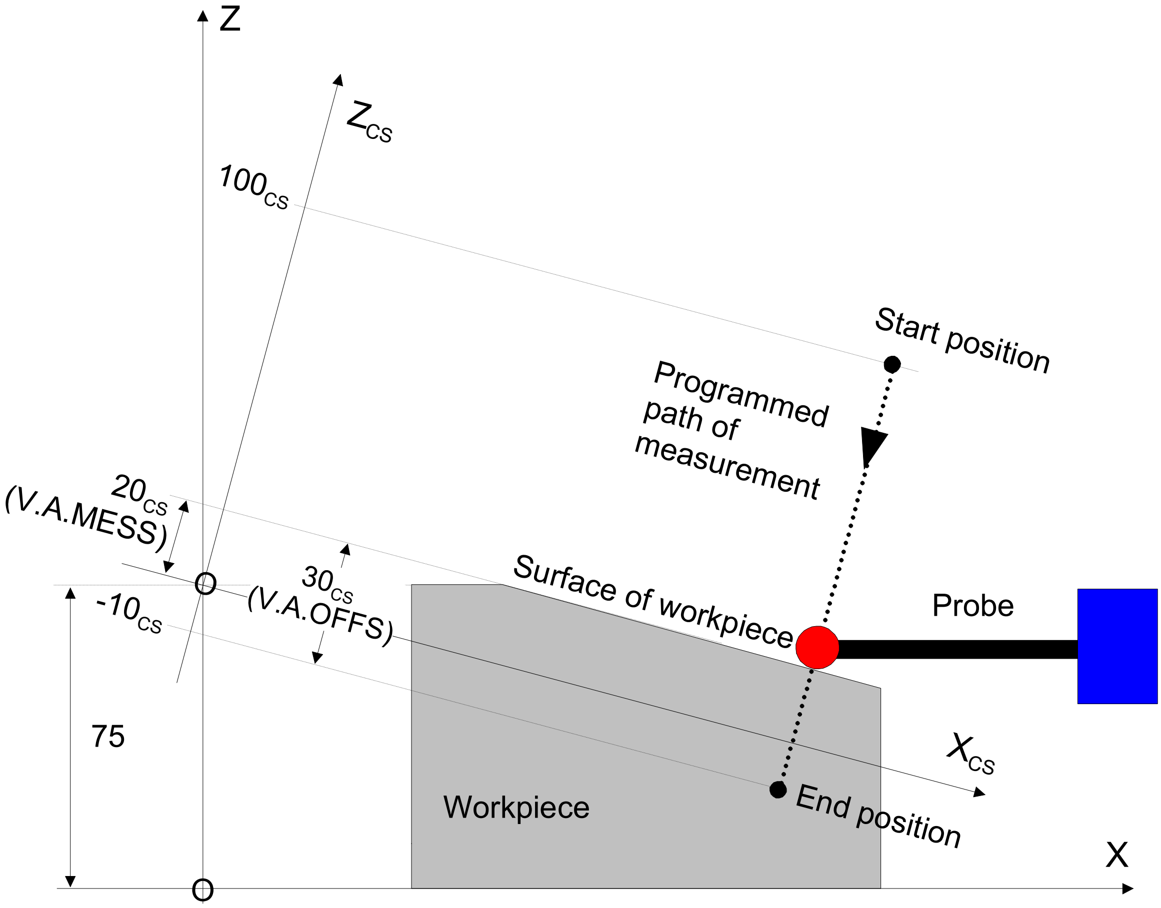


Fig. 11: Measure with CS, offset and rotation

6 Measured value detected in the drive hardware

6.1 SERCOS

Drive parameters

The following parameters must be set in the drive in order to use the measurement function:

- Real-time control and status bits used
- Measuring probe to be used
- Measuring probe control parameters
- Measured value in the cyclic telegram

Refer to the drive documentation for details of the parameters supported by the relevant drive.

In addition, a digital input of the drive amplifier may have to be parameterised as a measurement input. For details, refer to the drive amplifier documentation.

Real-time bits

The two real-time status bits and one real-time control bit are required for the measurement. The real-time status bits transfer the following information from the drive to the NC kernel:

- Edge occurred at measurement input (measurement completed)
- Measuring probe operated

In addition, a real-time control bit is required to activate the edge evaluation of the measurement input in the drive (enable measurement).

Assignment of the control and status bits used by the NC kernel is set in the NC kernel by the parameter P-AXIS-00060. In addition, parameters must be set accordingly in the drive amplifier.

The table below shows the assignment of P-AXIS-00060 in the NC kernel to the status and control bits used.

P-AXIS-00060	**Control bits**	**Status bits**	
	Measurement Enable	**measurement done**	**Measuring probe activated**
0, no entry	Real-time control bit 1	P-AXIS-00106	Real-time status bit 2
1	Real-time control bit 1	Real-time status bit 1	Real-time status bit 2
2	Real-time control bit 2	Real-time status bit 2	Real-time status bit 1

Notice

We recommend setting P-AXIS-00060 either to value 1 or 2. Value 0 is only present for reasons of backwards compatibility and requires additional settings in P-AXIS-00106.

Measuring probe control parameters

The measuring probe control parameter (S-0-0169) is used to configure which measuring probe and which edge of the probing signal is to be used in the drive. This parameter determines where the positions detected are stored in the various SEROS IDs. The SERCOS IDs must then be transferred in the cyclic actual value telegram of the drive.

Measuring probe/ edge	**Measuring probe control parameters S-0-0169**	**Measured value identification**
Measuring probe 1, positive edge	S-0-0169 = 1	S-0-0130
Measuring probe 1, negative edge	S-0-0169 = 2	S-0-0131
Measuring probe 2, positive edge	S-0-0169 = 4	S-0-0132
Measuring probe 2, negative edge	S-0-0169 = 8	S-0-0133

Parameterisation of the cyclic telegram

The measured value ID specified in the table above must be configured in the cyclic actual value telegram depending on the value of the measuring probe control parameter.

Axis parameter

For SERCOS drives, the following entries must be assigned in the axis parameter lists:

P-AXIS-00516 (old:P-AXIS-00116)	Measuring by drive: kenngr.measure.signal DRIVE
P-AXIS-00518 (old: P-AXIS-00113)	Latch at positive or negative probing signal edge: kenngr.measure.edge POS / NEG

Parameterise a SERCOS drive

The steps required to parameterise a SERCOS drive are presented in a flowchart on the following pages.

