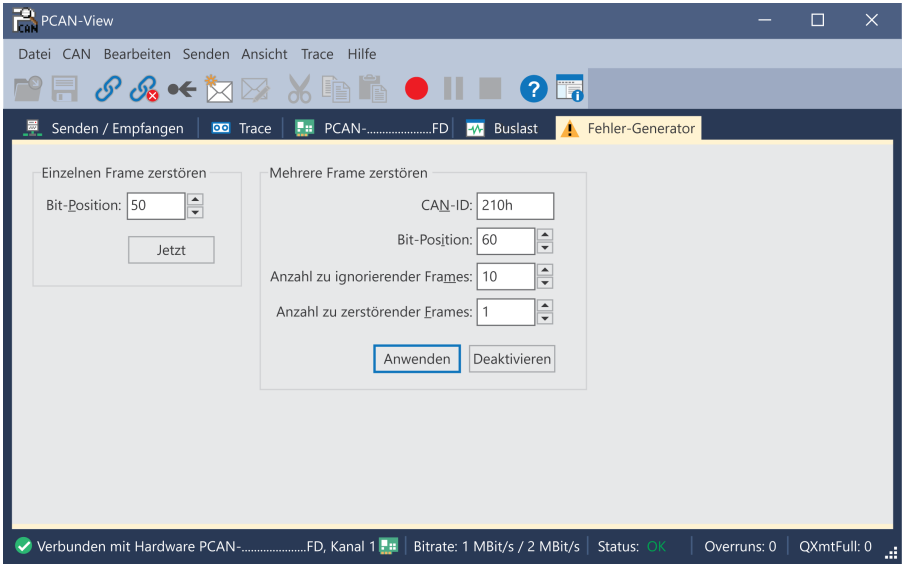
PCAN-View

Error Generator - User Guide



Contents

1 Description

Via the *Error Generator* tab, the communication on the CAN bus in test environments or during the development of CAN buses can be disturbed in a controlled way by six consecutive dominant bits. This is a violation of the CAN protocol on the CAN bus which must be recognized as an error by the connected CAN nodes.

Note: The error generator is intended exclusively for CAN technology specialists and only for development environments.

Note: In order for the error frames, error counters, and other states to be displayed, they must be switched on in the *Trace* menu.

You can destroy CAN frames with the error generator by two methods:

- one-time without reference to CAN-ID
- cyclic for a specific CAN-ID

1.1 Basics

The following must be observed before execution:

- **Principle:** By sending six consecutive dominant bits the CAN frames are destroyed.
- To achieve an unaltered test result, the CAN bus must be terminated.
- The bit position where the error is to be generated is specified without stuff bits.
  Exception: PCAN-USB Pro (IPEH-002061), here the stuff bits must be taken into account.
- In general as well as for error generation at a certain position the ID length, data length and total length must be known.
  Note that preceding dominant bits influence the error position in the CAN frame.

  Tip: For the analysis of CAN frames we recommend our free CAN FD Frame Analyzer: www.peak-system.com/quick/DL-Software-E
- PCAN-View only logs errors that occur on its own CAN node.
- To avoid a Bus Off condition at the transmitter, the ratio of "Number of frames to ignore" to "Number of frames to destroy" must be greater than 8:1.

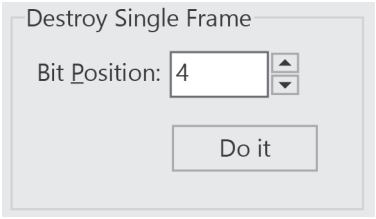
Note: The *Error Generator* tab of PCAN-View appears only when using a CAN FD interface.

1.2 Destroy Single Frame

Refers to the next CAN frame, independent of the CAN ID, that is recognized after the function is activated. The bit position must be a position within the CAN frame.

1.2.1 Generate error

1. Enter the *Bit Position* where in the CAN frame the error is to be generated.



2. Execute the destroy action with *Do it*.
   The next received or transmitted CAN frame will be destroyed at the selected bit position.

In this example the *Bit Position* at the transmitter is set to 4, that is within the 11 bit ID 123h selected here.

Trace Tab for 11 bit CAN-ID

Receive / Transmit | Trace | PCAN-..... | Bus Load | Error Generator

Recording... | 21,8026 s | 0,97 % | Ring Buffer | Rx: 968 | Tx: 0 | Status: 0

Time	CAN-ID	Rx/Tx	Type	Length	Data
1,4150	123h	Rx	Data	8	00 00 00 00 00 00 00 00
1,4240	123h	Rx	Data	8	00 00 00 00 00 00 00 00
1,4339	123h	Rx	Data	8	00 00 00 00 00 00 00 00
1,4439	123h	Rx	Data	8	00 00 00 00 00 00 00 00
1,4558	123h	Rx	Error		Stuff Error, Rx, ID.20 to ID.18, RxErr=1, TxErr=0
1,4559	123h	Rx	Error Counter		RxErr=0, TxErr=0
1,4659	123h	Rx	Data	8	00 00 00 00 00 00 00 00

The *Trace* tab of the receiver displays the error frame and the immediately following error counter, and data frame. The transmitting CAN node immediately recognizes the destroyed frame and starts retransmission.

