# CANopenFD\_NXP\_SDK\_Accel

## Electronic Datasheet Information

Version 2, revision 1  
CANopen Library for NXP SDK - CiA401 style accelerometer example  
Created on 09-25-2019, 07:06PM by Pf  
Modified on 04-18-2020, 12:49PM by Pf

Provided by Embedded Systems Academy  
www.em-sa.com/nxp  
  
This version is based on the CiA401 example, here implmenting object for an accelerometer as present on the NXP LPC55S16-EVK.

## Product Information

|  |  |
| --- | --- |
| Property | Value |
| Vendor Name | NXP Semiconductors BV |
| Vendor ID | 0xAF0002DC |
| Product Name | CANopenFD NXP accelerometer example |
| Product Code | 0xC0DE0021 |
| Revision Number | 0x20200417 |
| Order Code | C0DE0021 |

## Commissioning Information

|  |  |
| --- | --- |
| Property | Value |
| Node ID | 0x03 |
| Name | GenIO |
| Baudrate | 500 kbps |
| Network Number | 0 |
| Network Name |  |
| LSS Serial Number | 0x00000000 |
| CANopen Manager | No |

## PDO Configuration

### Communication Parameters

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| PDO | COBID | Tx Type | Inhibit Time | Event Time | Sync Start |
| RPDO1 | $NODEID+0x200 | 255 |  |  |  |
| TPDO1 | $NODEID+0x40000180 | 255 | 250.0 ms | 1000 ms |  |
| TPDO2 | $NODEID+0x40000280 | 255 | 20.0 ms | 500 ms |  |

### Mappings

|  |  |
| --- | --- |
| PDO | Mappings |
| RPDO1 | [0x6200,0x01] Command - CommandByte (Unsigned8) |
| TPDO1 | [0x2200,0x00] LoopCount (Unsigned32) |
| TPDO2 | [0x6401,0x01] Position - PosX (Integer16) |
| [0x6401,0x02] Position - PosY (Integer16) |
| [0x6401,0x03] Position - PosZ (Integer16) |

