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Communication DMA-20

1 Overview

The communication between STG-800/STG-810/ STG-820 and DMA-20 is made via a CAN bus with a baud rate of 250 kBit/s.

The internally filter will only process CAN messages that have the ID 0x7FD.

Pressing a displayed button causes a CAN message to be sent on ID 0x7FC.

2 Micro-SD card

The micro SD-card will log all received CAN-Messages which will fit in filters options. The filter IDs can be modified by sending a message to the DMA (see 2.1 Message format). After reset, the CAN-ID filter is open from 0x7F0 to 0x7F0. The DMA-20 will send a CAN-Message with result for each action with micro SD-card (see 2.2 Message Feedback format).

2.1 Message format


ID 0x7F1 (open filter from)
ID 0x7F2 (open filter to)
DLC: 8 Byte
Format: Intel (Byte 0 = LSB)

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
		I32 CAN-ID					

2.2 Message Feedback format

Errorcode 0x7F3
DLC: 8 Byte
Format: Intel (Byte 0 = LSB)

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
		I32 Result code 0: card inserted 1: card ready 2: message saved / card ready 6: file open error 7: file write error 8: micro SD-card removed / not present					


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3 CAN-Message (DMA-20 receive)

3.1 Message format

ID 0x7FB
 DLC: 8 Byte
 Format: Intel (Byte 0 = LSB)

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
U16 P-ID		I32 Value					U8 Visible
		Char 0	Char 1	Char 2	Char 3	Char 4	U8 Visible

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3.2 Message content


P-ID	Data type	Description
0	U32	Activate Template: <ul style="list-style-type: none"> 0: Template 0 - „Intro Screen“ 1: Template 1 - „1V“ 2: Template 2 - „1V_BAR“ 3: Template 3 - „7V“ 4: Template 4 - „TXT“
1	U32 or 4x Char	Parameter 0 or Char 0 ... Char 4 ¹
2	U32 or 4x Char	Parameter 1 or Char 5 ... Char 9 ³
3	U32 or 4x Char	Parameter 2 or Char 0 ... Char 4 ³
4	U32 or 4x Char	Parameter 3 or Char 5 ... Char 9 ³
...	U32 or 4x Char	Parameter ... or Char ³
Max.	U32	Parameter max.

4 CAN-Message (DMA-20 transmit)

ID 0x7FC
DLC: 8 Byte
Format: Intel (Byte 0 = LSB)

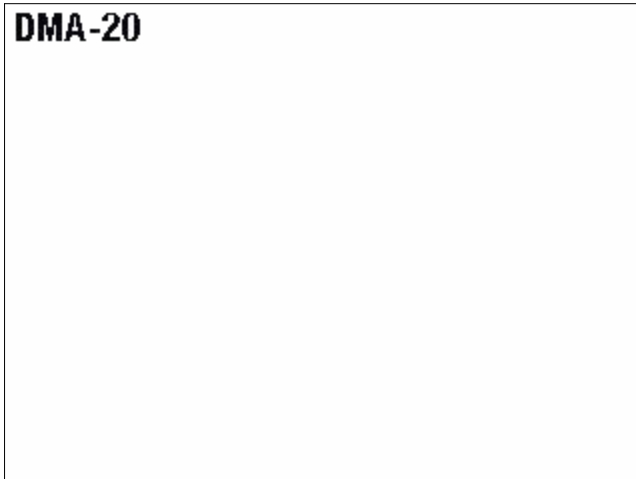
Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
U16 Template number		I32 Pressed button as bit				0x00	0x00

1 depending on used Template


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5 Templates

5.1 Template 0 - „Intro Screen“



This screen is displayed after power on until a CAN message with the ID 0x7FD is received.

