PT500-MHC/Canopen
CANopen pressure transmitter
CANopen DS 404 Conformance

通

讯

协

议

佛 山 市 普 量 电 子 有 限 公 司

2020-V1.0

1.Contents

1.General

This manual contains important information for the safe and compliant use of the CANopen pressure transmitter and must be read carefully before initial start-up.
It is created for personnel trained and qualified in handling electrical equipment.

1.1Safety instructions

- The pressure transmitter is a compact, extremely sensitive precision measuring instrument. It is used exclusively to measure pressure, to convert field values as CANopen signals for the downstream device. The pressure transmitter must only be used for this purpose.
- Correct and safe operation requires proper transport, storage, mounting and careful operation and maintenance.
- Check all electrical connections before using the system for the first time.
- In the case of systems where a malfunction may cause great damage to property or even to personnel, safety measures must be put in place that ensure a safe operating state in the event of a malfunction.
- You must not operate the pressure transmitter outside the specifications (see the data sheet).
- Do not make any mechanical or electrical changes to the transmitter.
- Despite the rugged housing, the pressure transmitter must not be subjected to any hard impacts.
- Avoid static and dynamic overpressure exceeding the overpressure range.

1.2Mounting and initial start-up

- Only perform wiring tasks when no power is applied.
- Do not attach or remove electrical connections that are powered.
- Install the entire system to maximize EMC. The installation environment and the cabling affect the EMC of the pressure transmitter. Install the device and the power line separated from one another and at a great distance from lines with high noise levels.
- Connect the pressure transmitter to protective ground and use shielded cables.

1.3Maximum system extent

One bus string with one master of the CAN network can have a maximum of 127 users. Every user has its own address. The default ID is 01h for PT500-MHC/Canopen pressure transmitter. The default baud rate is 250kbps.
You must absolutely comply with the permissible bus and stub line lengths given in Table 1.

Table 1 Baud rate with bus and stub length

Baud rate [kbps]	20	50	100	125	250	500	800	1000
Total bus length(m)	30	10	500	400	200	75	30	25
Total stub length(m)	87	35	175	140	70	35	20	17
Individual stub length(m)	17	70	35	28	14	7	4	3

Maximum total bus length (with 120-ohm termination resistor at each end) and maximum stub length (without termination resistor) as a function of the baud rate.

1.4 Connections

1.4.1 Electrical connection

The sensor housing must be grounded, and this is usually done with pressure connector. Use shielded cables. The cable shield must be grounded at both ends if possible. Avoid differences in electrical potential between parts of the system and the measuring chains. A 120-ohm termination resistor must be connected at the physical beginning and at the physical end of the bus system.

1.4.2 Connecting diagram

Connect the pressure sensor according to the schematic below. Make sure the polarity is correct.

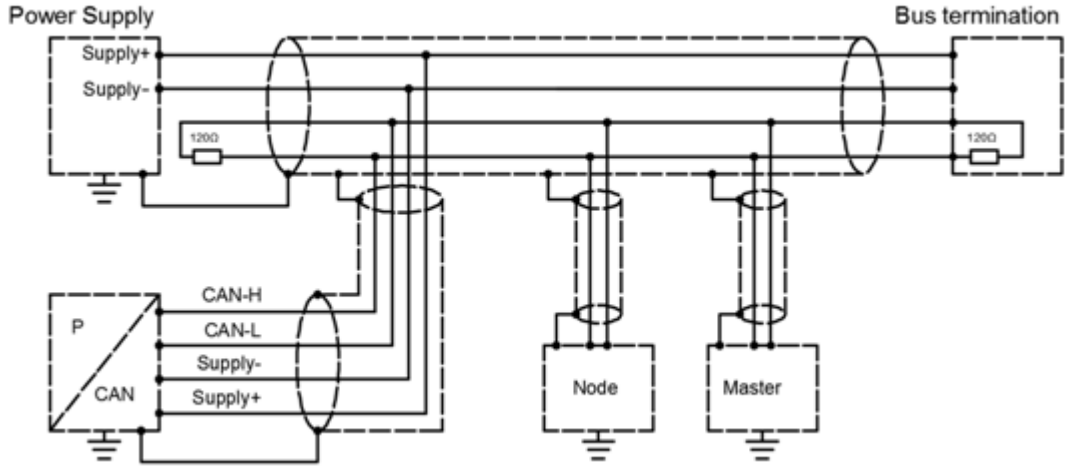

Figure 1 Connecting schematic

2.CANopen protocol

2.1 Bootloader

Bootloader is implemented in the sensor. Upon request, user can upgrade field sensors with PC upgrade software and USB-CAN bus tool.

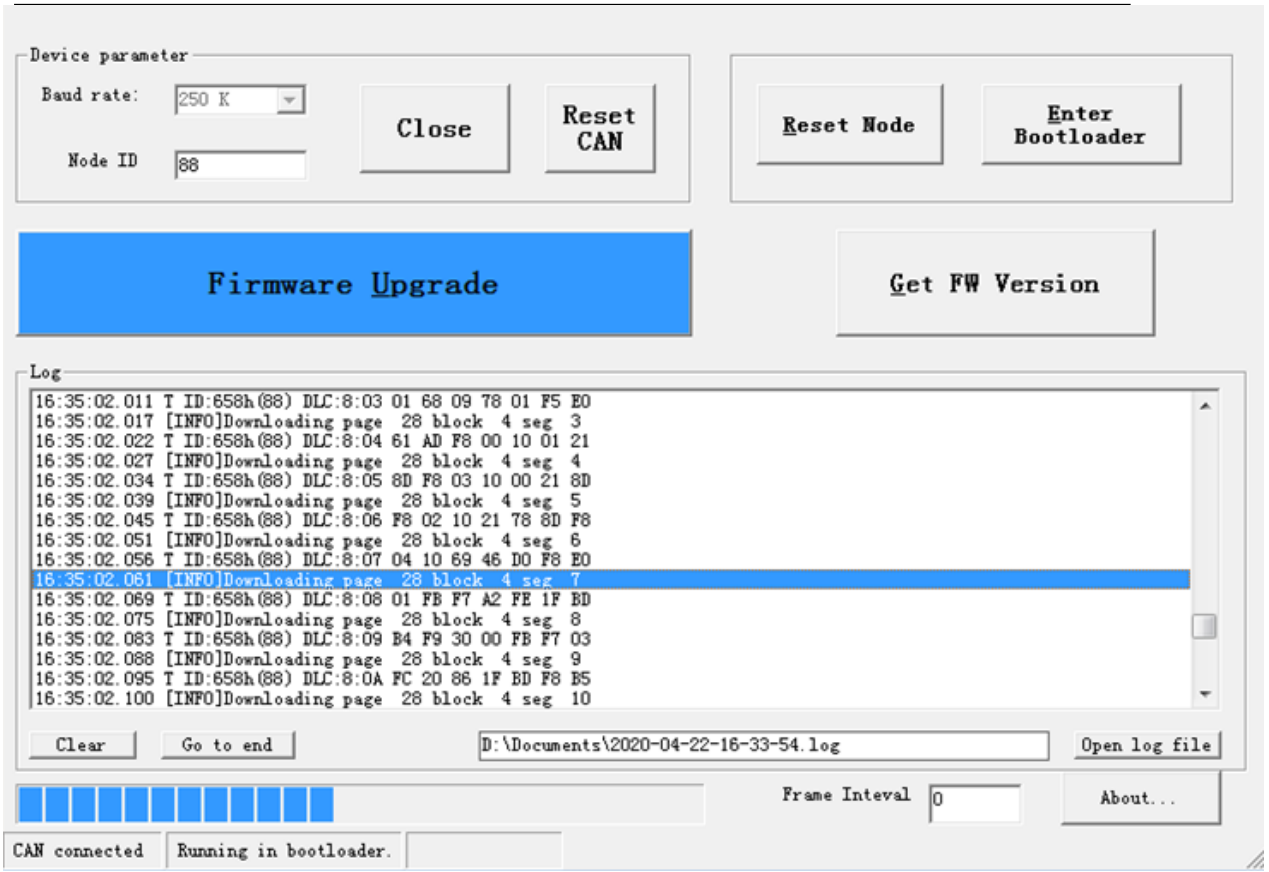

Figure 2 PT500-MHC/Canopen upgrade tool

2.2 Network management(NMT)

After pressure transmitter is powered on, the sensor sends the CAN Boot-up message.

