

# UM11664

SC18IM704-EVB evaluation board

Rev. 1.0 — 28 September 2021

User manual

## Document information

Information	Content
Keywords	SC18IM704, UART to I <sup>2</sup> C, SC18IM700, I <sup>2</sup> C Controller, I <sup>2</sup> C bridge, UART bridge
Abstract	SC18IM704 is designed to serve as an interface between the standard UART port of a host and the serial I <sup>2</sup> C-bus. This allows the host to communicate directly with other I <sup>2</sup> C-bus devices.



Revision history

Rev	Date	Description
v.1.0	20210928	Initial version

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## 1 Introduction

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SC18IM704 is designed to serve as an interface between the standard UART port of a microcontroller or microprocessor and the serial I<sup>2</sup>C-bus; this allows the microcontroller or microprocessor to communicate directly with other I<sup>2</sup>C-bus devices. SC18IM704 can operate as an I<sup>2</sup>C-bus controller. SC18IM704 controls all the I<sup>2</sup>C-bus specific sequences, protocol, arbitration and timing. The host communicates with SC18IM704 with ASCII messages protocol; this makes the control sequences from the host to SC18IM704 become very simple.

This document is intended to help the users to quickly setup, configure and operate the SC18IM704-EVB evaluation board in the users' hardware platform.

## 2 Finding kit resources and information on the NXP web site

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NXP Semiconductors provides online resources for this evaluation board and its supported device(s) on <http://www.nxp.com>.

The information page for SC18IM704-EVB evaluation board is at <http://www.nxp.com/SC18IM704-EVB>. The information page provides overview information, documentation, parametrics, ordering information and a **Getting Started** tab. The **Getting Started** tab provides quick-reference information applicable to using the SC18IM704-EVB evaluation board, including the downloadable assets referenced in this document.

### 2.1 Collaborate in the NXP community

The NXP community is for sharing ideas and tips, ask and answer technical questions, and receive input on just about any embedded design topic.

The NXP community is at <http://community.nxp.com>.

## 3 Getting ready

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Working with the SC18IM704-EVB evaluation board requires the kit contents.

### 3.1 Kit contents

- Assembled and tested evaluation board in an anti-static bag
- Quick Start Guide

## 4 Getting to know the hardware

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The SC18IM704-EVB evaluation board is designed to be connected to an external UART via a 9-pin RS-232 connector (J1). The SC18IM704-EVB evaluation board has an on-board I<sup>2</sup>C target serial EEPROM and an I<sup>2</sup>C target LED blinker, which can be directly accessed by the external host UART via SC18IM704. The external host UART can write, read, and program the serial EEPROM/LED blinker without requiring an I<sup>2</sup>C target to be connected to the board.

The SC18IM704-EVB evaluation board also has a I<sup>2</sup>C interface header (JP2) to allow other I<sup>2</sup>C target devices to be connected to the evaluation board. These I<sup>2</sup>C target devices can be accessed directly by the external host UART via the SC18IM704 UART to I<sup>2</sup>C bridge.

The power for the SC18IM704-EVB evaluation board is provided via the micro-B USB (J2), or via the I<sup>2</sup>C interface header (JP2).

The SC18IM704-EVB evaluation board 9-pin RS-232 port (J1) is intended to be the main UART interface to the host's UART, but UART TX and RX CMOS level signals are available on JP5. When JP5 is used to interface to the host's UART then the jumper on JP4 should be removed to remove power from the RS-232 line driver.

### 4.1 Headers and jumpers

Please refer to [Figure 1](#) to find the location of connectors and jumpers on the SC18IM704-EVB evaluation board.

