StarterKit-C868

Hardware Manual

Preliminary Edition January 2002

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Preface

This StarterKit-C868 User's Manual describes the board's design and functions. Precise specifications for the C868 microcontroller family can be found in the enclosed microcontroller Data-Sheet/User's Manual. If software is included please also refer to additional documentation for this software.

In this hardware manual and in the attached schematics, low active signals are denoted by a "/" in front of the signal name (i.e.: /RD). A "0" indicates a logic-zero or low-level signal, while a "1" represents a logic-one or high-level signal.

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1 Introduction to the StarterKit-C868

TEXT EINFÜGEN

The StarterKit-C868 offers the following features:

- Evaluation Board in format 85 x 85 mm, including wrap-field (30x85 mm) for easy layout of user circuitry.
- Requires single unregulated 7 to 12 V/300 mA power source
- on board programming of the code EEPROM possible via C868 MCU
- All controller ports are extended from the controller to the pins of X4 and X5 in the middle of the board
- RS-232 serial interface, available at DB9-socket P1
- Three multi-color LED's to display the boards status or to visualize the PWM signals
- Two 8K serial EEPROM´s (one with SPI and one with I2C Interface)
- 6-pin connector (X2) for an I2C-LCD display
- Two potentiometers for easy use of the on-chip ADC

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1.1 View of the StarterKit-C868

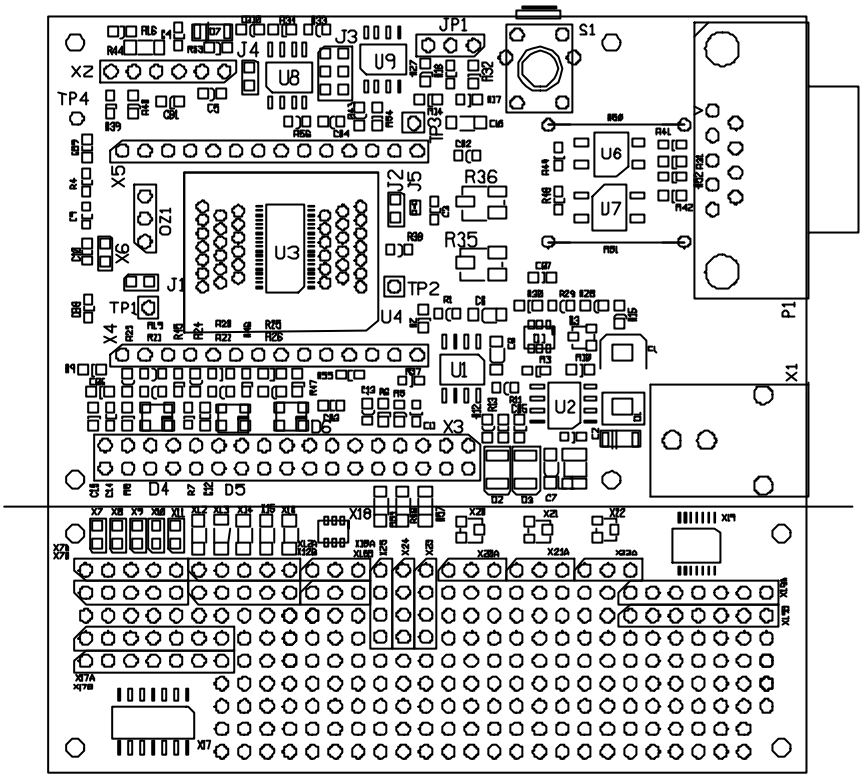


Figure 2: View of the StarterKit-C868 (Component Side)

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2 Pin Layout

Please note that all module connections are not to exceed their expressed maximum voltage or current. Maximum input values are indicated in the corresponding controller manuals. As damage from improper connections varies according to use and application, it is the user's responsibility to take appropriate safety measures to ensure that the module connections are protected from overloading through connected peripherals.

As shown in *Figure 5*, all relevant controller signals are brought out to the socket X4 and X5 in the middle of the board. The StarterKit-C868 is also prepared to accommodate an I2C LCD-Display at X2. The following section provides an overview of the pin assignment of the pin-rows.

