

SoftMotion: DriveInterface: ServoStar

Last update: 04.12.2007

| | |
|--------------------|--|
| Hardware interface | CAN; must support 3S_CANdrv.lib |
| Supported drives | ServoStar600, ServoStar400 (Danaher Kollmorgen Seidel) |
| Runtimes | x86 |
| Author | Hilmar Panzer |
| Components | ServostarDrive.lib; 3S_CanDrv.lib; SM_CAN.lib; SysLibCallback.lib; SysLibFile.lib |
| Version | 1.9.4.0 |

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1 Parameters in PLC config

1.1 BusInterface

| | |
|----------|----------|
| wParam1 | Not used |
| wParam2 | Not used |
| dwParam1 | Not used |
| dwParam2 | Not used |

1.2 AxisGroup

| | |
|----------|--|
| wParam1 | CAN channel No (typically 0) |
| wParam2 | Baudrate in kBit (125, 250, 500, 1000) |
| wParam3 | SYNC generator: 0: PLC generates SYNC (only possible if PLC is highly precise); 2: SYNC device generates SYNC (additional hardware needed) |
| wParam4 | Not used |
| dwParam1 | Reserved |
| dwParam2 | Reserved |
| dwParam3 | Not used |
| dwParam4 | Reserved |

1.3 supported Drive.wControlType

| | | | | | | |
|----------|---------|---------|---------|-----------|---------|----------|
| T / - no | V/V yes | V/P yes | P/P yes | PV/PV yes | V/- yes | CONF yes |
|----------|---------|---------|---------|-----------|---------|----------|

The cyclically sent/received data can consist of: fSet/ActPosition, fSet/ActVelocity, fSetCurrent.

1.4 Additional structure *ServoStar_AXIS_REF*

| Name | Type | Description |
|-----------------|-------------|--|
| byHomingDelay | Byte | Internal use: delays switching back from homing mode |
| strConfigFile | STRING | full name and path of config file |
| Acit | | internal use |
| byOperatingMode | BYTE | internal use: operation mode |
| wServoStarType | WORD | type of servostar (600/400) |
| crap | | Internal use |
| pParameterlist | | Internal use |
| wOldControl | WORD | Internal use |
| byOldOpMode | BYTE | Internal use |
| wControlWord | WORD | Control word (6040) |
| wStatusWord | WORD | Status word (6041) |
| wDRVSTATlw | WORD | Low word of DRVSTAT |

1.5 Firmware and configuration possibilities

The driver was implemented and tested on firmware version V7.12.

Because some problems could occur with former software versions, there are some possibilities to adapt some parameters. The following global variables must be set during the first cycle of the application:

| | | |
|-------------------------|---|-----|
| g_uiWaitTimeAfterSYNCus | Minimum time (μ s), between sending the SYNC and the first PDO | 500 |
| g_byServostarSYNCSOURCE | Parameter SYNCSCORC* | 3 |
| g_byServostarFPGA | Parameter FPGA* | 3 |

* normally the drive should work with SYNCSCRC 3 and FPGA 3, when controlled via CAN. Former firmware versions had some problems when running in this mode. Then it could help to set these values to 0.

2 **Features**

- **RegulatorOn, DriveStart**
- Detecting and acknowledging **errors**
- **reading/writing** SoftMotion and **drive parameters** (to access index 0xaabb subindex 0xcc with length 0xdd in byte (only necessary for writing) use MC_Read/Write(Bool)Parameter with parameter number -16#ddaabbcc)
- any **gearing factors** (dwRatioTechUnitsDenom/iRatioTechUnitsNum)
- **linear/rotary axes**
- drive internal **homing** (configure with object 0x6098 etc. or via ASCII commands NREF/DREF)
- **limit switches**
- 32-Bit **latching** (only possible after homing): 1 channel; digital input must be defined
- **configuration from file**
- **configuration from dialogs in PLC configuration**
- **controlling modes (SMC_SetControllerMode)**: position, velocity, current (switch regulator off before switching them)
- supported **SYNC generators** (to be set in PLC Configuration, AxisGroup) : PLC, SYNC-Device

3 CAN-Traffic

base load:

| <i>Telegram</i> | <i>Data bytes</i> | <i>Bit length</i> | <i>125 kBit/s</i> | <i>250 kBit/s</i> | <i>500 kBit/s</i> | <i>1 MBit/s</i> |
|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-----------------|
| SYNC | 0 | 47 | 0,376 ms | 0,188 ms | 0,094 ms | 0,047 ms |
| SDO | 8 | 111 | 0,888 ms | 0,444 ms | 0,222 ms | 0,111 ms |
| overall | | | 1,264 ms | 0,632 ms | 0,316 ms | 0,158ms |

per drive:

| <i>Telegram</i> | <i>Data bytes</i> | <i>Bit length</i> | <i>125 kBit/s</i> | <i>250 kBit/s</i> | <i>500 kBit/s</i> | <i>1 MBit/s</i> |
|------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-----------------|
| Control word and operation mode | 3 | 71 | 0,568 ms | 0,284 ms | 0,142 ms | 0,071 ms |
| SetPosition/SetVelocity/SetCurrent | 4 | 79 | 0,632 ms | 0,316 ms | 0,158 ms | 0,079 ms |
| Status word and actual position | 8 | 111 | 0,888 ms | 0,444 ms | 0,222 ms | 0,111 ms |
| optional: actual velocity | 3 | 71 | 0,568 ms | 0,284 ms | 0,142 ms | 0,071 ms |
| overall (no actual velocity) | | | 2,656 ms | 1,328 ms | 0,664 ms | 0,332 ms |
| overall (with actual velocity) | | | 3,288 ms | 1,644 ms | 0,822 ms | 0,411 ms |

With/Without receiving the actual velocity, and with one SDO reserve it is possible to control n drives:

| Cycle time [ms] | 125 kBit/s | 250 kBit/s | 500 kBit/s | 1 MBit/s |
|-----------------|------------|------------|------------|----------|
| 1 | 0/0 | 0/0 | 1/1 | 2/2 |
| 2 | 0/0 | 1/1 | 2/2 | 4/5 |
| 3 | 0/1 | 1/1 | 3/4 | 6/8 |
| 4 | 1/1 | 2/2 | 4/5 | 9/11 |
| 5 | 1/1 | 2/3 | 5/7 | 10/13 |
| 8 | 2/2 | 4/5 | 9/11 | 18/23 |