ID	DLC	Byte1
700h+ID	1	00h

2.2.1 Predefined connection set

COB ID = Function code (4 bits) + NodeId (7 bits)

Objects	COB ID(hex)
Network Management	00h
Sync	80h
Emergency	81h – FFh(80h + NodeID)
TPDO1	181h – 1FFh(180h + NodeID)
TPDO2	281h – 2FFh(280h + NodeID)
SDO (tx)	581h – 5FFh(580h + NodeID)
SDO (rx)	601h – 67Fh(600h + NodeID)
Heartbeat	701h – 77Fh(700h + NodeID)
LSS	7E4h - 7E5h

2.2.2 Sensor network state

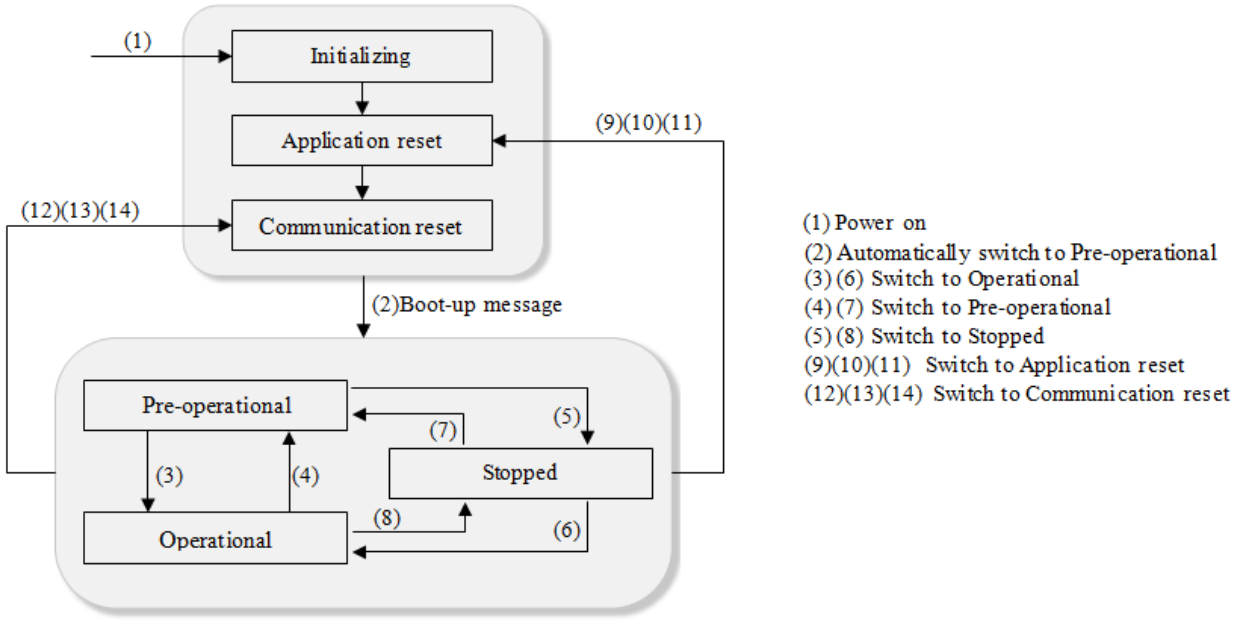

Figure 3 Sensor state transition diagram

Initialization

This is the state that a sensor passes through after power-on. During this phase, the device application and device communications are initialized. Then the node automatically enters the Pre-Operational state.

Pre-Operatioal

In this state, the node waits for the Operational mode to be enabled. The possible communications are shown in the table below.

Operatioal

In this state, the CANopen node is completely ready for operation and can transmit messages (PDOs, Emergency) on its own.

Table 2 Communications possible during the various modes

	Initialization	**Pre-Operational**	**Operational**	**Stopped**
PDO			X	
SDO		X	X	
Sync indexes			X	
Emergency indexes		X	X	
Boot-up message	X			
Network Management		X	X	X
Heartbeat		X	X	X
LSS				X

Note: X means communication supported

2.2.3 Start Node

Transition to Operational Mode

ID	DLC	Byte1	Byte2
00h	2	01h	NodeId

NodeId: Node ID, 0 = all nodes

2.2.4 Stop Node

Transition to Stopped Mode

ID	DLC	Byte1	Byte2
00h	2	02h	NodeId

NodeId: Node ID, 0 = all nodes

2.2.5 Pre-Operational Node

Transition to Pre-Operational Mode

ID	DLC	Byte1	Byte2
00h	2	80h	NodeId

NodeId: Node ID, 0 = all nodes

2.2.6 Reset Node

Software reset of the node

ID	DLC	Byte1	Byte2
00h	2	81h	NodeId

NodeId: Node ID, 0 = all nodes

Reset Node is corresponding to MCU software reset.

2.3 Supported Object Overview

The following table is a summary of all supported objects.

Index: 16bit index number in hex.

Sub-index: Sub-index in hex.

Name: Name of objects/Sub-index.

Data type: U-Unsigned, I-Integer, ARR = array, REC = record. (e.g. U32 means unsigned 32bits).

Acc: ro = read only, wo = write only, rw = read/write.

Default: Factory default value. Suffix letter: h-hexadecimal, d-decimal.

TPDO map: Indicating if object can be mapped to TPDO(Transmit-PDO) by user, Y=yes.

Table 3 All supported objects overview

Index	**Sub-index**	**Name**	**Data type**	**Acc**	**Default**	**TPDO map**
1000h	**00**	**Device type**	**U32**	**ro**	**00020194h**	**-**
1001h	**00**	**Error register**	**U8**	**ro**	**00h**	**Y**
1003h		**Emergency history**	**ARR**	**rw**		**-**
	00	Number of errors	U8	ro	00h	-
	01	Last error	U32	ro	-	-
	02-10h	Older errors	U32	ro	-	-
1005h	00	COB-ID SYNC	U32	ro	00000080h	-

1008h	00	Device name	U32	ro	53504C5Ah	-
1009h	00	Hardware version	U32	ro	e.g. “A”	-
100Ah	00	Firmware version	U32	ro	e.g.“1.02”	-
1010h		Store parameters	ARR			
	00	Highest sub-index supported	U8	ro	01h	-
	01	Save all parameters	U32	rw	65766173h	-
1011h		Restore default parameter	ARR			
	00	Highest sub-index supported	U8	ro	01h	-
	01	Restore all default parameters	U32	rw	64616F6Ch	-
1014h	00	COB-ID Emergency	U32	ro	00000081h	-
1017h	00	Producer heartbeat time	U16	rw	0000h	-
1018h		Identity object	REC	ro		
	00	Highest sub-index supported	U8	ro	04h	
	01	Vendor-ID	U32	ro	FFFFFFFFh	-
	02	Product code	U32	ro	801d	-
	03	Revision number	U32	ro	e.g.00000001h	-
	04	Serial number	U32	ro	e.g.20010001d	-
1800h		TPDO1 communication	REC			
	00	Highest sub-index supported	U8	ro	05h	-
	01	COB-ID and activation TPDO1	U32	rw	00000181h	-
	02	Transmission type	U8	rw	FFh	-
	05	Event timer	U16	rw	1000d	-
1801h		TPDO2 communication	REC			
	00	Highest sub-index supported	U8	ro	05h	-
	01	COB-ID and activation TPDO2	U32	rw	80000281h	-
	02	Transmission type	U8	rw	FFh	-
	05	Event timer	U16	rw	1000d	-
1A00h		TPDO1 mapping	ARR			
	00	Number of mapped objects TPDO1	U8	rw	02h	-
	01	First application object	U32	rw	71300110h	-
	02	Second application object	U32	rw	61500108h	-
1A01h		TPDO2 mapping	ARR			
	00	Number of mapped objects TPDO2	U8	rw	02h	-
	01	First application object	U32	rw	71300110h	-
	02	Second application object	U32	rw	61500108h	-
2001h	00	Averaging time	U8	rw	14h	-
2100h	00	Baud rate	U8	rw	03h	-
Index	Sub-	Name	Data	Acc	Default	TPDO
2101h	00	Identification	U8	rw	01h	-
6110h		Sensor type	ARR			
	00	Highest sub-index supported	U8	ro	01h	-
	01	Sensor type	U16	ro	005Ah	-
6131h		Physical unit	ARR			
	00	Highest sub-index supported	U8	ro	01h	-

