

MTC200 Fast Signal Transferring 21 VRS

Functional Description

SYSTEM200

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Fast Signal Transferring
21 VRS

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1 Overview

1.1 Function and Application

- Function** "Fast signal transfer" allows real-time data transfer of digital drive signals via the NC to the PLC. The real time data can be transferred in 10 ms cycle of up to 8 axes.
- Application** For instance, the "Fast signal transmission" can be used to transmit the actual torque of a spindle cyclically to a tool break monitoring system via the PLC.

1.2 Selecting the Drive Signals

The following drive signals can be transmitted via the real-time channels:

- Actual torque with mean value generation
- Actual torque without mean value generation (S-0-0084)
- Actual position 1 (active encoder: S-0-0051 or S-0-0053, depending on axis parameter Cxx.060 "position encoder assignment")
- Actual position 2 (S-0-0053, only if an additional encoder is configured in the SERCOS drive telegram)
- Actual speed (S-0-0040)
- Set position (S-0-0047)
- Set speed (internal signal value of NC)

Mean value generation The actual torque can be smoothed by mean value generation.

1.3 Parameter Value Assignment

The parameter assignment of the transmission channels is executed using the machine data page 092 "Fast Signal Transferring".

1.4 Boundary Conditions

- The number of real-time transmission channels is limited to 8.
- One signal can be transmitted per axis.
- All signals are delivered as 32-bit double-word values with sign.

2 Parameter Value Assignment via Machine Data

2.1 Machine Data Page 092 "Fast Signal Transferring"

The parameter assignment of the real-time transmission channels is executed using the machine data page 092 "Fast Signal Transferring".

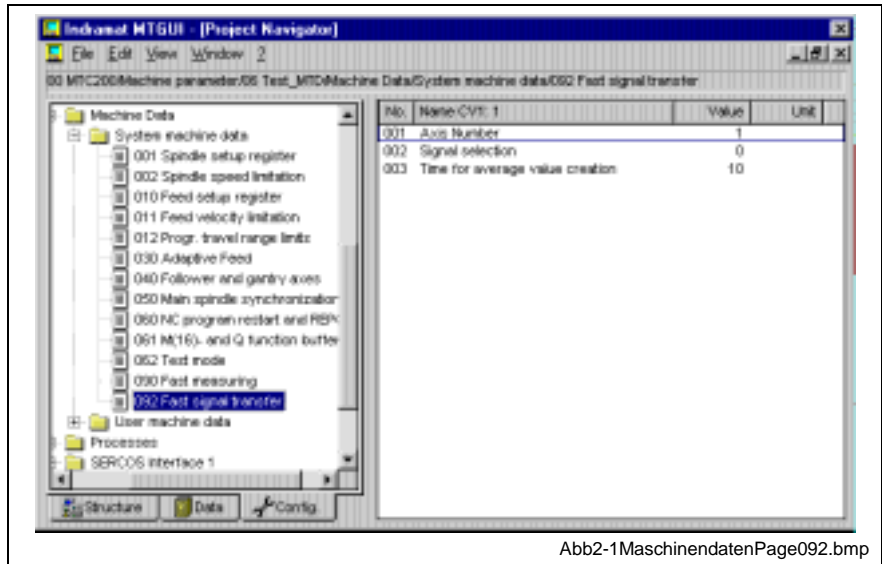


Fig. 2-1: System machine data with machine data Page 092

2.2 Selecting the Real-time transmission channels

Using the page run variable 1, the 8 transmission channels can be selected.