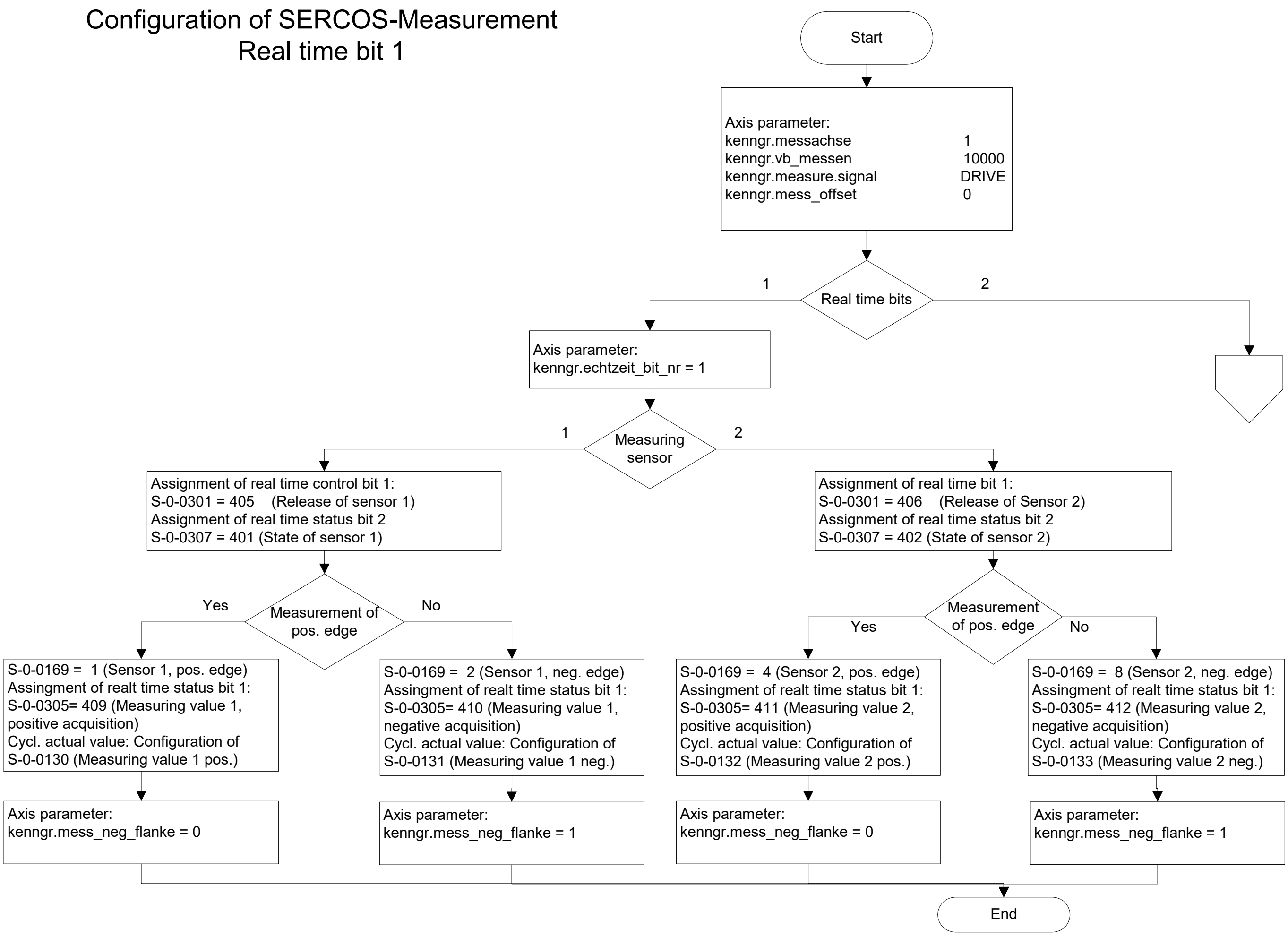


Fig. 12: Configuration of SERCOS measurement real-time bit no. 1

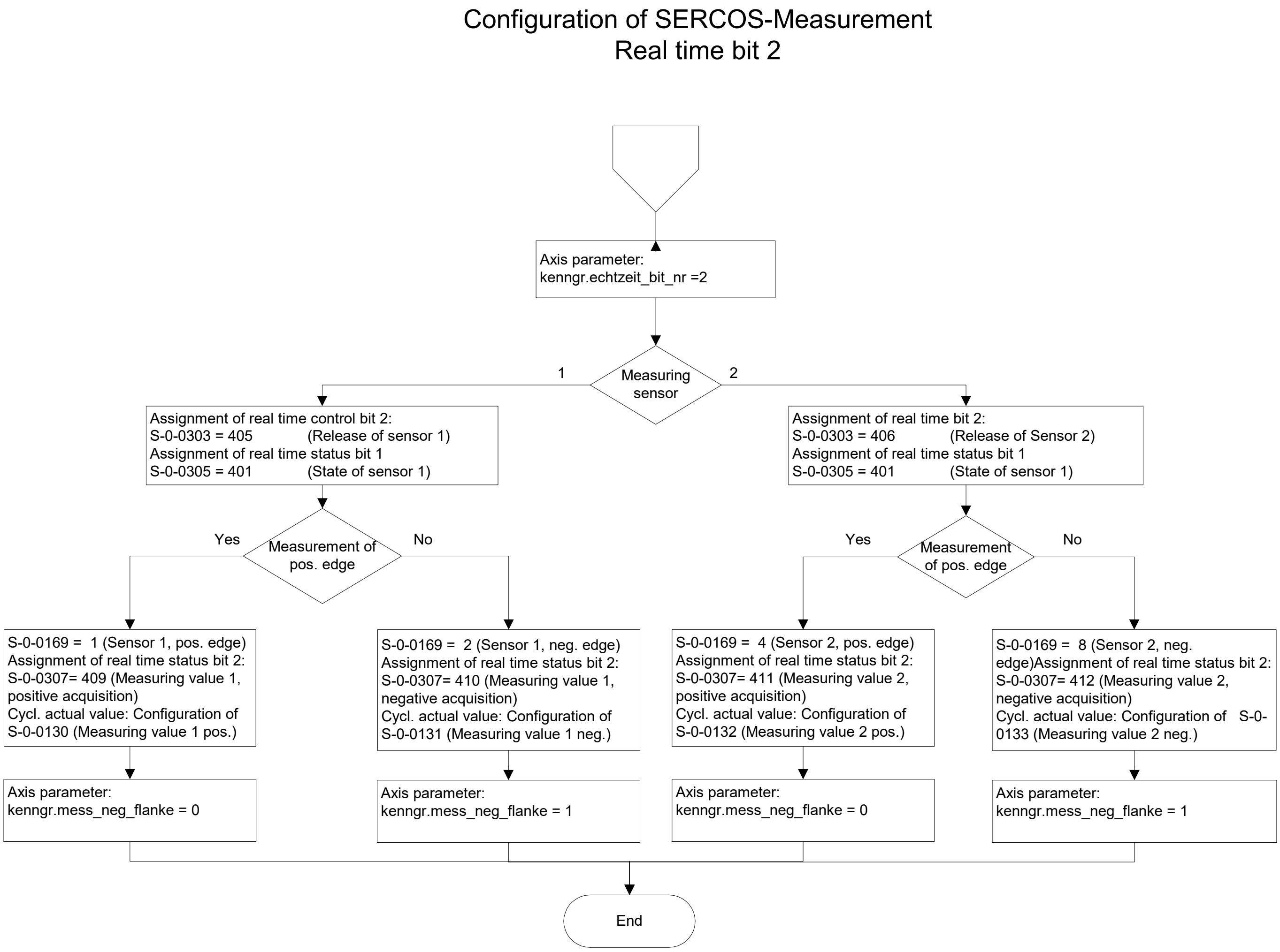


Fig. 13: Configuration of SERCOS measurement real-time bit no. 2

Example

Axis parameter

The following parameters are necessary in the drive and in the NC kernel to configure the measurement function of a SERCOS drive on the rising edge of measuring probe 1 using the real time and status bits 1.

```
kenngr.hub_messtaster        2000
kenngr.vb_messen             2000
kenngr.messachse             1
kenngr.measure.signal        DRIVE
kenngr.echtzeit_bit_nr       1
```

Cyclic telegram

Identification S-0-0130 must also be configured when a cyclic telegram is configured:

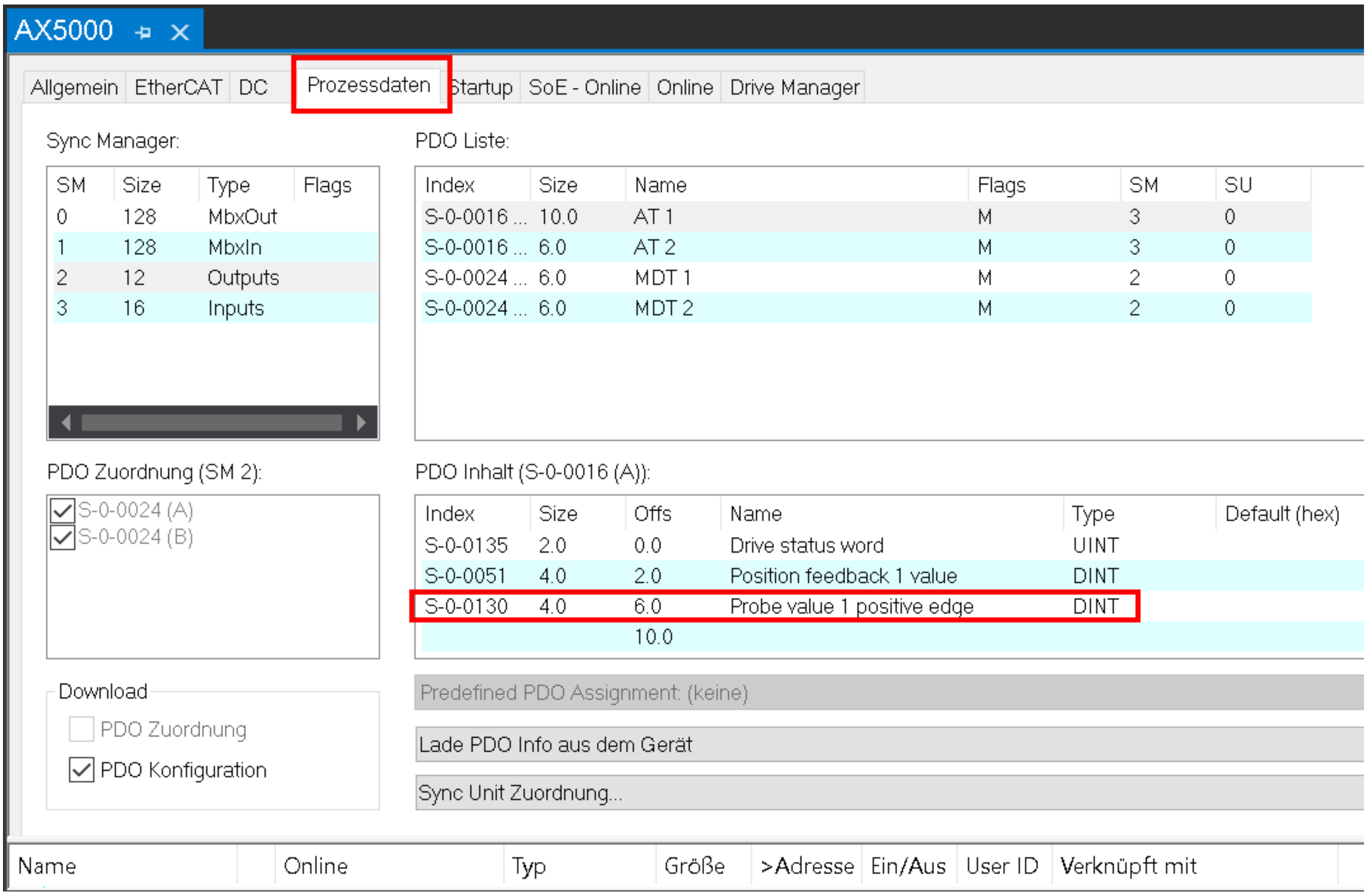


Fig. 14: Configuration of Ident. S-0-0130

Drive

The real time bits 1 and measuring probe 1 are used:

- S-0-0301= 405 (real-time control bit 1 = measuring probe 1 enabled)
- S-0-0305 = 409 (real-time status bit 1 = measuring probe 1, positive detected)
- S-0-0307 = 401 (real-time status bit 2 = measuring probe 1)

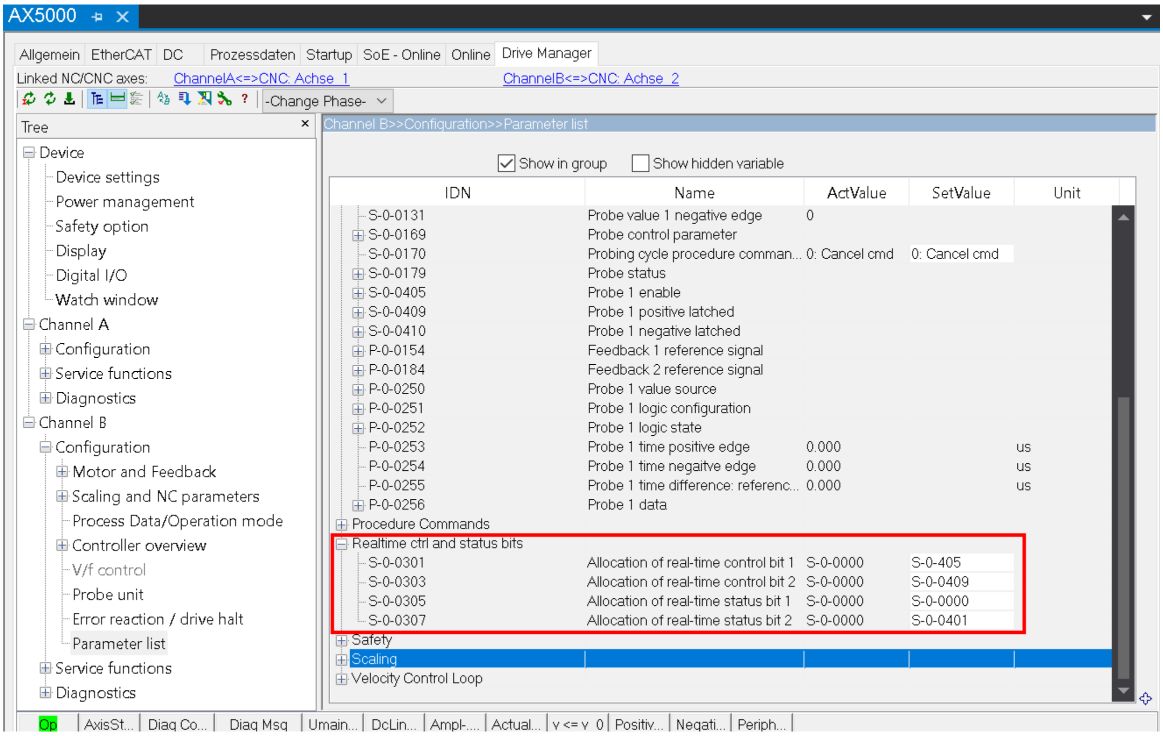


Fig. 15: Real-time bits in the Editor

Measuring probe control word

The value 1 must be entered in the measuring probe control word:

S-0-0169 = 1 (measuring probe 1 positive edge)

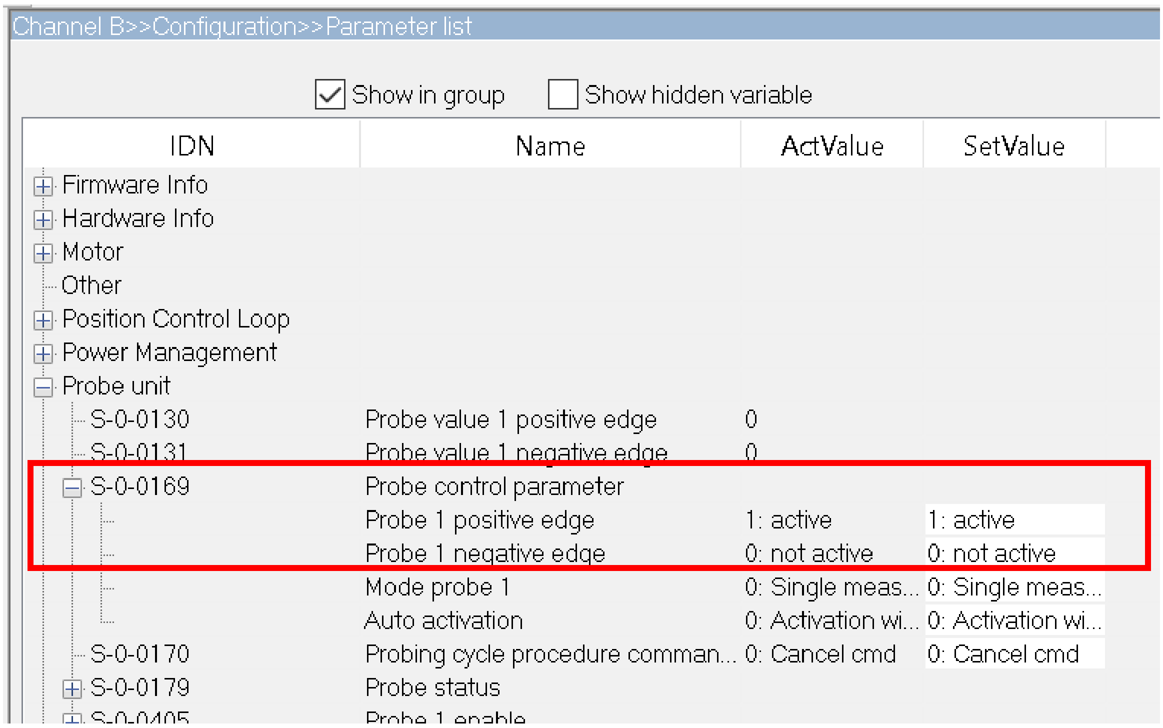


Fig. 16: Probe control word with value 1

6.2 Lightbus

Drive parameters

Digital input 2 in the drive must be programmed as the probing input in order to use the measurement function. The value 26 must then be assigned to the drive parameter IN2MODE. Connect the measuring probe to the digital input 2 (X3 terminal 12).

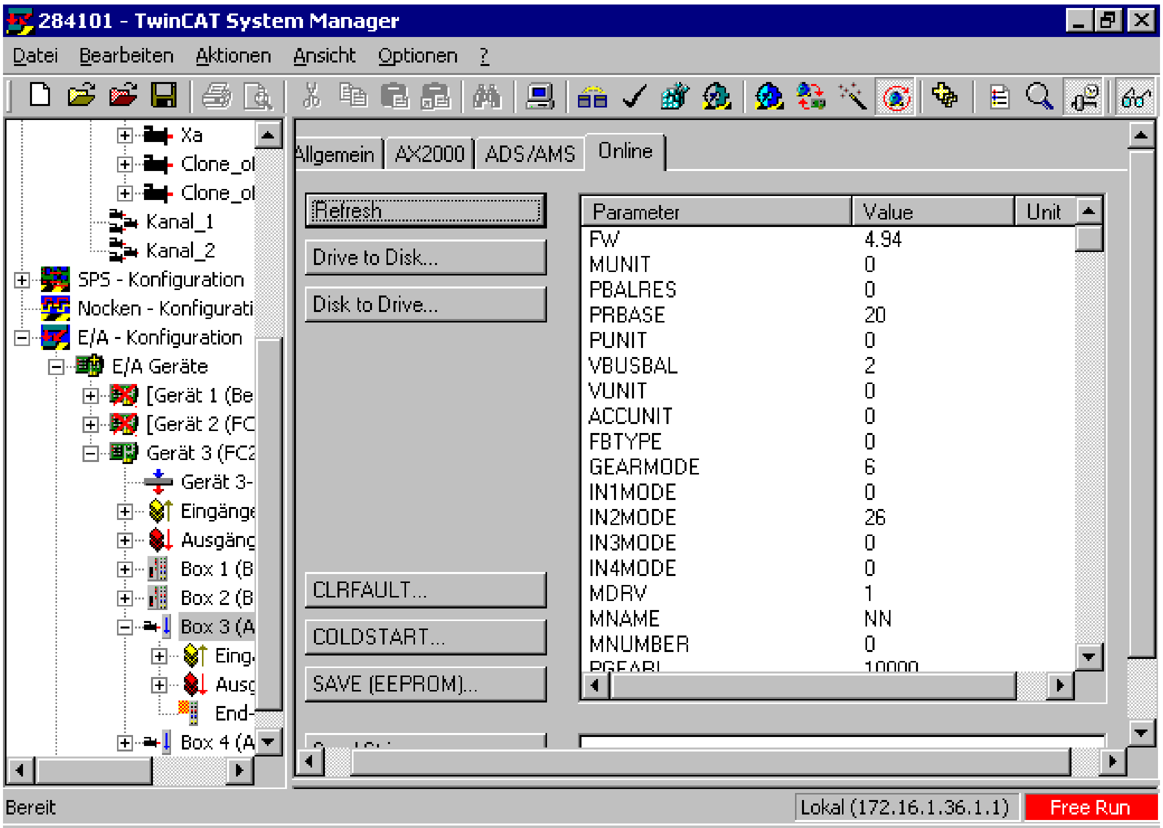


Fig. 17: Configure digital input 2 as probing input

Axis parameters

For Lightbus drives, the following entries must be assigned in the axis parameter lists:

P-AXIS-00518 (old: P-AXIS-00113)	Latch at positive or negative probing signal edge: kenngr.measure.edge POS / NEG

6.3 Terminal drives

Drive parameter / measuring probe terminal

Connect the measuring probe to terminal 4 of the incremental encoder interface KL5101.

Axis parameters

For terminal drives, assign the following entries in the axis parameter lists:

P-AXIS-00518 (old P-AXIS-00113)	Latch at positive probing signal edge (measurement at negative edge is not supported by the Encoder Interface): kenngr.measure.edge POS

6.4 CANopen

Drive parameters

Parameters in the drive

Depending on the drive hardware used, a digital input may have to be parameterised as a latch input in the drive.

The procedure for this depends on the drive and its manufacturer and must be carried out based on the drive documentation and possibly using commissioning and parameterisation software provided by the drive manufacturer.

The configuration corresponding to the object numbers defined in CiA DS402 or IEC 61800-7-200 is described below.

Parameterisation of the cyclic telegram

Parameterisation of the actual value telegram

When the measurement function is used in the cyclic actual value telegram, a telegram type must be configured containing the following data for transfer:

- Latch status word (‘touch probe status’, object number 0x60B9)
- Different process data must be configured here for latch position depending on the probing input used and the polarity of the probing signal edge; see table below.

Measuring hardware used	Name	Object number
Probing input 1, positive edge	Touch probe pos1 pos value	0x60BA
Probing input 1, negative edge	Touch probe pos1 neg value	0x60BB
Probing input 2, positive edge	Touch probe pos2 pos value	0x60BC
Probing input 2, negative edge	Touch probe pos2 neg value	0x60BD

If measurements need to be taken with different probing inputs or different edges, several of the process data listed above may have to be configured.

Parameterising the command value telegram

A telegram type must be configured in the cyclic command value telegram to transmit the latch control word.

Latch control word (‘touch probe status’ object number 0x60B8

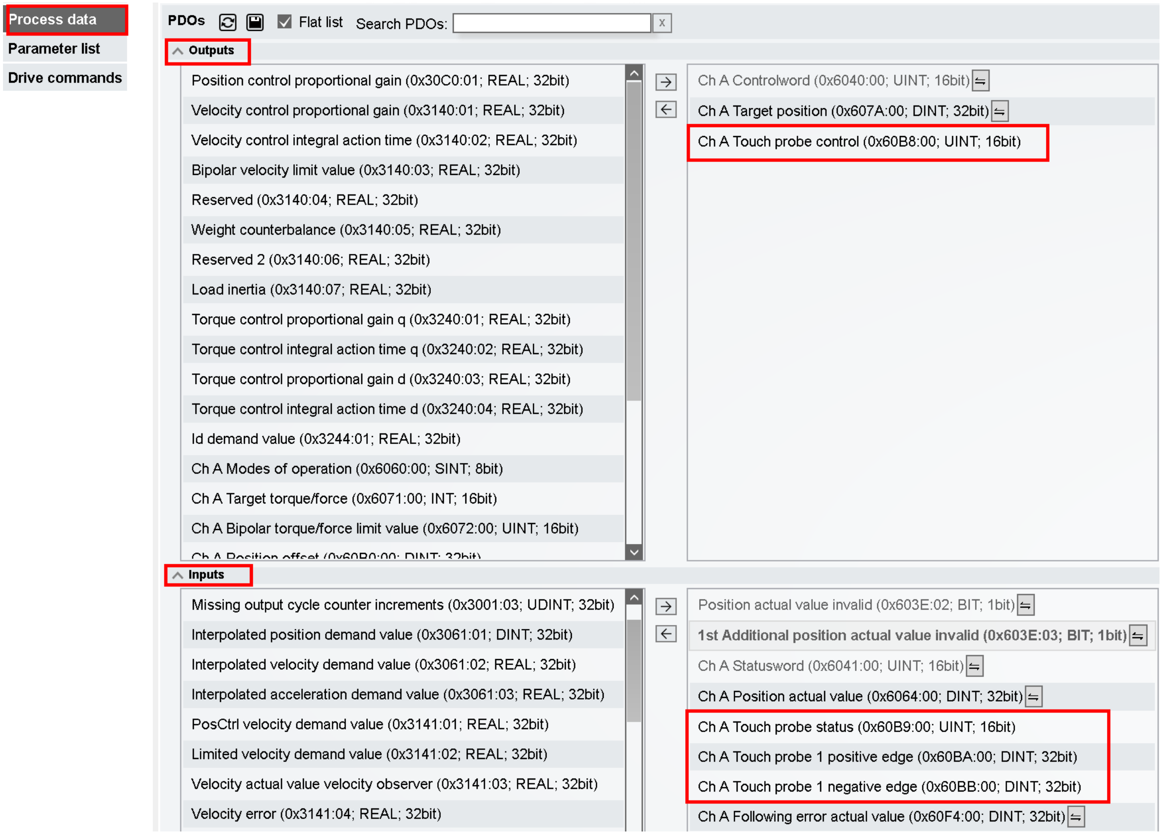


Fig. 18: Cyclic command/actual value telegram for probing

Special features when using the drive object 0x60D0

Some drives also offer the option of setting the trigger source for the latch event in the drive by means of drive object 0x60D0 subindex 1 or 2. This offers the option of using manufacturer- or drive-specific latch methods.