	01	Physical unit	U32	ro	004E0000h(bar)	-
6132h		Decimal digits	ARR			
	00	Highest sub-index supported	U8	ro	01h	-
	01	Decimal digits	U8	ro	e.g.02h	-
6150h		Status of measurement	ARR			
	00	Highest sub-index supported	U8	ro	01h	-
	01	Status of measurement	U8	ro	e.g.00h	Y
7130h		Process value 16bit	ARR			
	00	Highest sub-index supported	U8	ro	01h	-
	01	Process value	U16	ro	e.g. 1C20h	Y
7133h		Interrupt delta input 16bit	ARR			
	00	Highest sub-index supported	U8	ro	01h	-
	01	Interrupt delta input 16bit	U16	rw	0000h	-
7134h		Interrupt lower limit input 16bit	ARR			
	00	Highest sub-index supported	U8	ro	01h	-
	01	Interrupt lower limit input 16bit	U16	rw	0000h	-
7135h		Interrupt upper limit input 16bit	ARR			
	00	Highest sub-index supported	U8	ro	01h	-
	01	Interrupt upper limit input 16bit	U16	rw	FFFFh(65535d)	-
7148h		Sensor span start value 16bit	ARR			
	00	Highest sub-index supported	U8	ro	01h	-
	01	Sensor span start value	U16	ro	0000h	-
7149h		Sensor span end value 16bit	ARR			
	00	Highest sub-index supported	U8	ro	01h	-
	01	Sensor span end value	U16	ro	e.g.2710h	-

2.4 Sensor function block overview

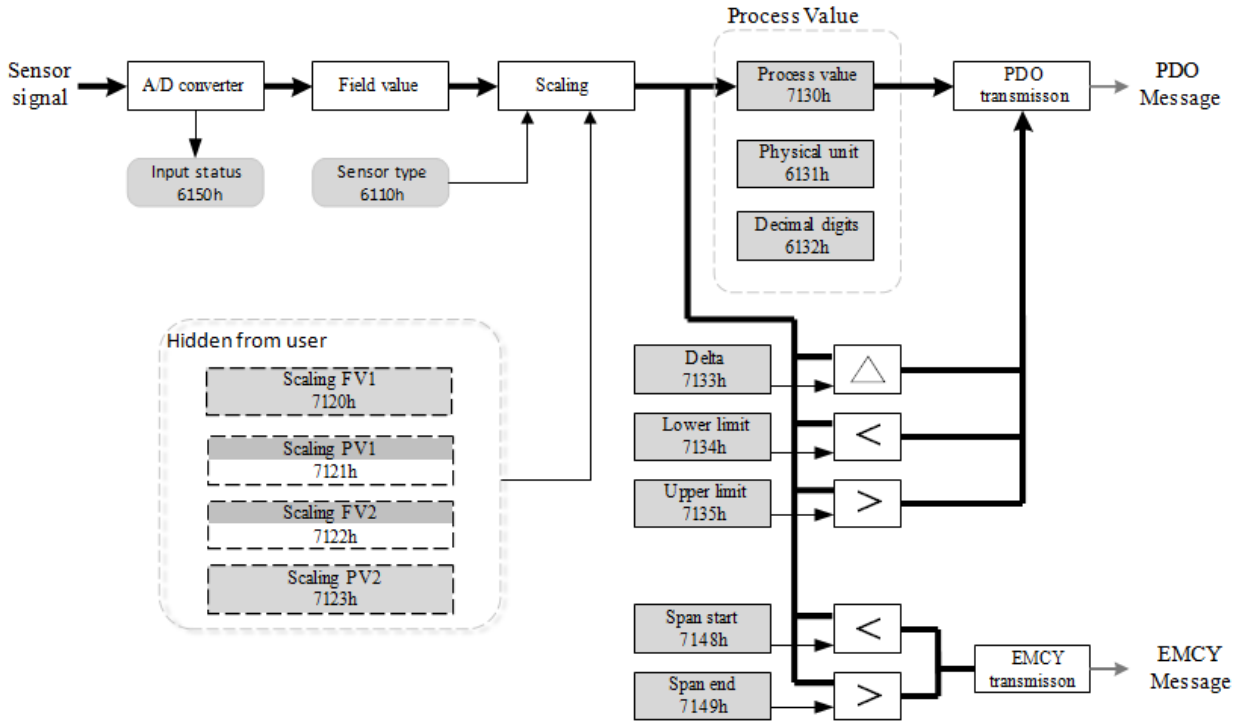

Figure 4 Sensor function block

3.Object description

3.1 Standard objects

3.1.1(object 1000h) Device type

The object 1000h is read only and has no sub-index. Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	00h	10h	00h	0	0	0	0

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	43h	00h	10h	00h	94h	01h	02h	00h

Byte 5-6: 0194h = 404d Device Profile Measuring Devices

Byte 7-8: 0002h Analog input

3.1.2 (object 1008h) Device name

The object 1008h is read only and has no sub-index. Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	08h	10h	00h	0	0	0	0
ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	43h	08h	10h	00h	5Ah	4Ch	50h	53h

Byte 5-8: 53504C5Ah “ZLPS” in ASCII

3.1.3 (object 1009h) Hardware version

The object 1009h is read only and has no sub-index. Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	09h	10h	00h	0	0	0	0

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	43h	09h	10h	00h	41h	00h	00h	00h

Example of hardware version A:

Byte 5-8: 00000041h “A” in ASCII

3.1.4 (object 100Ah) Firmware version

The object 100Ah is read only and has no sub-index. Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	0Ah	10h	00h	0	0	0	0

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	43h	0Ah	10h	00h	31h	2Eh	30h	32h

Example of firmware version 1.02:

Byte 5-8: 32302E31h “1.02” in ASCII

3.1.5 (object 1018h) Identity object

The object at index 1018h contains general information about the device. The object is read-only.