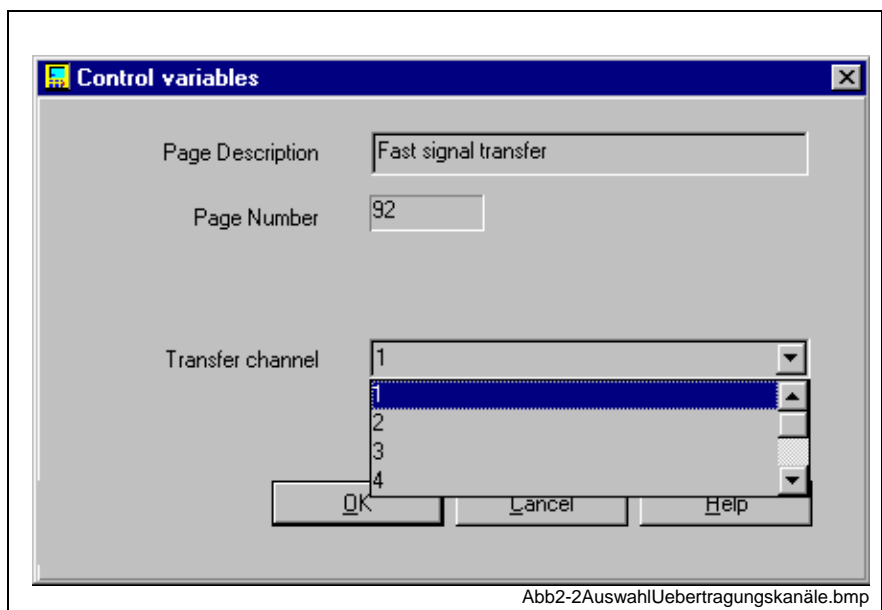


Fig. 2-2: Selecting the 8 transmission channels

2.3 Page Variables

The machine data page 092 "Fast signal transmission" is used to define the "Axis number", the "Signal selection" and the "Time base for average value" for each of the 8 transmission channels.

2.4 Axis Number

The "Axis number" defines the assignment of the real-time transmission channel to an axis. The same numbering (= SERCOS axis address) is used as in the control parameters. Value range: 0..32. The value 0 deactivates the corresponding transmission channel.

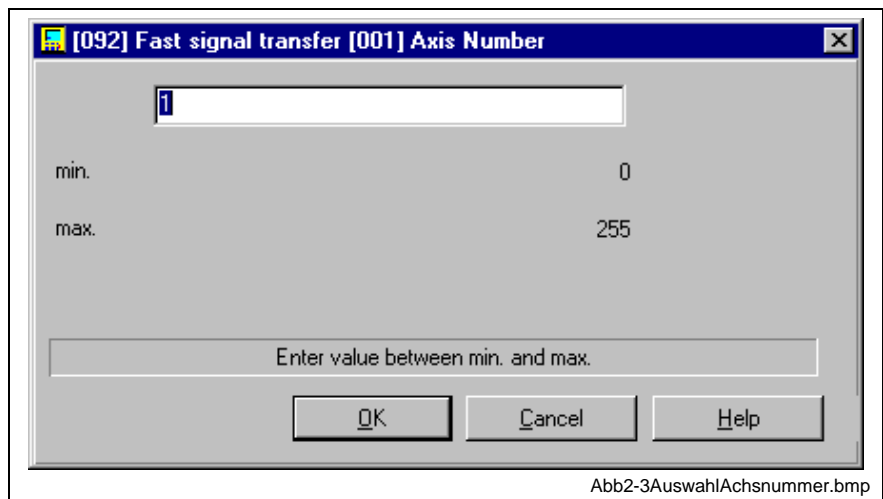


Fig. 2-3: Selection of axis numbers

2.5 Signal Selection

The "Signal selection" can be used to select the signal for the fast data transfer. Value range: 0..6.

