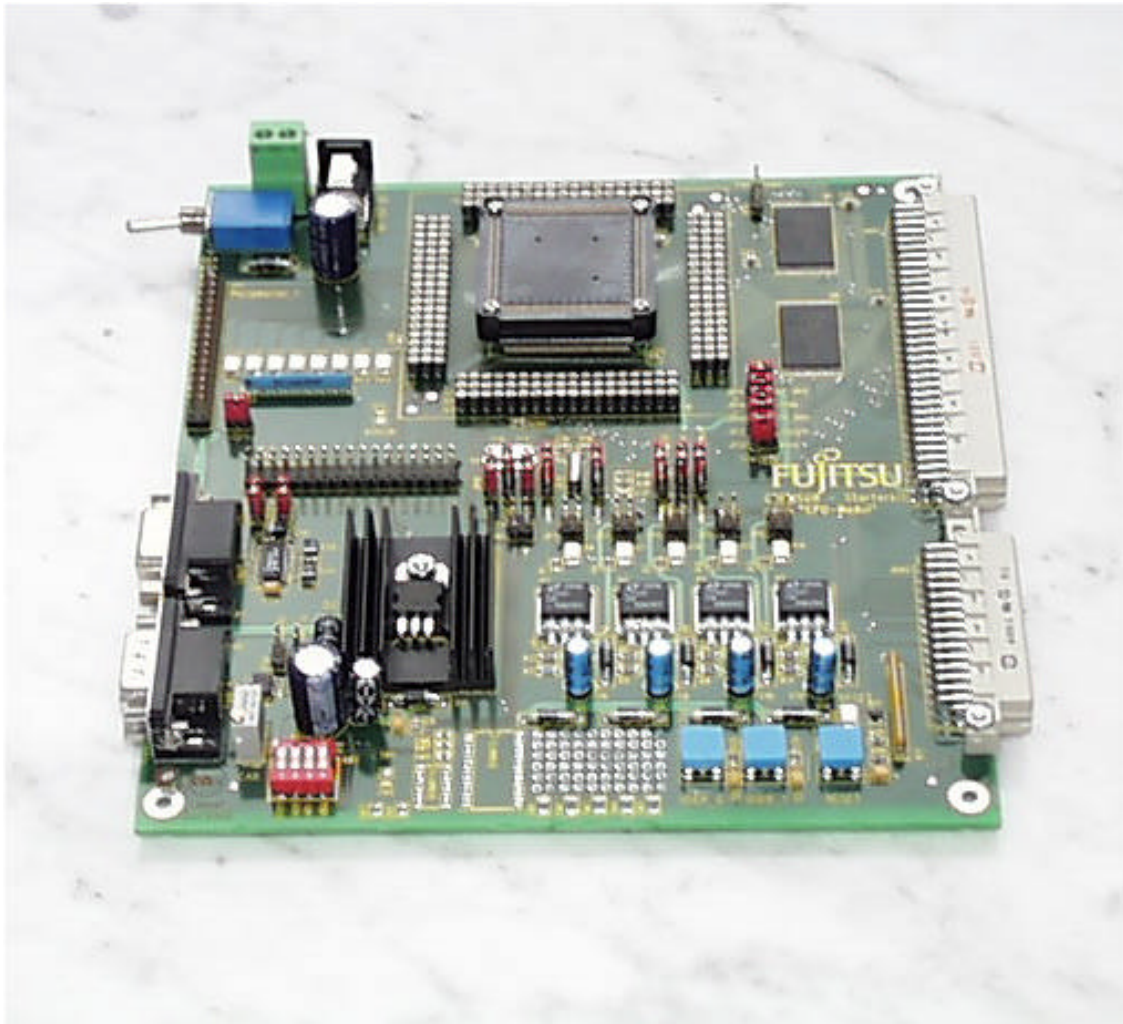


CPU-Modul Documentation

© **Fujitsu Microelectronics Europe GmbH**
Am Siebenstein 6-10
63303 Dreieich-Buchsschlag, Germany