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5.2 Template 1 - „1V“

Displays the controls and values (See XXXXXX):

P-ID: description

1: String0 (1/2)

2: String0 (2/2)

3: Parameter number

4: Value

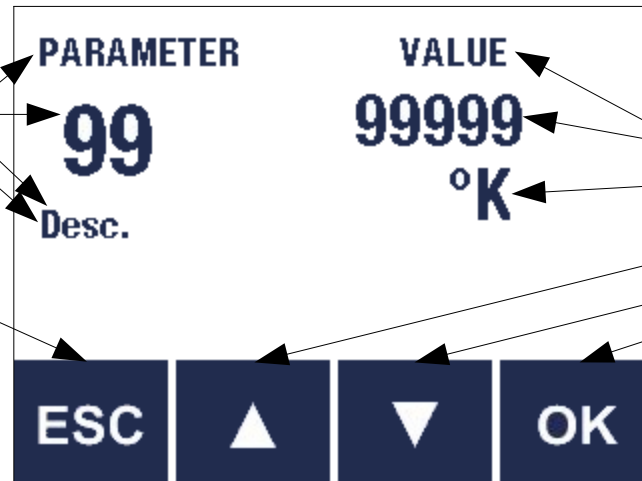
5: Unit

6: ESC

7: UP

8: DOWN

9: OK



P-ID: description

1: String0 (1/2)

2: String0 (2/2)

3: Parameter number

4: Value


5: Unit

6: ESC

7: UP

8: DOWN

9: OK

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5.3 Template 2 - „1V_Bar“

P-ID: description

1: String0 (1/2)

2: String0 (2/2)

3: Parameter number

4: Value

5: Unit

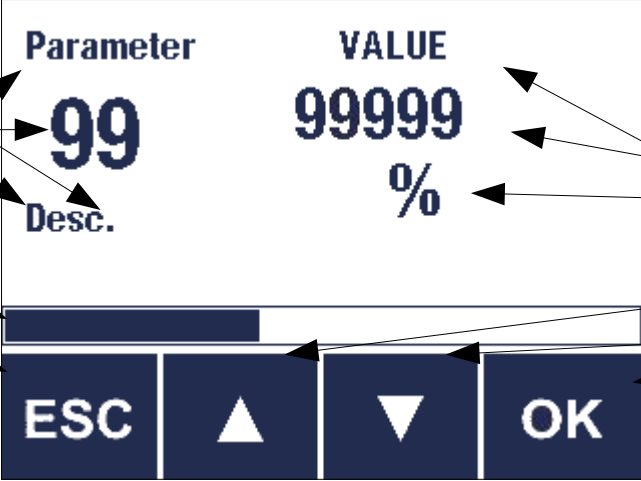
6: Bargraph

7: ESC

8: UP

9: DOWN

10: OK



P-ID: description

1: String0 (1/2)

2: String0 (2/2)

3: Parameter number

4: Value

5: Unit

6: Bargraph

7: ESC

8: UP

9: DOWN

10: OK

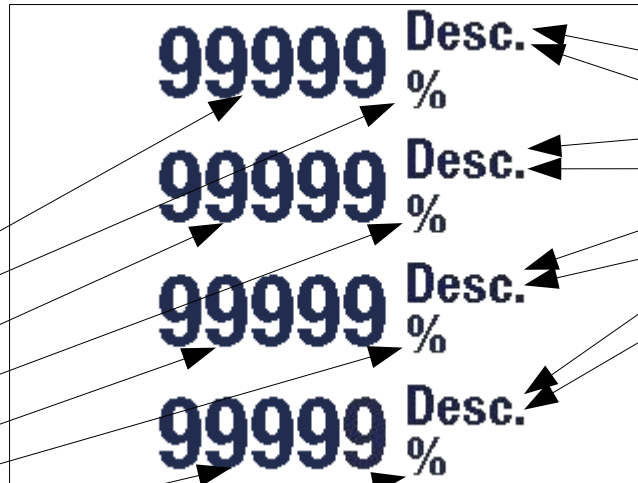
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5.4 Template 3 - „ 7V “


P-ID: description

- 1: String0 (1/2)
- 2: String0 (2/2)
- 3: String1 (1/2)
- 4: String1 (2/2)
- 5: String2 (1/2)
- 6: String2 (2/2)
- 7: String3 (1/2)
- 8: String3 (2/2)
- 9: Value
- 10: Unit
- 11: Value
- 12: Unit
- 13: Value
- 14: Unit
- 15: Value
- 16: Unit



P-ID: description

- 1: String0 (1/2)
- 2: String0 (2/2)
- 3: String1 (1/2)
- 4: String1 (2/2)
- 5: String2 (1/2)
- 6: String2 (2/2)
- 7: String3 (1/2)
- 8: String3 (2/2)
- 9: Value
- 10: Unit
- 11: Value
- 12: Unit
- 13: Value
- 14: Unit
- 15: Value
- 16: Unit

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5.5 Template 4 - „TXT“

This page contains three free to defined strings up to 20 chars (4x5).