## Object Dictionary

### Overview

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Index | Subindex | Name | Type | Access | Default Value |
| 0x0002 | 0x00 | INTEGER8 | I8 | CO |  |
| 0x0003 | 0x00 | INTEGER16 | I16 | CO |  |
| 0x0004 | 0x00 | INTEGER32 | I32 | CO |  |
| 0x0005 | 0x00 | UNSIGNED8 | U8 | CO |  |
| 0x0006 | 0x00 | UNSIGNED16 | U16 | CO |  |
| 0x0007 | 0x00 | UNSIGNED32 | U32 | CO |  |
| 0x1000 | 0x00 | Device Type | U8 | CO | 0x01 |
| 0x01 | Logical Device 1 | U32 | CO | 0x00000000 |
| 0x1001 | 0x00 | Error Register | U8 | CO |  |
| 0x1002 | 0x00 | Manufacturer Status Register | U32 | RO |  |
| 0x1005 | 0x00 | COB-ID SYNC | U32 | CO | 0x00000080 |
| 0x1008 | 0x00 | Manufacturer Device Name | VisStr | RO | See description |
| 0x1009 | 0x00 | Manufacturer Hardware Version | VisStr | RO | See description |
| 0x100A | 0x00 | Manufacturer Software Version | VisStr | RO | See description |
| 0x1010 | 0x00 | Store Parameters | U8 | CO | 0x04 |
| 0x01 | Save All Parameters | U32 | RW |  |
| 0x02 | Save Communication Parameters | U32 | RW |  |
| 0x03 | Save Application Parameters | U32 | RW |  |
| 0x04 | Save Manufacturer Parameters | U32 | RW |  |
| 0x1011 | 0x00 | Restore Parameters | U8 | CO | 0x04 |
| 0x01 | Save All Parameters | U32 | RW |  |
| 0x02 | Restore Communication Parameters | U32 | RW |  |
| 0x03 | Restore Application Parameters | U32 | RW |  |
| 0x04 | Restore Manufacturer Parameters | U32 | RW |  |
| 0x1014 | 0x00 | COB-ID EMCY | U32 | CO | $NODEID+0x80 |
| 0x1015 | 0x00 | Inhibit Time Emergency | U16 | CO | 100 |
| 0x1016 | 0x00 | Consumer Heartbeat Time | U8 | CO | 3 |
| 0x01 | Consumer Heartbeat Time 1 | U32 | RW | 0x000103E8 |
| 0x02 | Consumer Heartbeat Time 2 | U32 | RW | 0x00020000 |
| 0x03 | Consumer Heartbeat Time 3 | U32 | RW | 0x00030000 |
| 0x1017 | 0x00 | Producer Heartbeat Time | U16 | RW | 1000 |
| 0x1018 | 0x00 | Identity Object | U8 | CO | 4 |
| 0x01 | Vendor ID | U32 | CO | 0xAF0002DC |
| 0x02 | Product Code | U32 | CO | 0xC0DE0021 |
| 0x03 | Revision number | U32 | CO | 0x20200417 |
| 0x04 | Serial number | U32 | CO |  |
| 0x1400 | 0x00 | Receive PDO Communication Parameter | U8 | CO | 2 |
| 0x01 | COB-ID | U32 | RW | $NODEID+0x200 |
| 0x02 | Transmission Type | U8 | RW | 255 |
| 0x1600 | 0x00 | Receive PDO Mapping Parameter | U8 | CO | 0x01 |
| 0x01 | PDO Mapping Entry | U32 | CO | 0x62000108 |
| 0x1800 | 0x00 | Transmit PDO Communication Parameter | U8 | CO | 5 |
| 0x01 | COB-ID | U32 | RW | $NODEID+0x40000180 |
| 0x02 | Transmission Type | U8 | RW | 255 |
| 0x03 | Inhibit Time | U16 | RW | 2500 |
| 0x05 | Event Timer | U16 | RW | 1000 |
| 0x1801 | 0x00 | Transmit PDO Communication Parameter | U8 | CO | 5 |
| 0x01 | COB-ID | U32 | RW | $NODEID+0x40000280 |
| 0x02 | Transmission Type | U8 | RW | 255 |
| 0x03 | Inhibit Time | U16 | RW | 200 |
| 0x05 | Event Timer | U16 | RW | 500 |
| 0x1A00 | 0x00 | Transmit PDO Mapping Parameter | U8 | CO | 1 |
| 0x01 | PDO Mapping Entry | U32 | CO | 0x22000020 |
| 0x1A01 | 0x00 | Transmit PDO Mapping Parameter | U8 | CO | 3 |
| 0x01 | PDO Mapping Entry | U32 | CO | 0x64010110 |
| 0x02 | PDO Mapping Entry | U32 | CO | 0x64010210 |
| 0x03 | Mapping 3 | U32 | CO | 0x64010310 |
| 0x2010 | 0x00 | 128byte Buffer Segmentation Test | VisStr | RW | See description |
| 0x2200 | 0x00 | LoopCount | U32 | RO |  |
| 0x6200 | 0x00 | Command | U8 | CO | 0x01 |
| 0x01 | CommandByte | U8 | RWW |  |
| 0x6401 | 0x00 | Position | U8 | CO | 0x03 |
| 0x01 | PosX | I16 | RO | 0x1234 |
| 0x02 | PosY | I16 | RO | 0x2345 |
| 0x03 | PosZ | I16 | RO | 0x3456 |

### Device Type (0x1000)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Name | Highest Subindex |
| Data Type | Unsigned8 |
| Access | Const |
| Can be mapped | No |
| Default Value | 0x01 |

|  |  |
| --- | --- |
| Subindex | 0x01 |
| Name | Logical Device 1 |
| Data Type | Unsigned32 |
| Access | Const |
| Can be mapped | No |
| Default Value | 0x00000000 |

### Error Register (0x1001)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Data Type | Unsigned8 |
| Access | Const |
| Can be mapped | No |
| Default Value |  |

### Manufacturer Status Register (0x1002)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Data Type | Unsigned32 |
| Access | ReadOnly |
| Can be mapped | No |
| Default Value |  |

### COB-ID SYNC (0x1005)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Data Type | Unsigned32 |
| Access | Const |
| Can be mapped | No |
| Default Value | 0x00000080 |

### Manufacturer Device Name (0x1008)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Data Type | Visible String |
| Access | ReadOnly |
| Can be mapped | No |
| Default Value | CANopenLibNXPSDK Accelerometer Example |

### Manufacturer Hardware Version (0x1009)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Data Type | Visible String |
| Access | ReadOnly |
| Can be mapped | No |
| Default Value | LPC55S16-EVK |

### Manufacturer Software Version (0x100A)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Data Type | Visible String |
| Access | ReadOnly |
| Can be mapped | No |
| Default Value | EmSA MCOP 7.0 2019-09-25 |

### Store Parameters (0x1010)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Name | Number of Entries |
| Data Type | Unsigned8 |
| Access | Const |
| Can be mapped | No |
| Default Value | 0x04 |

|  |  |
| --- | --- |
| Subindex | 0x01 |
| Name | Save All Parameters |
| Data Type | Unsigned32 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value |  |

|  |  |
| --- | --- |
| Subindex | 0x02 |
| Name | Save Communication Parameters |
| Data Type | Unsigned32 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value |  |

|  |  |
| --- | --- |
| Subindex | 0x03 |
| Name | Save Application Parameters |
| Data Type | Unsigned32 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value |  |

|  |  |
| --- | --- |
| Subindex | 0x04 |
| Name | Save Manufacturer Parameters |
| Data Type | Unsigned32 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value |  |