History

Revision	Date	Comment
V1.0	08.03.01	New Document

Warranty and Disclaimer

To the maximum extent permitted by applicable law, Fujitsu Microelectronics Europe GmbH restricts its warranties and its liability for **all products delivered free of charge** (e.g. software include or header files, application examples, target boards, evaluation boards, engineering samples of IC's etc.), its performance and any consequential damages, on the use of the Product in accordance with (i) the terms of the License Agreement and the Sale and Purchase Agreement under which agreements the Product has been delivered, (ii) the technical descriptions and (iii) all accompanying written materials. In addition, to the maximum extent permitted by applicable law, Fujitsu Microelectronics Europe GmbH disclaims all warranties and liabilities for the performance of the Product and any consequential damages in cases of unauthorised decompiling and/or reverse engineering and/or disassembling. **Note, all these products are intended and must only be used in an evaluation laboratory environment.**

1. Fujitsu Microelectronics Europe GmbH warrants that the Product will perform substantially in accordance with the accompanying written materials for a period of 90 days from the date of receipt by the customer. Concerning the hardware components of the Product, Fujitsu Microelectronics Europe GmbH warrants that the Product will be free from defects in material and workmanship under use and service as specified in the accompanying written materials for a duration of 1 year from the date of receipt by the customer.
2. Should a Product turn out to be defect, Fujitsu Microelectronics Europe GmbH entire liability and the customer's exclusive remedy shall be, at Fujitsu Microelectronics Europe GmbH sole discretion, either return of the purchase price and the license fee, or replacement of the Product or parts thereof, if the Product is returned to Fujitsu Microelectronics Europe GmbH in original packing and without further defects resulting from the customer's use or the transport. However, this warranty is excluded if the defect has resulted from an accident not attributable to Fujitsu Microelectronics Europe GmbH, or abuse or misapplication attributable to the customer or any other third party not relating to Fujitsu Microelectronics Europe GmbH.
3. To the maximum extent permitted by applicable law Fujitsu Microelectronics Europe GmbH disclaims all other warranties, whether expressed or implied, in particular, but not limited to, warranties of merchantability and fitness for a particular purpose for which the Product is not designated.
4. To the maximum extent permitted by applicable law, Fujitsu Microelectronics Europe GmbH and its suppliers' liability is restricted to intention and gross negligence.

NO LIABILITY FOR CONSEQUENTIAL DAMAGES

To the maximum extent permitted by applicable law, in no event shall Fujitsu Microelectronics Europe GmbH and its suppliers be liable for any damages whatsoever (including but without limitation, consequential and/or indirect damages for personal injury, assets of substantial value, loss of profits, interruption of business operation, loss of information, or any other monetary or pecuniary loss) arising from the use of the Product.

Should one of the above stipulations be or become invalid and/or unenforceable, the remaining stipulations shall stay in full effect.

Important notice

This Starterkit contains an evaluation board, documentation and software on a CD-ROM.

For documentation or software updates, please refer to our web site www.fujitsu-fme.com !

Fujitsu reserves the right to make changes to its products or to discontinue any semiconductor product or service without notice.

08.03.01 V1.0

1. Introduction

The Fujitsu CPU-Modul is a low cost multifunctional evaluation board for Fujitsu 32-Bit Flash microcontroller that makes it easy to evaluate and demonstrate almost all features of the MB91360 microcontroller series. It can be used stand alone for software development and testing as a simple target board to work with the emulator system. It gives you the possibility to develop and evaluate applications with devices of the new embedded-graphic-controller family. Its modular concept makes it available to use one of several graphic device subboards just by plugging them to the CPU board.

The board allows the designer immediately to start the software development before his own final target system is available.