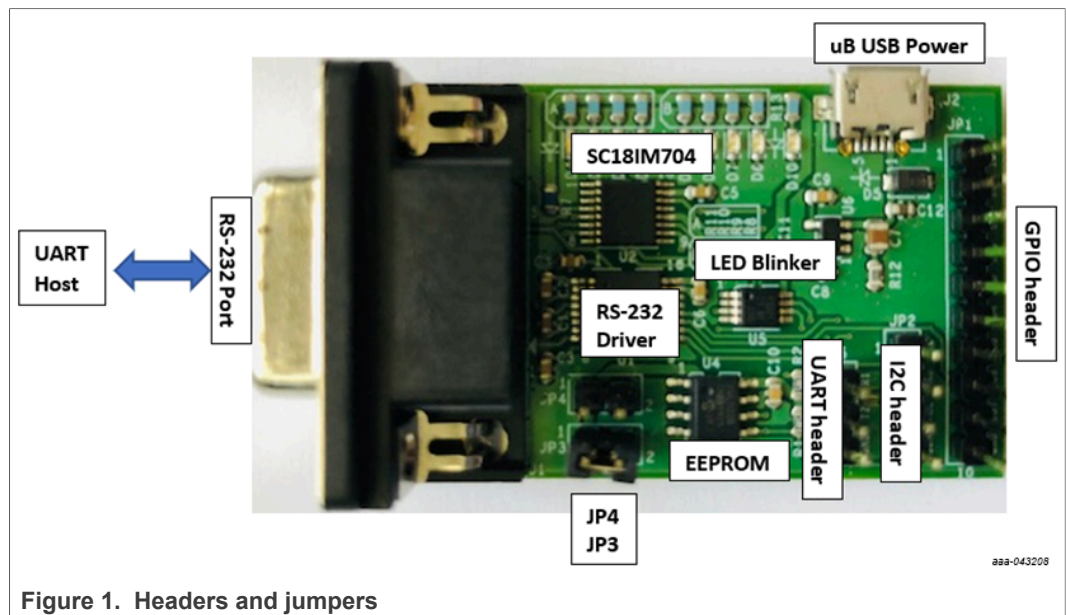


Figure 1. Headers and jumpers

### 4.2 Jumper settings

Table 1. Jumper settings

Header	Jumper on/off	Comment
JP3	ON	Pull out and insert current meter if SC18IM704 current is to be measured
JP4	ON	Pull out if UART interface is on JP5

Table 2. JP5 - UART header

JP5 – UART Header	Function
1	UART_RX
2	UART_TX
3	GROUND

Table 3. JP2 - I<sup>2</sup>C header

JP2 – I <sup>2</sup> C Header	Function
1	SCL
2	GROUND
3	VCC
4	SDA

Table 4. JP1 - GPIO

JP1 – GPIO	Function
1	GPIO0
2	GPIO1
3	GPIO2
4	GPIO3
5	GROUND
6	GPIO4
7	GPIO5
8	GPIO6
9	GPIO7
10	GROUND

### 4.3 Schematic, board layout and bill of materials

The schematic, board layout and bill of materials for the SC18IM704-EVB evaluation board are available at <http://www.nxp.com/SC18IM704-EVB>.

### 4.4 Sample control sequences from UART host

#### 4.4.1 Register read

```
0x52 0x00 0x01 0x50 // Read register 0x00 and 0x02
```

#### 4.4.2 Register write

```
0x57 0x02 0x54 0x03 0x56 0x50 // Write register 0x02 with 0x54 and 0x03 with 0x56
```

#### 4.4.3 GPIO as input

```
0x57 0x02 0x55 0x03 0x5 0x50 // program GPIOs as inputs  
0x49 0x50 // read input pin state
```

#### 4.4.4 GPIO as output

```
0x57 0x02 0xAA 0x03 0xAA 0x50 // program GPIOs as output (push-pull)
```

```
0x4F 0x0FF 0x50 // Set all outputs to '1'
0x4F 0x00 0x50 // Set all outputs to '0'
```

#### 4.4.5 I<sup>2</sup>C clock configuration

```
0x57 0x07 0x05 0x08 0x00 0x50 // Set I2C clock to 375KHz
```

#### 4.4.6 On-Board EEPROM write and read

```
0x53 0xA0 0x04 0x00 0x23 0x34 0x45 0x50 // write 0x23 0x34 0x45 to
                                           // EEPROM address 0x00
0x53 0xA0 0x01 0x00 0x50 // reset memory location to 0x00
0x53 0xA1 0x03 0x50 // read 3 bytes from EEPROM
```

IM704 should return 0x23 0x34 0x45.

#### 4.4.7 Blinking on-board LEDs

```
0x53 0xC4 0x06 0x11 0x97 0x80 0x00 0x00 0xAA 0x50 // write 6 control bytes to I2C blinker at address 0xC4
```

## 5 Errata list

Table 5. Errata list

Date	Errata Description	Demo Impact	Solution
-	None	None	None

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