### Restore Parameters (0x1011)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Name | Number of Entries |
| Data Type | Unsigned8 |
| Access | Const |
| Can be mapped | No |
| Default Value | 0x04 |

|  |  |
| --- | --- |
| Subindex | 0x01 |
| Name | Save All Parameters |
| Data Type | Unsigned32 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value |  |

|  |  |
| --- | --- |
| Subindex | 0x02 |
| Name | Restore Communication Parameters |
| Data Type | Unsigned32 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value |  |

|  |  |
| --- | --- |
| Subindex | 0x03 |
| Name | Restore Application Parameters |
| Data Type | Unsigned32 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value |  |

|  |  |
| --- | --- |
| Subindex | 0x04 |
| Name | Restore Manufacturer Parameters |
| Data Type | Unsigned32 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value |  |

### COB-ID EMCY (0x1014)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Data Type | Unsigned32 |
| Access | Const |
| Can be mapped | No |
| Default Value | $NODEID+0x80 |

### Inhibit Time Emergency (0x1015)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Data Type | Unsigned16 |
| Access | Const |
| Can be mapped | No |
| Default Value | 100 |

### Consumer Heartbeat Time (0x1016)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Name | Number of Entries |
| Data Type | Unsigned8 |
| Access | Const |
| Can be mapped | No |
| Default Value | 3 |

|  |  |
| --- | --- |
| Subindex | 0x01 |
| Name | Consumer Heartbeat Time 1 |
| Data Type | Unsigned32 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value | 0x000103E8 |

|  |  |
| --- | --- |
| Subindex | 0x02 |
| Name | Consumer Heartbeat Time 2 |
| Data Type | Unsigned32 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value | 0x00020000 |

|  |  |
| --- | --- |
| Subindex | 0x03 |
| Name | Consumer Heartbeat Time 3 |
| Data Type | Unsigned32 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value | 0x00030000 |

### Producer Heartbeat Time (0x1017)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Data Type | Unsigned16 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value | 1000 |

Note that CiA 401 sets the default to 0 and thereby disables heartbeat. In order to have a periodic transmission from the node right after initialization, this is changed to 1000 ms. This allows an easy verification that CAN is working and the stack is running, even before any interaction with a CANopen manager.

### Identity Object (0x1018)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Name | number of entries |
| Data Type | Unsigned8 |
| Access | Const |
| Can be mapped | No |
| Default Value | 4 |

|  |  |
| --- | --- |
| Subindex | 0x01 |
| Name | Vendor ID |
| Data Type | Unsigned32 |
| Access | Const |
| Can be mapped | No |
| Default Value | 0xAF0002DC |

|  |  |
| --- | --- |
| Subindex | 0x02 |
| Name | Product Code |
| Data Type | Unsigned32 |
| Access | Const |
| Can be mapped | No |
| Default Value | 0xC0DE0021 |

|  |  |
| --- | --- |
| Subindex | 0x03 |
| Name | Revision number |
| Data Type | Unsigned32 |
| Access | Const |
| Can be mapped | No |
| Default Value | 0x20200417 |

|  |  |
| --- | --- |
| Subindex | 0x04 |
| Name | Serial number |
| Data Type | Unsigned32 |
| Access | Const |
| Can be mapped | No |
| Default Value |  |

### Receive PDO Communication Parameter (0x1400)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Name | Number of Entries |
| Data Type | Unsigned8 |
| Access | Const |
| Can be mapped | No |
| Default Value | 2 |

|  |  |
| --- | --- |
| Subindex | 0x01 |
| Name | COB-ID |
| Data Type | Unsigned32 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value | $NODEID+0x200 |

|  |  |
| --- | --- |
| Subindex | 0x02 |
| Name | Transmission Type |
| Data Type | Unsigned8 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value | 255 |

### Receive PDO Mapping Parameter (0x1600)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Name | Number of Entries |
| Data Type | Unsigned8 |
| Access | Const |
| Can be mapped | No |
| Default Value | 0x01 |

|  |  |
| --- | --- |
| Subindex | 0x01 |
| Name | PDO Mapping Entry |
| Data Type | Unsigned32 |
| Access | Const |
| Can be mapped | No |
| Default Value | 0x62000108 [0x6200,0x01] Command - CommandByte (Unsigned8) |