2. Features

- Socket QFP208 for Microcontroller MB91F361 (or emulation socket), surrounded by headers for test-pins etc.
- 4MHz or 32 kHz crystal selectable
- DC Power supply circuit (incl. testpins for VCC, GND, power LED and switch)
- 1 MB external SRAM available for user code and data
- External Reset Button for MCU
- 2 Buttons for ext. Interrupt (USER_0 = ext. Interrupt0, USER_1 = ext. Interrupt1)
- MAX232 + DB9 (female) connector for internal UART
- CAN transceiver and DB9 (male) for internal CAN0
- 8 LEDs (on Port J)
- All peripheral pins are available by the connectors 'Peripheral_1' and 'Peripheral_2'
- Graphic controller interface

3. Jumpers and Switches

This chapter describes all jumpers and switches which can be modified on the evaluation board. The default setting is shown with a gray shaded area. All jumpers and switches are named directly on the board by its meaning, so it is very easy to set the jumpers according to the features.

3.1 Power Supply Voltage (SW1, JP11, JP12, JP13, JP14, JP15, JP25)

	Switch setting	Description
Power supply voltage (SW1)	1-2	Power ON
	2-3	Power OFF

	Jumper setting	Description
3V3 power supply (JP11)	ON (closed)	Power supply
	OFF (open)	NO Power supply

	Jumper setting	Description
5V0 power supply (JP12)	ON (closed)	Power supply
	OFF (open)	NO Power supply

	Jumper setting	Description
Bypass Capacitor Pin (JP13)	ON (closed)	Voltage regulator enable
	OFF (open)	Voltage regulator disable

	Jumper setting	Description
Power supply for SMT (JP14)	ON (closed)	Power supply
	OFF (open)	NO Power supply

	Jumper setting	Description
5V0 Power supply (JP15)	ON (closed)	Analog Power supply
	OFF (open)	NO Analog Power supply

	Jumper setting	Description
Power supply for LEDs (JP25)	ON (closed)	Power supply
	OFF (open)	NO Power supply

NOTE:

The supply voltage for the core and the IO Pins must be set. Otherwise it could happen that the controller does not work correctly!

3.2 Operating Mode (SW2)

SW2	DIP switch setting	Logical value	Description
Boot signal (SW2/1)	ON	0 (low)	Boot signal
MD2 (SW2/2)	ON	0 (low)	Internal ROM mode
MD1 (SW2/3)	ON	0 (low)	
MD0 (SW2/4)	ON	0 (low)	

3.3 UART (JP21, JP22)

	Jumper setting	Description
SOT_0 (JP21)	ON (closed)	UART0 Output enable
	OFF (open)	UART0 Output disable

	Jumper setting	Description
SIN_0 (JP22)	ON (closed)	UART0 Input enable
	OFF (open)	UART0 Input disable

Reserved future extension:

	Description
SIN_2 (JP7)	UART2 Input enable

	Description
SOT_2 (JP8)	UART2 Output enable

	Description
UART2 clock (JP9)	UART2 clock enable

3.4 Chip select enable for FLASH (JP10)

CS	Jumper setting	Description
CS2	ON (closed 1-2)	Ext. Flash – Chip-Select2
CS3	ON (closed 2-3)	Ext. Flash – Chip-Select 3

3.5 Hardware Standby (JP16)

	Jumper setting	Description
HSTX (JP16)	1-2	HSTX request is released
	2-3	

3.6 Clock Select (JP17, JP18, JP19, JP20)

	Jumper setting	Description
SELCLK (JP17)	1-2	Clock enable
	2-3	Clock disable

	Jumper setting	Description
4MHz clock (JP18)	1-2	4MHz clock enable
	2-3	4MHz clock disable

	Jumper setting	Description
32kHz clock (JP19)	1-2	32kHz clock enable
	2-3	32kHz clock disable

	Jumper setting	Description
Low pass filter (JP20)	1-2	Low pass filter for clock enable
	2-3	Low pass filter for clock disable

3.7 CAN controller interface (JP23, JP24)

	Jumper setting	Description
CAN transmit (JP23)	ON (closed)	Transmit data enable
	OFF (open)	Transmit data disable

	Jumper setting	Description
CAN receive (JP24)	ON (closed)	Receive data enable
	OFF (open)	Receive data disable

Header for Debug Signals

Power supply voltage (JP1, JP2, JP3, JP4, JP5, JP6)

