

TQ-Starterkit

STK16xU

with



Microcontroller

Hardware - Manual

Hardware Manual for:

STK16XU Rev. 100

Starterkit STK16XU can be used with following TQMinimoduls:

TQM167UL	Rev. 1XX
TQM167U	Rev. 1XX
TQM167UE	Rev. 1XX
TQM16xUS	Rev. 1XX

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1. Introduction

The Starterkit STK16XU is the universal EVA-board for TQMinimoduls Typ TQM16XU, TQM16XUL, TQM16XUE and TQM16XUS.

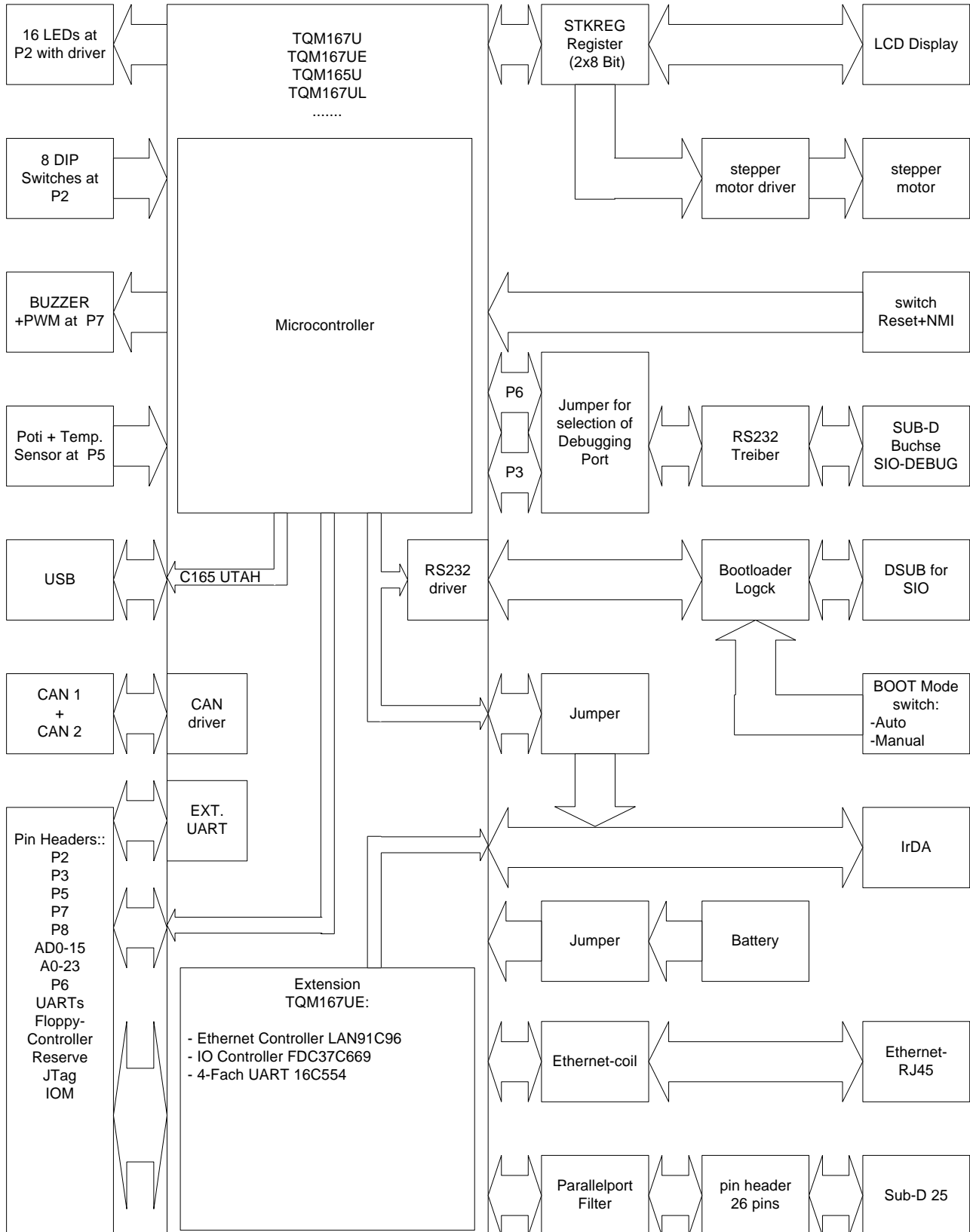
The Starterkit brings all port pins, address, data and control lines to 2.54 mm Header, to have access to all pins of the the Infineon Microcontroller. Additional Interfaces are directly integrated in the EVA-board, to launch your project immediately.

The quick view of STK16xU:

- Supply 5V / 3.3V
- Interface for Debug and Download purposes
- Simulated interface for Debug
- All main signals available on 2,54mm pin header
- USB interface
- Ethernet interface
- IrDA interface
- Register STKREG for the control of LC-Display and stepper motor
- Connectivity for stepper motor
- 16 LEDs on Port 2
- 8 Dip Switches on Port 2
- 2 DC Converters for 5V and 3.3V DC supply
- Programming voltages 3.3V / 5V / 12V for Controller internal Flash memory

