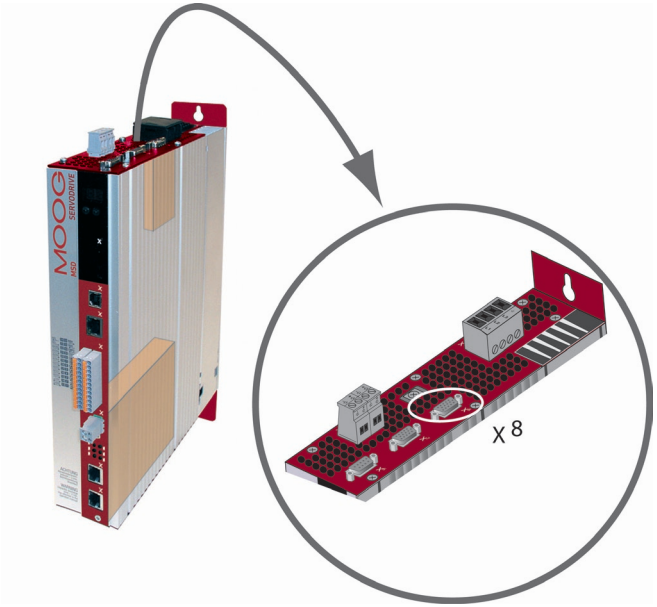

MSD Servo Drive

Specification

Option 2 - Technology

SSI Encoder simulation

Specification
Option 2 - Technology

SSI encoder simulation

ID No: CB08760-001, Rev. 1.3

Date: 04/2017

NOTE:
This document does not replace the MSD Servo Drive Operation Manual. Please be sure to observe the information contained in the “For your safety”, “Intended use” and “Responsibility” sections of the Operation Manual. For information on installation, setup and commissioning, and details of the warranted technical characteristics of the MSD Servo Drive series, refer to the additional documentation (Operation Manual, Device Help, etc.).

This documentation applies to:

Series	Model	Hardware version	Firmware version
MSD Servo Drive Single-Axis System	G392-xxxxx6xxxxx G395-xxx-x6xxxxx	from ...4.xxxx.0 from ...4.xxxx.0	from V2.15 / V201.07
MSD Servo Drive Multi-Axis System	G393-xxx-x6xxxxx G397-xxx-x6xxxxx	from ...4.xxxx.0	from V2.15 / V201.07
MSD Servo Drive Compact	not available	-	-

Table V.1 Applicability

Technical alterations reserved.

The contents of our documentation have been compiled with greatest care and in compliance with our present status of information.

Nevertheless we would like to point out that this document cannot always be updated parallel to the technical further development of our products.

Information and specifications may be changed at any time. For information on the latest version please refer to drives-support@moog.com.

Table of Contents

1 SSI Encoder Simulation

This document describes the SSI Encoder Simulation technology function of the MSD Servo Drive firmware and associated parameters, and provides information for commis-sioning.

ATTENTION:

For more information on safety, mechanical and electrical installation, pin assignments and parameter configuration refer to the MSD Servo Drive Operation Manual and user documentation.

1.1 Features

Using SSI Encoder Simulation, the current actual position of the drive controlled by the MSD Servo Drive can be read by a higher-level control system. The MSD Servo Drive then behaves like an SSI encoder in relation to the control. SSI Encoder Simulation uses the technolo-gy board slot (X8). The technology board is automatically detected.

- Parameterizable number of multi-turn and single-turn bits
- Binary transfer
- Clock rates between 200 kBit/s and 1500 kBit/s are supported
- Fastest possible cycle time: 125 µs
- Optional transfer with parity bit (Odd/Even)
- Optional synchronization of control to read cycle
- Display of synchronization status
- Encoder monoflop time: ~25 µs
- Clear parameter structure for quick and easy commissioning

1.2 Pin assignment of SSI Encoder Simulation

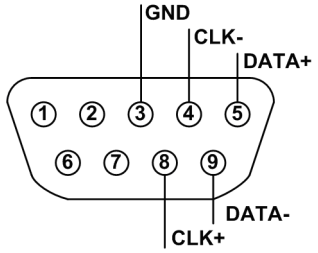

Bild 1.1 Pin assignment of SSI Encoder Simulation

Pin	Assignment
1	-
2	-
3	GND
4	CLK-
5	DATA+
6	-
7	-
8	CLK+
9	DATA-

Table 1.2 Pin assignment of SSI Encoder Simulation

2 Use of SSI Encoder Simulation

2.1 Enabling SSI Encoder Simulation

SSI Encoder Simulation is enabled as soon as parameter **TOPT_SSI_EncSimEnable (P 2800)** is set to 1. The parameter is located in the parameter group "Encoder > SSI Encoder simulation".

2.2 Parameter description for SSI Encoder Simulation

The parameters are in the parameter group "Encoder > SSI Encoder simulation", and all have the prefix "TOPT_SSI".