- JP1 - 12V – GND
- JP2 - 5V – GND
- JP3 - 3.3V – GND
- JP4 - 2.5_1V – GND
- JP5 - 2.5_2V – GND separated voltage
- JP6 - 2.5_3V – GND separated voltage

MCU Peripheral Signals

Peripheral_1

- BUS_PH7-0 - A/D Converter input [7:0]
- BUS_PG7-0 - A/D Converter input [15:8]
- PI3 - ATGX – A/D converter Trigger input
- DA0 - D/A Converter output 0
- DA1 - D/A Converter output 1
- ALARM - Alarm comparator input
- BUS_PK7-4 - External Interrupt [7:4]
- BUS_PL3-0 - Input Capture Unit input [3:0]
- BUS_PL7-4 - Output Compare Unit output [7:4]

Peripheral_2

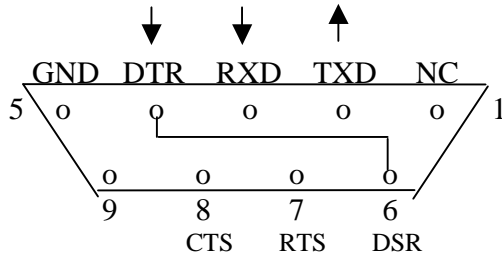
- PM0 - Sound Generator SGO
- PM1 - Sound Generator SGA
- BUS_PN5-0 - Serial I/O Interface signals (SOT3-4, SIN3-4, SCK3-4)
- BUS_PO7-0 - PPG output [7:0]
- PP5-2 - CAN Controller Signals (TX0-1, RX0-1)
- PQ5-2 - Serial I/O Interface signals (SOT1-2, SIN1-2)
- BUS_PR7-0 - PWM Pulse Generator Signals for Stepper Motor Controller

For more information please look at the Hardware Manual of the microcontroller and the Data Sheet of the SRAM 29LV400TC.

4. Connectors

4.1 Serial Interface Connector P1

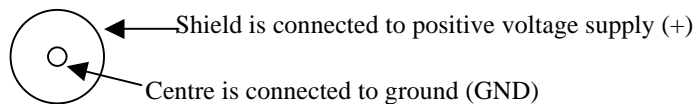
The following diagram shows the connection of the 9-pin D-Sub female connector P1 which is used for the serial interfaces.



TXD is the transmit output, RXD is the receive input. The DTR signal is used as an input, which can be connected to generate a reset.

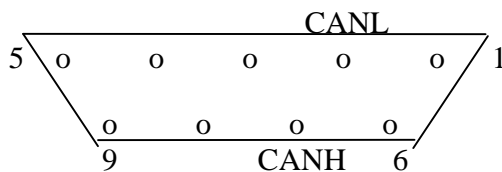
4.2 Power Connector J1

The following figure shows the power connection jack J1. This connector is used to connect an external regulated DC power supply voltage (7.5V-12V DC) to the evaluation board. It is recommended to use 7.5V to keep the power dissipation to a minimum. Otherwise an additional heat sink for the linear voltage regulator might be necessary.



4.3 CAN Interface Connector

The following diagram shows the connection of the 9-pin D-Sub male connector P2 which is used for the CAN interface.