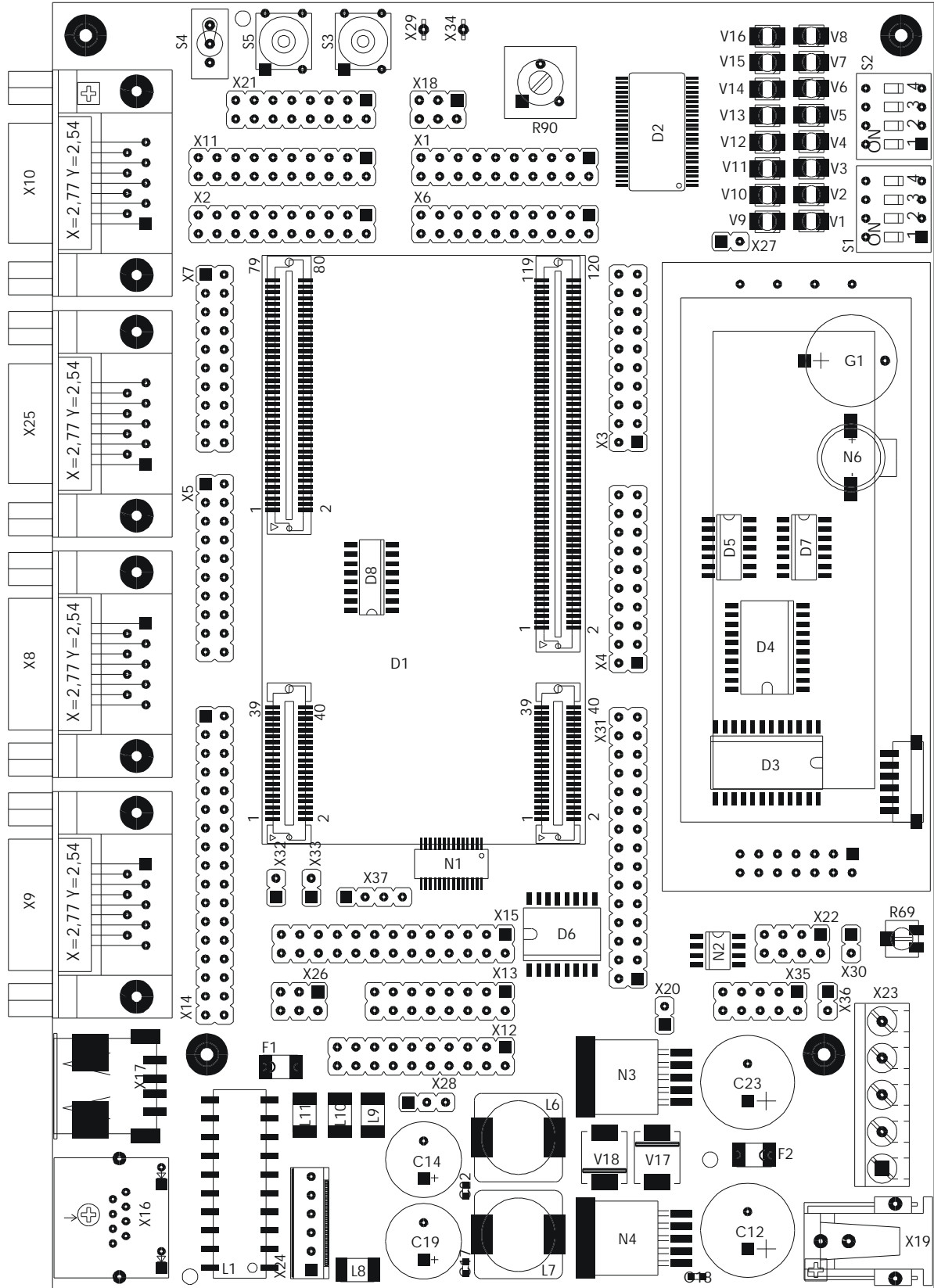
The „universal“ Starterkit principle enables the customer to use any of the available TQM16XU modules on one Starterkit.

2. Block Diagram



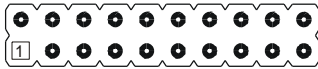
3. Parts Location

3.1 Parts Location STK16XU Rev. 200



4. Functions

4.1 X1-Connector: Port 2



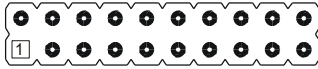
Pin	Function	Pin	Function
1	VCC5V	2	GND
3	P2.0/CC0IO	4	P2.1/CC1IO
5	P2.2/CC2IO	6	P2.3/CC3IO
7	P2.4/CC4IO	8	P2.5/CC5IO
9	P2.6/CC6IO	10	P2.7/CC7IO
11	P2.8/CC8IO/EX0IN	12	P2.9/CC9IO/EX1IN
13	P2.10/CC10IO/EX2IN	14	P2.11/CC11IO/EX3IN
15	P2.12/CC12IO/EX4IN	16	P2.13/CC13IO/EX5IN
17	P2.14/CC14IO/EX6IN	18	P2.15/CC15IO/EX7IN/T7IN
19	VCPU	20	GND

4.2 X2-Connector: Port 3



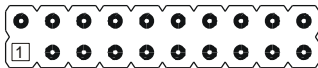
Pin	Function	Pin	Function
1	VCC5V	2	GND
3	P3.0/T0IN	4	P3.1/T6OUT
5	P3.2/CAPIN	6	P3.3/T3OUT
7	P3.4/T3EUD	8	P3.5/T4IN
9	P3.6/T3IN	10	P3.7/T2IN
11	P3.8/MRST	12	P3.9/MTSR
13	n.c.	14	n.c.
15	n.c.	16	P3.13/SCLK
17	n.c.	18	P3.15/CLKOUT/FOUT
19	VCPU	20	GND

4.3 X3-Connector: Port 5



Pin	Function	Pin	Function
1	VCC5V	2	GND
3	P5.0/AN0	4	P5.1/AN1
5	P5.2/AN2	6	P5.3/AN3
7	P5.4/AN4	8	P5.5/AN5
9	P5.6/AN6	10	P5.7/AN7
11	P5.8/AN8	12	P5.9/AN9
13	P5.10/AN10/T6EUD	14	P5.11/AN11/T5EUD
15	P5.12/AN12/T6IN	16	P5.13/AN13/T5IN
17	P5.14/AN14/T4EUD	18	P5.15/AN15/T2EUD
19	VCPU	20	GND

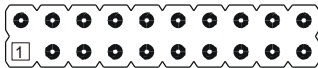
4.4 X4-Connector: Port 7 / Port 8



Pin	Function	Pin	Function
1	VCC5V	2	GND
3	P7.0/POUT0	4	P7.1/POUT1
5	P7.2/POUT2	6	P7.3/POUT3
7	P7.4/CC28IO	8	P7.5/CC29IO
9	P7.6/CC30IO/ Buzzer / PWM Out	10	P7.7/CC31IO
11	P8.0/CC31IO/IRQ_SIO_A	12	P8.1/CC31IO/IRQ_SIO_B
13	P8.2/CC31IO/IRQ_SIO_C	14	P8.3/CC31IO/IRQ_SIO_D
15	P8.4/CC31IO/IRQ_ETH	16	P8.5/CC31IO/IRQ_IO_A
17	P8.6/CC31IO/IRQ_IO_C	18	P8.7/CC31IO/IRQ_IO_D
19	VCPU	20	GND

Note: Pin9 (P7.6) is also connected with the Starterkit Buzzer (which can be disconnected using X30) and the PWM output (X29).