Using the drive object 0x60D0 requires a change in the control of the latch control word and a different evaluation of the latch status word.

To activate this special feature, assign the value “DRIVE_DEFINED” to the axis parameter P-AXIS-00702.

The latched values are transmitted in this case via the objects 0x60BA to 0x60BD in the cyclic process data.

Axis parameter

Assign the following entries in the axis parameter lists for EtherCAT drives:

- Select probing signal edge by P-AXIS-00518
- Select probing input used on the drive (Digital Input 1 or 2) by the parameter P-AXIS-00517
- When the drive object 0x60D0 is used to define the trigger source, set P-AXIS-00702 to “DRIVE_DEFINED“.

P-AXIS-00518 (old P-AXIS-00113)	Latch at positive or negative probing signal edge:	kenngr.measure.edge	POS / NEG
P-AXIS-00517 (old P-AXIS-00295)	Select the number of the digital probing input in the drive (1/2):	kenngr.measure.input	1 / 2
P-AXIS-00702	Define the trigger source in the drive using the drive object 0x60D0	antr.canopen.probing_trigger_source	“DEFAULT” | “CNC_DEFINED” | “DRIVE_DEFINED”

6.5 PROFIDRIVE

Drive parameters

In order to use the measurement function, the rapid digital input I0.0, or I0.X for a double-axis module, must be programmed.

1. The value 80 must then be assigned to the drive parameter P0660.
2. Connect the measuring probe to the digital input I0.0 or I0.X.

Axis parameters

For PROFIBUS drives, the following entries must be assigned in the axis parameter lists:

P-AXIS-00518 (old P-AXIS-00113)	Latch at positive or negative probing signal edge: kenngr.measure.edge POS / NEG

7 Measured value detection in the CNC

For special applications or if the drive hardware used provides no latch function, the measured value can be detected in the CNC.

7.1 Measuring probe signal via PLC interface

CNC – PLC

The status of the measuring probe signal is then transmitted to the CNC via the PLC interface; the CNC assumes edge evaluation and measured value detection. The task of the PLC is to read in the measuring probe signal and supply the signal to the PLC interface. See also [Axis control commands].

The measured value is the actual value at the time of occurrence of the probing signal.

Axis parameters

To activate this function, assign the value PLC to the axis parameter Measurement methods (P-AXIS-00516). Therefore, this parameter permits switchover only between probing signal detection modes via the drive or via probing signal detection via the PLC.

Notice

The accuracy of the measured values detected is dependent on the cycle time of the CNC and the PLC: The accuracy of the measured values detected in the drive is generally more precise since the position controller or the speed controller cycle time in the drive are used to evaluate the measured values.

7.2 Probing with switchable probe and measured value detection in the drive

Release Note

Function available as of V3.1.3080.05.

Basics

If a measuring probe is used that can be activated/deactivated when no measurement run is executed, the external measuring interface between the CNC and the PLC is used. (see Measure with external measuring hardware [▹ 47]).

The CNC informs the PLC of the start and end of a measurement run so that the PLC can activate or deactivate the measuring hardware accordingly.

A possible application is the use of radio probes to save power. Since it may take a few seconds to enable the probe, it is recommended to prepare a measurement run using #MEAS PREPARE [AXNR = ..]. This allows the user to actuate the probe early so that there is no stopping at the start of the measurement run. The user is responsible for programming the #MEAS PREPARE command in good time. If a reset is executed between preparation and the actual measuring block, the probe is enabled as normal at the start of the measuring block.

Notice

If homing is executed with one of the prepared axes before a measurement run is started, the preparation of all axes is reset. The same occurs when an axis prepared for a measurement run is exchanged from the channel. At the end of the program, all axes prepared for a measurement run are also reset.

CNC – PLC

The workflow from the CNC's point of view is as follows:

The interface between the CNC and the PLC is used to signal the initialisation, the start and the end of a measurement run. The probe can then be prepared, enabled or disabled.

The CNC writes each task (HLI_EXT_LATCH_PREPARE_PROBE, HLI_EXT_LATCH_ENABLE_PROBE, HLI_EXT_LATCH_DISABLE_PROBE) with the required parameter number of the probing input and the relevant edge to the interface and sets please_rw = TRUE.

Notice

The interpolator does not move to the measuring block until the PLC acknowledges that probe preparation is completed.

The workflow from the PLC's point of view is as follows:

After the task "HLI_EXT_LATCH_PREPARE_PROBE" is received, please_rw is set to FALSE. When the probe is enabled, the PLC signals this to the CNC with done_w = TRUE.

Please note that the SPS must always acknowledge these tasks. At the start of the measuring block the task “HLI_EXT_LATCH_ENABLE_PROBE“ must be acknowledged. After the measurement run is completed, the CNC again informs the PLC with the task "HLI_EXT_LATCH_DISABLE_PROBE"; this task must again be acknowledged by the PLC.

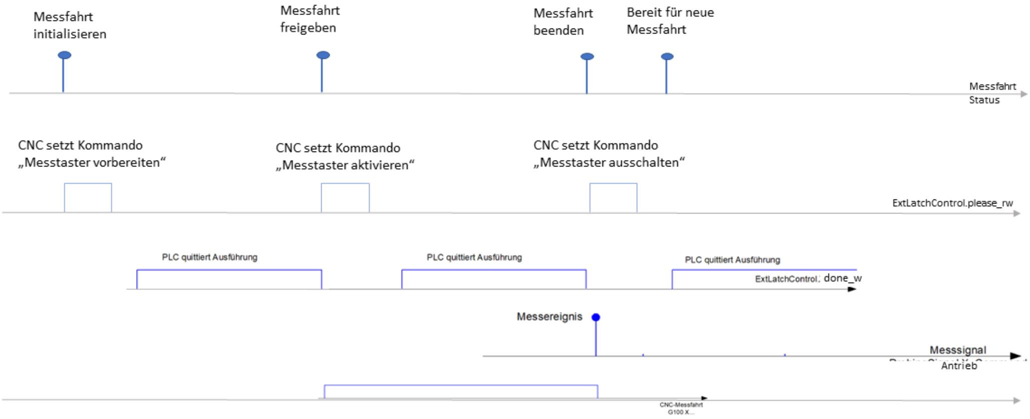


Fig. 19: Signal profile of the radio measuring button

Notice

Before a new measurement run starts, the system waits until the PLC acknowledges the task “HLI_EXT_LATCH_DISABLE_PROBE“.

For more information on the interface structure, refer to the HLI documentation. (see Measure with external measuring hardware [▸ 47]).

CNC – DRIVE

Depending on the drive type, the drive must be configured in the drive hardware as described in “Section: Measured value detection”.

Depending on the drive, the measured position is transmitted via the drive interface to the CNC.

Axis parameter

The following axis parameters are required for measuring with the CNC-PLC interface:

P-AXIS-00516 [▸ 57]	Select measurement method: kenngr.measure.signal EXT_PROBE_WITH_DRIVE
P-AXIS-00517 [▸ 58]	Number of the probing input used kenngr.measure.input 1 or 2
P-AXIS-00518 [▸ 59]	Relevant measuring edge:

	kenngr.measure.edge	POS or NEG

Alternatively, the measuring interface can also be enabled in the NC program by the #MEAS command (see [PROG//Extended programming]).

7.3 Measurement run to fixed stop

Detection of fixed stop

When measuring by motion to a fixed stop, the measuring event used is the detection of a mechanical stop against which the measuring axis moves.

Several criteria, also combined, can be used to detect the fixed stop:

- Overshooting a predefined position lag during the measuring movement.
- Undershooting a minimum actual speed of the axis during the measurement movement.

Default setting

When a measurement run is executed with Moving to a fixed stop, torque limitation must be activated in all drives involved and any drive-based position lag error monitor must be disabled.

Measurement on the path

The measurement run ends as soon as the fixed stop is detected in one of the axes involved in the measurement run.

Process

When measuring by Moving to a fixed stop, an axis movement is automatically generated after the fixed stop is detected, during which the axes involved in the measurement run are moved to the latched measuring position in each case. This relieves mechanical stresses accumulated when the axis is pressed against the fixed stop.

Measurement with gantry axes

With gantry systems (soft and hard gantry), the master axis is always used for measuring. During the measurement run, the slave axes also move. For this reason, torque limitation must also be activated and position lag monitoring disabled for motions to a fixed stop in slave axis drives.

Notice

On TwinCAT systems, torque limitation or position lag monitoring disable in the drives can be alternatively enabled in the PLC (via ADS) instead of the NC program (#IDENT...).

Channel parameters

The following entries must be assigned in the channel parameter list:

P-CHAN-00057	Measurement type 7 for measurement by moving to a fixed stop: messtyp 7
P-CHAN-00266	Error response with measurement type 7 meas_fixed_stop_no_error e.g. with value 1

Select measurement type in the NC program

Alternatively, the measurement type can be changed in the NC program by the command #MEAS MODE[7].

Parameterisation of fixed stop detection

Several criteria, also combined, can be used to detect the fixed stop:

- Overshooting a predefined position lag during the measuring movement.
- Undershooting a minimum actual speed of the axis during the measurement movement.

The active criteria in each case must be fulfilled for a certain period before the fixed stop is considered to be detected.

In addition, a minimum path distance can be specified until fixed stop detection is activated in the measurement motion block. This can be specified as an absolute value or as a percentage based on the length of the measurement motion block.

If the minimum path distance is specified both as an absolute value and as a percentage, the smaller of the two values is used to activate fixed stop detection.

The minimum value of all axes is used for activation in the case of a measurement run with several axes.

By default, fixed stop detection is activated immediately at the beginning of the block.