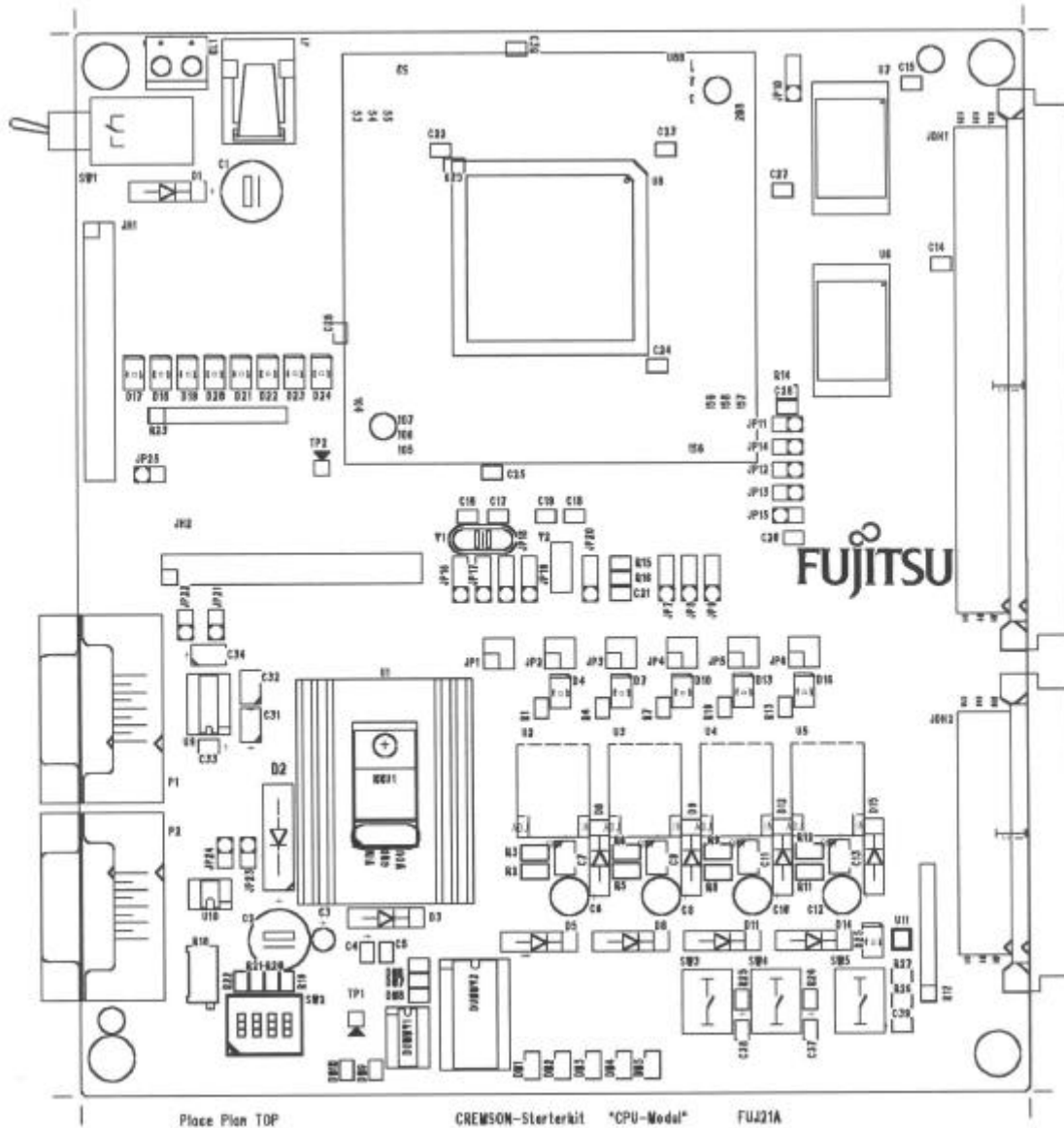
For the CAN interface the resistor trimmer R18 is used to adjust the slew rate. Take care that the slew rate is adjusted according to the local environment (CAN network configuration, transfer rate)

