

# **Freescale MQX RTOS Example Guide**

## **FSL FlexCAN example**

This document explains the FSL FlexCAN driver example, what to expect from the example and a brief introduction to the FSL FlexCAN example API.

### **The Example**

The example shows the usage of the FSL FlexCAN driver using interrupt driven.

### **Running the example with two boards**

Here is the test procedure for running FSL FlexCAN example:

- Prepare two same boards to test.
- Connect CANx pin 2 from one board to CANx pin 2 to another board, Connect CANx pin 7 from one board to CANx pin 7 to another board (If CAN1 is enabled, then x means 1. Otherwise, x means 2).
- Connect DEBUG USB port to PC for console output. Open a Terminal emulator program, and set it to 115200 baud, no parity, 8 bits.
- Build bsp, psp libraries, build fsl\_flexcan example with #define NODE 1 on mqx\examples\can\flexcan\fsl\_flexcan\_test.h
- Load image to the first board.
- Change #define NODE 2 on mqx\examples\can\flexcan\fsl\_flexcan\_test.h, re-build fsl\_flexcan example.
- Load image to the second board.
- Reset two of the boards and test.
- Check the result on terminal.

### **Running the example with a board and a CAN analyzer**

Here is the test procedure for running FSL FlexCAN example:

- Prepare a board to test.
- Connect DEBUG USB port to PC for console output. Open a Terminal emulator program.
- Set terminal to 115200 baud, no parity, 8 bits.

- Connect CANL from CAN analyzer cable to CANx pin 2 on the board; connect CANH from the CAN analyzer cable to CANx pin 7 on the board (If CAN1 is enabled, then x means 1. Otherwise, x means 2).
- Build bsp, psp libraries, build fsl\_flexcan example.
- Load image to the board.
- Check the result on terminal.

## Explaining the example

The FSL FlexCAN driver example will do all of configuration for getting ready to transmit and receive data, such as:

1. Initialize the FlexCAN.
2. Set the FlexCAN bitrate to 1 MHz.
3. Configure Rx MB for receiving data.
4. Configure Tx MB for transmitting data.
5. Start transmitting and receiving data.

The figures below show the similar output of the FSL FlexCAN example. The data transfer will be last forever. Figure 1 is the output for two-board connection. Figure 2 and Figure 3 are the output for one board and a CAN analyzer connection.

```

*****FLEXCAN TEST PROGRAM*****
Message format: Standard (11 bit id)
Message buffer 8 used for Rx.
Message buffer 9 used for Tx.
Interrupt Mode: Enabled
Operation Mode: TX and RX --> Normal
*****

FLEXCAN get bitrate: 250000 Hz
FlexCAN receive config
FlexCAN send config
DLC=1, mb_idx=8
RX MB data: 0x05
ID: 0x123
Data transmit: 0x01
DLC=1, mb_idx=8
RX MB data: 0x06
ID: 0x123
Data transmit: 0x02
DLC=1, mb_idx=8
RX MB data: 0x07
ID: 0x123
Data transmit: 0x03
DLC=1, mb_idx=8
RX MB data: 0x08
ID: 0x123
Data transmit: 0x04
DLC=1, mb_idx=8
RX MB data: 0x09
ID: 0x123
Data transmit: 0x05
DLC=1, mb_idx=8
RX MB data: 0x0a
ID: 0x123
Data transmit: 0x06
DLC=1, mb_idx=8
RX MB data: 0x0b
ID: 0x123
Data transmit: 0x07
DLC=1, mb_idx=8
RX MB data: 0x0c
ID: 0x123
Data transmit: 0x08
DLC=1, mb_idx=8
RX MB data: 0x0d
ID: 0x123
Data transmit: 0x09
DLC=1, mb_idx=8
RX MB data: 0x0e
ID: 0x123