Index	**Sub-index**	**Name**	**Type**	**Access**
1018h	0	Highest sub-index supported	U8	Read only
	1	Vendor-ID	U32	Read only
	2	Product code	U32	Read only
	3	Revision number	U32	Read only
	4	Serial number	U32	Read only

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	18h	10h	01h	0	0	0	0

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	43h	18h	10h	01h	FFh	FFh	FFh	FFh

Byte 5-8: FFFFFFFFh Vender ID

Read Product code (Sub-index 2):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	18h	10h	02h	0	0	0	0

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	43h	18h	10h	02h	21h	03h	00h	00h

Byte 5-8: 00000321h(801) Product code

Read Revision number (Sub-index 3):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	18h	10h	03h	0	0	0	0

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	43h	18h	10h	03h	01h	00h	00h	00h

Example of revision number:

Byte 5-8: 00000001h Revision number

Read serial number (Sub-index 4):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	18h	10h	04h	0	0	0	0

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	43h	18h	10h	04h	11h	54h	31h	01h

Example of serial number:

Byte 5-8: 20010001d(01315411h) Serial number

3.2 User parameter handling (save/load default)

The following changeable objects can be saved in the nonvolatile memory:

Table 4 User changeable objects

Object	**Name**	**Default**	**Remark**
1017h	Producer heartbeat time	0000h	Disabled
1800h	PDO1 COB-ID, sub-index 1	00000181h	180h+ID(Default ID 1)
	PDO1 transmission type, sub-Index 2	FFh	Transmit after event
	PDO1 event time , sub-index 5	03E8h	1000ms
1801h	PDO2 COB-ID , sub-index 1	80000281h	Disabled
	PDO2 transmission type, sub-index 2	FFh	Transmit after event
	PDO2 event time , sub-index 5	03E8h	1000ms
	TPDO1 mapping, sub-index 1	71300110h	Index 7130, sub-index 1 mapped

1A00h	TPDO1 mapping, sub-index 2	61500108h	Index 6150, sub-index 1 mapped
1A01h	TPDO2 mapping, sub-index 1	71300110h	Index 7130, sub-index 1 mapped
	TPDO2 mapping, sub-index 2	61500108h	Index 6150, sub-index 1 mapped
2001h	Averaging time	14h	20ms default
2100h	Baud rate	03h	250kbps default
2101h	Identification	01h	ID 1 default
7133h	Interrupt delta input 16bit	00h	Disabled
7134h	Interrupt lower limit input 16bit	0000h	Disabled
7135h	Interrupt upper limit input 16bit	FFFFh	Disabled

3.2.1 (object 1010h) Store parameters

This object supports the saving of parameters in nonvolatile memory. Sub-Index 1 refers to all parameters that can be stored on the device.

For the parameters that can be stored , see Table 4 .

Storage takes place when the “save” message is sent in ASCII code to index 1010h, sub-index 1. The message has the following structure:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	23h	10h	10h	01h	73h	61h	76h	65h

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	60h	10h	10h	01h	0	0	0	0

If wrong message is sent to index 1010h, sub-index 1, SDO abort code 08000021h will be returned in Byte 5-8.

3.2.2 (object 1011h) Restore default parameters

With object 1011h, the factory default settings can be loaded. In this process all parameters, except the communication parameters (Baud rate, Identification), will be set to default values. The default values will be stored in nonvolatile memory, and all user settings will be lost except baud rate and id. The default values will take effect until next reset. Sub-Index 1 refers to all parameters that can be restored.

For the parameters that can be restored to default values, see Table 4 .

Function block diagram for storing default parameters:

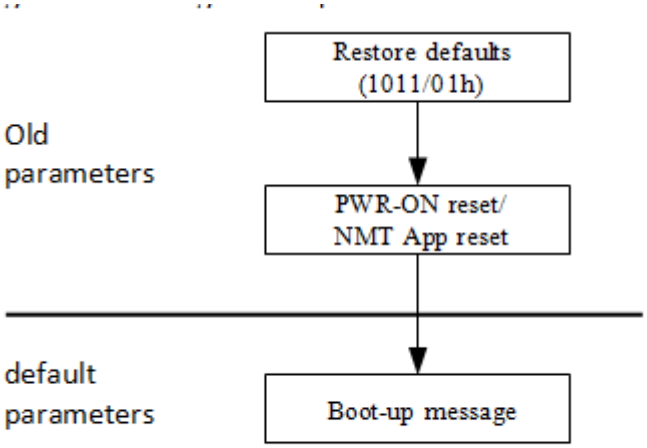

Figure 5 Restore defaults procedure

Loading the data takes place when the index 1011h with the “load” message in ASCII code on sub-index 1 is sent. The message has the following structure:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	23h	11h	10h	01h	6Ch	6Fh	61h	64h

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	60h	11h	10h	01h	0	0	0	0

If wrong message is sent to index 1011h, sub-index 1, SDO abort code 08000021h will be returned in Byte 5-8

3.3 Device profile specific objects

Following indices can be read for sensor specific information.

Table 5 Device profile specific objects

Object	**Name**
6110h	Sensor type
6131h	Physical unit PV
6132h	Decimal digits PV
6150h	Status of measurement
7130h	Process value 16bit
7133h	Interrupt delta input 16bit
7134h	Interrupt lower limit input 16bit
7135h	Interrupt upper limit input 16bit
7148h	Sensor span start 16bit
7149h	Sensor span end 16bit

3.3.1 (object 6110h) Sensor type

Sensor type is an object with type of array. The value is located at index 1 with type U16. The object is read-only.

Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	10h	61h	01h	0	0	0	0

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Bh	10h	61h	01h	5Ah	00h	0	0

Byte 5-6: 005Ah Pressure Transducer

3.3.2 (object 6131h) Physical unit PV

Physical unit is an object with type of array. The value is located at index 1 with type U32. The object is read-only.

Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	31h	61h	01h	0	0	0	0

Response (e.g. bar):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	43h	31h	61h	01h	00h	00h	4Eh	00h

Byte 5-8:	004E0000h	bar
	FD4E0000h	mbar
	00220000h	Pascal
	03220000h	kPa
	06220000h	MPa
	00AB0000h	PSI

3.3.3 (object 6132h) Decimal digits PV

Decimal digits PV is an object with type of array. The value is located at index 1 with type U8. The object is read-only.

Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	32h	61h	01h	0	0	0	0

Response (e.g. 2digits):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Fh	32h	61h	01h	02h	0	0	0

Byte 5:

00h	0 decimal digit
01h	1 decimal digit
02h	2 decimal digits
03h	3 decimal digits
04h	4 decimal digits

3.3.4 (object 6150h) Status of measurement

Status of measurement is an object with type of array. The value is located at index 1 with type U8. The object is read-only.

Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	50h	61h	01h	0	0	0	0

Response (e.g. normal):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Fh	50h	61h	01h	00h	0	0	0

Byte 5:

00h	Normal status
01h	Overflow of AD – converter
02h	Underflow of AD – converter

3.3.5 (object 7130h) Process value 16bit

Process value is an object with type of array. The value is located at index 1 with type U16. The object is read-only.

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	30h	71h	01h	0	0	0	0

Response (e.g. 1000):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Bh	30h	71h	01h	E8h	03h	0	0

Byte 5-6: 03E8h Process value 1000

Final value = 1000 / $10^{(6132\ \text{Dec digits})}$ [6131 PHY unit] = 1000 / 10^{2}[bar] = 10.00bar

3.3.6 (object 7133h) Interrupt delta input 16bit

Interrupt delta value is an object with type of array. The value is located at index 1 with type

U16. The object is read and write.

After delta function is activated (Interrupt delta input value is not 0), PDO will be sent after current process value passes the threshold value, and new threshold value will be set.

New threshold value = (Threshold-passed-time process value) ± (Interrupt delta value)

Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	33h	71h	01h	0	0	0	0

Response (e.g. 3bar):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Bh	33h	71h	01h	2Ch	01h	0	0

With 2 decimal digits, 3bar is corresponding with $3 \times 100^{(\text{Decimal digits})} = 300$(012Ch) Byte 5-6: 012Ch Delta value 300

Change interrupt delta value (e.g. 3bar):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	2Bh	33h	71h	01h	2Ch	01h	0	0

Byte 5-6: 012Ch Delta value 300

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	60h	33h	71h	01h	0	0	0	0

3.3.7 (object 7134h) Interrupt lower limit input 16bit

Interrupt lower limit input value is an object with type of array. The value is located at index 1 with type U16. The object is read and write.

After interrupt lower limit input function is activated (Interrupt lower limit input value is not 0), PDO message will be sent after current process value is lower than interrupt lower limit input value.

The interrupt lower limit input function will be disabled with value 0.

Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	34h	71h	01h	0	0	0	0

Response (e.g. 2bar):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Bh	34h	71h	01h	C8h	00h	0	0

With 2 decimal digits, 2bar is corresponding with $2 \times 100^{(\text{Decimal digits})} = 200$(00C8h) Byte 5-6: 00C8h Interrupt lower limit input value 200

Change interrupt lower limit input value (e.g. 2bar):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	2Bh	34h	71h	01h	C8h	00h	0	0

Byte 5-6 00C8h Interrupt lower limit input value 200

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	60h	34h	71h	01h	0	0	0	0

3.3.8 (object 7135h) Interrupt upper limit input 16bit

Interrupt upper limit input value is an object with type of array. The value is located at index 1 with type U16. The object is read and write.

After interrupt upper limit input function is activated (Interrupt upper limit input value is not FFFFh), PDO message will be sent after current process value is upper than interrupt upper limit input value.

The interrupt upper limit input function will be disabled with value 65535(FFFFh).

Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	35h	71h	01h	0	0	0	0

Response (e.g. 20bar):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Bh	35h	71h	01h	D0h	07h	0	0

With 2 decimal digits, 20bar is corresponding with $20 \times 100^{(\text{Decimal digits})} = 2000$(07D0h) Byte 5-6: 07D0h Interrupt upper limit input value 2000

Change interrupt upper limit input value (e.g. 20bar):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	2Bh	35h	71h	01h	D0h	07h	0	0

Byte 5-6: 07D0h Interrupt upper limit input value 2000

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	60h	35h	71h	01h	0	0	0	0

3.3.9 (object 7148h) Sensor span start 16bit

Sensor span start value is an object with type of array. The value is located at index 1 with type U16. The object is read-only. This value specifies the lower limit where process values are expected. Process values, which are lower than this limit, are marked as negative overloaded.

Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	48h	71h	01h	0	0	0	0

Response (e.g. 0bar):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Bh	48h	71h	01h	00h	00h	0	0

Byte 5-6: 0000h Value 0

Sensor span start actual value = 0 / $10^{(6132\ \text{Dec digits})}$ [6131 PHY unit] = 0 / 10^{2}[bar] = 0.00bar

3.3.10 (object 7149h) Sensor span end 16bit

Sensor span end value is an object with type of array. The value is located at index 1 with type U16. The object is read-only. This value specifies the upper limit where process values are expected. Process values exceeding this limit are marked as positive overloaded.

Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	49h	71h	01h	0	0	0	0

Response (e.g. 100bar):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Bh	49h	71h	01h	10h	27h	0	0

Byte 5-6: 2710h Value 10000

Sensor span end actual value = 10000 / $10^{(6132\ \text{Dec digits})}$ [6131 PHY unit] = 10000 / 10^{2}[bar] = 100.00bar

3.4 Manufacturer specific objects

The definition of the following objects is manufacturer specific. They are used to set the CANopen pressure transducer. List of supported objects:

Table 6 Manufacturer specific objects

Object	Name
2001h	Averaging time
2100h	Baud rate
2101h	Identification

3.4.1 (object 2001h) Averaging time

The average time specifies the time in ms over which the measured values are arithmetically averaged. The average time can be set between 0...100 (0…64h). The default value is 20ms which means object 7130h will refresh every 20ms with value averaged in the last 20ms. When average time is set with 0, 1ms averaging time will be used in device. Type for the object is U8.

Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	01h	20h	00h	0	0	0	0

Response (e.g. 14h → 20ms by default):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Fh	01h	20h	00h	14h	0	0	0

Byte 5: 14h 20ms

Function block diagram for changing averaging time:

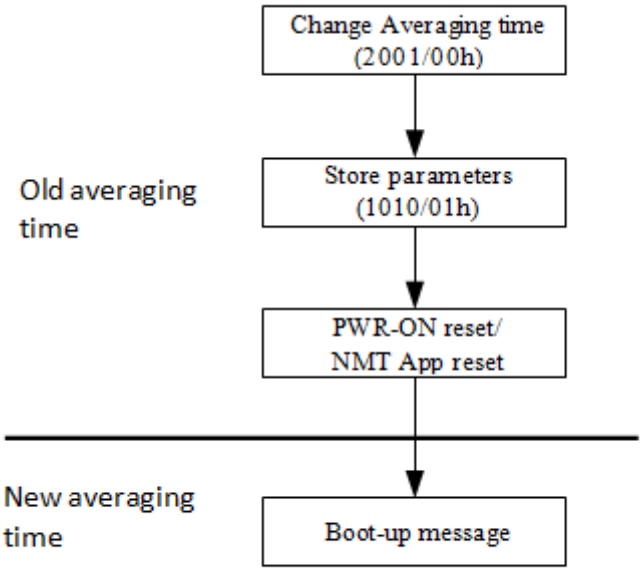

Figure 6 Change averaging time procedure

Change averaging time to 11h(17ms) for example:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	2Fh	01h	20h	00h	11h	0	0	0

Byte 5: 11h 17ms

Valid range for byte 4 is 0~100, otherwise SDO abort code out-of-range 06090030h will be returned.

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	60h	01h	20h	00h	0	0	0	0

3.4.2 (object 2100h) Baud rate

The baud rate specifies the speed at which the whole bus is operated. All users must have the same baud rate. The CANopen pressure transducer is shipped with 250kbps baud rate. Type for the object is U8.

Baud rate can also be changed by LSS service.

Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	00h	21h	00h	0	0	0	0

Response (e.g. 03h → 250kbps by default):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Fh	00h	21h	00h	03h	0	0	0

Byte 5: 03h 250kbps

All supported baud rates are shown below.

00h → 1Mbps 01h → 800kbps 02 h → 500kbps

03 h → 250kbps 04 h → 125kbps 05 h → 100kbps

06 h → 50kbps 07 h → 20kbps

Function block diagram for changing baud rate:

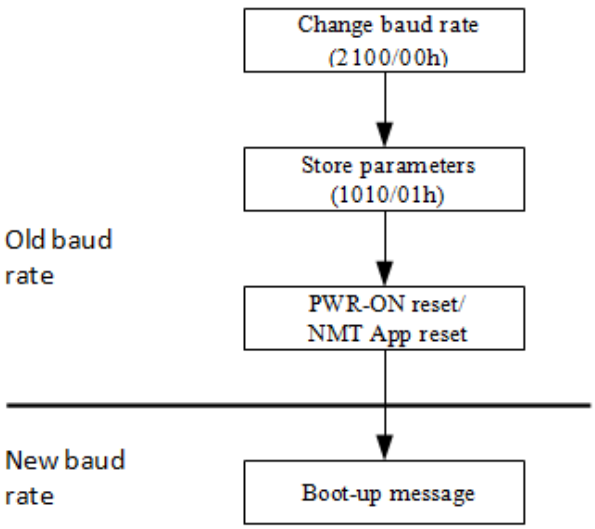

Figure 7 Change baud rate procedure

Change baud rate to 03h(250kbps) for example:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	2Fh	00h	21h	00h	03h	0	0	0

Byte 5: 03h 250kbps

Valid range for byte 4 is 0~7, otherwise SDO abort code out-of-range 06090030h will be returned.

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	60h	00h	21h	00h	0	0	0	0

3.4.3 (object 2101h) Identification

The ID of a device in a CANopen network must be unique. The identification can be set from 1 to 127(7bit). Type for the object is U8. The default ID for transmitter is 01h. Identification can also be changed by LSS service.

Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	01h	21h	00h	0	0	0	0

Response (e.g. Id 01h by default):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Fh	01h	21h	00h	01h	0	0	0

Byte 5: 01h Id 01

Function block diagram for changing Id:

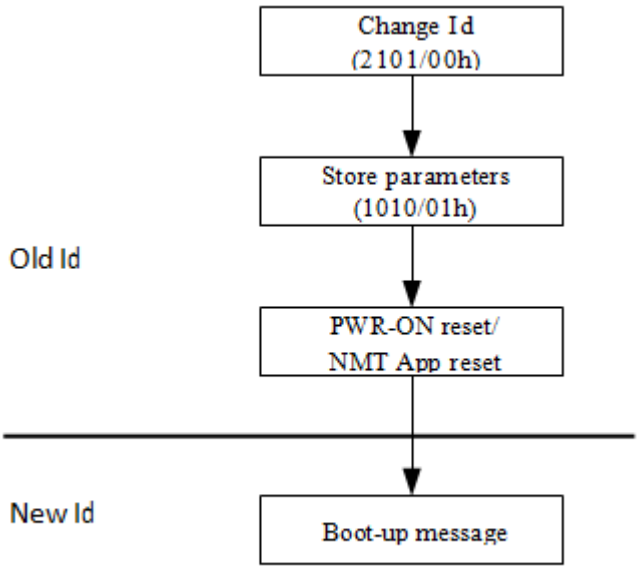

Figure 8 Change ID procedure

Change Id to 02h for example:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	2Fh	01h	21h	00h	02h	0	0	0

Byte 5: 02h Id 02h

Valid range for byte 4 is 1~127, otherwise SDO abort code out-of-range 06090030h will be returned.

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	60h	01h	21h	00h	0	0	0	0

3.5 PDO communication objects

It is possible to interrogate specified values of the CANopen sensor simply and quickly with PDO (Process Data Objects) communication.

Avariable PDO mapping is implemented in the pressure transmitter. The sendparameters and the conditions for the PDO sending can be defined by the user. The PDO can be activated by a sync message, by expiration of an event time, by passing beyond threshold which is determined by interrupt delta input value (object 7133h), or by passing beyond AI Interrupt lower limit input (object 7134h)/upper limit input (object7135h).

3.5.1 (object 1800h) TPDO 1 communication

TPDO1 setting parameters can be set via this object. The type for the object is RECORD.

The object has the following structure:

Index	**Sub-index**	**Name**	**Type**	**Access**
1800h	0	Highest sub-index supported	U8	Read only
	1	COB-ID TPDO 1	U32	Read/ Write
	2	Transmission type	U8	Read/ Write
	5	Event timer	U16	Read/ Write

Change TPDO1 from enable to disable:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	23h	00h	18h	01h	81h	01h	00h	80h

Byte 5-6: 0181h 180h + ID 1 (COB-ID)

Byte 8: 00h PDO enabled and RTR supported
80h PDO disabled and RTR supported
40h PDO enabled and RTR not supported
C0h PDO disabled and RTR not supported

Do not try to modify value of byte 5-6. ID should be changed with object 2101h Identification or LSS service if needed.

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	60h	00h	18h	01h	0	0	0	0

Change transmission type:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	2Fh	00h	18h	02h	FFh	0	0	0

Byte 5: FFh transmit with event timer or interrupt delta input value

01–F0h transmit after N^{th} Sync 1 – 240

FE-FFh transmit with event timer or interrupt delta input value

Response:

580h+ID	8	60h	00h	18h	02h	0	0	0	0

The event timer defines in which cycle the PDO will be transmitted.

The value range is 0 ~ [(2^{16} – 1) = 65535] (ms). 0 means timer is disabled.

Change event timer (e.g. 1000ms):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	2Bh	00h	18h	05h	E8h	03h	0	0

Byte 5-6: 03E8h (1000ms)

Too small values make no sense, because the bus will be overloaded and the measured values may still not be updated.

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	60h	00h	18h	05h	0	0	0	0

The PDO parameters are not stored automatically, and must be done with object 1010h.

3.5.2 (object 1801h) TPDO 2 communication

This object is used to set TPDO2 communication parameters and is similar with the object 1800h. Refer to previous section for detailed information.

The default COB-ID for object 1801h is 80000281h which means that the TPDO2 is disabled by default.

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8

3.5.3 (object 1A00h) TPDO 1 mapping parameter

The mapping of the TPDO 1 can be changed with this object. The object has the following structure:

Index	Sub-index	Name	Type	Access
	0	Number of mapped objects TPDO1	U8	Read/Write

1A00h	1	1st application object	U32	Read/Write
	2	2nd application object	U32	Read/Write

The TPDO1 has 8 Bytes and is freely configurable by the user. If an application object is not used, it should be configured with 0 (e.g. configure 1A00/02h with 0 to disable the corresponding application object mapping), otherwise the PDO will fail to send. The following objects can be mapped:

Index	**Sub-index**	**Name**	**Type**
7130h	01	Process value 16bit	U16
6150h	01	Status of measurement PV 1	U8
1001h	00	Error register	U8

Mapping TPO1 1st application object example:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	23h	00h	1Ah	01h	10h	01h	30h	71h

Example of mapping TPDO 1 with process value 16bit.

Byte 4: 01h Mapping 1st application object

Byte 5: 10h 16 Bit data length of the mapped object (2 Byte) Byte 6:

01h Mapped sub-index of target object

Byte 7-8: 7130h Mapped application object index

Notice that the total length for all mapped application object should be no more than 8 bytes.

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	60h	00h	1Ah	01h	0	0	0	0

The final TPDO1 message will be like following with 1st mapped application object 71300110h and 2nd mapped application object 61500108h:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
180h+ID	3	56h	89h	00h	-	-	-	-	-

DLC value and following bytes depend on the actual mapped application objects.

Byte1-2: 8956h Value for object 7130h/01h(16bits)

Byte3: 00h Value for 6150h/01h(8bits)

3.5.4 (object 1A01h) TPDO 2 mapping parameter

This object is used to set the mapping of TPDO2 and is similar with the object 1A00h. Refer to previous section for detailed information.

3.5.5 (object 1005h) COB-ID SYNC

With this object the ID of the sync message can be interrogated. If a sync message with the following ID is on the bus, the PDO can be triggered (compare PDO communication) if the corresponding transmission type is correctly configured. The object is read only and has no

sub-index.

ead:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	05h	10h	00h	0	0	0	0

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Fh	05h	10h	00h	80h	0	0	0

The ID is defined as 80h. This ensures that the sync messages have a high priority on the CAN bus

4.Emergency and services

4.1 Error register and history

4.1.1 (object 1001h) Error register

The object is read only and has no sub-index.

Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	01h	10h	00h	0	0	0	0

Response (e.g. no error):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Fh	01h	10h	00h	00h	0	0	0

Byte 5:	00h	No error
	01h	Generic error
	81h	Manufacturer specific error

4.1.2 (object 1003h) Emergency history

This object stores the last 16 error messages (Emergency Messages) which have occurred during operation in RAM which means that at the next power on reset the data is deleted. The recording will be deleted if 00h is written on the sub index 0.