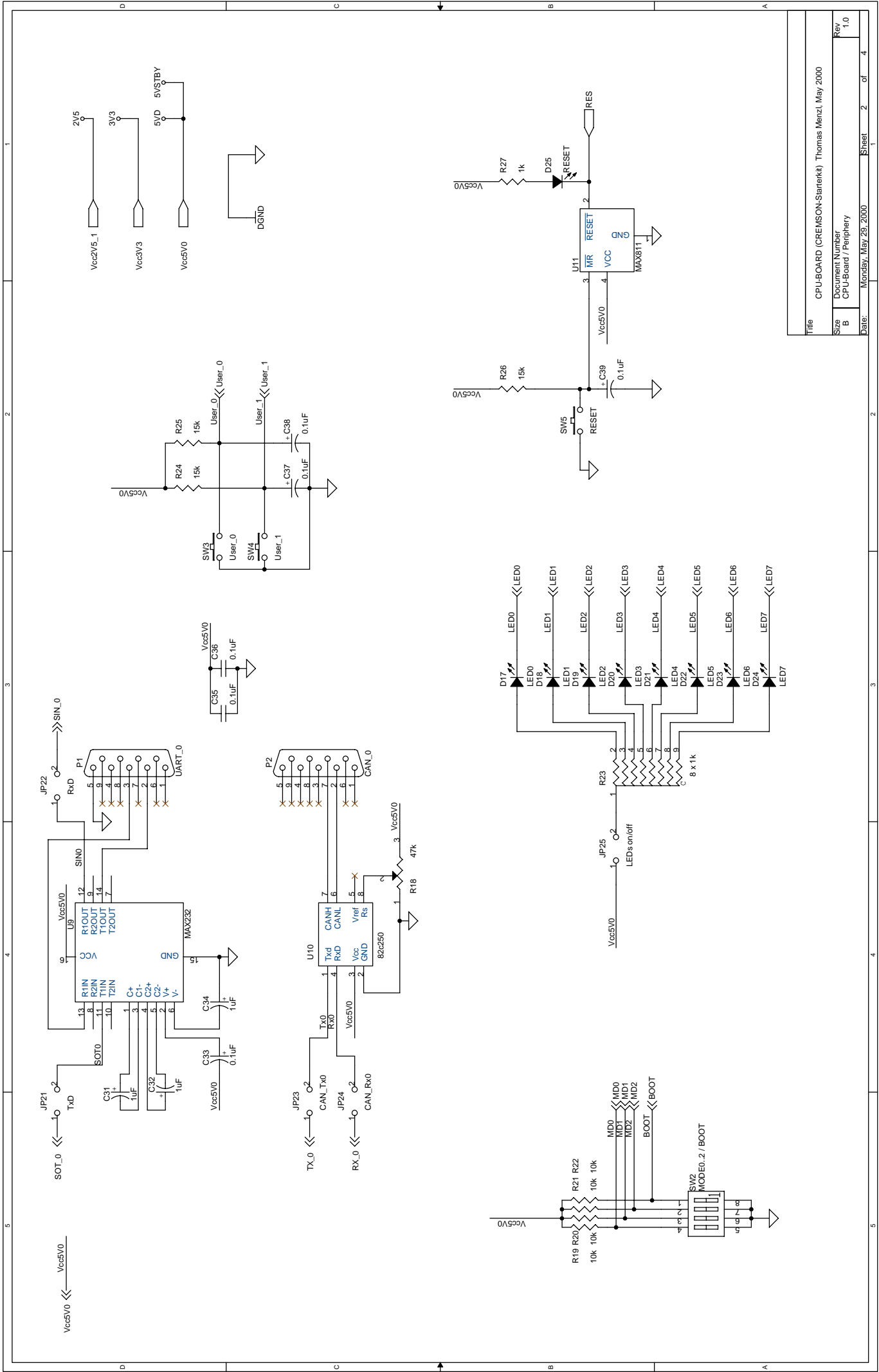
NOTE: To use the board as target for the In-Circuit-Emulator, unscrew the socket and remove the MB91F361 from the socket. Be careful not to bend any pins of the chip ! Using a vacuum chip-handler is highly recommended.

Then mount the emulator probe-cable on top of the QFP-socket. Use the provided screws and make sure the cable has the right orientation.

Follow the emulator set-up manual on the CD-ROM for any further steps.

