Technical Note

WDGA

Setting the CANopen Node-ID and baudrate

Stand: 20.02.2018

Inhaltsverzeichnis

1. General information

This technical note is to assist all those who deal with the products stated above.

This technical note serves as an example of a functioning application. A liability is excluded for material and legal errors in this documentation, especially for their accuracy, correctness, freedom from intellectual property and rights of third parties, completeness and/or usability in cases of intent or malice.

To ensure a safe operation, the device may be operated only according to the instructions of the operating manual. When used, the legal and security provisions are also to be observed for each specific application.

This also applies when using accessories.

The different settings are available at our technical manual "Technical Manual Absolute Encoder WDGA with CANopen interface". You can download it on www.wachendorff-automation.de/download.html

2. Communication mechanisms

SDO Service Data Object

Use: For status query and changes in the object directory. Two identifiers are assigned to one SDO channel. A SDO always has to be confirmed therefore the receiver acknowledges the receipt of each SDO message. In the event of an error, an "abort" message can also be sent. For WDGA rotary encoders the delay time until the acknowledge message is sent is maximum 1 millisecond.

PDO Process Data Object

Use: For process data transmission. A PDO supports the full length of a CAN message (8 data bytes), since a PDO does not require a protocol overhead. PDOs are not acknowledged and can be used for time-critical applications. By exploiting the full 8 bytes for user data, the protocol information is not available. As a result, the format between the PDO producer and consumer must be defined during configuration.

This is done by PDO mapping.

PDOs can be sent in several ways:

- **On request:** Another bus subscriber requests data via an RTR. (CiA does not advise the use of RTR. That's why RTR isn't supported by Wachendorff Automation.)
- **In synchronous mode:** On receive of a synchronization message (SYNC) from another bus subscriber, PDOs are transmitted independently.
- **In asynchronous mode:** A PDO message is triggered by an internal event (e.g. measured value change, internal event timer, etc.).

3. Setting Node-ID with SDO

After connecting the encoder WDGA with the CAN bus respectively the master and suppling the product-specific voltage the LED starts "flickering red and green".

The Node ID is set to 127d (7Fh) by factory default. Proceed the following steps to change the Node ID.

(The following pictures were taken with the tool PCAN-View by PEAK Systems: https:/www.peak-system.com/PCAN-View.242.0.html)

3.1. Step: Activation of the pre-operational mode.

⚠	The setting by SDO is only possible, if the encoder is in pre-operational mode (green flashing). For this send a sync message (siehe Tabelle 3.1; Abbildung 3.1).

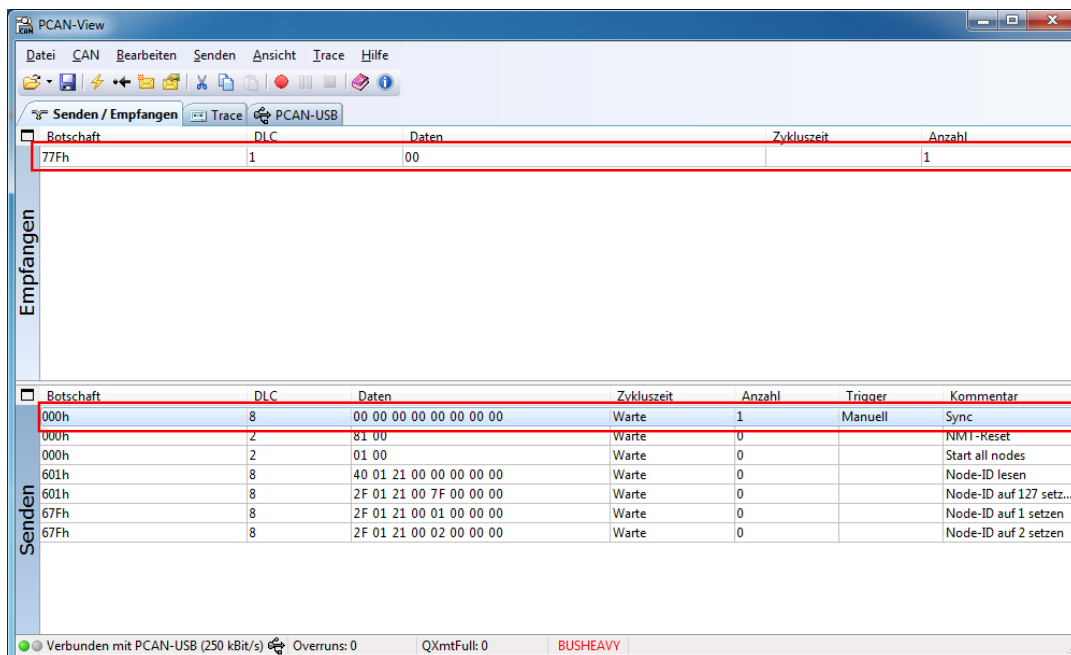| 080h	8	00h	00h	00h	00h	00h	00h	00h	00h
CAN-ID	DLC	Command	Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6