4.5 X5-Connector: Adress Bus



Pin	Function	Pin	Function
1	VCC5V	2	GND
3	AD0	4	AD1
5	AD2	6	AD3
7	AD4	8	AD5
9	AD6	10	AD7
11	AD8	12	AD9
13	AD10	14	AD11
15	AD12	16	AD13
17	AD14	18	AD15
19	VCPU	20	GND

4.6 X6-Connector: A Bus



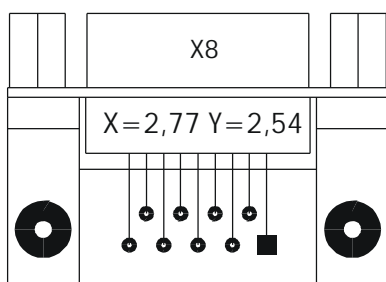
Pin	Function	Pin	Function
1	VCC5V	2	GND
3	P1L0/A0/AN16	4	P1L1/A1/AN17
5	P1L2/A2/AN18	6	P1L3/A3/AN19
7	P1L4/A4/AN20	8	P1L5/A5/AN21
9	P1L6/A6/AN22	10	P1L7/A7/AN23
11	P1H.0/A8	12	P1H.1/A9
13	P1H.2/A10	14	P1H.3/A11
15	P1H.4/A12/CC24IO	16	P1H.5/A13/CC25IO
17	P1H.6/A14/CC26IO	18	P1H.7/A15/CC27IO
19	VCPU	20	GND

4.7 X7-Connector: A Bus / C Bus



Pin	Function	Pin	Function
1	VCC5V	2	GND
3	P4.0/A16	4	P4.1/A17
5	P4.2/A18	6	P4.3/A19
7	P4.4/A20/CAN2_RXD	8	P4.5/A21/CAN1_RXD
9	P4.6/A22/CAN1_TXD	10	P4.7/A23/CAN2_TXD
11	P6.2/CS2#/CSXREG+IOCTRL+UART#	12	P6.3/CS3#/CSETH#
13	P6.4/CS4#	14	RSIN#
15	ALE	16	WRL#
17	RD#	18	WRH#
19	RSTOUT#	20	GND

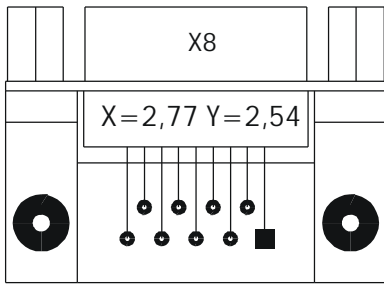
4.8 X8-Connector: DSUB CAN 1



Pin	Function	Pin	Function
1	n.c.	2	CAN1_L
3	GND	4	n.c.
5	n.c.	6	n.c.
7	CAN1_H	8	n.c.
9	n.c.	M1	Grounding DSUB connector

If X33 is set the CAN1 will be terminated with a value of 120 Ohms

4.9 X9-Connector: DSUB CAN 2

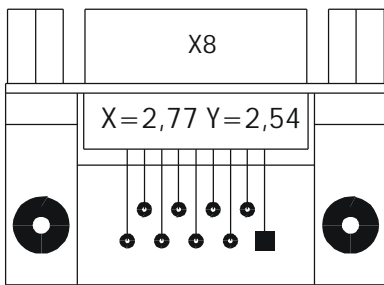


Pin	Function	Pin	Function
1	n.c.	2	CAN2_L
3	GND	4	n.c.
5	n.c.	6	n.c.
7	CAN2_H	8	n.c.
9	n.c.	M1	Grounding DSUB connector

If X32 is set the 2nd CAN Controller will be terminated with a value of 120 Ohms

Please note that the 2nd CAN Controller is only available on modules which are equipped with the SAB167CS Processor.

4.10 X10-Connector: DSUB RS232/1



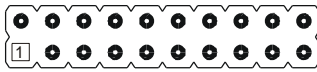
Pin	Signal	Function
1	n.c.	Not connected
2	TXD0 (µC=>PC)	TXD Outout Microcontroller V24 level
3	RXD0 (PC=>µC)	RXD input vom Microcontroller V24 level
4	BOOTSTR	Bootloader control
5	GND	Ground
6	n.c.	Not connected
7	RSINS	Reset control serial interface
8	BOOTSTR	Bootloader control
9	n.c.	Not connected

On the Starterkit 2 serial interfaces are implemented:

- SIO0: Connected to ASC0 of the Microcontroller. This interface can be used for downloads into the flash and SRAM memory of the module.
- Debugging SIO(SIO_DEBUG): Tool provider (debugger) use port pins to simulate a serial interface. The main advantage is that the ASC0 will not be used by the

debugging tool and remains free for the application. For the SIO_DEBUG please refer to X25 and X26.

4.11 X11-Connector: Serial Input / Output A-D (QUAD UART)

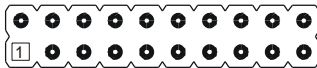


Pin	Function	Pin	Function
1	VCC5V	2	GND
3	TXD_A	4	RXD_A
5	TXD_B#	6	RXD_B#
7	TXD_C#	8	RXD_C#
9	TXD_D#	10	RXD_D#
11	OUT1#/DTR_B#	12	OUT2#/RTS_B#
13	TXD_A#	14	RXD_A#
15	RTS_A#	16	CTS_A#
17	DTR_A#	18	DSR_A#
19	RLA#	20	DCD_A#

Note:

- TQM167UL: No UART is equipped on the module
- TQM167U: Only UART A is available
- TQM161US: Only UART A is available
- TQN165US: Only UART A is available
- TQM167US: UART A through D are available

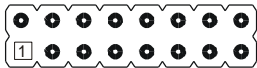
4.12 X12-Connector: Serial Input / Output 1 – 2 (only TQM167UE)