This object has the following structure:

Index	Sub-index	Name	Type	Access
1003h	0	Number of errors Occurred (No more than 16)	U8	Read/Write
	1...16	Error messages	U32	Read

Read number of errors occurred (sub-index 0):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	03h	10h	00h	0	0	0	0

Response (e.g. 2):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Fh	03h	10h	00h	02h	0	0	0

Byte 5: 02h 2 errors have occurred (no more than 16)

Clear emergency history messages by writing 0 to sub-index 0:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	2Fh	03h	10h	00h	00h	0	0	0

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	60h	03h	10h	00h	0	0	0	0

Read history error messages (e.g. last recorded emergency message):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	03h	10h	01h	0	0	0	0

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Fh	03h	10h	00h	01h	F0h	00h	00h

Byte 5-6: F001h Emergency error code

Byte 7-8: 0000h Additional Information(Not used in sensor)

The error message code is descripted in section Emergency Messages

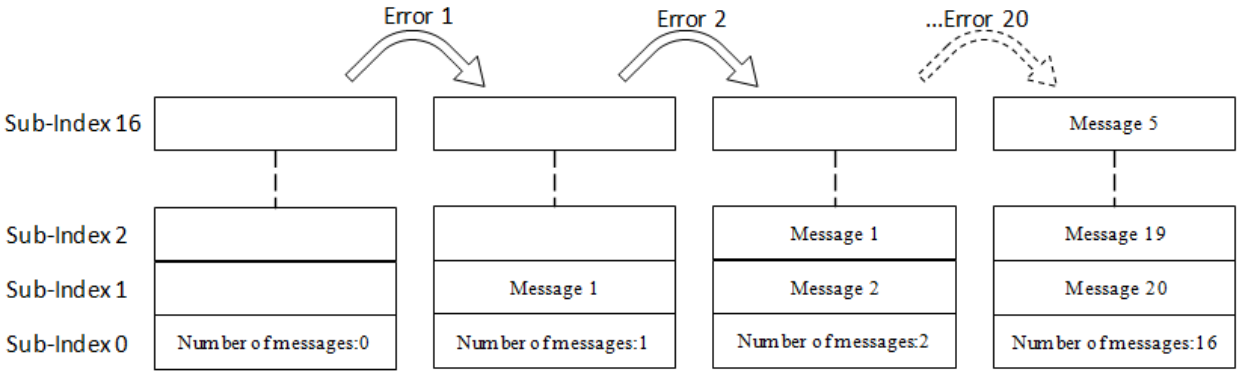

Figure 9 Emergency error messages illustration

The sensor can store the last 16 emergency error messages. The last message is stored under sub-index 1 and all previous ones are pushed upward by one position.

If the memory is full and a new message comes, it is stored in sub-index 1 and the oldest message

in sub-index 16 is pushed out of the memory.

4.2 Abort SDO Transfer messages

If wrong access is made to an object index or error occurs when sensor processing the access, abort SDO transfer message will be responded by sensor.

An abort SDO transfer message has following structure:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	80h	Index		Sub-index	SDO abort codes			

The ID of the message and the index and sub-index refer to the corresponding message which has caused an error.

Table 7 SDO abort codes

Abort code	Description
0503 0000h	Toggle bit not alternated.
0504 0000h	SDO protocol timed out.
0504 0005h	Out of memory.
0601 0001h	Write only access possible.
0601 0002h	Read only access possible.
0602 0000h	Object does not exist.
0604 0041h	Object cannot be mapped to the PDO.
0606 0000h	Access failed due to an hardware error.
0607 0010h	Data type does not match, length of service parameter does not match.
0609 0011h	Sub-index does not exist.
0609 0030h	Invalid value for parameter.
0609 0031h	Value of parameter written too high.
0609 0032h	Value of parameter written too low.
0800 0000h	General error.
0800 0021h	Data cannot be transferred or stored to the application because of local control.

4.3Emergency Messages

Emergency messages will be sent from the sensor independently in error case. When an error occurs for the first time an error message will be sent. If the error is eliminated or it is not pending anymore an appropriate error message will be sent.

The last 16 error messages will be saved in the emergency history.

Emergency message has following structure:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8

80h+ID	8	Emergency	Error	Manufacturer specific error code

Following error codes will be supported:

Emergency error code	Error registe	Manu specific	Description
F001	81h	00h	Positive overloaded(Process value is upper than span end)
F003	81h	00h	Negative overloaded(Process value is lower than span start)

4.3.1 (object 1014h) COB-ID Emergency object

The emergency object COB-ID is stored in this object. This object is read only and has no sub-index.

Read:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	14h	10h	00h	0	0	0	0

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	43h	14h	10h	00h	81h	00h	00h	00h

Byte 5: 81h ID = 80h + Node ID (1 by default)

4.4 Heartbeat

CANopen heartbeat protocol is a keeping-alive mechanism. The bus controller does not have to interrogate the sensor for error control. The Heartbeat producer transmits the status message cyclically with period defined in object 1017h. If the message does not arrive within the defined time, the CAN bus controller can take certain predefined actions. The heartbeat time can be adjusted between 1 and 65535 (1ms up to 65.535 seconds).

4.4.1 (object 1017h) Producer heartbeat time

Read heartbeat time:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	40h	17h	10h	00h	0	0	0	0

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	4Bh	17h	10h	00h	00h	00h	0	0

Byte 5-6: 0000h 0-heartbeat disabled by default

Change heartbeat time (e.g. 1000ms):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
600h+ID	8	2Bh	17h	10h	00h	E8h	03h	0	0

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
580h+ID	8	60h	17h	10h	00h	0	0	0	0

If this time is set to 0, heartbeat will be disabled. The setting takes effect immediately, but should be stored in the nonvolatile memory with the object 1010h if the setting needs to be effective permanently.

The heartbeat message has the following structure:

ID	DLC	Byte1
700h+ID	1	05h

Byte 1: 00h boot up
04h stop mode
05h operate
7Fh pre-operational

4.5 LSS (Layer setting services)

4.5.1 Printed LSS information on the sensor

Table 8 LSS information

Item	Value
Vendor Id	FFFFFFFFh
Product Code	321h(801)
Revision number	Printed on device label
Serial number	Printed on device label

4.5.2 Address and configure the sensor with LSS

LSS provides two ways to switch a sensor into configuration mode, Switch Mode Global and Switch Mode Selective. Switch Mode Selective switches exactly one sensor in the network into configuration mode and this mode is usually used when there are more than one sensors in the network. Switch Mode Global switches all sensors in the network into configuration mode and this mode is usually used when there is only one individual sensor in the network. In both cases the bus has to be brought into stop mode first.

Put all sensors to stop mode:

ID	DLC	Byte1	Byte2
00h	2	02h	00h

From network management point of view, LSS service is part of Stop mode.

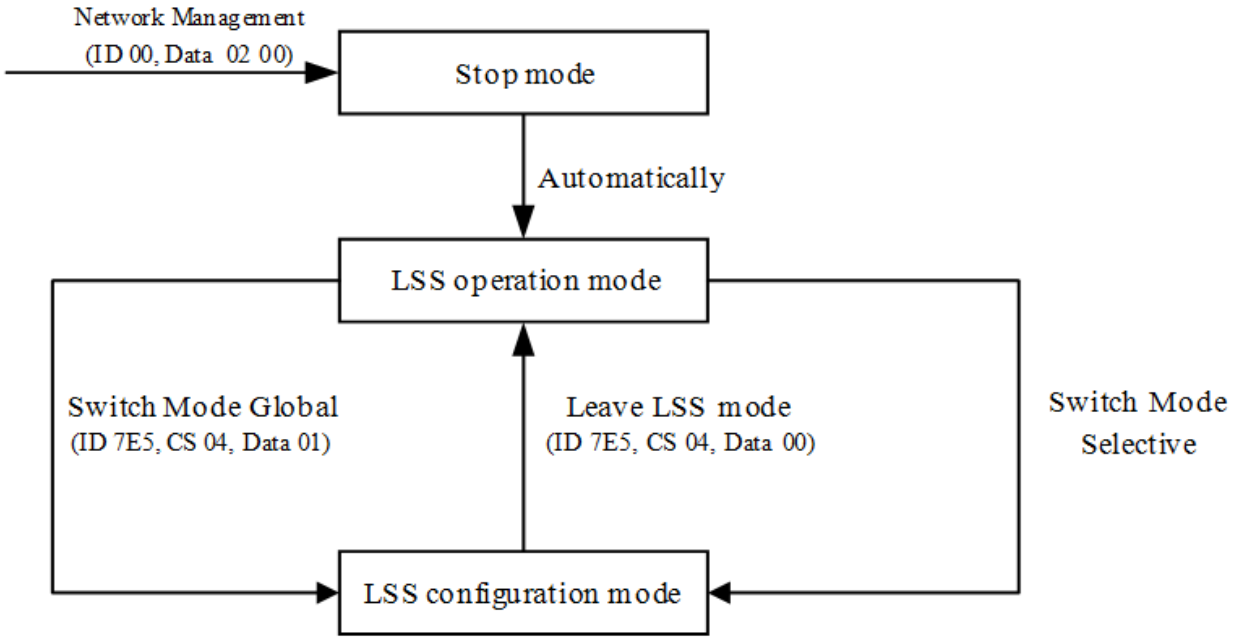

Figure 10 LSS modes and switching procedure

In LSS mode the sensors are addressed with ID 7E5h. The respond is with ID 7E4h.