Tabelle 3.1: Sync-message

Abbildung 3.1: reaction of the encoder after sync message

3.2. Step: Changing of the specified object.

The Node-ID is saved in object 2101h sub-index 00h, so this is the object to change the Node-ID by using the following message (see Tabelle 3.2).

The SDO-write-message with the elected Node-ID (value as hex) must be sent (see Tabelle 3.2; Abbildung 3.2).

600h+ID	8	2Fh	01h	21h	00h	**Node-ID**	00h	00h	00h
CAN-ID	DLC	Command	Objekt L	Objekt H	Sub-Index	Byte 0	Byte 1	Byte 2	Byte 3

Tabelle 3.2: SDO-write command to set Node-ID

The Node-ID can be selected. A value between 1-127d is possible. These value has to be send to the encoder as an hex value. The following table includes examples (see Tabelle 3.3).

Node-ID (d)	Node-ID (hex)
1	01h
2	02h
…	…
4	04h
…	…
127	7Fh

Tabelle 3.3: Examples for Note-ID in hex and dec

After changing the Node-ID it is not necessary to save this change manually. The change will not be active before you have done a NMT-reset or a manuell reset. After this reset it will be saved in the EPROM (see Abbildung 3.3).
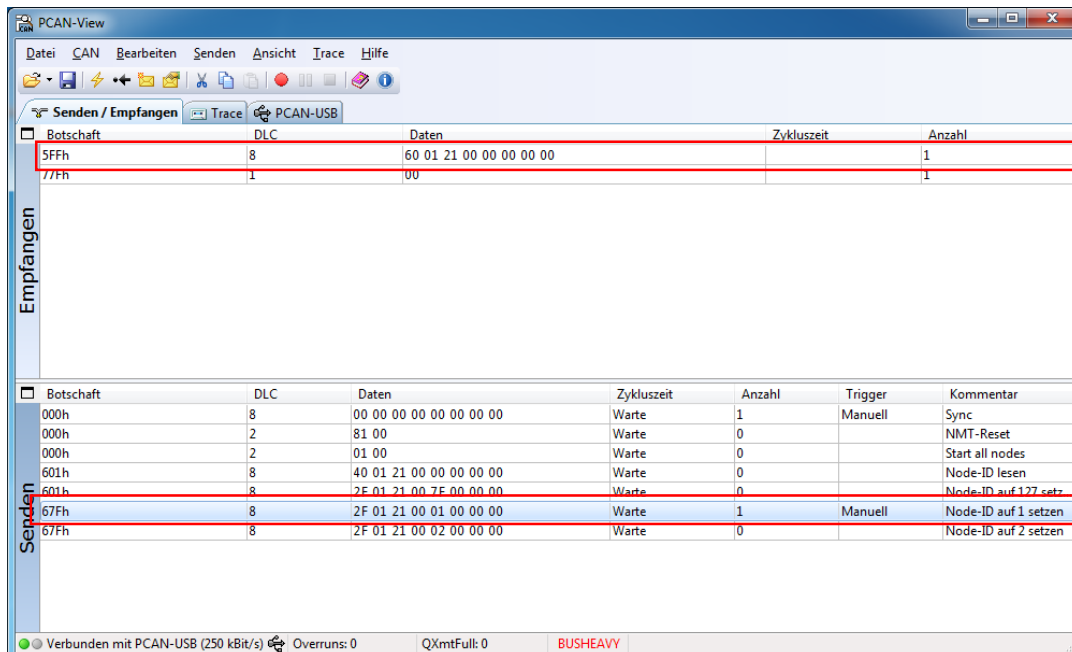

Abbildung 3.2: Example: changed Node-ID on 1

3.3. Step: To check the setting, read out the specified object

The changed Object 2101h Sub-Index 00h has to be read out. This is possible with the following message (see Tabelle 3.4; Abbildung 3.4)

600h+ID	8	40h	01h	21h	00h	00h	00h	00h	00h
CAN-ID	DLC	Command	Objekt L	Objekt H	Sub-Index	Byte 0	Byte 1	Byte 2	Byte 3

Tabelle 3.4: Message to read Node-ID

In the following screenshot you can see the response of the encoder (see Tabelle 3.5). The Node-ID of the encoder is displayed in Byte 0 as a hex value.