Pin	Function	Pin	Function
1	VCC5V	2	GND
3	RXD_IO1#	4	TXD_IO1#
5	RTS_IO1#	6	DTR_IO1#
7	CTS_IO1#	8	DSR_IO1#
9	DCD_IO1#	10	RI_IO1#
11	RXD_IO2#/IRRX#*	12	TXD_IO2#/IRTX#*
13	IDEEN#	14	HDCS0#
15	HDCS1#	16	GAMECS#
17	DRV2	18	CS2_2#
19	CS2_3#	20	GND

* Pins used by IrDA Interface

4.13 X13-Connector: Port 6 / Port 9



Pin	Function	Pin	Function
1	VCC5V	2	GND
3	P9.0	4	P9.1
5	P9.2	6	P9.3
7	P9.4	8	P9.5
9	P9.6	10	P9.7
11	P6.5 / HOLD#	12	P6.6 / HLDA#
13	P6.7 / BREQ#	14	XR12
15	XR13	16	GND

4.14 X14-Connector: FDD Interface



Pin	Function	Pin	Function
1	GND	2	DRV DEN0/DENSEL / pull up 4k7
3	GND	4	n.c.
5	GND	6	n.c.
7	GND	8	INDEX#
9	GND	10	MTR0# / pull up 4k7
11	GND	12	DSD0# / pull up 4k7
13	GND	14	DSD1# / pull up 4k7
15	GND	16	MTR1# / pull up 4k7
17	GND	18	DIR# / pull up 4k7
19	GND	20	STEP# / pull up 4k7
21	GND	22	WDATA# / pull up 4k7
23	GND	24	WGATE# / pull up 4k7
25	GND	26	TRK00#
27	GND	28	WRPRT#
29	GND	30	RDATA#
31	GND	32	HDSEL# / pull up 4k7
33	GND	34	DSKCHG#

Note: This functionality can only be used on the TQM167UE (Super IO Controller FDC37C669 equipped on the board).

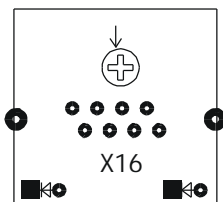
4.15 X15-Connector: Parallelport



Pin	Function	Pin	Function
1	STROBE_B#	2	AUTOFD#
3	PD_B_0	4	ERROR#
5	PD_B_1	6	INIT#
7	PD_B_2	8	SLCIN#
9	PD_B_3	10	GND
11	PD_B_4	12	GND
13	PD_B_5	14	GND
15	PD_B_6	16	GND
17	PD_B_7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	GND

Note: This functionality can only be used on the TQM167UE (Super IO Controller FDC37C669 equipped on the board).

4.16 X16-Connector: Ethernet

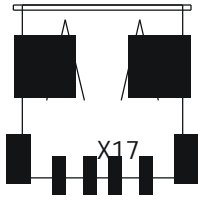


See Ethernet Specifications

Pin	Belegung
1	TD+
2	TD-
3	RD+
4	NC
5	NC
6	RD-
7	NC
8	NC
Housing	GND
LED Yellow	LNKLED# (91C96 Pin 70)
LED Green	RXLED# (91C96 Pin 71)

Note: This functionality can only be used on the TQM167UE.

4.17 X17-Connector: USB



See USB Specifications

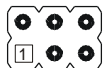
Pin	Function
1	+5V
2	DMNS
3	DPLS
4	GND
Schirm	GND

Maximum supply current for 5V supply: 0.5A

Automatic switch off (Thermo fuse) at a maximum current of approximately 1A.

Note: This functionality can only be used on the TQM161US/TQM165US.

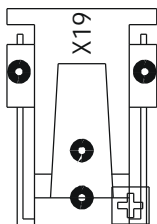
4.18 X18-Connector: IOM for SAB165UTAH



Pin	Function	Pin	Function
1	VCPU	2	FSC
3	DCL	4	DD
5	DU	6	GND

Note: This functionality can only be used on the TQM161US/TQM165US.

4.19 X19-Connector: External Power Supply



For external Power supply. Use only the power supply which is supplied with the starter kit.

Input: 15V ($\pm 10\%$)

4.20 X20-Connector: Switch 3.3V

If X20 is set the DC Converter 3.3V is set active and supplies 3.3V at X23 Pin4.
X20 is usually needed when using the TQM161US or the TQM165US.

4.21 X21-Connector: JTAG (only TQM16xUS)

Pin	Bezeichnung	Pin	Bezeichnung
1	TMS	2	5V/3V
3	TDO	4	GND
5	P3.15	6	GND
7	TDI	8	RSIN#
9	TRST#	10	BRKOUT#
11	TCK	12	GND
13	BRKIN#	14	OCDS_E#
15	NC	16	NC

4.22 X22-Connector: Choosing the Flash programming voltage

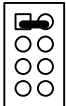
The STK16xU supplies the programming voltage for the internal flash memory (for instance ST10 derivatives).

The programming voltage will be applied at the VPP pin of the microcontroller.

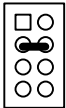
Pin1 of the X22 connector is marked with a square pad on the Starterkit PCB.

SetupX22

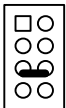
VPP voltage



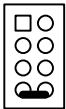
0 Volt



3.3 Volt

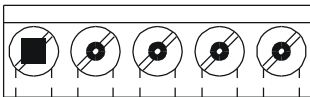


5 Volt



12 Volt

4.23 X23-Connector: Power output



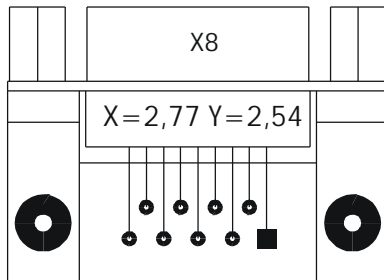
Pin	Function	Pin	Function
1	VCC15V	2	VCC5V
3	DGND	4	VCC3V3
5	DGND	6	

If an external power supply on X19 is used the voltages 3.3V and 5V are available on X23. Maximum current = 0.5A.

