MCA-527

Digital Multi-Channel Analyzer

Description of the MCA527 Serial Interface

(especially within bus systems)

Exclusion of liability

The information in this manual has been carefully reviewed and is believed to be accurate and reliable. However, the GBS Elektronik GmbH assumes no liabilities for inaccuracies in this manual. This manual is subject to change without notice.

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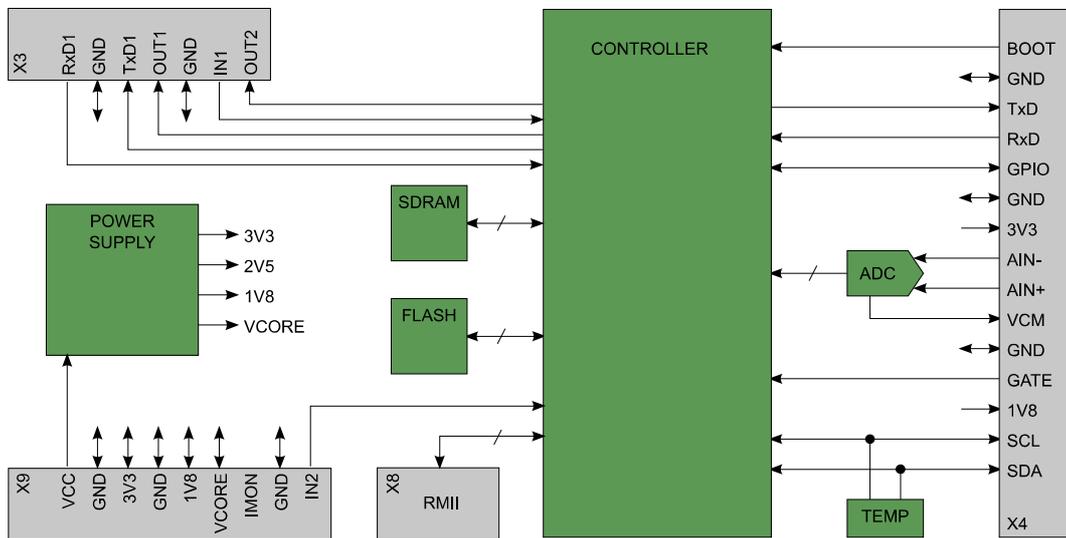
1 Introduction

The MCA527 microE and the MCA527 nano are operable within a bus systems (e.g. RS485). For the use within a bus system, the MCA527 has a special bootstrap loader. Take this into account when placing your order.

We provide complete systems with RS485 interface, but users can also develop and use their own serial interface board.

2 Wiring

This information is intended for users who want to develop and use their own serial interface board especially for bus system.
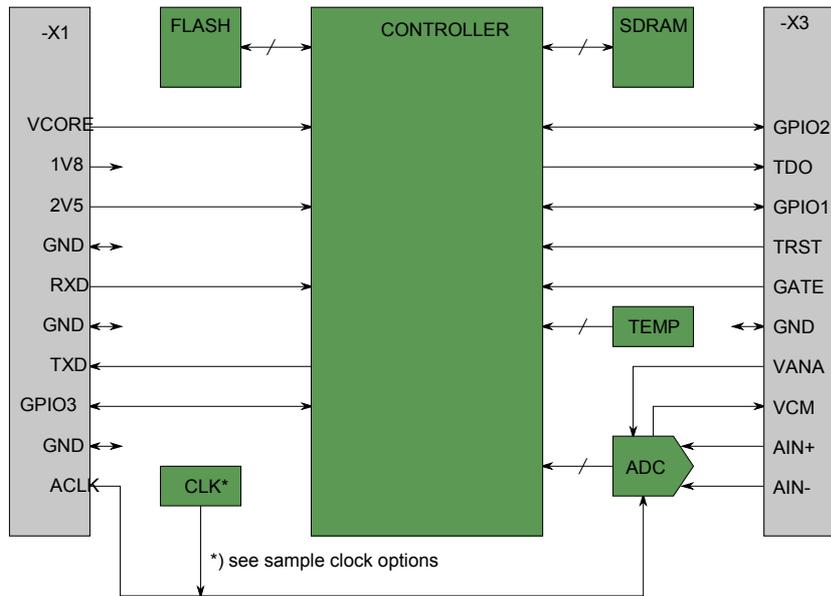
2.1 MCA527 microE