1. First line contain complete String0 and String1.
2. The second line contain string2 and string3.
3. The third line contain string4 and string5.

P-ID: description

- 1: String0 (1/2)
- 2: String0 (2/2)
- 3: String1 (1/2)
- 4: String1 (2/2)
- 5: String2 (1/2)
- 6: String2 (2/2)
- 7: String3 (1/2)
- 8: String3 (2/2)
- 9: String4 (1/2)
- 10: String4 (2/2)
- 11: String5 (1/2)
- 12: String5 (2/2)

XXXXXXXXXXXXXXXXXXXXX

12345678901234567890

your text here


ESC

▲

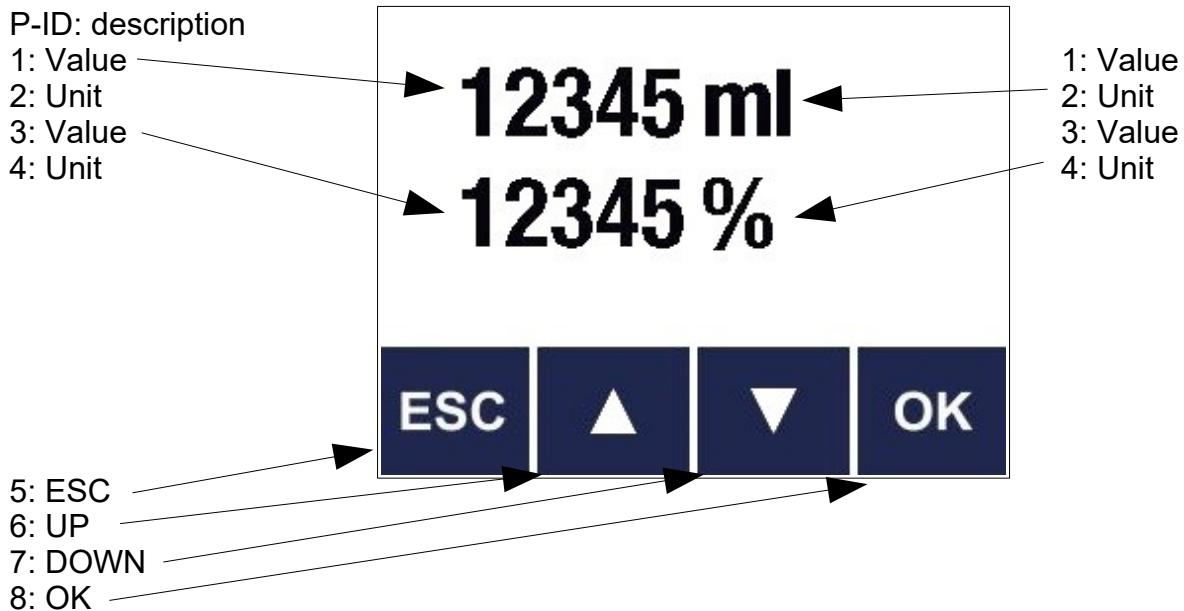
▼

OK

- 13: ESC
- 14: UP
- 15: DOWN
- 16: OK

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5.6 Template 5 - „ 2 Values “




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5.7 Template 6 - „ 4 Numbers “



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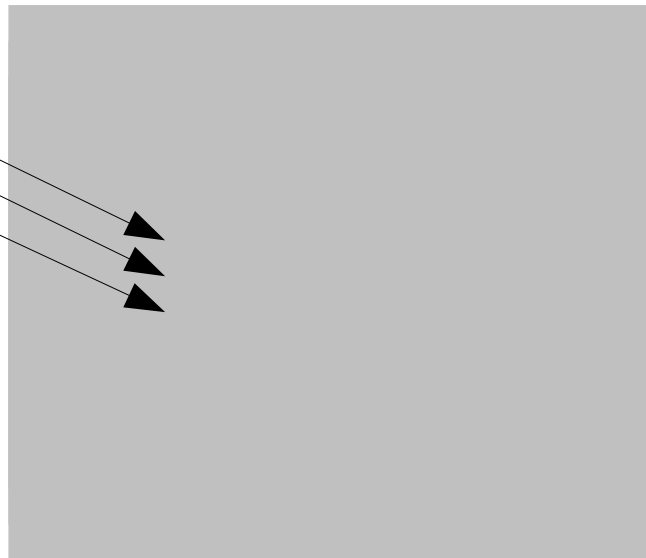
5.8 Template 7 - „Colored screen“