Axis parameters

The following entries must be assigned in the axis parameter lists:

P-AXIS-00516 (Previous P-AXIS-00330)	Select the Fixed Stop probing signal source: kenngr.measure.signal FIXED_STOP
P-AXIS-00774 [▸ 62] (Previous P-AXIS-00331 [▸ 65])	Position lag limit for fixed stop detection with Measuring travel on fixed stop
P-AXIS-00775 [▸ 62] (Previous P-AXIS-00332 [▸ 66])	Minimum time for fixed stop detection with Measuring travel to fixed stop
P-AXIS-00776 [▸ 63]	Minimum path to activate fixed stop detection with Measuring travel to fixed stop
ID 51026 [▸ 64]	Minimum distance to activate fixed stop detection with Measuring travel to fixed stop, specified in per mil of block length
P-AXIS-00778 [▸ 65]	Maximum permitted position change during fixed stop detection with Measuring travel to fixed stop

Sequence of measurement run

Measurement by Moving to a fixed stop can be represented by the example of SERCOS drives as shown in the process below [▸ 44] .

7.3.1 Example for SERVOS drive

NC program (user):

1. Reduce bipolar torque limit S-0-0092 for all drives involved in the measurement run (e.g. by the NC command #IDENT WR SYN).
2. Disable position lag monitoring in the drives:
   Ident S-0-0159 = 0
3. Start measurement run (G100).

CNC:

1. Disable position lag monitoring in the position controller for all axes involved in the measurement run.
2. Start of measurement run
3. Adoption of the actual position as a measured value as soon as the parameterised conditions for fixed stop detection are fulfilled. On gantry systems, only the master axis is monitored.
4. Reduce interpolation to measured value by axis position lag.
5. Enable position lag monitoring in the position controller.

NC program (user):

1. Move away from fixed stop (e.g. G01).
2. Enable position lag monitoring in the drives (set S-0-0159 to original value).
3. NC program: Disable torque limiting in the drives (set S-0-0092 to original value).

Programing Example

Measurement run to fixed stop with a gantry system (Soft Gantry):

```
%Meas_fixed_stop

; enable SoftGantry
N010 G0 X100 X2=0
N020 #SET AX LINK[1,[X2=X,G,15,20]]
N030 #ENABLE AX LINK[1]

; read values from drives
N040 #IDENT RD     [AXNR 1 ID S-0-0092 P=P1092   TYP 2 DEC 0 SERC]
N050 #IDENT RD     [AXNR 1 ID S-0-0159 P=P1159  TYP 4 DEC 0 SERC]
N060 #IDENT RD     [AXNR 4 ID S-0-0092 P=P2092   TYP 2 DEC 0 SERC]
N070 #IDENT RD     [AXNR 4 ID S-0-0159 P=P2159  TYP 4 DEC 0 SERC]

; enable torque limiting
N080 #IDENT WR SYN [AXNR 1 ID S-0-0092 VAL=100 TYP 2 DEC 0 SERC]
N090 #IDENT WR SYN [AXNR 4 ID S-0-0092 VAL=100 TYP 2 DEC 0 SERC]

; disable position lag monitoring in drives
N100 #IDENT WR SYN [AXNR 1 ID S-0-0159 VAL=0   TYP 4 DEC 0 SERC]
N110 #IDENT WR SYN [AXNR 4 ID S-0-0159 VAL=0   TYP 4 DEC 0 SERC]

; start measurement run
N120 G100 X1000 Y1000 Z1000 Z2=1000 F1000

; move away from fixed stop
N130 G01 X100 F1000

; re-enable position lag monitoring
N140 #IDENT WR SYN [AXNR 1 ID S-0-0159 VAL=P1159 TYP 4 DEC 0 SERC]
N150 #IDENT WR SYN [AXNR 4 ID S-0-0159 VAL=P2159 TYP 4 DEC 0 SERC]

; disable torque limiting
N160 #IDENT WR SYN [AXNR 1 ID S-0-0092 VAL=P1092  TYP 2 DEC 0 SERC]
N170 #IDENT WR SYN [AXNR 4 ID S-0-0092 VAL=P2092  TYP 2 DEC 0 SERC]

N180 M30
```

7.3.2 Example for CANopen drive

The following axis parameters are required in order to use #DRIVE commands:

```
antr.function[0].id                     MON_WINDOW
antr.function[0].wr_ident[0]            6065_00
antr.function[0].commu                  ACYCLIC
antr.function[0].data_type              UNS32
antr.function[0].mask                   NOT_USED
antr.function[0].scaling_type           UNSCALED
antr.function[0].scaling_factor         1.0
antr.function[0].min_limit              0.0
antr.function[0].max_limit              4294967295


antr.function[1].id                     TORQUE_LIMIT
antr.function[1].wr_ident[0]            6072_00
antr.function[1].commu                  ACYCLIC
antr.function[1].data_type              UNS16
antr.function[1].mask                   NOT_USED
antr.function[1].scaling_type           LINEAR
antr.function[1].scaling_factor         10.0
```

For more details on how to use the #DRIVE command, see [FCT-A10// Parameterising the DRIVE command].

Programing Example

Measurement run with CANopen drive

```
%Meas_fixed_stop
N010 #MEAS MODE [7]
;
N020 G0 Z100
; enable torque limiting
N030 #DRIVE WR SYN [AX=Z KEY=TORQUE_LIMIT VAL=10 WAIT]
; disable position lag monitoring in drive
N040 #DRIVE WR SYN [AX=Z KEY=MON_WINDOW VAL=4294967295 WAIT]
; start measurement run
N050 G100 Z1000 F100
; move away from fixed stop
N060 G01 Z100 F1000
; re-enable position lag monitoring
N070 #DRIVE WR SYN [AX=Z KEY=MON_WINDOW VAL=1048575 WAIT]
; disable torque limiting
N080 #DRIVE WR SYN [AX=Z KEY=TORQUE_LIMIT VAL=5000 WAIT]
;
N090 M30
```

7.4 Measure with external measuring hardware

Basics

If the control of an external measuring hardware required for the measurement run, the external measurement interface between the CNC and the PLC can be used. The CNC informs the PLC of the start and end of a measurement run so that the PLC can enable and disable the measuring hardware accordingly.

CNC – PLC

At the start of a measurement run, the CNC writes the task ‘Enable probe” containing the required parameter number of the probing input and the relevant edge in the interface and ‘Enable probe” and sets please_rw = TRUE.

After reading (please_rw = FALSE) and enabling the measuring hardware, the PLC acknowledges the task with done_w = TRUE). Accordingly, if the position latch is successful or aborted, the CNC signals the end of the measurement run with a CNC reset. Please note that the PLC must always acknowledge these tasks.

For more information on the interface structure, refer to the HLI documentation ([HLI]).

After the probing event occurs, the PLC writes the detected probing position to the probing_position control unit and then signals the probing event to the control unit probing_signal (see [HLI// Control commands of an axis]).

Notice

When the external measuring interface is used, the measurement signal of the probing_signal [▶ 66] control unit is not dependent on the relevant measuring edge P-AXIS-00518. A positive edge always signals the successful detection of a measured value in the external measuring hardware.

Notice

If the probing_signal [▶ 66] control unit is not enabled when the probing event occurs, the actual value at the time the probing signal occurs is used.

Axis parameter

The following axis parameters are required for measuring with the CNC-PLC interface:

P-AXIS-00516	Select the external measurement interface: kenngr.measure.signal PLC_EXT_LATCH_CONTROL
P-AXIS-00517	Number of the probing input used kenngr.measure.input 4
P-AXIS-00518	Relevant measuring edge: kenngr.measure.edge NEG

Alternatively, the measuring interface can also be enabled in the NC program by the #MEAS command (see [PROG//Extended programming]).

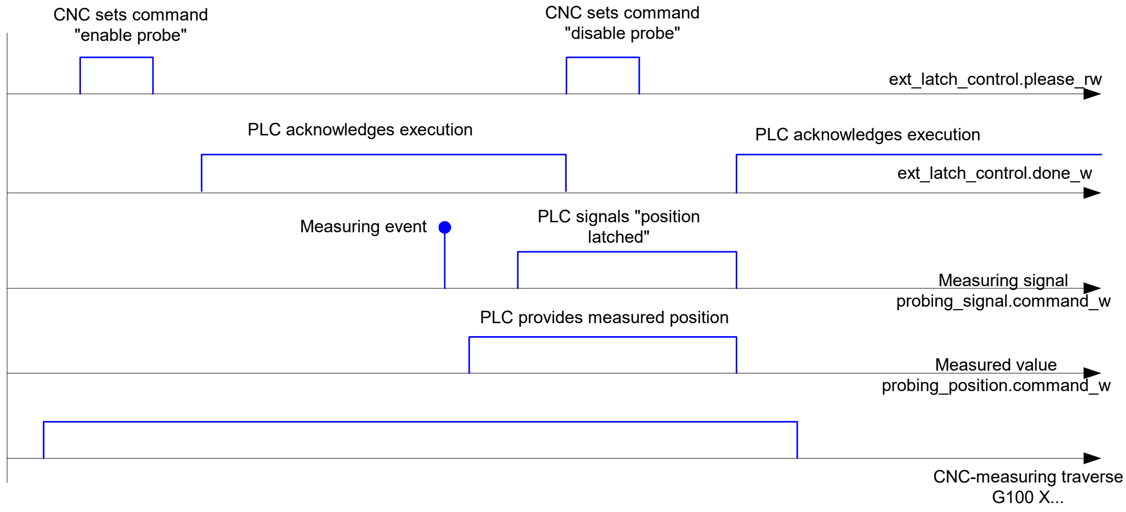


Fig. 20: Time sequence of a measurement run with the external measuring interface

7.5 Measuring with Distributed Clocks Timestamp

The function Measuring with Distributed Clocks Timestamp is available as of Build V3.01.3079.28.
For example, the function can be used if a drive itself does not have a fast measuring input.

The function uses the technology of distributed clocks to calculate back the exact position of the drive when a measurement event occurs via the timestamp of a digital input terminal. The measuring signal is evaluated in the digital input terminal. The state and timestamp of the terminal are transferred to the CNC via the PLC interface.

The following steps must be carried out besides the basic settings [▸ 10] to use the function:

Set the probing signal source:

Use the parameter P-AXIS-00516 [▸ 57]

```
kenngr.measure.signal          PLC_TIMESTAMP
```

Or the NC command

```
#MEAS [ AXNR=xx SIGNAL=PLC_TIMESTAMP]
```

Linking the digital input terminal to the PLC:

The state and the latched timestamp must be transferred via the PLC interface to the CNC using appropriate control units.

The state of the digital input terminal is transferred via the measuring signal control unit [▷ 66] to the CNC.

Transfers the latched timestamp to the CNC is transferred via the timestamp time stamp [▷ 67].

The parameters of the digital input terminal must be linked to the control units accordingly.

Example

Example using an EL1252 terminal

The probe is connected to Channel 2 of the EL1252 terminal. Axis 2 performs the measurements. When the measuring signal is received, a rising edge is registered in the "Input" parameter of the EL1252. This must be forwarded to the CNC via the measuring signal control unit [▷ 66]. The latched timestamp is stored in “LatchPos2” and must be notified to the CNC by the timestamp control unit [▷ 67].

