

SoftMotion: DriveInterface: LexiumCAN

Last update: 22.09.2008

| | |
|--------------------|---|
| Hardware interface | CAN; must support 3S_CANdrv.lib |
| Supported drives | Lexium05A , Lexium15LP, Lexium15MP, SD3-28 , SD3 -18, Lexium32 |
| Runtimes | Any |
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| Components | LexiumCANDrive.lib; 3S_CanDrv.lib; SM_CAN.lib; SysLibCallback.lib; SysLibFile.lib |
| Version | 1.9.4.5 |

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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); 1: first drive of AxisGroup generates SYNC 2: SYNC device generates SYNC (additional hardware needed) |
| wParam4 | Not used |
| dwParam1 | Reserved |
| dwParam2 | Reserved |
| dwParam3 | Not used |
| dwParam4 | Not used |

1.3 supported Drive.wControlType

The cyclic send data must consist of: fSetPosition.

The cyclic receive data can consist of: fActPosition.

1.4 Additional structure *LexiumCAN_AXIS_REF*

| name | Type | |
|----------------------------------|-----------------------|-----------------------------------|
| eType | LexiumDriveType | internal use |
| byDriveState, byDriveStateOld | BYTE | internal use |
| wStateCounter | WORD | internal use |
| wp | SMC_WriteCANParameter | internal use |
| wStatusWord | WORD | Status word (16#6041) |
| wControlWord | WORD | Control word (16#6040) |
| dwSetPosition | DWORD | Set position transmitted to drive |
| strConfigFile | STRING | full name and path of config file |
| acit | | internal use |
| crap | SMC_CANReadAllParams | internal use |

| | | |
|-----------------|--------------------------------|--------------|
| pParameterlist | POINTER TO CAN_InitTelegram | internal use |
| wLimitSw | WORD | Internal use |
| bOldLimitState | BOOL | Internal use |
| wType | WORD | Internal use |
| byOperatingMode | BYTE | Internal use |

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) either use MC_Read/Write(Bool)Parameter with parameter number -16#ddaabbcc) or SMC_ReadCANParameter and SMC_WriteCANParameter to address a standard CAN object via index, subindex.
- any **gearing factors** (dwRatioTechUnitsDenom/iRatioTechUnitsNum)
- **linear/rotary axes**
- **controlling modes**: position.
- drive internal **homing** (first configure 16#6098, 16#6099)

Lexium05/Lexium SD3-28:

- **capturing**: 2 possible latching inputs: CAP1 (TriggerNumber=1), CAP2 (TriggerNumber=2). To set, whether the inputs react on rising or falling edges, use the drive internal object 0x300A.
- **hardware limit switches**: when one of the hardware limits is reached, the drive goes in state errorstop. To be used again, it must be resetted (MC_Reset) and homed (MC_Home). It is not possible to run the drive again without homing first.
- **configuration from file**
- **configuration from dialogs in PLC config**
- supported **SYNC generators** (to be set in PLC Configuration, AxisGroup) : PLC, SYNC-Device

Lexium15LP:

- **capturing**: configurable latching input: (TriggerNumber=1-4) Trigger1: Input1 rising Edge, Trigger 2 Input1 falling Edge, Trigger 3 Input2 rising Edge, Trigger 4 Input2 falling Edge
Important: Set DRVCNFG2 Bit1 and Bit2 to have compatible setting to LexiumMP! (No auto Latch reenable)
(Notice: SAVE and COLDSTART for changes in DRVCNFG2 is essential)
- **hardware limit switches**: when one of the hardware limits is reached, it is possible to move in free direction otherwise drive goes in errorstop.
- **configuration from file**
- **configuration from dialogs in PLC config**
- supported **SYNC generators** (to be set in PLC Configuration, AxisGroup) : PLC, SYNC-Device

Lexium15MP:

- **capturing**: configurable latching input: (**only Trigger 3 -4 supported!**) Trigger 3 Input2 rising Edge, Trigger 4 Input2 falling Edge
- **hardware limit switches**: when one of the hardware limits is reached, it is possible to move in free direction otherwise drive goes in errorstop.
- **configuration from file**
- **configuration from dialogs in PLC config**
- supported **SYNC generators** (to be set in PLC Configuration, AxisGroup) : PLC, SYNC-Device

Lexium32

capturing: 2 possible latching inputs: CAP1 (TriggerNumber=1), CAP2 (TriggerNumber=2). To set, whether the inputs react on rising or falling edges, use the drive internal object 0x300A.