LSS commands must be sent to switch sensors into LSS configuration mode. In configuration mode, parameters can be changed and stored. The whole process is shown in the following block diagram.

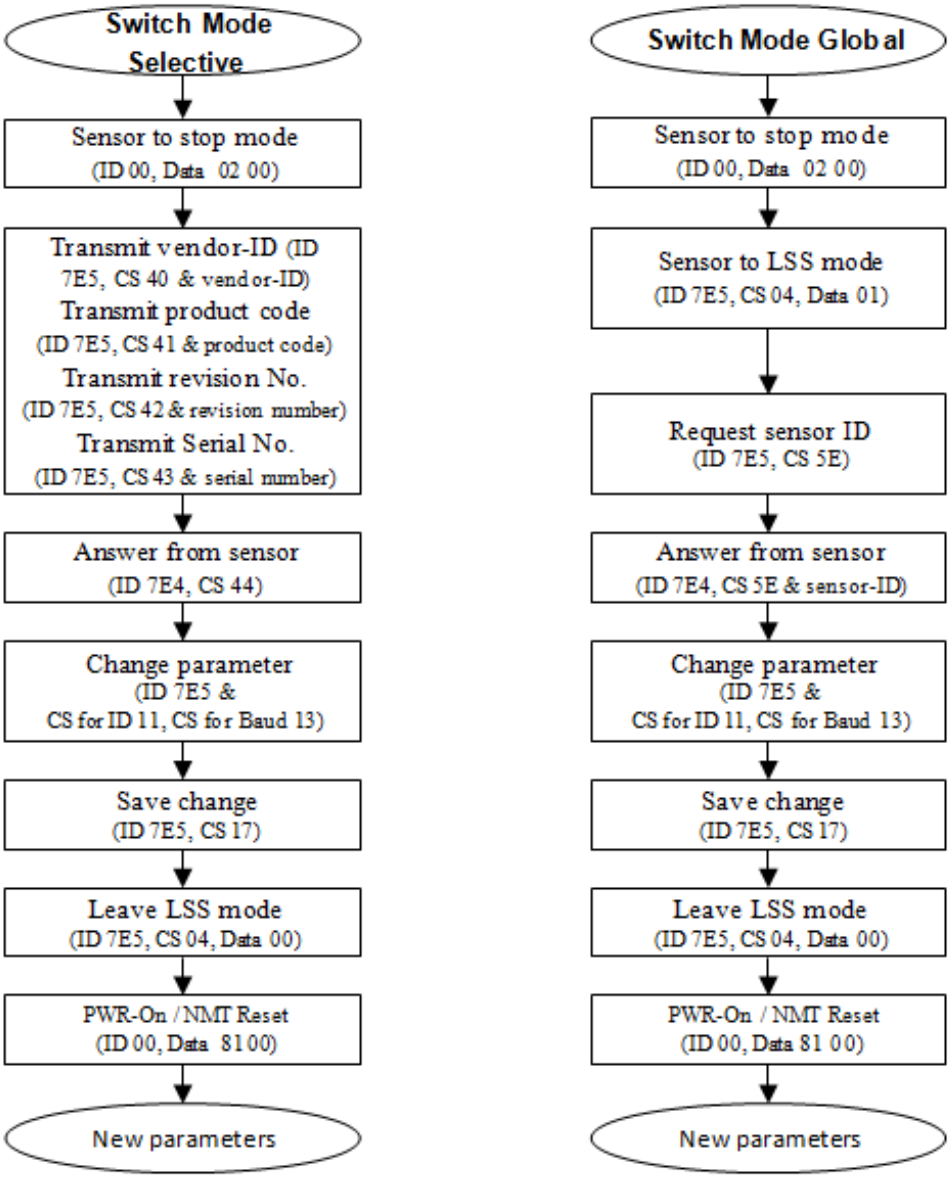

Figure 11 LSS configuration procedure

4.5.3 Switch Mode Global

Bring sensors to configuration mode globally:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
7E5h	8	04h	01h	0	0	0	0	0	0

No response will be sent for this command.

The current ID can be interrogated to test if the sensor has switched into the configuration mode:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
7E	8	5Eh	0	0	0	0	0	0	0

Response (e.g. ID FFh):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
7E4h	8	5Eh	FFh	0	0	0	0	0	0

Byte1: 5Eh Specifier for LSS read-ID

Byte2: FFh ID

If the sensor does not response, the sensor may be not in LSS configuration mode or does not support LSS service.

Now the ID or the baud rate can be changed if sensor responds with ID.

4.5.4 Switch Mode Selective

When there is more than one sensor in the network, senor has to be identified before being configured.

Transmission of vender-ID:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
7E5h	8	40h	FFh	FFh	FFh	FFh	0	0	0

Byte1: 41h Specifier for product code

Byte2-5: 00000201h Product code for pressure transducer

Transmission of revision number:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
7E5h	8	42h	01h	00h	00h	00h	0	0	0

Byte1: 42h Specifier for product code

Byte2-5: 00000001h Revision number

Transmission of serial number:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
7E5h	8	43h	FFh	FFh	FFh	FFh	0	0	0

Byte1: 43h Specifier for serial number

Byte2-5: FFFFFFFFh Serial number

The pressure transmitter confirms the identification with the response if all information matches, otherwise no response will be generated.

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
7E4h	8	44h	0	0	0	0	0	0	0

Now the ID or the baud rate can be changed.

4.5.5 Changing ID and baud rate

Set new ID (e.g. to 2):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
7E5h	8	11h	02h	0	0	0	0	0	0

Byte 1:	11h	Specifier for changing ID
Byte 2:	02h	New ID, valid range 1~127

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
7E4h	8	11h	00h	0	0	0	0	0	0

Byte 1:	11h	Specifier for changing ID
Byte 2:	00h	ID successfully changed
	01h	Out of range
	FFh	Specific failure

Set new baud rate (e.g. to 250kbps):

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
7E5h	8	13h	00h	03h	0	0	0	0	0

Byte 1:	13h	Specifier for changing baud rate
Byte 2:	03h	New baud rate, valid range 00~07h

All supported baud rates are shown below.

00h → 1Mbps	01h → 800kbps	02 h → 500kbps
03 h → 250kbps	04 h → 125kbps	05 h → 100kbps
06 h → 50kbps	07 h → 20kbps	

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
7E4h	8	13h	00h	0	0	0	0	0	0

Byte 1:	13h	Specifier for changing baud rate
Byte 2:	00h	Successfully changed
	FFh	Baud rate not supported

4.5.6 Save settings

To accept the changes, settings must be saved. Save changes:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
7E5h	8	17h	0	0	0	0	0	0	0

Response:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
7E4h	8	17h	00h	0	0	0	0	0	0

Byte 1:	17h	Specifier for save settings
Byte 2:	00h	Successfully changed
	01h	Save not possible

4.5.7 Leave LSS configuration mode

The sensor can be set with the following command to leave LSS configuration mode:

ID	DLC	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
7E5h	8	04h	00h	0	0	0	0	0	0

No response will be sent for this command.

佛山市普量电子有限公司
电话：15875736878（微信号同步）
传真：0757-26619508
官网： http://www.puliangmeter.com
云物联平台：http://www.puliangiot.com
地址：佛山市顺德区容桂镇容里天富来工业区五期八座 501
邮编：528300