5. Schematics and Drawings

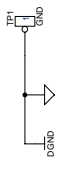
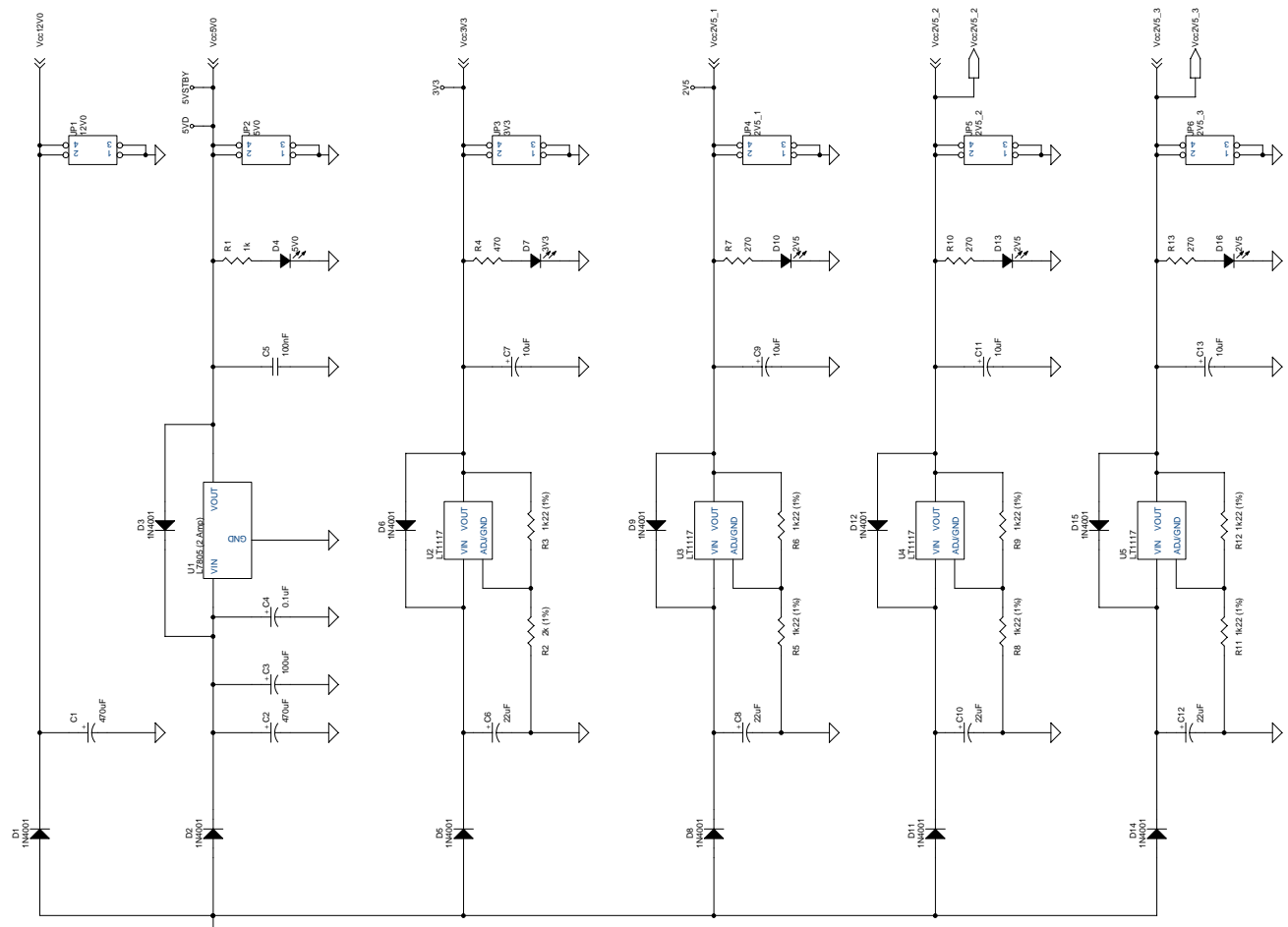