600h+ID	8	4Fh	01h	21h	00h	**7Fh**	00h	00h	00h
CAN-ID	DLC	Command	Objekt L	Objekt H	Sub-Index	Byte 0	Byte 1	Byte 2	Byte 3

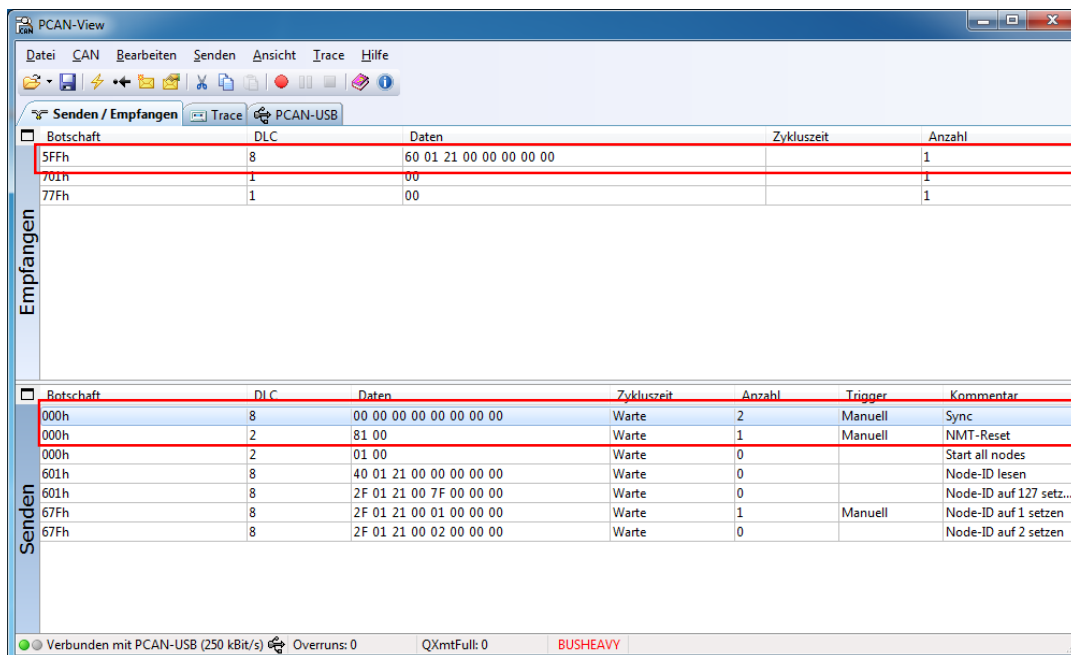*Tabelle 3.5: Answer of the encooder after reading the Node ID*

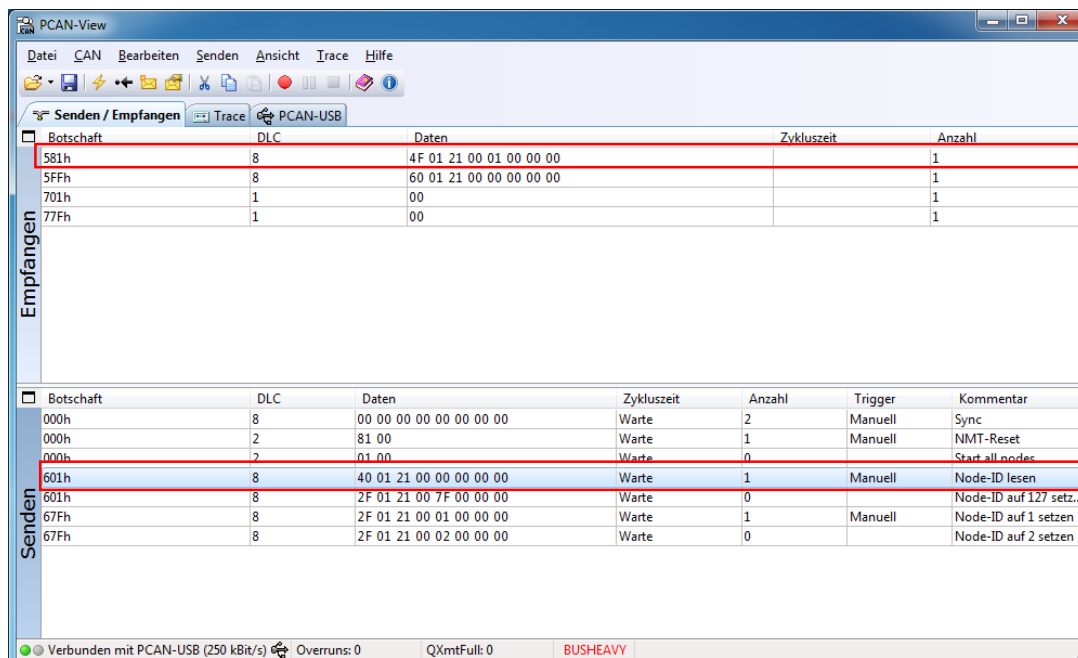*Abbildung 3.3: After NMT-Reset and Sync message*