4.24 X24-Connector: Stepper motor

Pin	Function	Pin	Function
1	VCC15V (Input voltage dependent)	2	Loop1
3	Loop2	4	VCC15V (Input voltage dependent)
5	Loop3	6	Loop4

4.25 X25-Connector: RS232 / SIO Debug



Pin	Signal	Function
1	n.c.	Not connected
2	DEBUG_TXD ($\mu\text{C} \Rightarrow \text{PC}$)	Output Microcontroller, V24 level
3	DEBUG_RXD ($\text{PC} \Rightarrow \mu\text{C}$)	Input Microcontroller V24 level
5	GND	

4.26 X26-Connector: Selection of the port for Debug SIO

Select the port pins for debugging with the simulated interface.

Pin1 of the connector is marked with a square pad on the Starterkit PCB.



$TxD (16X \Rightarrow PC) = P6.7$
 $RxD (PC \Rightarrow 16X) = P6.6$



$TxD (16X \Rightarrow PC) = P3.9$
 $RxD (PC \Rightarrow 16X) = P3.8$

4.27 X27-Connector: Enable Disable VBat

If X27 is set the Starterkit Vbat supply for the SRAM is enabled.

If the Starterkit is not used for a longer period the Vbat supply should be disabled.

4.28 X28-Connector: Selection of the controller power supply

For the each module the following voltage selection has to be applied:

Modul	Supply voltage
TQM167U	5V
TQM167UL	5V
TQM167UE	5V
TQM165U	3.3V

Pin1 of the connector is marked with a square pad on the Starterkitg PCB.



Controller voltage = 5 Volt



Controller voltage = 3.3 Volt

Please take in mind that the selection of the wrong supply voltage might destroy the microcontroller circuit.

4.29 X29 Connector: PWM output

The pin X29 is connected via 5k6 to the PWM output P7.5 of the microcontroller. X34 is connected to GND.

The PWM output is connected to port P7.5 via low pass ($f_g = 280\text{Hz}$) of 5.6kOhms and 100nF. Using the Capture Compare register CC29 a DC signal with a resolution of 7..8 Bit can be realized.

4.30 X30 Connector: Enable disable buzzer

If X30 is set the buzzer is active. The buzzer is directly connected to Port 7.6 (PWM).

Using the buzzer with continous DC voltage might damage it.

4.31 X31 Connector: Spare

This connector will be used for future functionalities.

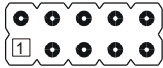
4.32 X32 Connector: Termination of CAN2

If X32 is set the CAN2 will be terminated with a value of 120 Ohms

4.33 X33 Connector: Termination of CAN1

If X33 is set the CAN1 will be terminated with a value of 120 Ohms

4.34 X35 Connector: Other signals



Pin	Function	Pin	Function
1	EA#	2	READY#
3	LOWL#	4	BSELED#
5	TXLED#	6	DRVDEN1
7	IOCHRDY	8	BAUDOUT#
9	TEST	10	DGND

4.35 X36 Connector: enable / disable external memory access

Closing X36 will set the EA# pin of Microcontrollers with integrated Flash (e.g. ST10 derivatives) to logical high. In this case the external memory access is deactivated thus the controller boots from internal flash.

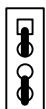
4.36 X37 Connector: Configuration of ASC0

The SAB C 165 UTAH is able to supply the data for an IrDA Transmission up to max. 115.2 Kbaud. An IrDA transceiver is applied to the starterkit.

Setting the jumpers as following will enable ASC0 for data transmission via RS232 or IrDA.



ASC0 will be used for RS232 transmission



ASC0 will be used for IrDA transmission

When using the IrDA Interface over ASC0 it is recommended not to use the ASC0 over RS232 at the same time.

RXD0 of SIO0 should be left open or on a level of -10 V.

4.37 NMI Switch

Pressing the button of the NMI Switch will cause a non maskable interrupt to the module. This function be used for instance for debugging purposes.

4.38 Reset Switch

Pressing the button of the Reset Switch will cause a Reset while the button is pressed down.

4.39 Boot mode switch

This switch defines whether the control lines of the serial interface will be used during download to perform a reset or the port pin POL.4 will be manually pulled to ground.

The tools *TQ-Load* and *TQ-Select* use the control lines of the serial interface. Using these tools the “Auto”-mode must be applied.

Many other tools do not support this feature. In this case the Port pin POL.4 must be set to GND by setting the switch to “Manual”-mode. After that a Reset has to be performed by pushing the RESET button on the Starterkit. This will set the microcontroller in the bootstrap loader mode.

Please note: After performing a download on the module the switch has to be set to “Auto” mode again. This enables the module to start up after reset.

4.40 Potentiometer

The poti is connected to port P5.0. The voltage can be altered in a range between 0V and VCCCPU (3.3V or 5V).

4.41 Temperature sensor

Port P5.1 of the microcontroller is connected to a temperature sensor.

Sensor type: **S8110** (Seiko Instruments) with

- Linear behaviour
- $T_{a1} = -30^{\circ}\text{C}$ $V_{Ta1} = 1.823\text{V}$
- $T_{a2} = 30^{\circ}\text{C}$ $V_{Ta2} = 1.326\text{V}$
- $T_{a3} = 100^{\circ}\text{C}$ $V_{Ta3} = 0.718\text{V}$

4.42 LEDs

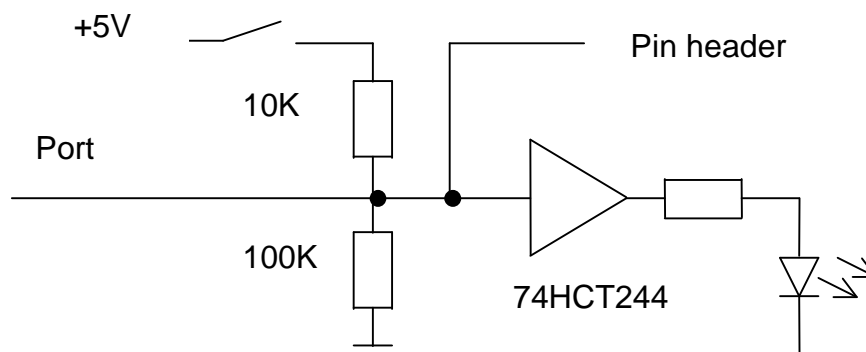
Port P2 is connected via bus driver to the LEDs V1..V16.

Using a module with the microcontroller SAB C 164 (without Port2) Port1 can be linked to Port2 by using a cable.