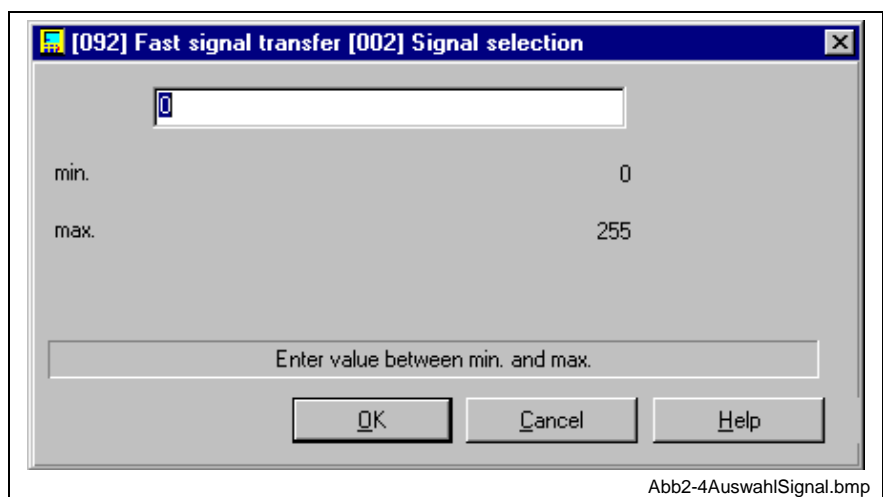


Fig. 2-4: Selection of signals

No.	Signal	Axis type	Unit	Standardization
0	Actual torque with mean value generation	Linear or rotary axis	%	10^2
1	Actual torque without mean value generation (S-0-0084)	Linear or rotary axis	%	10^1
2	Actual position 1 (S-0-0051 or S-0-0053)	Linear axis	mm	10^4
		Rotary axis	Degree	
3	Actual position 2 (S-0-0053, SERCOS DT)	Linear axis	mm	10^4
		Rotary axis	Degree	
4	Actual speed (S-0-0040)	Linear axis	m/min	10^6
		Rotary axis	rpm	10^4
5	Set position (S-0-0047)	Linear axis	mm	10^4
		Rotary axis	Degree	
6	Set speed (internal signal value)	Linear axis	m/min	10^6
		Rotary axis	rpm	10^4

Fig. 2-5: Selection of signals

- Actual torque** The actual torque can be transmitted with (signal selection 0) and without (signal selection 1) mean value generation. If the actual torque with mean value generation is preselected, the "Time base for average value" parameter must also be set to the desired value.
- Actual Position 1** The **actual position 1** corresponds to the encoder position which is used on the drive for controlling the position (motor encoder or external encoder).
- Actual Position 2** The **actual position 2** can only be used if a second encoder is connected to the drive, with the position of the encoder being also configured in the cyclic SERCOS drive telegram (DT). The second encoder of a digital drive can be activated via the AXD Ident number 65062 (P-7-3622):
0: only encoder 1 active
1: Additionally to encoder 1, encoder 2 is activated in the cyclic SERCOS telegram.

The standardization of signals (= number of decimal places) corresponds to the standardization in SERCOS.

Merely the standardization of signal 0 "Actual torque with mean value generation" deviates from that. Signal 0 is generated with two instead of one decimal place. In comparison to SERCOS torque standardization, the signal value is multiplied by a factor of 10.

2.6 Examples for Standardization of Signals

Signal	Axis type	Example signal value	Transmitted signal value
Torque with mean value generation	Linear or rotary axis	42.35 %	4235
Torque without mean value generation	Linear or rotary axis	80.5 %	805
Speed	Linear axis	-2.551687 m/min	-2551687
	Rotary axis	-8.3268 rpm	-83268
Position	Linear axis	15.7698 mm	157698
	Rotary axis	15.7698 degree	

Fig. 2-6: Examples for the standardization of signals

2.7 Time Base for Average Value

The “Time base for average value” parameter is only effective with a signal selection of 0 (averaged actual torque value). Value range: 0.0.1000 ms.

A value of 0 msec deactivates the mean value generation. If other parameter values are selected, the actual torque of the drive is added over the set time period and then divided by the value of the parameter “Time base for average value”.

Note: Internally, only time intervals of $[n * 10\text{ms}, n = 0, 1, 2\dots]$ are used for mean value generation. The set parameter is then rounded off to multiples of 10 msec.