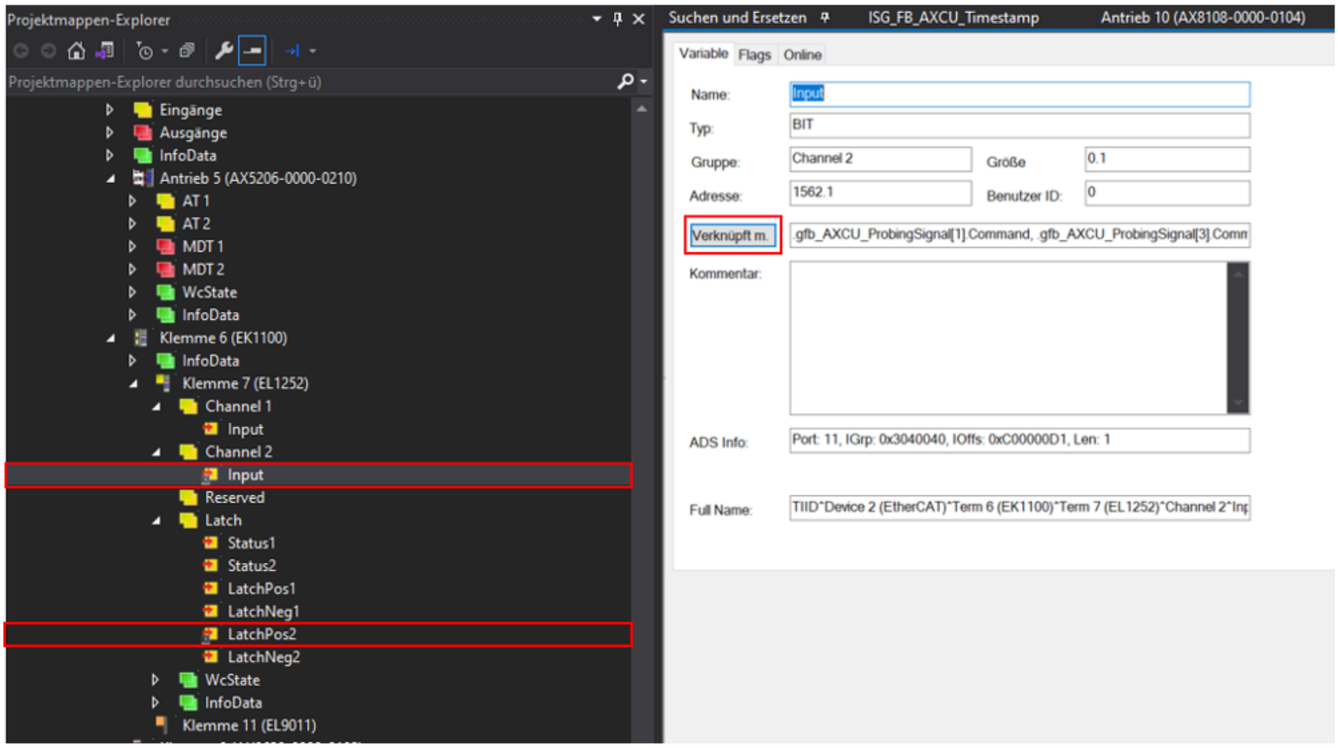


Fig. 21: Linking the input and LatchPos2

8 Parameter

8.1 Overview

ID	Parameter	Description
P-CHAN-00057	messtyp	Setting the default measurement type
P-CHAN-00097	use_drive_curr_limit	Valid deceleration ramp at feedhold
P-CHAN-00176	meas_error_no_signal	Error reaction with measurement type 1
P-CHAN-00214	meas_deceleration_mode	Active delay with measuring signal
P-CHAN-00266	meas_fixed_stop_no_error	Error response with measurement type 7
P-CHAN-00296	meas_use_std_dynamic	Active dynamic for measurement run

ID	Parameter	Description
P-AXIS-00060	echtzeit_bit_nr	Number of real-time bit used for SERCOS drives
P-AXIS-00086	hub_messtaster	Measuring probe stroke
P-AXIS-00118	messachse	Axis can be used as measurement axis.
P-AXIS-00215	vb_messen	Measurement feed rate in accordance with measurement type 2
P-AXIS-00467	probing_offset	Permitted path after target point
P-AXIS-00516	measure.signal	Measurement methods
P-AXIS-00517	measure.input	Number of probing input
P-AXIS-00518	measure.edge	Relevant measuring edge
P-AXIS-00774	kenngr.measure. fixed_stop_detect. pos_lag_limit	Position lag limit for fixed stop detection with Measuring travel to fixed stop
P-AXIS-00775	kenngr.measure. fixed_stop_detect. min_time	Minimum time in µs for fixed stop detection with Measuring travel to fixed stop
P-AXIS-00776	kenngr.measure. fixed_stop_detect. start_distance	Minimum path to activate fixed stop detection with Measuring travel to fixed stop
P-AXIS-00777	kenngr.measure. fixed_stop_detect. start_distance_per_mille	Minimum distance to activate fixed stop detection with Measuring travel to fixed stop, specified in per mil of block length
P-AXIS-00778	kenngr.measure. fixed_stop_detect. max_delta_position_window	Maximum permitted position change during fixed stop detection with Measuring travel to fixed stop
Old parameter up to CNC Build V.2.11.28XX.YY (available for downward compatibility)		
P-AXIS-00331	fixed_stop_pos_lag_limit	Position lag limit
P-AXIS-00332	fixed_stop_nbr_cycles	Number of position control cycles
Old parameter up to CNC Build V.2.11.2019.14 (available for downward compatibility)		
P-AXIS-00113	mess_neg_flanke	Probing signal edge
P-AXIS-00115	mess_signal_achs_steuer	Consider external probing signals
P-AXIS-00116	mess_signal_sercos	Read in the probing signal with SERCOS
P-AXIS-00117	mess_signal_taster	Measuring probe signal via hardware interface
P-AXIS-00257	probing_signal_via_plc	Measured value detection in the CNC
P-AXIS-00330	meas_signal_fixed_stop	Measurement with motion to a fixed stop

8.2 Description

8.2.1 Channel parameters

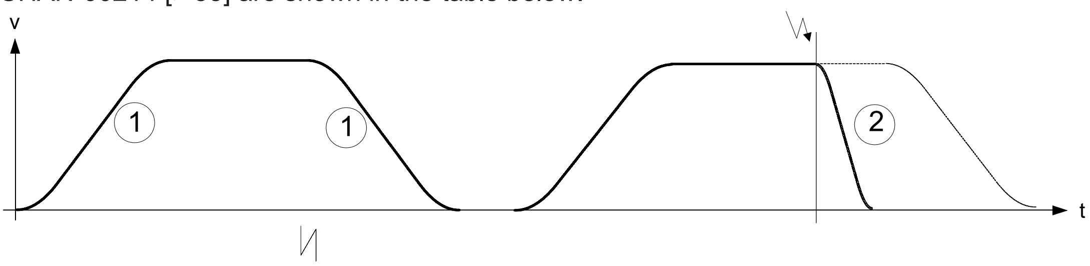
P-CHAN-00057	**Predefine measurement type**
Description	Seven different measurement types are available. This element sets the required measurement type.
Parameter	messtyp
Data type	UNS16
Data range	1*: Measurement travel with at least one axis, Measurement feed programmable by F word. 2*: Measurement travel with exactly one axis. Measurement feed is specified in the axis data list. 3: Measurement travel with at least one axis, Measurement feed programmable by F word, optionally continue motion up to the target point. 4: Measurement travel only with the maximum of 3 main axes, Measurement feed programmable by F word. 5: Interruptible measurement travel with at least one axis, Measurement feed programmable by F word. 6: Interruptible measurement travel with at least one SERCOS axis, Measurement feed programmable by F word. 7*: Measurement travel (G100) by moving to a fixed stop with at least one axis, Measurement feed programmable by F word.
Dimension	----
Default value	1
Remarks	* for these measurement types a measurement travel is also possible with independent axes. This measurement type can be changed at any time in the NC program with #MEAS MODE or #MEAS [TYPE..]. Further information is described in detail in [PROG]. Parameterisation example: Select measurement type 3 for a measurement travel with two axes and then continue motion up to the programmed target point. *Measurement type 3*

P-CHAN-00097	Valid deceleration ramp at FEEDHOLD
Description	This parameter defines the deceleration ramp used when FEEDHOLD is active. When P-CHAN-00097 is set, the parameterised delay is dependent on the slope used. With a linear slope, the delay is defined by P-AXIS-00024; if the slop is non-linear, it is defined by P-AXIS-00053 and P-AXIS-00081.
Parameter	use_drive_curr_limit
Data type	BOOLEAN
Data range	0: When FEEDHOLD is set, deceleration takes place using the currently valid deceleration rate. 1: When FEEDHOLD is set, deceleration takes place using the parameterised delay depending on the slope used. If these two parameters are not set, deceleration takes place at the currently valid deceleration rate (P-AXIS-00004).
Dimension	----
Default value	0
Remarks	

P-CHAN-00176	Error reaction with measurement type 1
Description	With measurement type 1, this parameter can influence the error reaction when the measurement signal is missing from the measurement block.
Parameter	meas_error_no_signal
Data type	BOOLEAN
Data range	0: No output of an error message if no measurement signal is received (default). 1: Output of an error message if no measurement signal is received.
Dimension	----
Default value	0
Remarks	Parameterisation example: *meas_error_no_signal 1*

P-CHAN-00214	Active delay with measurement signal
Description	In general, the effective feedhold deceleration is selected in all motion blocks by the channel parameter P-CHAN-00097 . The controller uses this deceleration to brake motion by default, even after the measurement signal is activated (e.g. measuring probe). Set the parameter to 1 if braking is required on activation of the measurement signal with rapid traverse deceleration.
Parameter	meas_deceleration_mode
Data type	UNS16
Data range	0: When the measurement signal is received, the motion is braked with feedhold deceleration (P-AXIS-00053 for non-linear slope) (default). 1: When the measurement signal is received, the motion is braked with rapid traverse deceleration (P-AXIS-00004 for non-linear slope).
Dimension	----
Default value	0
Remarks	Parameterisation example: *meas_deceleration_mode 1*

P-CHAN-00266	Error reaction with measurement type 7
Description	With measurement type 7 (measuring with motion to fixed stop), this parameter influences the error response when the fixed stop is not detected in the measurement block. If no error message is output when the fixed stop is not found, the CNC still goes to the position of the current axis actual value at the end of the measurement travel in order to eliminate a possible position lag (e.g. if the specified position lag is not reached completely).
Parameter	meas_fixed_stop_no_error
Data type	BOOLEAN
Data range	0: Output of an error message if the fixed stop is not detected (default). 1: No output of an error message if the fixed stop is not detected.
Dimension	----
Default value	0
Remarks	Parameterisation example: *meas_fixed_stop_no_error 1*

P-CHAN-00296	Active dynamic for measurement run
Description	The measurement travel profile planning is executed based on G00 dynamic parameters. In general, this ensures that the system can stop the motion in good time if the probe deflection is limited. If the measurement travel profile planning must be executed with G01 values, set the parameter to 1. The deceleration ramp used when the measuring signal is received is always dependent on P-CHAN-00097 [▹ 54] and P-CHAN-00214 [▹ 55].
Parameter	meas_use_std_dynamic
Data type	BOOLEAN
Data range	0: The measurement travel profile planning is executed based on rapid traverse acceleration values (G00) dependent on P-CHAN-00097 [▹ 54] and P-CHAN-00214 [▹ 55] . The CNC functions for acceleration and ramp time weighting are not effective here. 1: The dynamics of the measurement travel is dependent on P-CHAN-00097 [▹ 54] and P-CHAN-00214 [▹ 55] and is executed based on the dynamics of feed blocks (G01). CNC functions for acceleration and ramp time weighting can be used here. The deceleration ramp used when the measurement signal is received is always a_feedh.
Dimension	----
Default value	0
Remarks	Parameterisation example: *meas_use_std_dynamic 1* The effective dynamics dependent on the parameters P-CHAN-00097 [▹ 54] and P-CHAN-00214 [▹ 55] are shown in the table below. 