P-ID: description

1: char 0 (blue)


1: char 1 (green)

1: char 2 (red)




5.8.1 CAN-Example

CAN-ID	DLC	Data								Result
0x7FB	6	0x00	0x00	0x07	0x00	0x00	0x00			activate Template 7
0x7FB	6	0x01	0x00	0xFF	0x00	0x00	0x00			blue screen (char 0) 0x00 = 0% 0xFF = 100%
0x7FB	6	0x01	0x00	0x00	0xFF	0x00	0x00			green screen (char 1) 0x00 = 0% 0xFF = 100%
0x7FB	6	0x01	0x00	0x00	0x00	0xFF	0x00			red screen (char 2) 0x00 = 0% 0xFF = 100%
0x7FB	6	0x01	0x00	0xFF	0xFF	0xFF	0x00			white screen

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6 Samples

For sample code see programming example "DMA-20_ByCAN".

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7 Sample Code for DMA-20 with embedded menu generator

7.1 Requirements

- Keil μ V5
- license to compile code for STM32F407
- DMA-20
- STM32 ST-LINK Utility (removing readout protection)

7.2 Step by step

- unzip the downloaded package
- open the project in Keil μ V5 and try compiling
 - if compiling fail you can install μ V5 to another disk location (use the MDK-Lite Evaluation-Version from the another disk location to compile the project file)
 - when compiling was successful you can continue
- open embedded menu generator (EMG)
- open Sample.xml in embedded menu generator
(unzipped project location)...\dma20_emg1page\EMG2\Sample.xml
- change the saving path to the correct path:
- (unzipped project location)...\dma20_emg1page\DMA-20\Drivers\jasys_EMG_data
- modify screen with controls
- save changes in embedded menu generator
- build application in embedded menu generator
- compile code in Keil μ V5 and download to target
- after flashing you will see the page you modify on the DMA-20 screen

