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## Communication DMA-20 ↔ STG-570

### 1 Overview

The communication between STG-570 and DMA-20 is made via a CAN bus with a baud rate of 250 kBit/s.

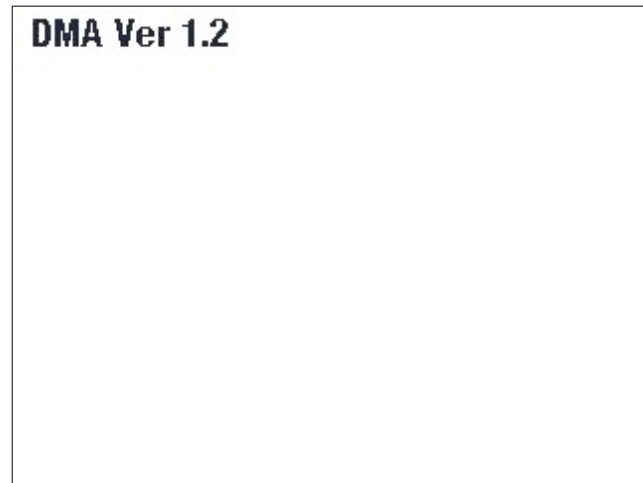
The internal filter will not process CAN messages that do not have the ID 0x7FD.

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

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## 2 Template 0 - Intro Screen


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



### 2.1 Show Template

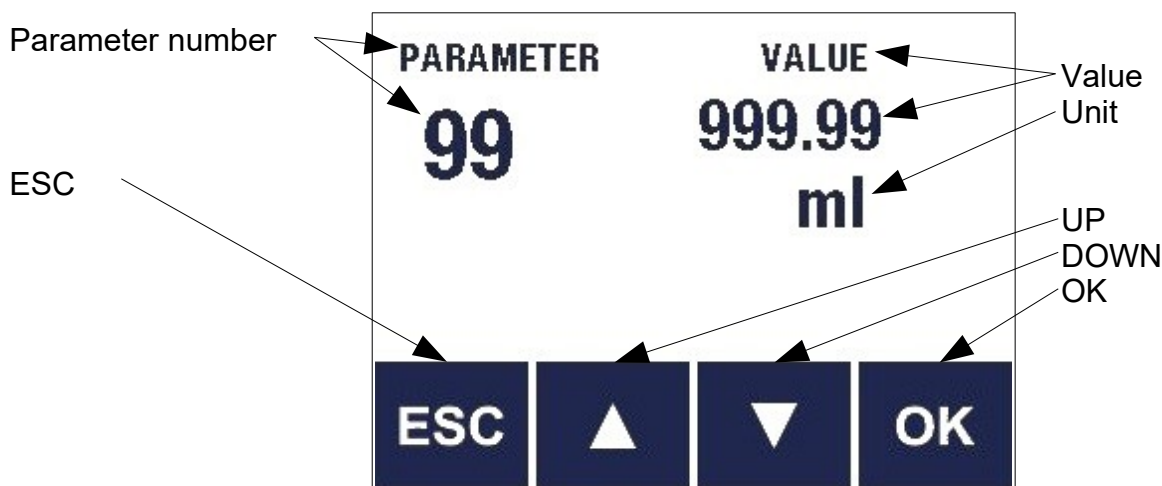
CAN-ID: 0x7FD  
DLC: 8 Byte

<b>Byte 0</b>	<b>Byte 1</b>	<b>Byte 2</b>	<b>Byte 3</b>	<b>Byte 4</b>	<b>Byte 5</b>	<b>Byte 6</b>	<b>Byte 7</b>
U8 Template number 0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00

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## 3 Template 1 - „1V“

Displays the controls and values:



### 3.1 Show Template


CAN-ID: 0x7FD  
DLC: 8 Byte

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
U8 Tem- plate number 0x01	U8 Param- eter number 0 ...255	I32 Value -2147483648 ... 2147483647  Value will be shown with two Decimal places (-21474836,48 ... 21474836,47)				U8 Unit 0 1 % 2 °C 3 °K 4 l 5 ml 6 m 7 mm 8 kg 9 g 10 kN 11 N 12 V 13 mV 14 A 15 mA	U8 Visibility of the con- trols masked with one bit per Control  Bit 0: Parameter number Bit 1: Value Bit 2: Unit Bit 3: — Bit 4: Button ESC Bit 5: Button UP Bit 6: Button DOWN Bit 7: Button OK

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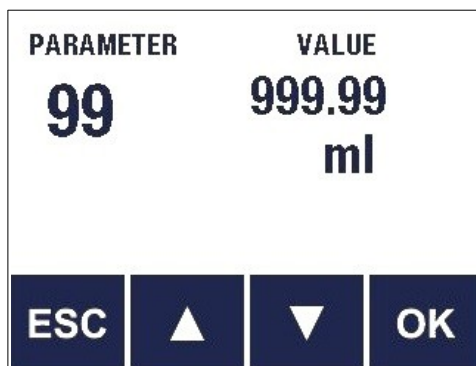


Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
						16 kΩ	
						17 Ω	
						18 kW	
						19 W	
						20 h	
						21 min	
						22 s	
						23 ms	
						24 kHz	
						25 Hz	
						26 Ws	
						27 Wh	
						28 kWh	
						29 MWh	
						30 ‰	
						31 As	
						32 Ah	
						33 H	
						34 F	
						35 V/m	
						36 A/m	
						37 lx	
						38 cd	
						39 lm	
						40 bar	
						41 Pa	
						42 kPa	
						43 J	
						44 kJ	
						45 m/s	
						46 km/h	
						47 m/s <sup>2</sup>	
						48 mol	
						49 mol/l	
						50 m <sup>2</sup>	
						51 m <sup>3</sup>	
						52 °	
						53 rad	

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## 3.1.1 Example

Parameter number: 99  
 Value: 99999  
 Unit: 5 (ml)  
 Visibility: 0xF7  
 -Parameter (Visible)  
 -Value (Visible)  
 -Unit (Visible)  
 -Button ESC (Visible)  
 -Button UP (Visible)  
 -Button DOWN (Visible)  
 -Button OK (Visible)



CAN-ID: 0x7FD  
 DLC: 8 Byte

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x01	0x63	0x9F	0x86	0x01	0x00	0x05	0xF7

## 3.2 Button Feedback Message

The message will be sent after releasing the button.

CAN-ID: 0x7FC  
 DLC: 8 Byte


Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Template number 0x0005: Template 2		Pressed button as Bit: bit 5: Button ESC bit 6: Button UP bit 7: Button DOWN bit 8: Button OK				0x00	0x00

### 3.2.1 Example

When the button "ESC" gets pressed.