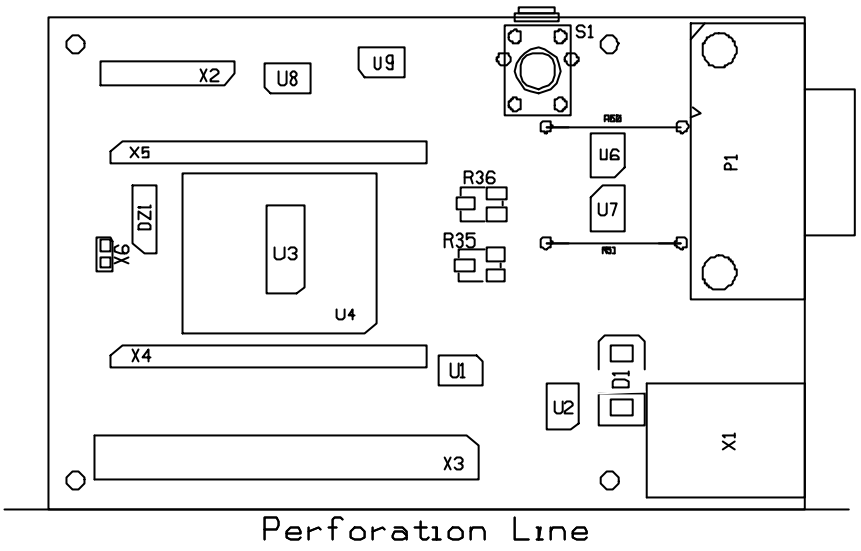


Figure 5: Position of the Connectors

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2.1 The LCD-Display Connector X2

The LCD-Display connector is designed to support an LCD display with I2C interface like the EA7123-I2C from Electronic Assembly (www.lcd-module.de)

Pin Number	Signal	Description
1	GND	
2	VCC	3,3V supply voltage
3	VLCD	backlight voltage
4	V0	brightness
5	SDA	I2C data
6	SCL	I2C clock

Table 1: Pinout of the LCD-Connector X2

If the controller port pins P1.1 and P1.2 should not be used as I2C-Bus you could disconnect X2 from this signal lines by unsoldering the 0Ohm resistors R39 and R40.

2.2 Connector X3

EINFÜHRUNGSTEXT?

Pin Number	Signal Name	Signal Type	Pin Number	Signal Name	Signal Type
2	VIN	Supply-Inp	1	VIN	Supply-Inp
4	+3.3V	Supply-Out	3	GND	Ground
6	GND	Ground	5	VAGND	Analog Gnd
8	ISUM	Analog-Input	7	nc	
10	TEMP	Analog-Input	9	nc	
12	nc		11	nc	
14	VAREF	Analog-Input	13	ENABLE\	O
16	RESET\	I	15	nc	
18	COUT3	I/O	17	ENCA	I/O
20	ENCB	I/O	19	INT3	I/O
22	PWM2	I/O	21	PWM1	I/O
24	LS0	I/O	23	HS0	I/O
26	LS1	I/O	25	HS1	I/O
28	LS2	I/O	27	HS2	I/O
30	HALL2	I/O	29	HALL1	I/O
32	HALL0	I/O	31	TRAP	I/O
34	+2.5V	Supply-Out	33	nc	

Table 2: Pinout of X3

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2.3 Relevant CPU signals X4 / X5

The two socket stripes X4 and X5 are directly connected to the most relevant CPU signals.

X4	
Pin number	**Signal**
1	P3.4
2	P3.0
3	P3.1
4	BSL
5	P3.6
6	P3.7
7	/RESET
8	RxD
9	P1.3
10	P1.2
11	P1.1
12	TxD
13	VddP(3,3V)
14	GND

X5	
Pin number	**Signal**
1	Xtal2
2	Xtal1
3	VddC (2,5V)
4	P3.3
5	P3.2
6	P3.5
7	AN4
8	AN3
9	Varef
10	Vagnd
11	AN2
12	AN1
13	AN0
14	GND

Tabelle 3: Pinout of X4 and X5

2.4 Clock generater source OZ1

There are two possibilities to supply the C868 controller with an external clock signal.

1. 10,66 MHz resonator with intecrated caps from Murata mounted on OZ1 (default).
2. Standard crystal up to 10MHz mounted on OZ1. In this case two resonators wit 22pF capacity have to be soldered on C9 and C10.

clock source	OZ1 pin numbers used
Murata resonator	1,2,3
standard crystal	1, 2

Tabelle 4: clock input on OZ1

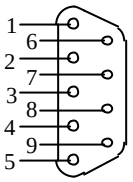
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2.5 The DB9-socket P1

The DB9-socket P1 uses U6 and U7 to serve as an optic decouppled serial-interface. The high level is generated with the voltage level of the PC-RS232-Signal DTR.

