

# Motorola MPC555

## APPLICATION NOTE

# EVB1\_PB1 CAN Piggyback for EVB555 — User's Guide



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# **EVB1\_PB1**

CAN Piggyback for EVB555 — User's Guide

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# 1 General

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The CAN Piggyback (EVB1\_PB1) is designed for use as an expansion module for the EVB555 Evaluation Board. It allows operating the two CAN interfaces of the Motorola MPC555 controller using appropriate driver components. Adding a second serial interface is also possible.

The delivery package includes this manual, the CAN Piggyback, and a threaded spacer post for mounting.

## 1.1 Connection

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The connectors of the *Customized Communication Expansion* port (CO105, CO106) on the EVB555 are used for the connection with the EVB1\_PB1. There are four CAN sockets (Lemosa type 05) on the EVB1\_PB1 for connecting the CAN lines: two for the CAN\_A and two for the CAN\_B channel.

## 1.2 Customized Serial Interface

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The second serial interface of the MPC555 is available on the *Customized Communication Expansion* port in addition to the CAN signals. TXD2 is located at TP115 and RXD2 at TP116 of the EVB1\_PB1. The empty grid provides space, e.g., for setting up a serial interface according to your own specific requirements (refer to Fig. 2-1 "Top view of EVB555 with EVB1\_PB1").

## 1.3 CAN Line Termination

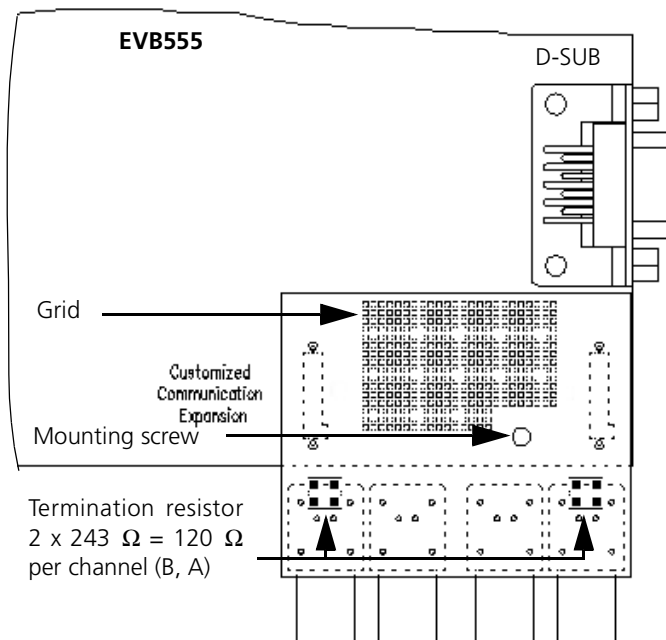
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The two sockets of each channel are equivalent. If the EVB1\_PB1 is located at the end of a CAN line, the line must be terminated with a line resistor (120  $\Omega$ ). The circuit board is shipped with two 243  $\Omega$  termination resistors (type MINIMELF, metal film resistor) installed.

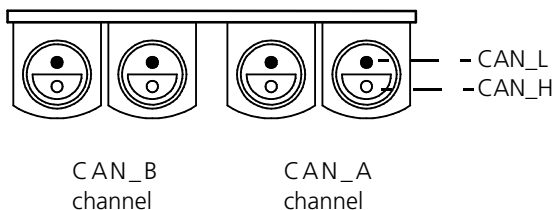
If the EVB1\_PB1 is to be operated as a participant of a CAN bus, the two termination resistors of the corresponding channel need to be removed from the circuit board. In this configuration, a plug-in termination resistor is inserted in the 2nd socket of the channel if the module is connected at the end of the line. Fig. 2-1 "Top view of EVB555 with EVB1\_PB1" shows the location of the inserted resistors.

Termination resistors and accessories from ETAS GmbH & Co.KG can be found under "Accessories and Order Information" on page 12.