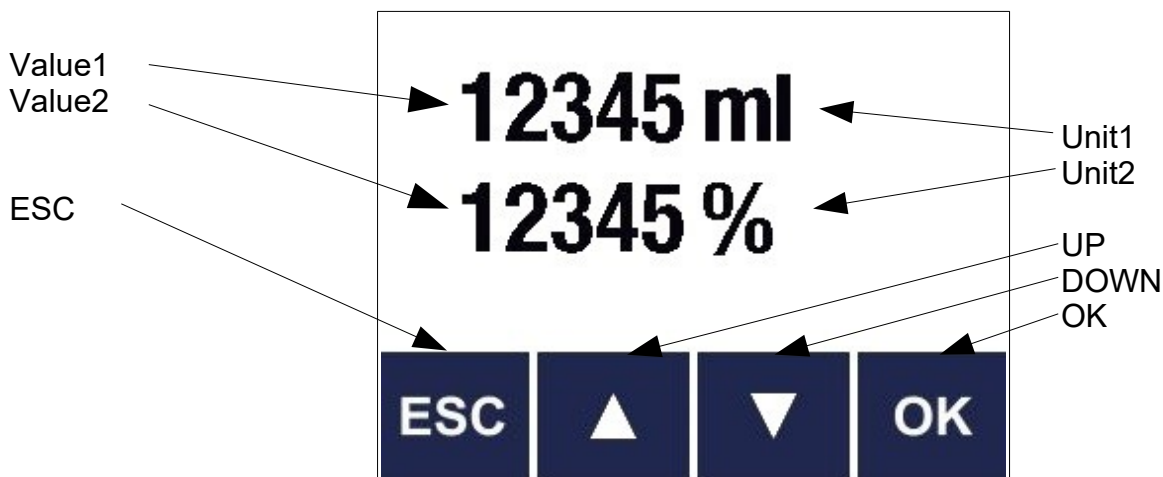
CAN-ID: 0x7FC  
 DLC: 8 Byte

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x0005		0x00000020				0x00	0x00

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## 4 Template 2 - „2 Value“


Displays the controls and values:




### 4.1 Show Template

CAN-ID: 0x7FD  
DLC: 8 Byte

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
U8 Tem- plate number 0x02	I16 Value 1 -32768 ... 32767	I16 Value 2 -32768 ... 32767			U8 Unit1 0 1 % 2 °C 3 °K 4 l 5 ml 6 m 7 mm 8 kg 9 g 10 kN 11 N 12 V 13 mV 14 A 15 mA 16 kΩ	U8 Unit2 0 1 % 2 °C 3 °K 4 l 5 ml 6 m 7 mm 8 kg 9 g 10 kN 11 N 12 V 13 mV 14 A 15 mA 16 kΩ	U8 Visibility of the con- trols masked with one bit per Control Bit 0: Value1 Bit 1: Unit1 Bit 2: Value2 Bit 3: Unit2 Bit 4: Button ESC Bit 5: Button UP Bit 6: Button DOWN Bit 7: Button OK

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Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
					17 Ω	17 Ω	
					18 kW	18 kW	
					19 W	19 W	
					20 h	20 h	
					21 min	21 min	
					22 s	22 s	
					23 ms	23 ms	
					24 kHz	24 kHz	
					25 Hz	25 Hz	
					26 Ws	26 Ws	
					27 Wh	27 Wh	
					28 kWh	28 kWh	
					29 MWh	29 MWh	
					30 ‰	30 ‰	
					31 As	31 As	
					32 Ah	32 Ah	
					33 H	33 H	
					34 F	34 F	
					35 V/m	35 V/m	
					36 A/m	36 A/m	
					37 lx	37 lx	
					38 cd	38 cd	
					39 lm	39 lm	
					40 bar	40 bar	
					41 Pa	41 Pa	
					42 kPa	42 kPa	
					43 J	43 J	
					44 kJ	44 kJ	
					45 m/s	45 m/s	
					46 km/h	46 km/h	
					47 m/s <sup>2</sup>	47 m/s <sup>2</sup>	
					48 mol	48 mol	
					49 mol/l	49 mol/l	
					50 m <sup>2</sup>	50 m <sup>2</sup>	
					51 m <sup>3</sup>	51 m <sup>3</sup>	
					52 °	52 °	
					53 rad	53 rad	

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## 4.1.1 Example

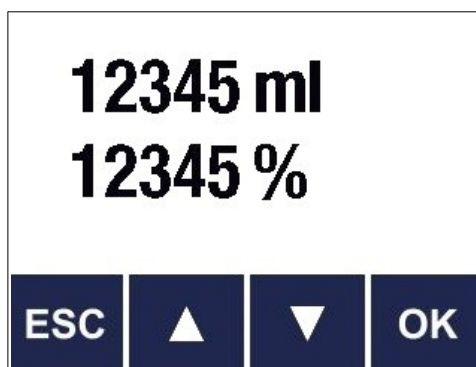
Value1: 12345

Value2: 12345

Unit1: 5 (ml)