1.3 Destroy Multiple Frames

This operation mode stays active until the function is disabled or the CAN interface is reset. The bit position must be after the identifier for this function.

The following parameters are required:

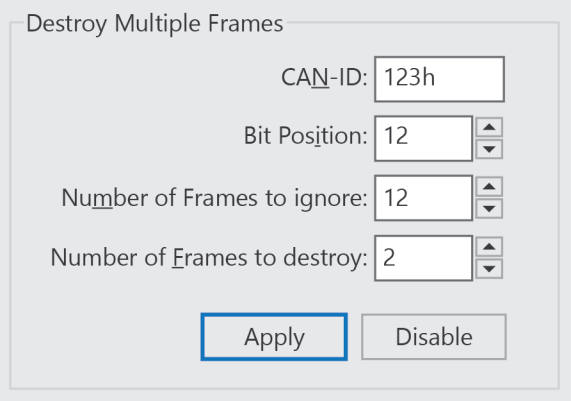
- CAN-ID for 11 bit or 29 bit
- Bit Position
- Number of Frames to ignore
- Number of Frames to destroy

1.3.1 Generate error

1. Determine the CAN ID of the CAN frame that is to be destroyed multiple times. The following specifications refer to this ID.
2. Enter the *Bit Position* where in the CAN frames the error is to be generated. The bit position must start after the identifier.
3. If CAN messages are to be sent unharmed before destruction, specify the *Number of Frames to ignore*.
4. Determine the *Number of Frames to destroy*.
5. Run the error generator with *Apply*.
   The frames are displayed in the *Trace* tab.
6. Quit the error generator with *Disable*.

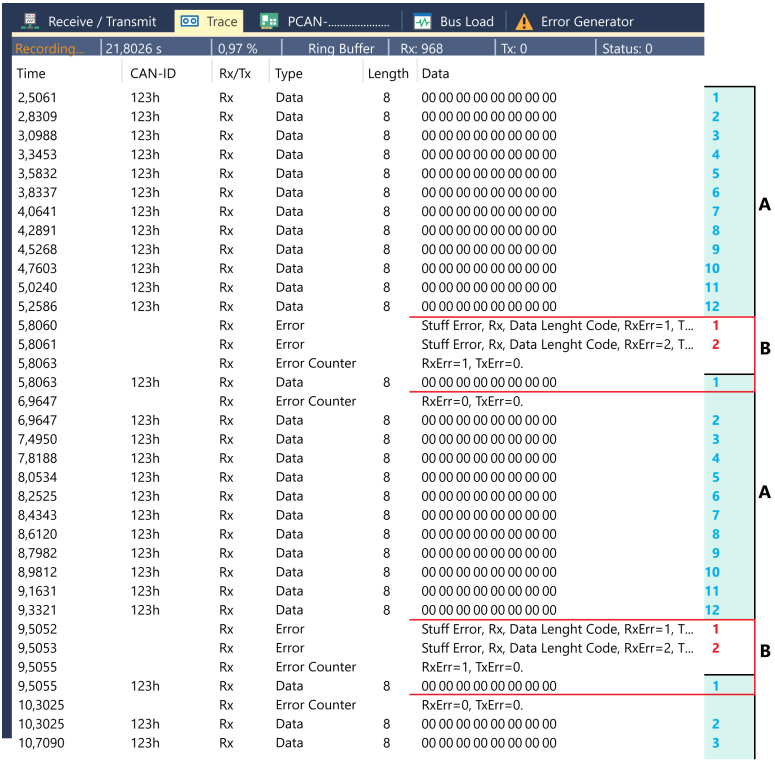
> **Note:** If you do not quit the error generator with *Disable* and close the window, the error generator will not be terminated and will continue to destroy the frames.

1.3.2 Example with 11 bit CAN-ID



The *Bit Position* to destroy the CAN frames is set to 12, which is after the end of the 11 bit ID field.
The Number of Frames to ignore is set to 12, consequently 12 CAN frames are received, which are ignored by the error generator.
The Number of Frames to destroy is set to 2, consequently 2 consecutive CAN frames with the CAN-ID 123h are destroyed.