## 2 View



**Fig. 2-1** Top view of EVB555 with EVB1\_PB1

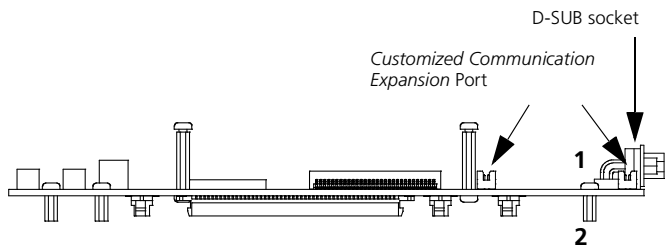


**Fig. 2-2** Pin assignment of CAN connectors

### 3 Mounting the EVB1\_PB1 on the EVB555

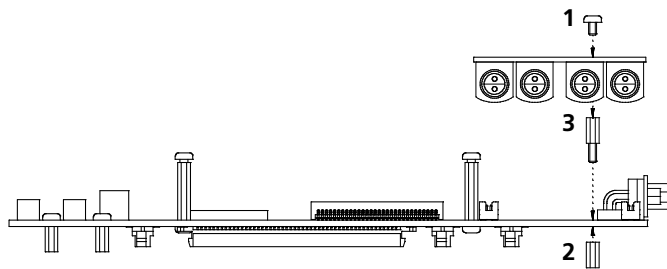
Fig. 3-1 "Side view of the EVB555", Fig. 3-2 "Side view of the EVB555 with EVB1\_PB1", and Fig. 3-3 "Side view of the EVB555 and EVB1\_PB1 after mounting" show the mounting of the EVB1\_PB1 on the EVB555.

First remove the screw **1** of the spacer post **2** near the RS232 socket on the EVB555. The two parts are required for the mounting.



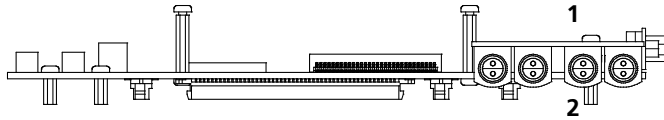
**Fig. 3-1** Side view of the EVB555

Secure the provided spacer post **3** with the screw **1** on the connector side of the EVB1\_PB1 as shown. The circuit board has a special hole for this purpose.



**Fig. 3-2** Side view of the EVB555 with EVB1\_PB1

Press the EVB1\_PB1 carefully down on the connectors of the *Customized Communication Expansion* port. The CAN sockets must be facing out. Reinstall the spacer post **2**. Fix the module in its position by tightening the spacer post **2**.



**Fig. 3-3** Side view of the EVB555 and EVB1\_PB1 after mounting. This finishes the mounting the EVB1\_PB1. The EVB1\_PB1 expansion module is now ready for use.



## 4 Getting Started

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To get you up to speed quickly in using the CAN functions, some batch files (\*.cmn) are printed below that are suitable for the Lauterbach Debugging Tool "TRACE32". They can be used to configure the two CAN channels of the MPC555; as an example for a CAN connection, data are exchanged between the two CAN channels. The two channels of the EVB1\_PB1 can be connected with a suitable cable for this purpose. Cables and accessories from ETAS GmbH & Co.KG can be found under "Accessories and Order Information" on page 12..