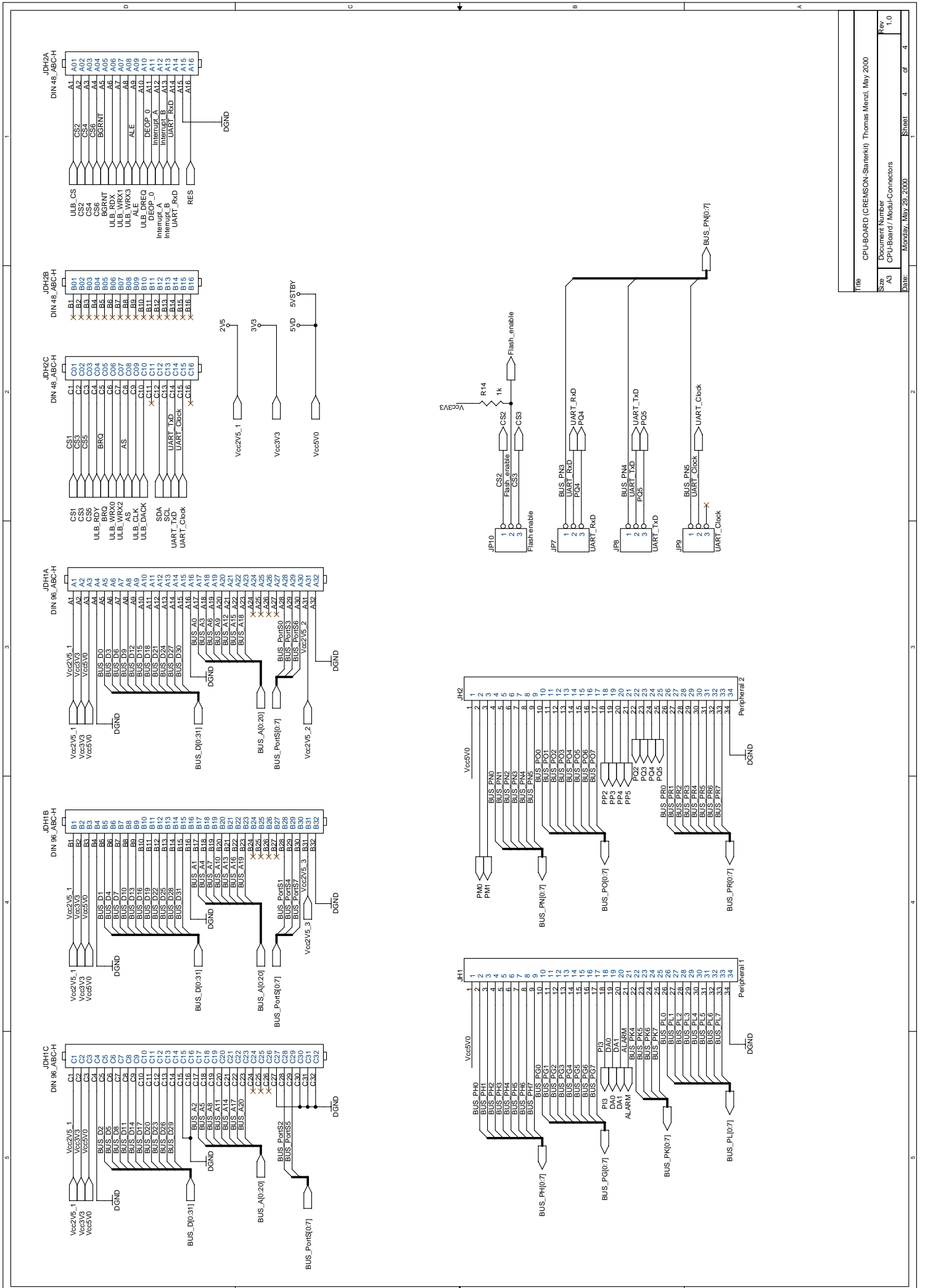


Title				CPU-BOARD (CREIMSON-Startkit) Thomas Menzl, May 2000			
Size				Document Number			
B				CPU-Board / Periphery			
Date:				Monday, May 29, 2000			
Sheet				2 of 4			
Rev				1.0			

TP3 & TP4:
 estrabbebe klammern, um
 Messfall anzuschließen!

TP3
 TP4





Title				CPU-BOARD (CREMSON-Startkit) Thomas Menzi, May 2000			
Size				Document Number			
A3				CPU-Board / Modul-Connectors			
Date:				Monday, May 29, 2000			
Sheet			4	of			4
New			1.0				