8.2.2 Axis parameters

P-AXIS-00516	**Measurement methods**	
Description	The parameter defines the source of the probing signal during a measuring travel, e.g. the probing position can be latched in the drive or the probing signal can be provided by the PLC. This setting can also be changed in the NC program by the #MEAS command (see [PROG//Extended programming]. This parameter replaces the following old configuration parameters: • kenngr.mess_signal_taster (P-AXIS-00117) • kenngr.mess_signal_sercos (P-AXIS-00116) • kenngr.mess_signal_achs_steuer (P-AXIS-00115) • kenngr.probing_signal_via_plc (P-AXIS-00257) • kenngr.meas_signal_drive (P-AXIS-00269) • kenngr.meas_signal_fixed_stop (P-AXIS-00330)	
Parameter	kenngr.measure.signal	
Data type	STRING	
Data range	DRIVE_TYPE_DEFAULT PLC FIXED_STOP DRIVE PLC_EXT_LATCH_CONTROL PLC_FIRST_EVENT PLC_TIMESTAMP EXT_PROBE_WITH_DRIVE (as of V3.1.3080.05)	
Axis types	T, R, S	
Dimension	T: ----	R,S: ----
Default value	*	
Drive types	----	
Remarks	If the parameter P-AXIS-00516 is not defined, the measurement method resulting from previous parameters is used for backward compatibility reasons. * Note: The default value of variables is a blank string.	

<table>
<tr><th>P-AXIS-00517</th><th>Number of probing input</th></tr>
<tr><td>Description</td><td>The parameter defines the measuring channel which is used during a measurement travel. When the DRIVE measuring signal is set (see P-AXIS-00516) the selected measuring channel must also be parametrised in the drive (see FCT-C4 [▸ 4]]).
This parameter replaces the old setting antr.probing_input_nbr (P-AXIS-00430).</td></tr>
<tr><td>Parameter</td><td>kenngr.measure.input</td></tr>
<tr><td>Data type</td><td>UNS08</td></tr>
<tr><td>Data range</td><td>Valid probing inputs dependent on drive type and probing signal source (see table below):
<table>
<tr><th>Measurement methods
P-AXIS-00516</th><th>Drive type
P-AXIS-00020</th><th>Probing inputs</th></tr>
<tr><td>PLC_EXT_LATCH_CONTROL</td><td>all</td><td>1 to 255</td></tr>
<tr><td>EXT_PROBE_WITH_DRIVE</td><td>all</td><td>1 to 2</td></tr>
<tr><td rowspan="2">DRIVE</td><td>SERCOS
CANopen
PROFIDRIVE MC</td><td>1 to 2</td></tr>
<tr><td>Conventional
Beckhoff Lightbus
+-10V via Fieldbus
Real-time (RT)-Ethernet
CAN-Bus</td><td>1</td></tr>
</table></td></tr>
<tr><td>Axis types</td><td>T, R, S</td></tr>
<tr><td>Dimension</td><td>T: ----   R,S: ----</td></tr>
<tr><td>Default value</td><td>0 **</td></tr>
<tr><td>Drive types</td><td>----</td></tr>
<tr><td>Remarks</td><td>*All probing signals which are not listed in the table above do not use the parameter 'Input' for the probing input.
**If the parameter P-AXIS-00517 is not specified, the setting in P-AXIS-00430 is used for reasons of backward compatibility.</td></tr>
</table>

P-AXIS-00518	Probing signal edge	
Description	The axis parameter defines the edge of the probing signal which is used to latch the position value. The parameter replaces the setting kenngr.mess_neg_flanke (P-AXIS-00113).	
Parameter	kenngr.measure.edge	
Data type	STRING	
Data range	POS: Latching if positive measured signal edge NEG: Latching if negative measured signal edge	
Axis types	T, R, S	
Dimension	T: ----	R,S: ----
Default value	*	
Drive types	----	
Remarks	If the parameter P-AXIS-00518 is not specified, the setting in P-AXIS-00113is output. * Note: The default value of variables is a blank string.	

P-AXIS-00086	Probe stroke for measurement types 2 and 4	
Description	Some types of mechanical measuring probes have a limited stroke. After activating the probe, the axis continues to travel by the braking distance which is dependent on the axis speed and the allowed axis deceleration. In order to avoid damage to the probe, the maximum permitted stroke can be parametrised. This parameter is only effective for measurement types 2 and 4 (see P-CHAN-00057). When using these types, the measurement speed is limited in such a way that the braking distance is less than the probe stroke. If measurement speed correction is executed, a warning is output.	
Parameter	kenngr.hub_messtaster	
Data type	UNS32	
Data range	0 ≤ hub_messtaster ≤ MAX(UNS32)	
Axis types	T, R	
Dimension	T: 0.1 µm	R: 0.0001°
Default value	50000	
Drive types	----	
Remarks	A buffer exists between the interpolator and the position controller to calculate the parameters for feedforward control of axes. This results in a dead time between calculating a command value by the interpolator and its execution in the position controller. In the worst case, an error may occur during measurement travel because the interpolator, which monitors the stroke of the measuring probe, ignores the distance components in the buffer. This can be prevented by enlarging the actual measurement probe stroke.	

P-AXIS-00467	**Measurement travel offset for all measurement types**	
Description	The measurement travel offset defines how much further the axis is allowed to move past the programmed target position if the probe was not yet actuated and the target point is already reached. The parameter is not effective in measurement type 3 (see P-CHAN-00057with optional continue to the target point!	
Parameter	kenngr.probing_offset	
Data type	UNS32	
Data range	0 ≤ probing_offset ≤ MAX(UNS32)	
Axis types	T, R	
Dimension	T: 0.1 µm	R: 0.0001°
Default value	0	
Drive types	----	
Remarks	As of CNC Build **V2.11.2010.09** P-AXIS-00467 replaces the parameter P-AXIS-00114. For compatibility reasons, the parameter continues to be available, but it should not be used in new applications because it only has an influence on measurement travels with measurement type 2 (see P-CHAN-00057). The function of P-AXIS-00467 is more extensive; it can be used for all measurement types P-CHAN-00057 with the exception of measurement type 3 (optional continue motion up to the target point).	

P-AXIS-00118	**Define axis as measurement axis**	
Description	The parameter must be assigned to TRUE for all axes that participate in a measurement traverse.	
Parameter	kenngr.messachse	
Data type	BOOLEAN	
Data range	0/1	
Axis types	T, R	
Dimension	T: ----	R: ----
Default value	0	
Drive types	----	
Remarks		

P-AXIS-00215	Measurement speed for measurement type 2	
Description	Depending on the application, measurement travel does not take place with the programmed feed, but with the feed defined by this parameter.	
Parameter	kenngr.vb_messen	
Data type	UNS32	
Data range	1 ≤ vb_messen ≤ P-AXIS-00212	
Axis types	T, R	
Dimension	T: µm/s	R,S: 0.001°/s
Default value	16666	
Drive types	----	
Remarks	This parameter is only used for measurement type 2 [PROG], [[CHAN].	

P-AXIS-00060	SERCOS status/define control bit for measurement			
Description	This entry defines the real time state/control bits used for probing.			
Parameter	kenngr.echtzeit_bit_nr			
Data type	UNS08			
Data range	0 ≤ echtzeit_bit_nr ≤ 2 The real-time status and control bits are assigned according to the table below:			
	P-AXIS-00060	**Control bits**	**Status bits**	
		Measurement Enable	**measurement done**	**Measuring probe activated**
	0, no entry	1	P-AXIS-00106	2
	1	1	1	2
	2	2	2	1
Axis types	T, R			
Dimension	T: ----	R: ----		
Default value	0			
Drive types	SERCOS			
Remarks	It is recommended to set P-AXIS-00060 to either 1 or 2. The value 0 is only for backward compatibility with older version and requires additional settings (P-AXIS-00106). If P-AXIS-00060 is assigned 1 or 2, the entry in P-AXIS-00106 is not used.			