Trace Tab for 11 bit CAN-ID



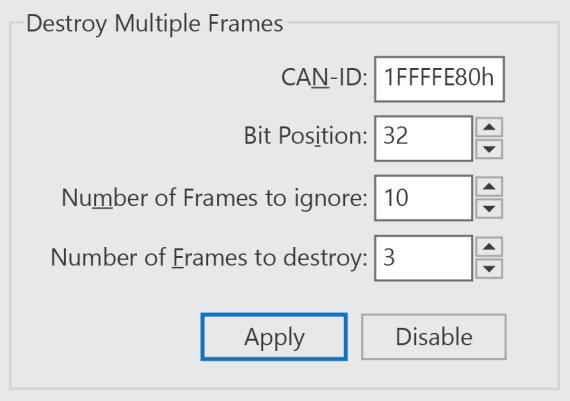
Receive / Transmit | Trace | PCAN-..... | Bus Load | Error Generator

Recording... | 21,8026 s | 0,97 % | Ring Buffer | Rx: 968 | Tx: 0 | Status: 0

Time	CAN-ID	Rx/Tx	Type	Length	Data		
2,5061	123h	Rx	Data	8	00 00 00 00 00 00 00 00	1	
2,8309	123h	Rx	Data	8	00 00 00 00 00 00 00 00	2	
3,0988	123h	Rx	Data	8	00 00 00 00 00 00 00 00	3	
3,3453	123h	Rx	Data	8	00 00 00 00 00 00 00 00	4	
3,5832	123h	Rx	Data	8	00 00 00 00 00 00 00 00	5	
3,8337	123h	Rx	Data	8	00 00 00 00 00 00 00 00	6	
4,0641	123h	Rx	Data	8	00 00 00 00 00 00 00 00	7	A
4,2891	123h	Rx	Data	8	00 00 00 00 00 00 00 00	8	
4,5268	123h	Rx	Data	8	00 00 00 00 00 00 00 00	9	
4,7603	123h	Rx	Data	8	00 00 00 00 00 00 00 00	10	
5,0240	123h	Rx	Data	8	00 00 00 00 00 00 00 00	11	
5,2586	123h	Rx	Data	8	00 00 00 00 00 00 00 00	12	
5,8060		Rx	Error		Stuff Error, Rx, Data Lenght Code, RxErr=1, T...	1	
5,8061		Rx	Error		Stuff Error, Rx, Data Lenght Code, RxErr=2, T...	2	B
5,8063		Rx	Error Counter		RxErr=1, TxErr=0.		
5,8063	123h	Rx	Data	8	00 00 00 00 00 00 00 00	1	
6,9647		Rx	Error Counter		RxErr=0, TxErr=0.		
6,9647	123h	Rx	Data	8	00 00 00 00 00 00 00 00	2	
7,4950	123h	Rx	Data	8	00 00 00 00 00 00 00 00	3	
7,8188	123h	Rx	Data	8	00 00 00 00 00 00 00 00	4	
8,0534	123h	Rx	Data	8	00 00 00 00 00 00 00 00	5	
8,2525	123h	Rx	Data	8	00 00 00 00 00 00 00 00	6	A
8,4343	123h	Rx	Data	8	00 00 00 00 00 00 00 00	7	
8,6120	123h	Rx	Data	8	00 00 00 00 00 00 00 00	8	
8,7982	123h	Rx	Data	8	00 00 00 00 00 00 00 00	9	
8,9812	123h	Rx	Data	8	00 00 00 00 00 00 00 00	10	
9,1631	123h	Rx	Data	8	00 00 00 00 00 00 00 00	11	
9,3321	123h	Rx	Data	8	00 00 00 00 00 00 00 00	12	
9,5052		Rx	Error		Stuff Error, Rx, Data Lenght Code, RxErr=1, T...	1	
9,5053		Rx	Error		Stuff Error, Rx, Data Lenght Code, RxErr=2, T...	2	B
9,5055		Rx	Error Counter		RxErr=1, TxErr=0.		
9,5055	123h	Rx	Data	8	00 00 00 00 00 00 00 00	1	
10,3025		Rx	Error Counter		RxErr=0, TxErr=0.		
10,3025	123h	Rx	Data	8	00 00 00 00 00 00 00 00	2	
10,7090	123h	Rx	Data	8	00 00 00 00 00 00 00 00	3	