- **hardware limit switches:** when one of the hardware limits is reached, the drive goes in state errorstop. To be used again, it must be resetted (MC_Reset) and homed (MC_Home). It is not possible to run the drive again without homing first.
- **configuration from file**
- **configuration from dialogs in PLC config**
- supported **SYNC generators** (to be set in PLC Configuration, AxisGroup) : PLC, SYNC-Device

3 configured parameters during startup

The following parameters are set during startup Lexium05 / SD3-28, SD3-18:

| Parameter | Wert |
|-----------------|---|
| 16#1005:0 | 16#80 |
| 16#1014:0 | 0 |
| 16#1400-16#14FF | PDO mapping |
| 16#3006:7 | 16#20000 |
| 16#3006:8 | 1 |
| 16#3004:1 | 1 (after this wait, until 16#3004:1Bit0 is reset) |
| 16#3012:8 | 100 |

The following parameters are set during startup Lexium32:

| Parameter | Wert |
|-----------------|-------------|
| 16#1005:0 | 16#80 |
| 16#1014:0 | 0 |
| 16#1400-16#14FF | PDO mapping |

The following parameters are set during startup Lexium15LP:

| Parameter | Wert |
|-----------------|---------------|
| 16#1005:0 | 16#80 |
| 16#1014:0 | 0 |
| 16#1400-16#1A03 | PDO mapping |
| 16#60C2:1 | CycleTime |
| 16#60C2:2 | 16#FC |
| 16#3683:1 | 3 |
| 16#35CA:1 | 16#100000 |
| 16#35CB:1 | 1 |
| 16#35CF:1 | 0 |
| 16#36EB:1 | 1 |
| 16#363E:1 | Bit 16 = TRUE |

The following parameters are set during startup Lexium15MP:

| Parameter | Wert |
|-----------------|-------------|
| 16#1005:0 | 16#80 |
| 16#1014:0 | 0 |
| 16#1400-16#1A03 | PDO mapping |
| 16#60C2:1 | CycleTime |

| | |
|-----------|---------------|
| 16#60C2:2 | 16#FC |
| 16#3683:1 | 3 |
| 16#363B:1 | 3 |
| 16#35CA:1 | 1 |
| 16#35CB:1 | 1 |
| 16#36EB:1 | 1 |
| 16#363E:1 | Bit 16 = TRUE |

4 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 |

Lexium 05 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, set position | 6 | 95 | 0,760 ms | 0,380 ms | 0,190 ms | 0,095 ms |
| Status Word, actual position | 6 | 95 | 0,760 ms | 0,380 ms | 0,190 ms | 0,095 ms |
| overall | | | 1,520 ms | 0,760 ms | 0,380 ms | 0,190 ms |

Lexium15LP and Lexium15MP 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, set position | 7 | 103 | 0,824 ms | 0,412 ms | 0,206ms | 0,103 ms |
| Status Word, actual position | 7 | 103 | 0, 824 ms | 0,412 ms | 0,206 ms | 0,103 ms |
| overall | | | 1,648 ms | 0,824 ms | 0,412ms | 0,206 ms |

According to that, the following table shows the maximum number of drives per cycle time:

Network with Lexium 05, Lexium15LP and Lexium15MP drives :

| max. number of drives | 125 kBit/s | 250 kBit/s | 500 kBit/s | 1 MBit/s |
|-----------------------|------------|------------|------------|----------|
| 1 ms | 0 | 1 | 1 | 4 |
| 2 ms | 0 | 1 | 3 | 8 |
| 3 ms | 1 | 2 | 6 | 12 |
| 4 ms | 1 | 3 | 8 | 16 |
| 5 ms | 2 | 4 | 10 | 20 |