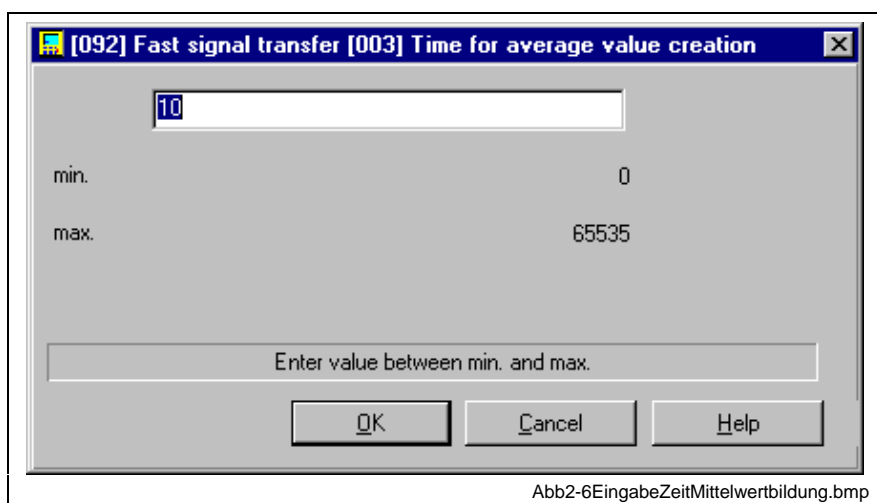


Fig. 2-7: Selection of times for mean value generation

3 Further Processing of the Signal Values in the PLC

3.1 FB „RT_DATA“ for Fast Signal Transferring

The signal values can be accessed in the PLC using the function block "RT_DATA".

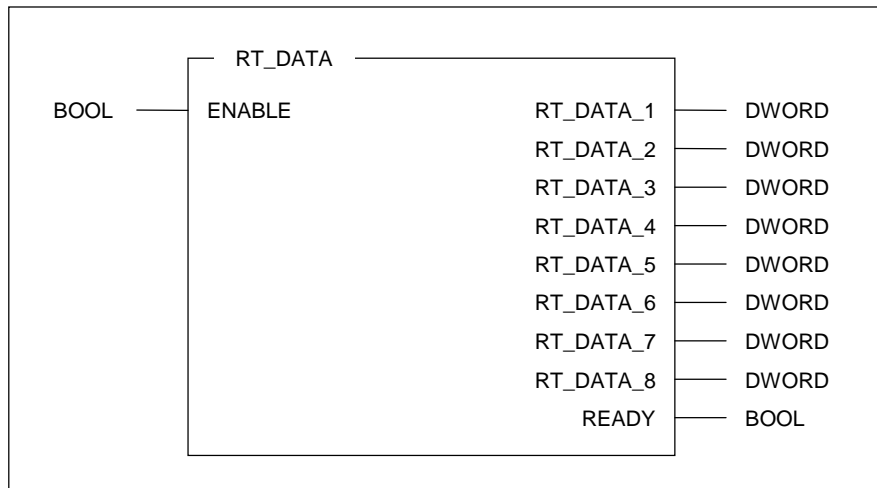


Fig. 3-1: FB „RT_DATA“ for fast transmission of signal values

ENABLE:	0 – FB not active 1 – Transferring of signal values
READY:	0 – Data transfer active or FB not active 1 – Data was transferred
RT_DATA1:	Signal value of the 1st channel
RT_DATA2:	Signal value of the 2nd channel
RT_DATA3:	Signal value of the 3rd channel
RT_DATA4:	Signal value of the 4th channel
RT_DATA5:	Signal value of the 5th channel
RT_DATA6:	Signal value of the 6th channel
RT_DATA7:	Signal value of the 7th channel
RT_DATA8:	Signal value of the 8th channel

3.2 Fast Transmission to the I/O Module

If the signal values are to be transmitted to an I/O module as fast as possible, the FB should be called in the corresponding fast PLC task with 2 or 4 msec cycle time.

Moreover, the fact that the signals in the NC are, in general, transmitted to the internal I/O interface at 10-msec intervals must be taken into consideration in the signal transmission. The further transmission from the I/O interface to the PLC I/O module is then implemented asynchronously to the 10-msec cycle. This results in a non-affectable jitter in the signal transmission, which is determined significantly by the cycle of the used fieldbus.

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- per e-Mail: **service@indramat.de**

Our service helpdesk at our headquarters in Lohr am Main, Germany can assist you in all kinds of inquiries. Contact us

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