### Transmit PDO Communication Parameter (0x1800)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Name | Number of Entries |
| Data Type | Unsigned8 |
| Access | Const |
| Can be mapped | No |
| Default Value | 5 |

|  |  |
| --- | --- |
| Subindex | 0x01 |
| Name | COB-ID |
| Data Type | Unsigned32 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value | $NODEID+0x40000180 |

|  |  |
| --- | --- |
| Subindex | 0x02 |
| Name | Transmission Type |
| Data Type | Unsigned8 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value | 255 |

|  |  |
| --- | --- |
| Subindex | 0x03 |
| Name | Inhibit Time |
| Data Type | Unsigned16 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value | 2500 |

|  |  |
| --- | --- |
| Subindex | 0x05 |
| Name | Event Timer |
| Data Type | Unsigned16 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value | 1000 |

### Transmit PDO Communication Parameter (0x1801)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Name | Number of Entries |
| Data Type | Unsigned8 |
| Access | Const |
| Can be mapped | No |
| Default Value | 5 |

|  |  |
| --- | --- |
| Subindex | 0x01 |
| Name | COB-ID |
| Data Type | Unsigned32 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value | $NODEID+0x40000280 |

|  |  |
| --- | --- |
| Subindex | 0x02 |
| Name | Transmission Type |
| Data Type | Unsigned8 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value | 255 |

|  |  |
| --- | --- |
| Subindex | 0x03 |
| Name | Inhibit Time |
| Data Type | Unsigned16 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value | 200 |

|  |  |
| --- | --- |
| Subindex | 0x05 |
| Name | Event Timer |
| Data Type | Unsigned16 |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value | 500 |

### Transmit PDO Mapping Parameter (0x1A00)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Name | Number of Entries |
| Data Type | Unsigned8 |
| Access | Const |
| Can be mapped | No |
| Default Value | 1 |

|  |  |
| --- | --- |
| Subindex | 0x01 |
| Name | PDO Mapping Entry |
| Data Type | Unsigned32 |
| Access | Const |
| Can be mapped | No |
| Default Value | 0x22000020 [0x2200,0x00] LoopCount (Unsigned32) |

### Transmit PDO Mapping Parameter (0x1A01)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Name | Number of Entries |
| Data Type | Unsigned8 |
| Access | Const |
| Can be mapped | No |
| Default Value | 3 |

|  |  |
| --- | --- |
| Subindex | 0x01 |
| Name | PDO Mapping Entry |
| Data Type | Unsigned32 |
| Access | Const |
| Can be mapped | No |
| Default Value | 0x64010110 [0x6401,0x01] Position - PosX (Integer16) |

|  |  |
| --- | --- |
| Subindex | 0x02 |
| Name | PDO Mapping Entry |
| Data Type | Unsigned32 |
| Access | Const |
| Can be mapped | No |
| Default Value | 0x64010210 [0x6401,0x02] Position - PosY (Integer16) |

|  |  |
| --- | --- |
| Subindex | 0x03 |
| Name | Mapping 3 |
| Data Type | Unsigned32 |
| Access | Const |
| Can be mapped | No |
| Default Value | 0x64010310 [0x6401,0x03] Position - PosZ (Integer16) |

### 128byte Buffer Segmentation Test (0x2010)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Data Type | Visible String |
| Access | ReadWrite |
| Can be mapped | No |
| Default Value | This is a 128 byte long test string for the NXP MCUXpresso SDK Micro CANopen FD demo by Embedded Systems Academy (www.em-sa.com) |

### LoopCount (0x2200)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Data Type | Unsigned32 |
| Access | ReadOnly |
| Can be mapped | Yes |
| Default Value |  |

### Command (0x6200)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Name | Number of Elements |
| Data Type | Unsigned8 |
| Access | Const |
| Can be mapped | No |
| Default Value | 0x01 |

|  |  |
| --- | --- |
| Subindex | 0x01 |
| Name | CommandByte |
| Data Type | Unsigned8 |
| Access | ReadWriteWrite |
| Can be mapped | Yes |
| Default Value |  |

### Position (0x6401)

|  |  |
| --- | --- |
| Subindex | 0x00 |
| Name | Number of Elements |
| Data Type | Unsigned8 |
| Access | Const |
| Can be mapped | No |
| Default Value | 0x03 |

|  |  |
| --- | --- |
| Subindex | 0x01 |
| Name | PosX |
| Data Type | Integer16 |
| Access | ReadOnly |
| Can be mapped | Yes |
| Default Value | 0x1234 |

|  |  |
| --- | --- |
| Subindex | 0x02 |
| Name | PosY |
| Data Type | Integer16 |
| Access | ReadOnly |
| Can be mapped | Yes |
| Default Value | 0x2345 |

|  |  |
| --- | --- |
| Subindex | 0x03 |
| Name | PosZ |
| Data Type | Integer16 |
| Access | ReadOnly |
| Can be mapped | Yes |
| Default Value | 0x3456 |