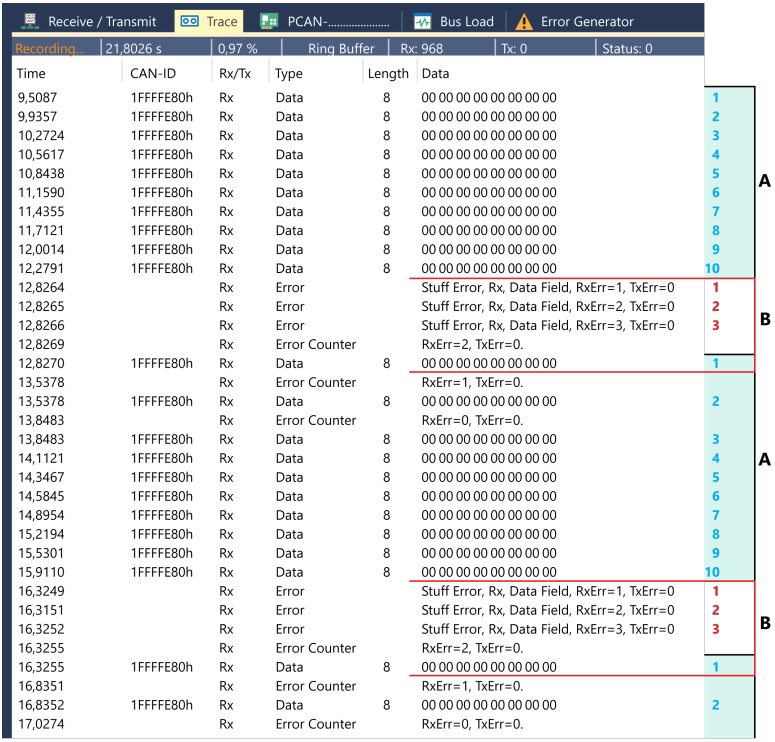
The *Trace* tab of the receiver shows 12 data frames with CAN-ID 123h (A), followed by 2 error frames, an error counter, and a correct data frame (B). This 3 frames (error frame, error frame, data frame) are transmitted within a few microseconds. The transmitting CAN node detects the destroyed frame and starts the retransmission immediately. Again 12 frames are sent and the 2 following frames are destroyed. This process is repeated until the function is terminated.

1.3.3 Example with 29 bit CAN-ID



The *Bit Position* to destroy the CAN frames is set to 32, which is after the end of the 29 bit ID field.
The Number of Frames to ignore is set to 10, consequently 10 CAN frames are received, which are ignored by the error generator.
The Number of Frames to destroy is set to 3, consequently 3 consecutive CAN frames with the CAN-ID 123h are destroyed.

Trace Tab for 29 bit CAN-ID



Receive / Transmit | Trace | PCAN-..... | Bus Load | Error Generator

Recording... | 21,8026 s | 0,97 % | Ring Buffer | Rx: 968 | Tx: 0 | Status: 0

Time	CAN-ID	Rx/Tx	Type	Length	Data		
9,5087	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	1	A
9,9357	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	2	
10,2724	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	3	
10,5617	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	4	
10,8438	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	5	
11,1590	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	6	
11,4355	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	7	
11,7121	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	8	
12,0014	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	9	
12,2791	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	10	
12,8264		Rx	Error		Stuff Error, Rx, Data Field, RxErr=1, TxErr=0	1	B
12,8265		Rx	Error		Stuff Error, Rx, Data Field, RxErr=2, TxErr=0	2	
12,8266		Rx	Error		Stuff Error, Rx, Data Field, RxErr=3, TxErr=0	3	
12,8269		Rx	Error Counter		RxErr=2, TxErr=0.		
12,8270	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	1	
13,5378		Rx	Error Counter		RxErr=1, TxErr=0.		
13,5378	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	2	
13,8483		Rx	Error Counter		RxErr=0, TxErr=0.		
13,8483	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	3	
14,1121	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	4	A
14,3467	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	5	
14,5845	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	6	
14,8954	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	7	
15,2194	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	8	
15,5301	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	9	
15,9110	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	10	
16,3249		Rx	Error		Stuff Error, Rx, Data Field, RxErr=1, TxErr=0	1	B
16,3151		Rx	Error		Stuff Error, Rx, Data Field, RxErr=2, TxErr=0	2	
16,3252		Rx	Error		Stuff Error, Rx, Data Field, RxErr=3, TxErr=0	3	
16,3255		Rx	Error Counter		RxErr=2, TxErr=0.		
16,3255	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	1	
16,8351		Rx	Error Counter		RxErr=1, TxErr=0.		
16,8352	1FFFFE80h	Rx	Data	8	00 00 00 00 00 00 00 00	2	
17,0274		Rx	Error Counter		RxErr=0, TxErr=0.		

The *Trace* tab of the receiver shows 10 data frames with the CAN-ID 1FFFFE80h (A), followed by 3 error frames, an error counter, and a correct data frame (B). These 3 error frames, the error counter, and the data frame are transmitted within a few microseconds. The transmitting CAN node immediately recognizes the destroyed frame and starts retransmission. Again 10 frames are transmitted and the 3 following frames are destroyed. This process is repeated until the function is terminated.