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7.3 embedded menu generator

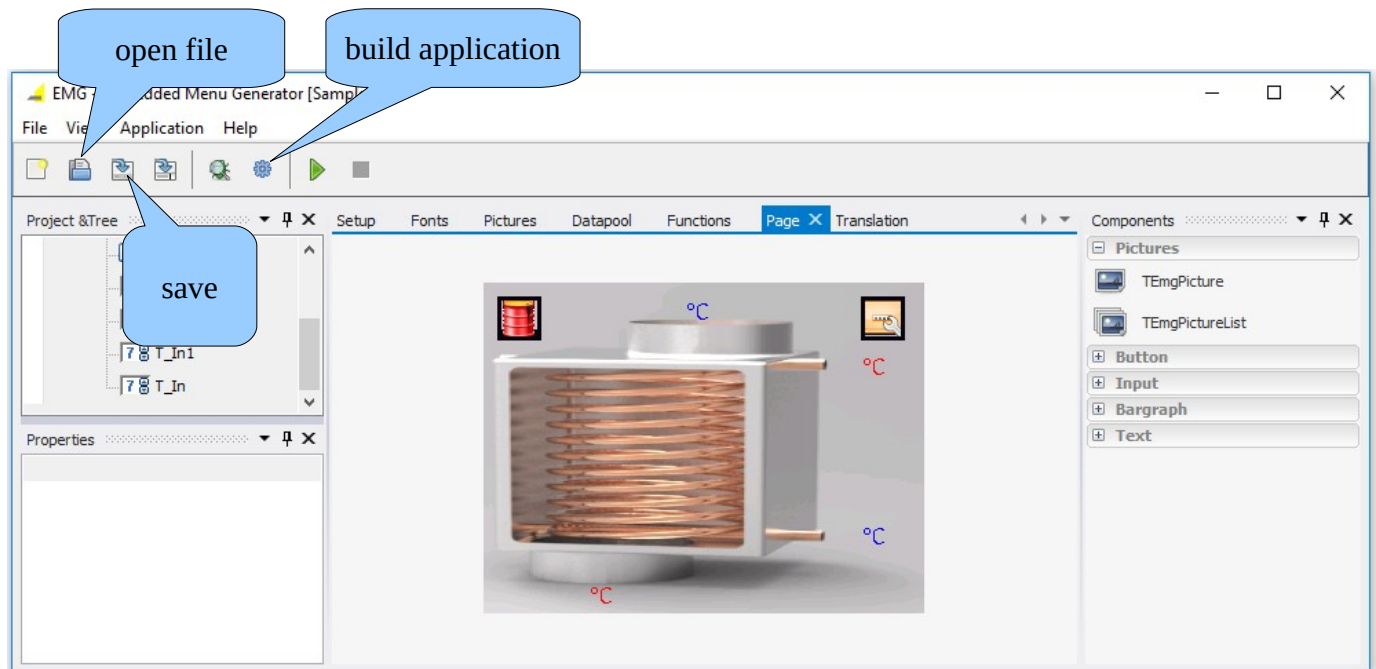


Abbildung 1: start screen embedded menu generator

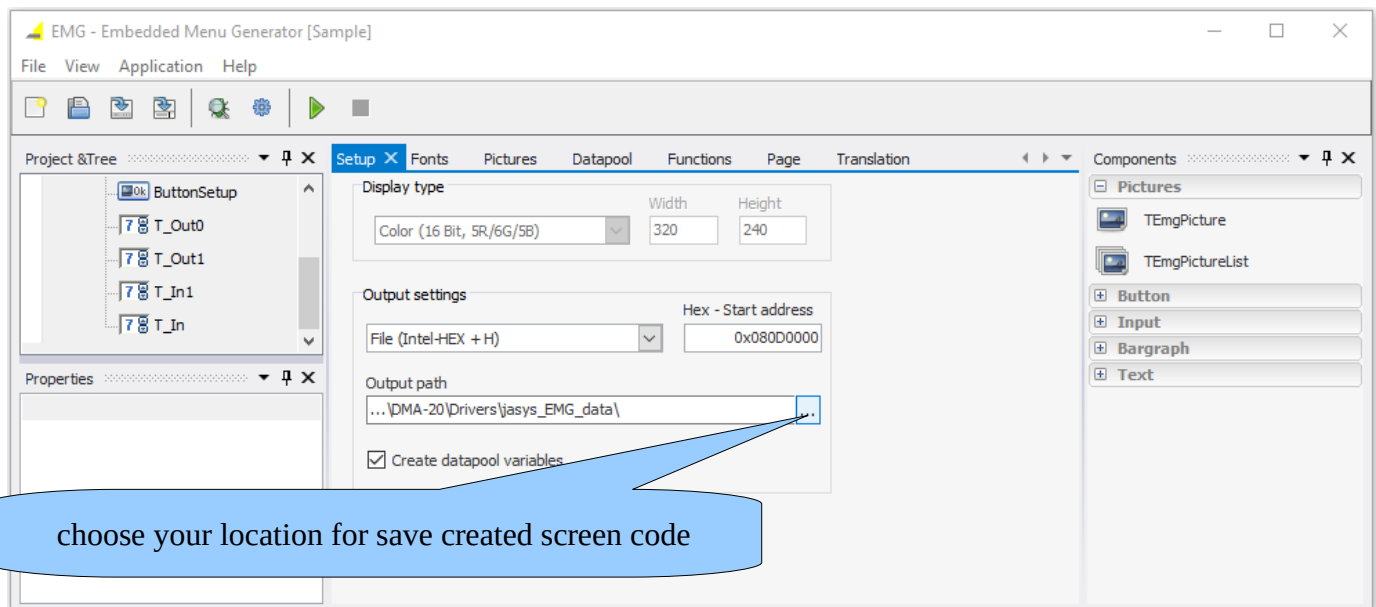


Abbildung 2: select save path