Abbildung 3.4: After reading-message

> ⚠️ Changing the Node ID automatically adjusts the PDO and EMCY COB IDs. After the first manual storage, they are frozen at their current value and no longer automatically adjusted. Performing the "Restore Defaults" command will re-enable automatic adjustment.

4. Node-ID einstellen mit LSS

The encoder offers also the possibilty to change the Node-ID with LSS (Layer Setting Services). These explanation is available at the technical manual in chapter 8.2 (site 41-44). The technical manual is available for as a free download by our website ((www.wachendorff-automation.de/download.html).

5. Setting baudrate with SDO

The encoders WDGA by Wachendorff Automation provide an automatic baudrate detection. It is also possible to use a fixed baudrate which can be set by either LSS (as described above) or SDO.

The configuration of the encoder is only possible in Pre-Operational mode. To alter the baudrate you have to change object 2100h Sub-Index 00h. This can be achieved with a simple SDO write command with the target baudrate as data.

600h+ID	8	2Fh	00h	21h	00h	**Baud**	00h	00h	00h
CAN-ID	DLC	Command	Object L	Object H	Sub-index	Byte0	Byte1	Byte2	Byte3

Tabelle 5.1: SDO- message – set baudrate

The following values represent the valid baud rates:

Value (d)	Baudrate (kBit/s)
0	1000
1	800
2	500
3	250
4	125
5	100
6	50
7	20
8	10
9	Auto

Tabelle 5.2: Baudrate coding

> ⚠ The new baudrate will become effective after a reset of the encoder (hard reset or NMT reset). Writing on object 2100h is not protected and the change will be immediately stored in the internal EEPROM. It is not necessary to perform a "save parameters".

6. Recommended accessories

We recommend the following for a frictionless starting up of the encoder:

„Starter package with absolute CANopen WDGA encoder"

1x Encoder WDGA 36A
Item-Nr:
WDGA-36A-06-1218-COA-B00-CB5
www.wachendorff-automation.de/wdga36a

1x Stub/ Bus cable 1m
Item-Nr: CVK-5-67-010
www.wachendorff-automation.de/cvk567

2x T-junction
Item-Nr: CTA-21-67-01
www.wachendorff-automation.de/cta216701

1x PEAK-CAN-USB-Analyzer with
connection adapter
Item-Nr: CANUSBANALYZER
www.wachendorff-automation.de/canusbanalyzer

1x Termination resitor plug 120 Ohm
Item-Nr: CEW-120-67-S
www.wachendorff-automation.de/cew12067S

1x Termination resitor bush 120 Ohm
Item-Nr: CEW-120-67-B
www.wachendorff-automation.de/cew12067b

Order-Nr: WDGA-36A-06-1218-COA-B00-CB5-KIT

For more information please visit our website or contact our customer service or technical support.

7. Copyright

This document is the property of Wachendorff Automation GmbH & Co. KG. Copying and duplication are prohibited without prior permission. The content of this documentation refers to the device described there and/or the described product group.

8. Additional exclusion of liability

All technical content within this document can be modified without prior notice. The content of the document is the content of a recurring revision.

In the event of loss due to fire, earthquake, intervention by a third party or other accidents, or intentional or accidental misuse or improper use, or use under abnormal conditions, repairs shall be invoiced to the user. Wachendorff is not liable for accidental loss due to use of or inability to use this product, such as loss of business income.

Wachendorff is not liable for the consequences of improper use.

9. Customer service and technical support

If you have technical questions, you can reach us at

Tel.:   +49 67 22 / 99 65 - 414
E-Mail: support-wdga@wachendorff.de

Please refer to our website for more details: www.wachendorff-automation.de