```

Figure 1  
Example output on FSL FlexCAN test with two boards

```




*****FLEXCAN TEST PROGRAM.*****
Message format: Standard (11 bit id)
Message buffer 9 used for Rx.
Message buffer 13 used for Tx.
Interrupt Mode: Enabled
Operation Mode: TX and RX --> Normal
*****





FLEXCAN get bitrate: 1000000 Hz
FlexCAN receive config
FlexCAN send config
Data transmit: 0x01
Data transmit: 0x02
Data transmit: 0x03
Data transmit: 0x04
Data transmit: 0x05
DLC=8, mb_idx=9
RX MB data: 0x11 22 33 44 55 66 77 88
ID: 0x123
Data transmit: 0x06
Data transmit: 0x07
Data transmit: 0x08
Data transmit: 0x09
Data transmit: 0x0a
Data transmit: 0x0b
Data transmit: 0x0c
Data transmit: 0x0d
DLC=8, mb_idx=9
RX MB data: 0x22 11 22 33 44 55 66 77
ID: 0x123
Data transmit: 0x0e
Data transmit: 0x0f
Data transmit: 0x10
Data transmit: 0x11
DLC=8, mb_idx=9
RX MB data: 0x34 22 11 22 33 44 55 66
ID: 0x123
Data transmit: 0x12
Data transmit: 0x13
Data transmit: 0x14
Data transmit: 0x15
Data transmit: 0x16
Data transmit: 0x17
DLC=8, mb_idx=9
RX MB data: 0x45 34 22 11 22 33 44 55
ID: 0x123
Data transmit: 0x18
Data transmit: 0x19
Data transmit: 0x1a
Data transmit: 0x1b
Data transmit: 0x1c
Data transmit: 0x1d

```

Figure 2

Example output on FSL FlexCAN test with a board and a CAN analyzer

	m:s.ms.us	ID	RTR	DLC	Data
	0:00.000.000				Capture started on 04/01/14 12:11:29
	0:00.000.000				Bus Event: Bitrate Changed (1000 kHz)
	0:00.000.000				Bus Event: Control, Active
	0:16.117.052	0x321	0	1	01
	0:17.120.406	0x321	0	1	02
	0:18.123.760	0x321	0	1	03
	0:19.127.115	0x321	0	1	04
	0:20.130.469	0x321	0	1	05
	0:20.414.612	0x123	0	8	11 22 33 44 55 66 77 88
	0:21.133.822	0x321	0	1	06
	0:22.137.177	0x321	0	1	07
	0:23.140.531	0x321	0	1	08
	0:24.143.885	0x321	0	1	09
	0:25.147.240	0x321	0	1	0A
	0:26.150.593	0x321	0	1	0B
	0:27.153.947	0x321	0	1	0C
	0:28.157.302	0x321	0	1	0D
	0:28.745.611	0x123	0	8	22 11 22 33 44 55 66 77
	0:29.160.656	0x321	0	1	0E
	0:30.164.010	0x321	0	1	0F
	0:31.167.364	0x321	0	1	10
	0:32.170.718	0x321	0	1	11
	0:32.676.614	0x123	0	8	34 22 11 22 33 44 55 66
	0:33.174.072	0x321	0	1	12
	0:34.177.427	0x321	0	1	13
	0:35.180.781	0x321	0	1	14
	0:36.184.134	0x321	0	1	15
	0:37.187.489	0x321	0	1	16
	0:38.190.843	0x321	0	1	17
	0:38.832.611	0x123	0	8	45 34 22 11 22 33 44 55
	0:39.194.197	0x321	0	1	18
	0:40.197.551	0x321	0	1	19
	0:41.200.906	0x321	0	1	1A
	0:42.204.259	0x321	0	1	1B
	0:43.207.613	0x321	0	1	1C
	0:44.210.968	0x321	0	1	1D

 Create Batch Script
 Clear Log
 Export Log


.000000 Hz
SN: 1645-101100 (0)

**Figure 3**  
**Example output from a CAN analyzer on FSL FlexCAN test with a board and a CAN analyzer**