LED	Port Nr#	LED	Port Nr#
1	P2.0	2	P2.1
3	P2.2	4	P2.3
5	P2.4	6	P2.5
7	P2.6	8	P2.7
9	P2.8	10	P2.9
11	P2.10	12	P2.11
13	P2.12	14	P2.13
15	P2.14	16	P2.15

4.43 DIP switches

The DIP switches are connected to P2.0..P2.3 (S1) and P2.8..P2.11 (S2). If the port has been defined as an input its value can be changed by using the DIP switch:



4.44 LCD contrast

The contrast of the STK LCD can be set up by using the poti R69.

4.45 Programming the STKREG

The STREG gets active if CS4# is selected (please refer also to the manual of your TQ-module). It consists of an 8 bit wide data register (bi directional) for the LCD, an 8 bit wide control register (write only) for the LCD and the stepper motor.

Recommended bus initialisation using the STKREG:

Buscon4: **0x040D** **: 8 Bit; 2 WS; Tristate + R/W-Delay**
Addrse14: **0xA008** **: Adresse 0xA00000**

A16 and A17 are used for encoding the registers:

A16 = 0: data register is addressed.
A17 = 0: control register is addressed

In this case the following addresses are the result for encoding the registers:

Kontrollregister: **0xA10000**
Datenregister: **0xA20000**

The data register is connected to the LCD-pins DB0..DB7 (HD44780 compatibel).

Pin out control register:

Bit	Labeling	Reset state	Function
0	LCD_R/W#	1	R/W# Pin of LCD. Switches the Latch 74543. 0: writing LCD; Latch is configured as output 1: reading LCD; Latch is configured as input.
1	LCD_RS	0	RS of LCD
2	LCD_E	0	E of LCD
3	SMT_EN	0	ENABLE of stepper motor driver; 0: stepper motor inactive (output tristate) 1: stepper motor active
4	SMT_1	Undefined	Stepper motor loops; 0: no current 1: with current
5	SMT_2	Undefined	
6	SMT_3	Undefined	
7	SMT_4	Undefined	

More hints for programming the LCD:

<http://home.iae.nl/users/pouweha/lcd/lcd.shtml>

5. Order Codes

Order Codes STK161US

Order Code	Starterkit	Description
STK161US-AA	STK161USD9C	Starterkit with TQM161USD9C, EVA-board, power supply (EUR or US) and download-cable, demo software, Module with <ul style="list-style-type: none"> • Infineon SAB-C161U @ 36MHz • 8 MB Flash • 1,5MB SRAM • RS232 Interface • 4kBit EEPROM • 5 mm Board to Board, 200 pin., RM0.8 mm • 54*44 mm²

Order Codes STK165US

Order Code	Starterkit	Description
STK165US-AA	STK165USA7C	Starterkit with TQM165USA7C, EVA-board, power supply (EUR or US) and download-cable, demo software, Module with <ul style="list-style-type: none"> • Infineon SAB-C165UTAH @ 36MHz • 1 MB Flash • 1,5MB SRAM • DC/DC Converter • RS232 Interface • 4kBit EEPROM • 5 mm Board to Board, 200 pin., RM0.8 mm • 54*44 mm²

Order Codes STK167UL

Order Code	Starterkit	Description
STK167UL-AA	STK167ULH7ACR	Starterkit with TQM167ULH7ACR, EVA-board, power supply (EUR or US) and download-cable, demo software, Module with <ul style="list-style-type: none"> • Infineon SAB-C167CR @ 20MHz • 256kB Flash • 256kB SRAM • RS232 Interface • 5 mm Board to Board, 200 pin., RM0.8 mm • 54*44 mm²