Pin	Description
X3:RxD1	Received data
X3:TxD1	Transmitted data
X3:OUT1, X3:OUT2	These both pins are usable for controlling driver enable. The pins are set to high while the MCA527 transmits data via X3:TxD1. As long as they are not used as an extension port pin[1], they are always operated.
X9:IN2, X3:IN1	The pin X9:IN2 is the prioritized hardware indicator for using the bus protocol (see chapter 4). A high level (1.8V) at this pin indicates that the bus protocol shall be used. If the pin X9:IN2 is used as an extension port pin, the pin X3:IN1 can alternatively be used for this purpose. (If the pin X9:IN2 is not used as an extension port pin, the firmware only reads the state from this pin, the state at pin X3:IN1 is then meaningless.) If both pins are used as extension port pins, there is no way to indicate that the bus protocol shall be used.
	Additionally, there is a software indicator for using the bus protocol that can be set with a little tool (see chapter 3).

1 The extension port pins provide additional option of use.

2.2 MCA527 nano

*) see sample clock options

Pin	Description
X1:RxD	Received data
X1:TxD	Transmitted data
X3:GPIO1	This pin is usable for controlling driver enable. It is set to high while the MCA527 transmits data via X1:TxD. As long as it is not used as an extension port pin[2], it is always operated.
X3:GPIO2	The pin X3:GPIO2 is the hardware indicator for using the bus protocol (see chapter 4). A high level (1.8V) at this pin indicates that the bus protocol shall be used. If the pin X3:GPIO is used as an extension port pin, there is no way to indicate that the bus protocol shall be used.

Additionally, there is a software indicator for using the bus protocol that can be set with a little tool (see chapter 3). |

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2 The extension port pins provide additional option of use.

3 Bus configuration
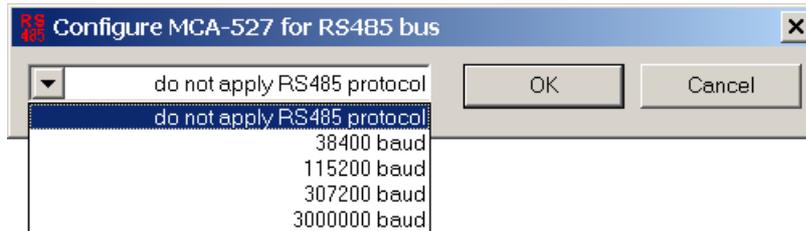
This tool[3] allows to set a fixed baud rate. Theoretically, any baud rate is possible, but the tool allows only to set the 4 baud rates that are supported by our software. A fixed baud rate is the software indicator for using the bus protocol (see chapter 4). For the hardware indicator see chapter 2.1 or 2.2. Only if both indicators are set, the bus protocol is used.

Click here to download the tool.

4 Bus protocol

The bus protocol is applied if the hardware indicator (see chapter 2) and the software indicator (see chapter 3) apply. The bus protocol is needed to address the MCA527 within a bus system. Without the bus protocol, the MCA527 can only be used within a peer-to-peer connection.

The bus protocol follows the following rules:

(1) The MCA527 communicates only with the predefined baud rate.

(2) The MCA527 has to be addressed by its serial number. For it, the two bytes of the standard preamble[4] have to be replaced by the serial number (low byte, high byte). Correctly addressed commands are executed and responded.

(3) If the two bytes of the preamble are set to 0xA5, 0xA5, all MCA527 within the bus system execute the command, but do not respond.

(4) If the preamble or the end flag are invalid, or the number of the received bytes is fewer than 12, the MCA527 does not respond.

(5) If the preamble and the end flag are valid but the number of the transmitted bytes is larger than 12, the additionally arriving bytes collide with the response bytes. For this reason, the response bytes are no longer readable.

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3   In older documents and tools, the bus protocol is still labeled as RS485 prototol.
4   See document "Description of the MCA527 Firmware Commands"