Unit2: 1 (%)

Visibility: 0xFF  
 Value1 (Visible)  
 Unit1 (Visible)  
 Value2 (Visible)  
 Unit2 (Visible)  
 Button ESC (Visible)  
 Button UP (Visible)  
 Button DOWN (Visible)  
 Button OK (Visible)



CAN-ID: 0x7FD

DLC: 8 Byte

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x02	0x39	0x30	0x39	0x30	0x05	0x01	0xFF

## 4.2 Button Feedback Message

The message will be sent after releasing the button.

CAN-ID: 0x7FC

DLC: 8 Byte

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Template number 0x0005: Template 2		Pressed button as Bit: bit 5: Button ESC bit 6: Button UP bit 7: Button DOWN bit 8: Button OK				0x00	0x00

### 4.2.1 Example


When the button "ESC" gets pressed.

CAN-ID: 0x7FC

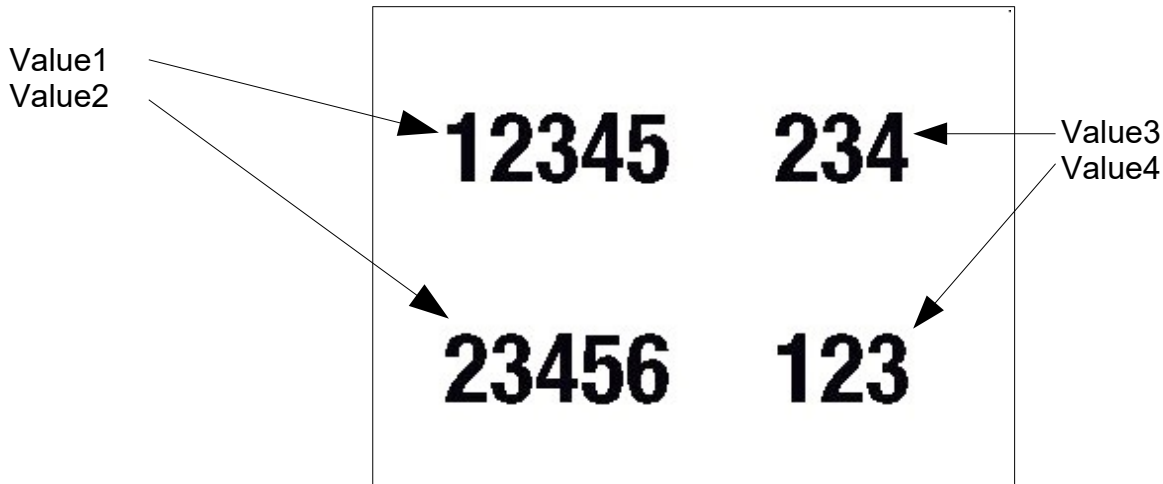
DLC: 8 Byte

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x0005		0x00000020				0x00	0x00



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## 5 Template 3 - „4NUMBER“



### 5.1 Show Template

CAN-ID: 0x7FD  
DLC: 8 Byte

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
U8 Tem- plate number  0x03	I16 Value 1 -32768 ... 32767	I16 Value 2 -32768 ... 32767			U8 Value 3 0 ... 255	U8 Value 4 0 ... 255	U8 Visibility of the con- trols masked with one bit per Control  Bit 0: Value1 Bit 1: Value2 Bit 2: Value3 Bit 3: Value4 Bit 4: Bit 5: Bit 6: Bit 7:

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## 5.1.1 Example

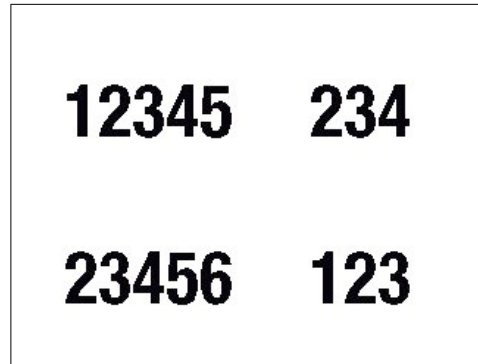
Value1: 12345

Value2: 23456

Value3: 234

Value4: 123


Visibility: 0x0F  
 Value1 (Visible)  
 Value2 (Visible)  
 Value3 (Visible)  
 Value4 (Visible)



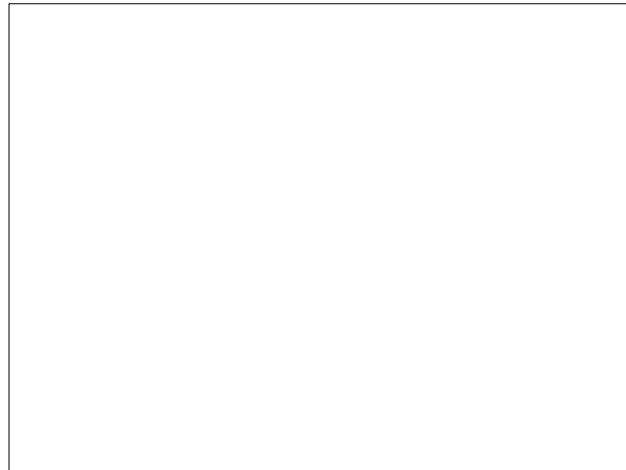
CAN-ID: 0x7FD

DLC: 8 Byte

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x03	0x39	0x30	0xA0	0x5B	0xEA	0x7B	0x0F

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## 6 Template 4 - „Colored screen“



### 6.1 Show Template

CAN-ID: 0x7FD  
DLC: 8 Byte

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
U8 Template number 0x04	not used 0x00	U8 blue 0 ... 255  0 = 0% 255 = 100%	U8 green 0 ... 255  0 = 0% 255 = 100%	U8 red 0 ... 255  0 = 0% 255 = 100%	not used 0x00	not used 0x00	not used 0x00

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## 6.1.1 Example

Blue: 255

Green: 255


Red: 255

This shows a white screen.

CAN-ID: 0x7FD

DLC: 8 Byte

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x04	0x00	0xFF	0xFF	0xFF	0x00	0x00	0x00

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## 7 Template 5 - “Keyboard”

### 7.1 Show Template

CAN-ID: 0x7FD  
DLC: 8 Byte

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
U8 Template number 0x05	I32 Value 0 ... 2147483647				U8 Decimal Places 0: 0 1: 1 2: 2 3: 3 4: 4	not used 0x00	not used 0x00


#### 7.1.1 Example

Value: 123456



CAN-ID: 0x7FD  
DLC: 8 Byte

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x05	0x40	0xE2	0x01	0x00	0x00	0x00	0x00

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## 7.2 Button Functionality

### 7.2.1 Button with Numbers (1, 2, 3, 4, 5, 6, 7, 8, 9, 0)

When pressing one of these buttons the number will be added on last position of the number field. If the Number is out of Range of signed word the value will be zero "0".

### 7.2.2 Button "+-"

If the button "+-" is pressed the value will be negated (e.g. 123 → -123 or -234 → 234).

### 7.2.3 Button "ESC"

If the button "ESC" is pressed the field for the value will be cleared and show a zero "0".

### 7.2.4 Button "OK"

The message will be sent after releasing the button.

CAN-ID: 0x7FC

DLC: 8 Byte

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
U16 Template number 0x0008: Template 5		I32 Value -2147483648 ... 2147483647				0x00	0x00

### Example

When the button "OK" gets pressed and Value 123456 was shown.

CAN-ID: 0x7FC

DLC: 8 Byte

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x0008		0x0001E240				0x00	0x00