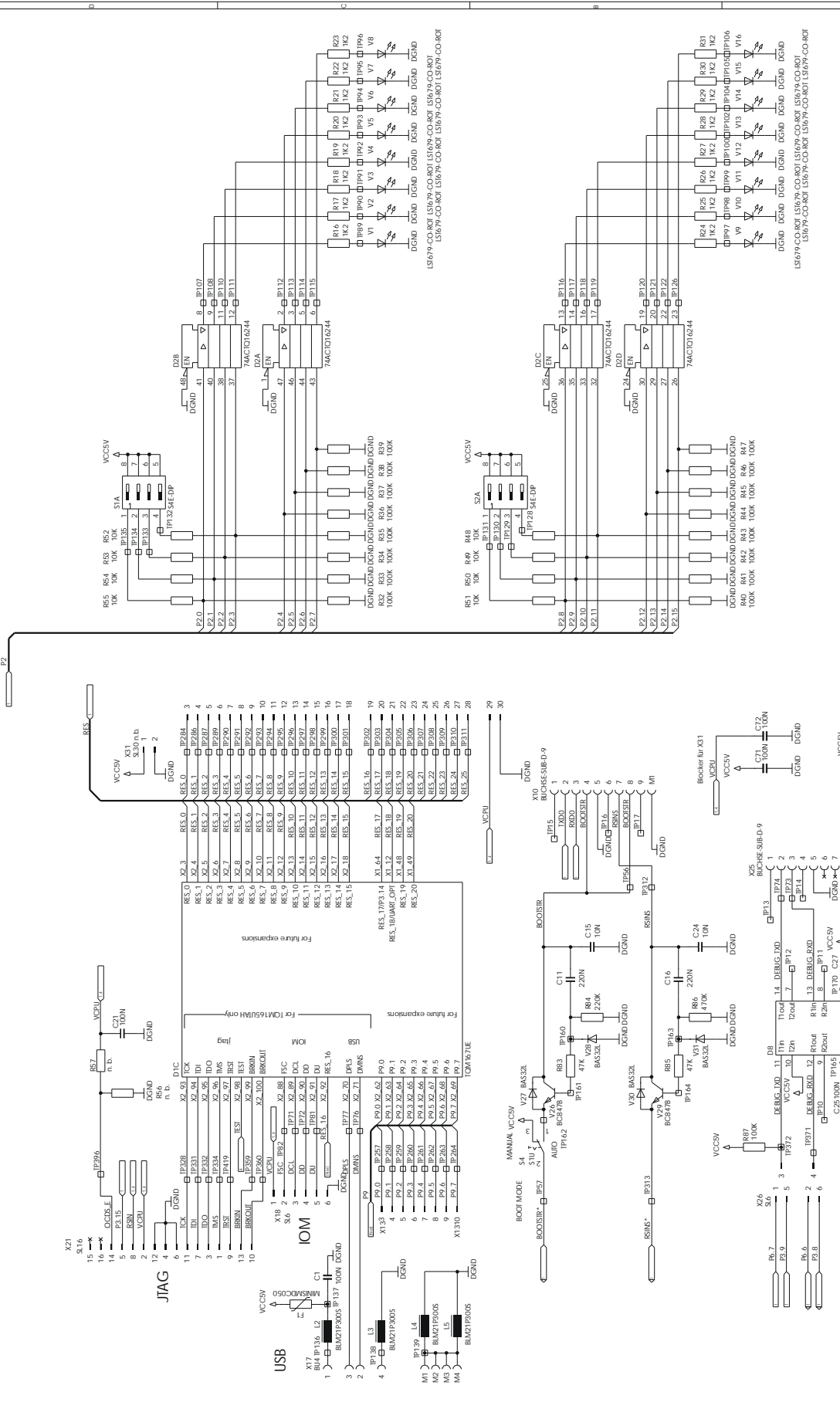
Order Codes STK167U

Order Code	Starterkit	Description
STK167U-AA	STK167UH7HCR016	Starterkit with TQM167UH7HCR016, EVA-board, power supply (EUR or US) and download-cable, demo software, Module with <ul style="list-style-type: none"> • Infineon SAB-C167CR @ 20MHz • 256kB Flash • 256kB SRAM • RS232 Interface • 4kBit EEPROM • Quad UART • 1 CAN driver • 5 mm Board to Board, 200 pin., RM0.8 mm • 54*44 mm²
STK167U-AB	STK167UK7RCS032	Starterkit with TQM167UH7HCR016, EVA-board, power supply (EUR or US) and download-cable, demo software, Module with <ul style="list-style-type: none"> • Infineon SAB-C167CS @ 20MHz • 1MB Flash • 1MB SRAM • RS232 Interface • 4kBit EEPROM • Quad UART • 2 CAN driver • 7 Segment Display • 5 mm Board to Board, 200 pin., RM0.8 mm • 54*44 mm²

Order Codes STK167UE

Order Code	Starterkit	Description
STK167UE-AA	STK167UEK7KCR016	Starterkit with TQM167UH7HCR016, EVA-board, power supply (EUR or US) and download-cable, demo software, Module with <ul style="list-style-type: none"> • Infineon SAB-C167CR @ 20MHz • 1MB Flash • 1MB SRAM • RS232 Interface • Ethernet Controller • 4kBit EEPROM • Quad UART • 1 CAN driver • 5 mm Board to Board, 280 pin., RM0.8 mm • 80*44 mm²

Other version on request.



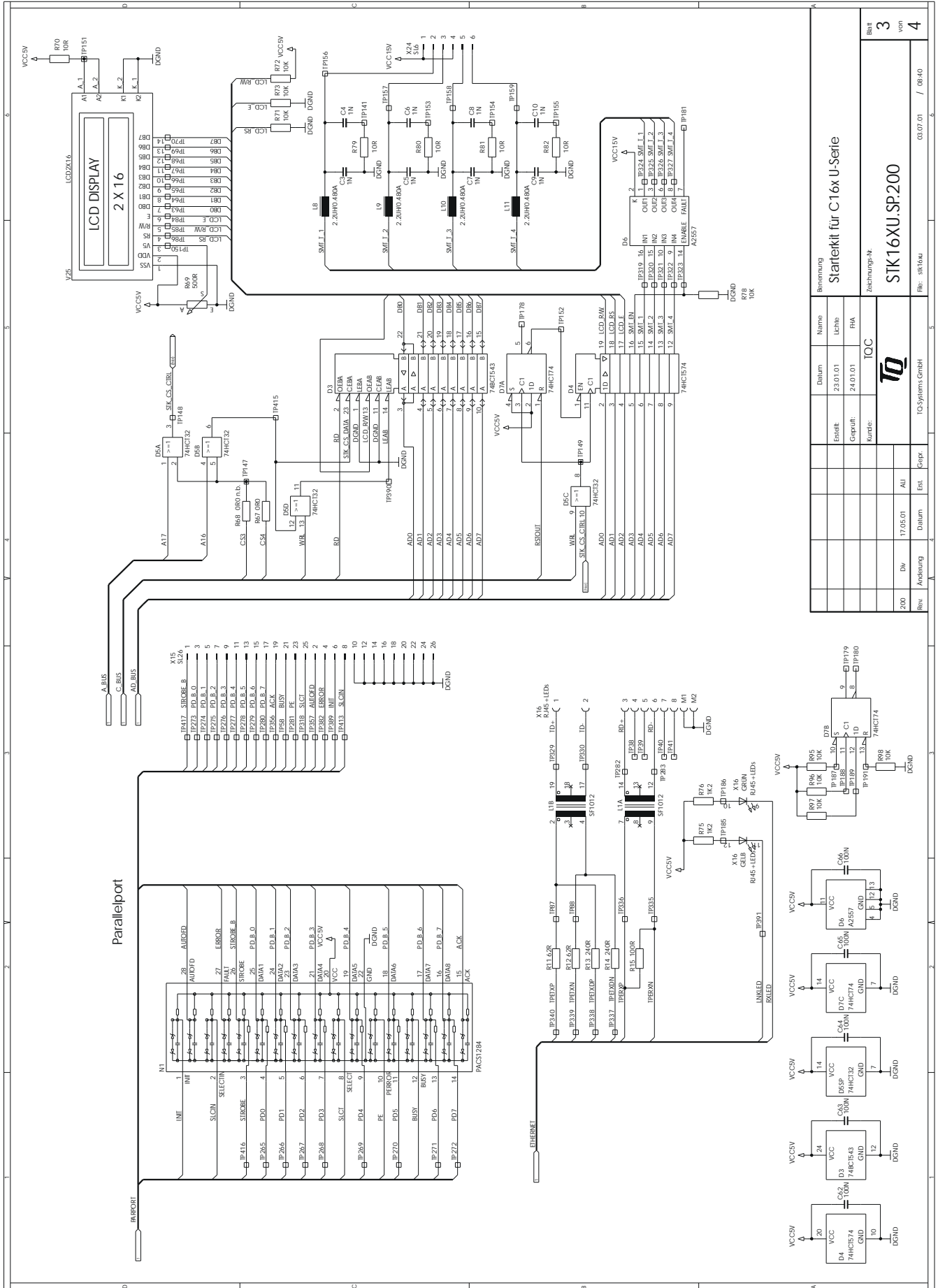
Rev.	Änderung	Datum	Erst.	Erztr.	IO-Systems GmbH
200	Dv	17.05.01	AU		