The Pinout is shown below.

DB9-socket P1



Pin 2:	C868 TxD via U7
Pin 4:	DTR from PC
Pin 3:	C868 RxD via U6
Pin 5:	GND from PC

Figure 6: Pinout of the DB9-socket P1 (front view)

3 Jumper

To configure the module, the StarterKit-C868 has 6 insertable or solderable jumpers. In order to use the module immediately, the jumpers have been configured prior to delivery. *Figure 8* illustrates the numbering of the jumper-pads, while *Figure 9* indicates the location of the jumpers on the board.

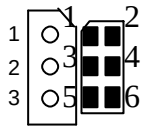


Figure 8: Numbering of the jumper-pads

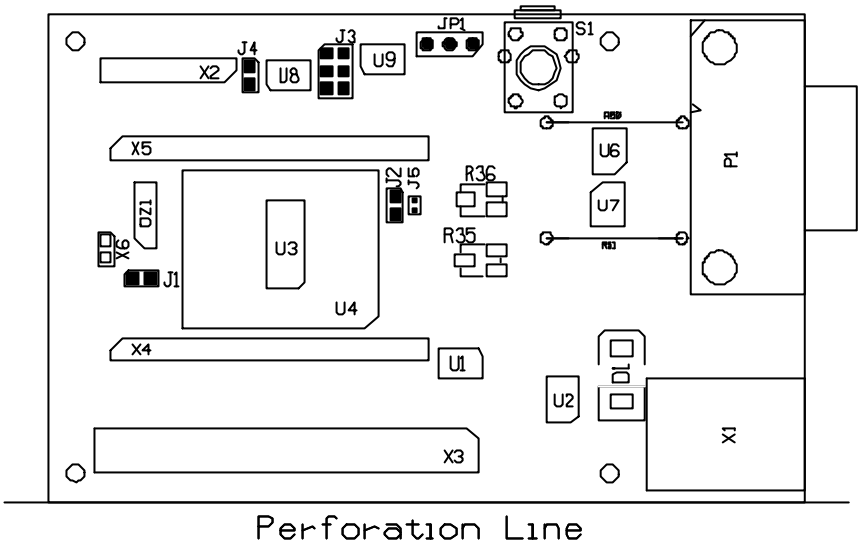


Figure 9: Location of the Jumper (component side)

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The jumpers (JP = insertable jumper, J = solderable jumper) have the following functions:

	Default Setting		**Alternate Setting**	
JP1	(2+3)	Bootstrap loader activated after RESET	(1+2)	Bootstraploader disabled
J1	(closed)	Vcc Core connected to C868	(open)	closed via current measurement instrument
J2	(closed)	Vcc Ports connected to C868	(open)	closed via current measurement instrument
J3	(3+5, 4+6)	Port pins P1.1 and P1.2 connected to SPI-EEPROM U9	(1+3, 2+4)	Port pins P1.1 and P1.2 connected to I2C-EEPROM U8
J4	(closed)	Write access to I2C-EEPROM U8 is possible	(open)	I2C-EEPROM U8 is write protected
J5	(closed)	analog ground is connected to the digital ground	(open)	analog ground is NOT connected to digital ground

Table 3: Jumper Settings

4 The LED´s

The StarterKit-C868 is fitted with three multicolor (red, green, blue) LEDs D4, D5 and D6 to indicate the status of the controller port P3. Port P3 could also be used to generate PWM signals. With the three colors of each LED and the PWM all possible colors could be mixed. Table 5 shows the context between portpins and colors.

LED	Connected portpin	LED color
D4	P3.7	red
	P3.5	green
	P3.3	blue
D5	P3.6	red
	P3.4	green
	P3.2	blue
D6	P3.1	red
	P3.0	green
	/ALE/BSL via JP1	blue

Tabelle 5: Multi color LEDs

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5 The Potentiometers R35 and R36

For an easy use of the on chip analog to digital converter the StarterKit-C868 is populated with two potentiometers. The potentiometers are hardwired to the analog inputs AN3 and AN4 (see Table 6). The connection could be opened by unsoldering the resistors R37 and R38.

Analog input	Potentiometer	Resistor
AN3	R35	R37
AN4	R36	R38

Tabelle 6: Potentiometer connections

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