The following batch sequence performs a basic configuration of the two CAN channels:

```
; startup program for CAN example
; basic config
; move internal registers and CMF to 01000000
D.S SPR:27E %LONG 04000808
; reset all message buffers to RxOff
; with 8 Byte msg data length
; channel A
D.S C:1307100 %WORD 8
D.S C:1307110 %WORD 8
D.S C:1307120 %WORD 8
D.S C:1307130 %WORD 8
D.S C:1307140 %WORD 8
D.S C:1307150 %WORD 8
D.S C:1307160 %WORD 8
D.S C:1307170 %WORD 8
D.S C:1307180 %WORD 8
D.S C:1307190 %WORD 8
D.S C:13071A0 %WORD 8
D.S C:13071B0 %WORD 8
D.S C:13071C0 %WORD 8
D.S C:13071D0 %WORD 8
D.S C:13071E0 %WORD 8
```

```
D.S C:13071F0 %WORD 8
; channel B
D.S C:1307500 %WORD 8
D.S C:1307510 %WORD 8
D.S C:1307520 %WORD 8
D.S C:1307530 %WORD 8
D.S C:1307540 %WORD 8
D.S C:1307550 %WORD 8
D.S C:1307560 %WORD 8
D.S C:1307570 %WORD 8
D.S C:1307580 %WORD 8
D.S C:1307590 %WORD 8
D.S C:13075A0 %WORD 8
D.S C:13075B0 %WORD 8
D.S C:13075C0 %WORD 8
D.S C:13075D0 %WORD 8
D.S C:13075E0 %WORD 8
D.S C:13075F0 %WORD 8
; initalize data to send in msg buffers 0
; channel A
D.S C:1307106 0A
D.S C:1307107 1A
D.S C:1307108 2A
D.S C:1307109 3A
D.S C:130710A 4A
D.S C:130710B 5A
D.S C:130710C 6A
D.S C:130710D 7A
; channel B
D.S C:1307506 0B
D.S C:1307507 1B
D.S C:1307508 2B
```

```

D.S C:1307509 3B
D.S C:130750A 4B
D.S C:130750B 5B
D.S C:130750C 6B
D.S C:130750D 7B
; initalize extended ID for msg buffers 0
D.S C:1307102 %WORD 8
D.S C:1307104 %WORD 0
D.S C:1307502 %WORD 8
D.S C:1307504 %WORD 0
; define resync width=1
; channel A
D.S C:1307089 40
; channel B
D.S C:1307489 40
; start cannel A
D.S C:1307080 %WORD 1080
; start cannel B
D.S C:1307480 %WORD 1080

```

When this sequence finishes, the timer is already running in the CAN windows of the TRACE32. Choose the TOUCANA and TOUCANB options in the Peripherals menu to open the CAN windows.

The following sequence starts an endless poll procedure.

```

; service program for CAN example
; toggle poll channel A/channel B
;enable remote function
D.S C:1307104 %WORD 1
D.S C:1307504 %WORD 1
; mark buffer0 channel A as RESPOND
D.S C:1307100 %WORD 0A8
; poll from channel B with SEND ONCE
D.S C:1307500 %WORD 0E8

```

The two channels are alternating in requesting information from the remote end. The status code of the two buffers 0 of channels A and B toggles between RESPOND, TXONCE, and BUSY. If the buffer's status code does not change, check the cables and connectors, and restart the EVB555. Do not change the connection of the CAN cables during the operation.



The eight data bytes of the two buffers are not overwritten in this example. Therefore, the transmission of the CAN data can not be verified directly. Here is a procedure sequence for the data transmission:

```
; service program for CAN example
; send channel B => channel A
;disable remote function
D.S C:1307104 %WORD 0
D.S C:1307504 %WORD 0
; mark buffer0 channel A as RxEMPTY
D.S C:1307100 %WORD 048
; send data from channel B with TxDATA
D.S C:1307500 %WORD 0C8
```

The eight data bytes in buffer 0 of channel B have been transferred into buffer 0 of channel A. Buffer 0 of channel A changes to status code RXFULL, and buffer 0 of channel B changes to status code TXEMPTY.

5

Accessories and Order Information

| Name   | Short Name / Graphic  | Order Number |
|--|---|--------------|
| Evaluation Board for Motorola MPC555                   | EVB555  | F00K000978   |
| CAN Piggyback for EVB555                               | EVB1_PB1  | F00K001234   |
| CAN cable suitable for EVB1_PB1                        |  | F00K000549   |
| Termination 120 Ω for CAN socket suitable for EVB1_PB1 |  | Y261A24264   |

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## Contacts

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