Benennung	Name	Datum	Entleert:	Geprüft:	Kunde:
Starterkit für C16x U-Serie	Lichte	23.01.01			
Zuschungs-Nr.	FMA	24.01.01			

TQ	
IO-Systems GmbH	

Bestell-Nr.	2
von	4

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Rev.	Änderung	Datum	Est.	Corpr.
200	Dv	17.05.01	AU	

Benennung	Name	Datum	Ueche	Rev.
Starterkit für C16x U-Serie		23.01.01		
Zuschungs-Nr.	PHA	24.01.01		

Best.Nr.	Rev.	von	4
STK16XU.SP.200			

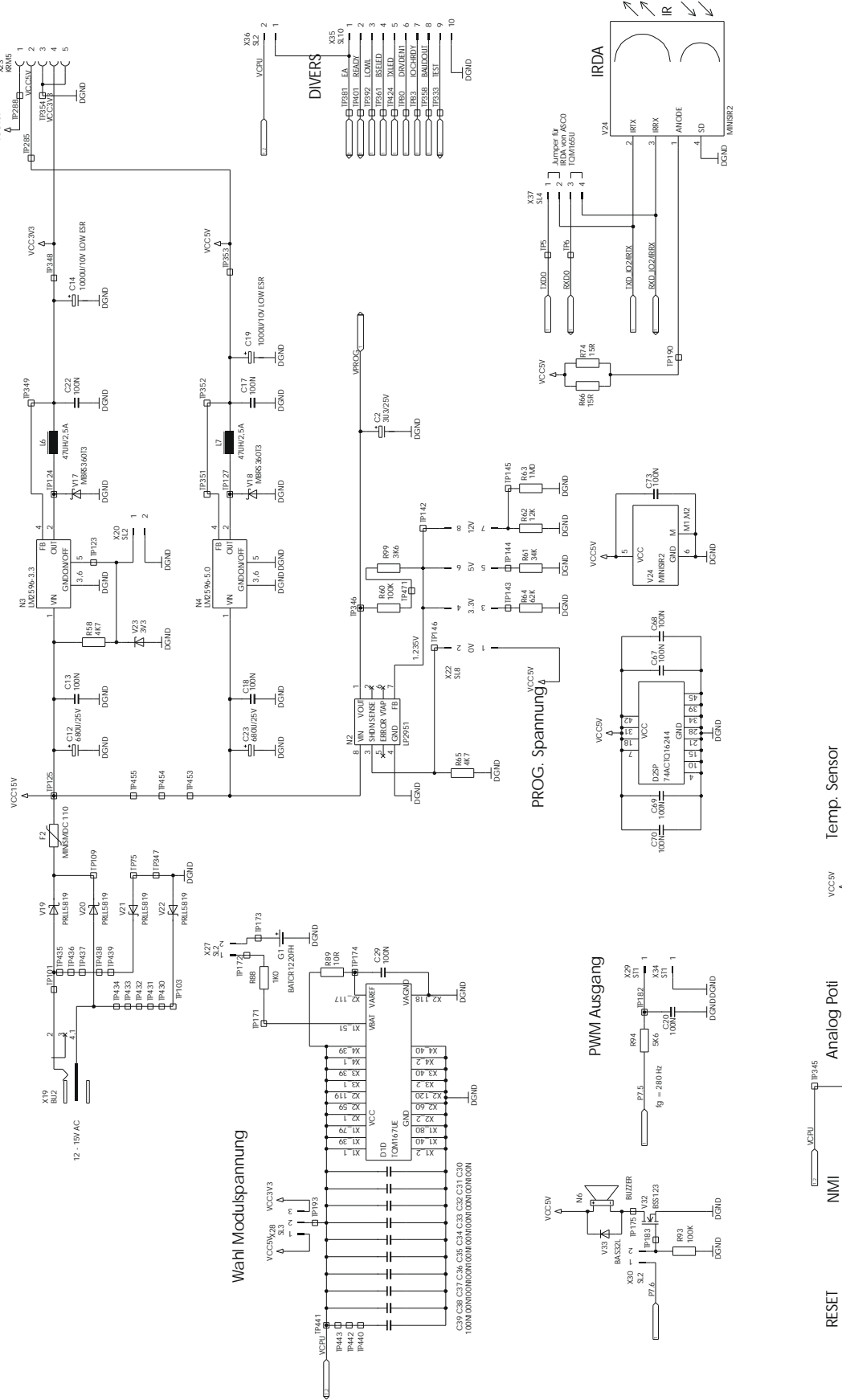
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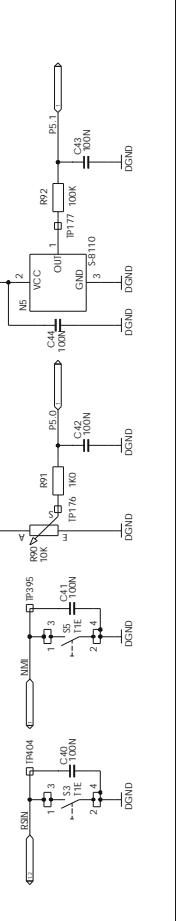
TQ-Systems GmbH

03.07.01 / 08/40

Direkte VCC-Erpesung oder Anzapfung für externe Verbraucher



Benennung		Name		Datum		Itrhb		RHA	
Starterkit für C16x U-Serie		TQC		25.01.01		24.01.01		FHA	
Zuschungs-Nr.		STK16XU.SP.200		Rev.		Änderung		Datum	
Blatt		4		Vop		4		03.07.01 / 08.80	



Rev No.	Designed by:	Date	Approved by:	Date:	Changes:
100	ANW	13.09.01			1 st Version

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