ID	Parameter	Unit	Access	Data type	Description	
2800	EncSimEnable		r/w	UInt16	Enable SSI Encoder Simulation	
2801	MultiT	Bit	r/w	UInt16	Number of multi-turn bits to transfer	
2802	SingleT	Bit	r/w	UInt16	Number of single-turn bits to transfer	
2803	Polarity		r/w	UInt16	No-load level of data line	
					False	Clock line resting at Low level
					True	Clock line resting at High level
2804	Phase		r/w	UInt16	Indicates the clock edge at which new data are set	
					False	Sets data on the leading edge
					True	Sets data on the following edge
2805	ParityEnable		r/w	UInt16	Enable the parity bit	
2806	ParityType		r/w	UInt16	ODD	Odd parity
					EVEN	Even parity
2807	SyncOffset	µs	r/w	Float32	Shift of synchronization signal to closed-loop control cycle	
2808	SyncUse		r/w	UInt32	Synchronization to read cycle	
2809	InSync		r	UInt32	False	MSD Servo Drive does not run synchronously with the read clock
					True	MSD Servo Drive has synchronized to the read cycle
2810	EncobsUse		r/w	UInt32	Enables transfer of an additional encoder monitoring bit	

Table 2.1 SSI Encoder Simulation parameters

2.3 Notes on parameterizing the SSI resolution

The MSD Servo Drive supports transfer of a total of 32 information bits which can be broken down in any way into single-turn and multi-turn information. When generating the position information, parameter **CON_PCON_ActPosition (P 0412)**, likewise presenting a 32-bit variable, is used as the data source. The 32 bits of this parameter can likewise be broken down into multi-turn and single-turn information. It is important in parameter setting that the SSI Encoder Simulation does not, for example, transfer more single-turn bits than correspond to the internal resolution, as they could otherwise not be filled with information. Parameter **MPRO_FG_PosNorm (P 0270)** defines this resolution. The default setting for this parameter is 1048576, corresponding to 2^20. So with default settings the MSD Servo Drive expects 12 multi-turn and 20 single-turn bits. In this case it would not make sense to transfer more than 12 multi-turn bits, as the number overflow would occur at the 12th bit, despite a higher parameter setting. Nor would it make sense to set the number of single-turn bits higher than 20 here, as in this case the additional bits are always filled with 0.

2.4 Parameterization of polarity and phase

Correct configuration of the polarity and phase is important for error-free operation of the SSI interface. The polarity setting is determined by the resting level of the SSI clock line. If the clock line rests at a Low level, parameter TOPT_SSI_Polarity (P 2803) should be set to False. True means the clock level rests at High level. The phase indicates when a new bit is placed on the data line and when the bit is then evaluated. If parameter TOPT_SSI_Phase (P 2804) is set to False, the data are always applied back to the resting level at the edge. If the setting is True, the data are applied away from the resting level at the edge.

Polarity	Phase	
False	False	
False	True	
True	False	
True	True	
Daten		

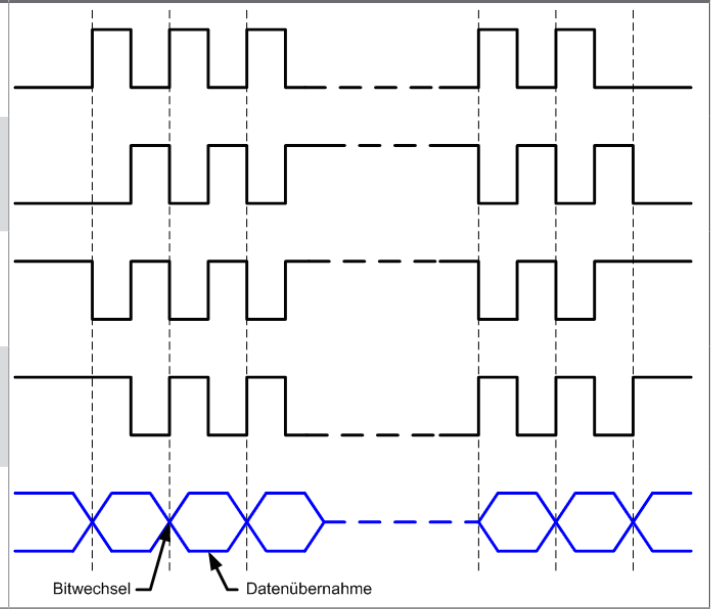

Table 2.2 Parameterization of polarity and phase

2.5 Suffixing a parity bit

A parity bit can optionally be suffixed after the user data. The parity bit is then transferred after the least significant bit (LSB). The parity bit is enabled by way of parameter TOPT_SSI_ParityEnable (P 2805). The parity can be set either as "odd" or "even". This can be selected by way of parameter TOPT_SSI_ParityType (P 2805).

2.6 Using synchronization

Where the SSI information is scanned at equidistant time intervals it is possible to synchronize the control cycle of the MSD Servo Drive to the scan cycle. The synchronization is executed to the first clock edge of a transfer. When using synchronized mode, it is important that the read cycle of the control system is an integer multiple of the speed control cycle. Synchronized scanning can be used to ensure that position values polled at the equidistant time intervals can be transferred to the higher-level control system. If multiple synchronized MSD Servo Drive units were scanned simultaneously, all actual position values would be generated at the same time.

Synchronization is enabled by way of parameter TOPT_SSI_SyncUse (P 2808). Parameter TOPT_SSI_InSync (P 2809) displays the synchronization status.

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The German version is the original of this Operation Manual.