P-AXIS-00774	**Position lag limit for fixed stop detection when measuring travel on fixed stop**	
Description	This parameter defines the position lag that must be exceeded to detect a fixed stop when measuring on a fixed stop. When set to the value 0, the system check of the position lag to detect a fixed stop is deactivated. If this parameter has the value < 0 (default assignment), a check is made whether P-AXIS-00769 has the value > 0 and this is used if necessary. If P-AXIS-00769 is also < 0, the value of P-AXIS-00331 is used to detect the fixed stop.	
Parameter	kenngr.measure.fixed_stop_detect.pos_lag_limit	
Data type	SGN32	
Data range	MIN(SGN32) < P-AXIS-00774 < MAX(SGN32)	
Axis types	<T, R>	
Dimension	T: 0.1 µm	R: .1* 10- 4 °
Default value	-1	
Drive types	SERCOS, Terminal, Lightbus, Profidrive, CANopen*	
Remarks	*Delete axis types that do not apply! Parameter available as of CNC Build V2.11.2810.01 and higher	

P-AXIS-00775	**Minimum time for fixed stop detection when measuring travel to fixed stop**	
Description	This parameter defines the length of time that the test conditions for detection of the fixed stop must be fulfilled when measuring to fixed stop so that the fixed stop is considered to be detected. If this parameter has the value zero (default), the system checks whether P-AXIS-00770 has a value > 0 and, if so, this is used. If P-AXIS-00770 is also 0, the value of P-AXIS-00332 is used as the time limit for fixed stop detection.	
Parameter	kenngr.measure.fixed_stop_detect.min_time	
Data type	UNS32	
Data range	0 < P-AXIS-00775 < MAX(UNS32)	
Axis types	<T, R>	
Dimension	T: µs	R: µs
Default value	0	
Drive types	----	
Remarks	Parameter available as of CNC Build V2.11.2810.01 and higher	

P-AXIS-00776	**Minimum path to activate fixed stop detection with Measuring travel on fixed stop**	
Description	This parameter defines how far to travel in the measuring block before fixed stop detection is activated. The value specified is a distance within the measuring block. If the value is less than zero, a check is made to see whether the parameter P-AXIS-00771 has a value greater than or equal to zero and, if necessary, this is used; otherwise, the value zero is used for this parameter. A value of zero activates fixed stop detection immediately at the start of the block. If P-AXIS-00777 is parameterised at the same time, the smaller block motion path defined by the two parameters is used as the minimum path. When measuring with several axes, the smallest block motion path of all axes involved in the measurement is used as the minimum path.	
Parameter	kenngr.measure.fixed_stop_detect.start_distance	
Data type	SGN32	
Data range	MIN(SGN32) < P-AXIS-00776 < MAX(UNS32)	
Axis types	<T, R>	
Dimension	T: 0.1 µm	R: 10-4 °
Default value	0	
Drive types	----	
Remarks	Parameter available as of CNC Build V2.11.2810.01	

P-AXIS-00777	**Minimum path to activate fixed stop detection when measuring travel to fixed stop, specified in per mill of block length**	
Description	This parameter defines the distance per mill of the measuring block that must be travelled before fixed stop detection is activated. If the value is less than 0, the system checks whether P-AXIS-00772 has a value greater than or equal to zero and, if necessary, this is used; otherwise, fixed stop detection is activated at the start of the block. A value of zero activates fixed stop detection immediately at the start of the block. If P-AXIS-00776 is parameterised at the same time, the smaller block motion path defined by the two parameters is used as the minimum path. When measuring with several axes, the smallest block motion path of all axes involved in the measurement is used as the minimum path. The permitted maximum value is 1000. If this value is exceeded at controller start, the warning ID 110757 is output but the value is not automatically corrected. If the parameter is still greater than 1000 at the start of a measuring travel, the error message ID 51026 is output and the program is aborted.	
Parameter	kenngr.measure.fixed_stop_detect.start_distance_per_mille	
Data type	SGN16	
Data range	MIN(SGN16) < P-AXIS-00777 ≤ 1000	
Axis types	<T, R>	
Dimension	T: 0.1 %	R: 0.1 %
Default value	-1	
Drive types	----	
Remarks	If the error message ID 51026 is output at the start of a measuring travel and this parameter has a value less than 0, the value of the parameter P-AXIS-00772 must be checked. Parameter available as of CNC Build V2.11.2810.xx ??	

P-AXIS-00778	**Maximum permitted position change during fixed stop detection when measuring travel to fixed stop**	
Description	This parameter defines the maximum path which may be travelled in the time defined by P-AXIS-00775 to detect the fixed stop. Together with P-AXIS-00775 , an average velocity is defined but this may not be exceeded to detect the fixed stop. If the value is less than 0, the system checks whether P-AXIS-00773 has a value greater than or equal to zero and, if necessary, this is used; otherwise, velocity monitoring for fixed stop detection is deactivated.	
Parameter	kenngr.measure.fixed_stop_detect.max_delta_position_window	
Data type	SGN32	
Data range	MIN(SGN32) < P-AXIS-00778 ≤ MAX(UNS32)	
Axis types	<T, R>	
Dimension	T: 0.1 µ	R: 10e-4 °
Default value	-1	
Drive types	----	
Remarks	Parameter available as of CNC Build V2.11.2810.xx ??	

Old probing signal parameters (up to version V2.11.2810.01)

P-AXIS-00331	**Limit for position lag during movement to a fixed stop**	
Description	This parameter specifies the limit for the position lag. After exceeding this limit, the fixed stop is detected and the measuring position is taken over.	
Parameter	kenngr.fixed_stop_pos_lag_limit	
Data type	UNS32	
Data range	0 ≤ fixed_stop_pos_lag_limit ≤ MAX(UNS32)	
Axis types	T, R	
Dimension	T: 0.1 µm	R: 0.0001°
Default value	0	
Drive types	Conventional, SERCOS, Terminal, Lightbus, Profidrive, CANopen	
Remarks		

P-AXIS-00332	**Number of position control cycles during movement to a fixed stop**	
Description	This parameter defines the number of position control cycles for the waiting time after exceeding the specified position lag limit P-AXIS-00331 before the measured value is determined. If the limit is again exceeded after this time, counting starts from the beginning.	
Parameter	kenngr.fixed_stop_nbr_cycles	
Data type	UNS16	
Data range	0 < fixed_stop_nbr_cycles < MAX(UNS16)	
Axis types	T, R	
Dimension	T: Number of interpolation cycles	R: Number of interpolation cycles
Default value	0	
Drive types	Conventional, SERCOS, Terminal, Lightbus, Profidrive, CANopen	
Remarks		

8.2.3 PLC parameters

Probing signal	
Description	This control unit can transfer the probing signal. When this control unit is used, set the entry kenngr.measure.signal (P-AXIS-00516 [▸ 57]) to “PLC” or “PLC_TIMESTAMP” in the parameter list of the associated axis.
Data type	MC_CONTROL_BOOL_UNIT, see description of Control unit
Special features	Edge evaluation: Use the edge parameterised in the axis parameter list in the entry kenngr.mess_neg_flanke (P-AXIS-00518) [▸ 59] to accept the measured value.
Access	PLC reads request_r + state_r and writes command_w + enable_w
ST path	gpAx[*axis_idx*]^.lr_mc_control.**probing_signal**
Commanded, requested and return values	
ST element	**.command_w** **.request_r** **.state_r**
Data type	BOOL
Value range	[TRUE, FALSE]
Redirection	
ST element	.enable_w

Timestamp	
Description	This control unit transfers the timestamp of a digital input terminal to the CNC via the HLI.
Data type	MC_CONTROL_SGN64_UNIT, see description of Control unit
Access	PLC reads request_r + state_r and writes command_w + enable_w
ST path	gpAx[axis_idx]^.lr_mc_control.**timestamp**
Commanded, requested and return values	
ST element	**.command_w** **.request_r** **.state_r**
Data type	LINT
Unit	[ns]
Value range	[MIN_SGN64, MAX_SGN64]
Redirection	
ST element	.enable_w
Special features	If the timestamp is used for the function “Measure with distributed clocks timestamp”, the probing_signal control unit [▸ 66] must also be enabled. Available as of CNC Build V3.01.3079.28

8.2.4 Old probing signal parameters (up to version V2.11.2019.14)

P-AXIS-00113	**Pulse edge**	
Description	This parameter defines the measurement signal edge at which the actual value counter executes the latch point.	
Parameter	kenngr.mess_neg_flanke	
Data type	BOOLEAN	
Data range	0: Latch at positive edge of pulse 1: Latch at negative edge of pulse	
Axis types	T, R	
Dimension	T: ----	R: ----
Default value	0	
Drive types	----	
Remarks		

P-AXIS-00115	**Measurement signal via axis specific control bit mask**			
Description	To allow external measurement signals to be taken into account as well, one bit in the axis-specific control bit mask is treated as the measurement signal. This possibility is defined by this parameter.			
Parameter	kenngr.mess_signal_achs_steuer			
Data type	BOOLEAN			
Data range	0/1			
Axis types	T, R			
Dimension	T: ----	R: ----		
Default value	0			
Drive types	----			
Remarks		**Measurement method**		
		P-AXIS-00117 (mess_signal_taster)	P-AXIS-00116 (mess_signal_sercos)	P-AXIS-00115 (mess_signal_achs_steuer)
	Drive simulation	X	-	X
	Conventional drive interface	X	-	X
	SERCOS drive interface	X	X	X

P-AXIS-00116	**Measurement with SERCOS drives**	
Description	Measurement with SERCOS drives can be performed with two different methods. The flag defines the measurement signal to be read in via the SERCOS interface.	
Parameter	kenngr.mess_signal_sercos	
Data type	BOOLEAN	
Data range	0: Request from a measurement probe 1: Usage of measurement function supplied by the drive (SERCOS measurement)	
Axis types	T, R	
Dimension	T: ----	R: ----
Default value	0	
Drive types	SERCOS	
Remarks	For the measurement with SERCOS drives, the parameters P-AXIS-00060 or P-AXIS-00106 are also required.	

P-AXIS-00117	Measurement signal from hardware interface	
Description	This parameter selects the use of the NC kernel hardware interface.	
Parameter	kenngr.mess_signal_taster	
Data type	BOOLEAN	
Data range	0/1	
Axis types	T, R	
Dimension	T: ----	R: ----
Default value	0	
Drive types	----	
Remarks		

P-AXIS-00257	Measurement signal via HLI Control Unit	
Description	This parameter can determine that the probing signal is read from the HLI via the control unit PLC parameters [▶ 66] and not via the cyclical drive interface. The probing value is the actual value at the moment of the occurrence of the probing signal.	
Parameter	kenngr.probing_signal_via_plc	
Data type	BOOLEAN	
Data range	0/1	
Axis types	T, R	
Dimension	T: ----	R: ----
Default value	0	
Drive types	----	
Remarks	Due to the scanning of the probing signal in the cycle time of the PLC, the accuracy of the probed value is less than the accuracy achieved by using drive-internal probing latches.	

P-AXIS-00330	**Measurement with movement to a fixed stop**	
Description	This parameter enables the measurement signal source 'Fixed stop'.	
Parameter	kenngr.meas_signal_fixed_stop	
Data type	BOOLEAN	
Data range	0/1	
Axis types	T, R	
Dimension	T: ----	R: ----
Default value	0	
Drive types	Conventional, SERCOS, Terminal, Lightbus, Profidrive, CANopen	
Remarks	The user must ensure that, during movement to a fixed stop in the drives affected, a torque limitation is active and the velocity is low enough. All other measurement signal sources (e.g. P-AXIS-00116) must be deselected. For measurement with movement to a fixed stop, the parameters P-AXIS-00331 or P-AXIS-00332 are also required.	

9 Appendix

9.1 Suggestions, corrections and the latest documentation

Did you find any errors? Do you have any suggestions or constructive criticism? Then please contact us at documentation@isg-stuttgart.de.

The latest documentation is posted in our Online Help (DE/EN):

QR code link: https://www.isg-stuttgart.de/documentation-kernel/

The link above forwards you to:

https://www.isg-stuttgart.de/fileadmin/kernel/kernel-html/index.html

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Keyword index

A

F

P