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Introduction

ITSTR9 is a medium size (167x105 mm) board based on ST's STR912FW44 32-bit microcontroller. ITSTR9 board is based on universal base board with all peripheral (LCD, LED's, push buttons, power supply, prototyping area,...) and piggyback module with target CPU. The board is well suited for a wide range of application development and prototyping purposes

Description

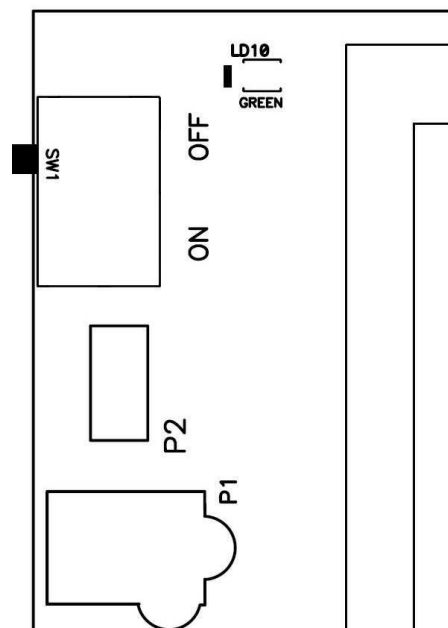
Features

The ITSTR9 board provides the following features:

- STR912FW44 microcontroller with 32-bit ARM966E-S RISC core capable running at 96Mhz and up to 80 MIPS directly from Flash memory, 96KB of 32-bit internal SRAM, 512KB main internal FLASH and 32KB 2nd Flash memory
- General purpose RS-232 serial port
- 2x16 LCD with backlight
- Potentiometer for analog voltage
- LED indicator for power supply
- 8 programmable LEDs and 4 push buttons
- Small prototyping area
- 8-24 Vdc power supply

Board Installation

The board is designed to work with any regulated or unregulated power supply, which is capable of delivering 8-12 V, 250mA on a standard 5mm power JACK connector P1 or . The polarity of the power supply is not critical. When the power is switched ON by the SW1 switch, the LD10 light up.



Functional Description

Using this board, the user can evaluate ARM ARM966E-S core and the ST STR912FW44 CPU with belonging peripherals. It can also be used as a development platform. The user can exploit available debug capabilities by connecting the development tool to a standard 20-pin ARM debug connector or to the 38-pin Mictor connector, which connects to the on-chip debug and trace (ETM) module.

View of the ITSTR9

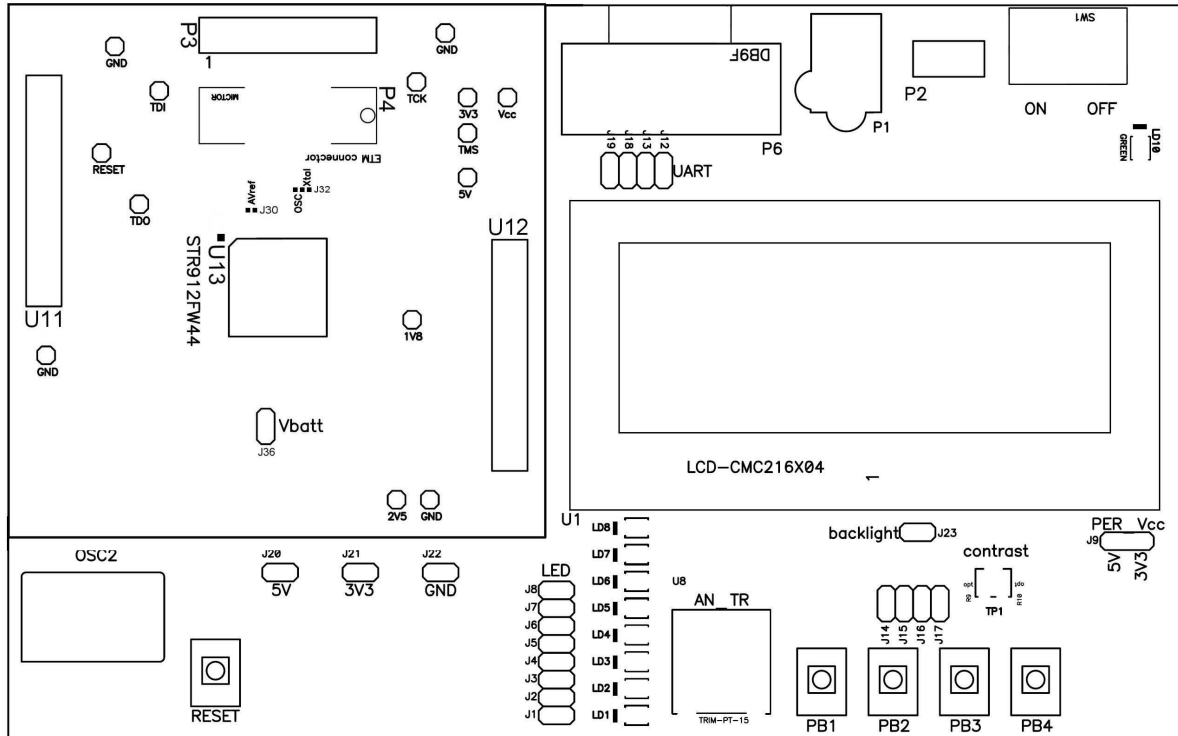


Figure 2: Top View of the ITSTR9

Power supply

The board can be powered from any regulated or unregulated power supply. The board has low-drop voltage regulators providing low voltage such as +5V for LCD, +3.3V for local peripherals, CPU and custom made hardware, +2.5V and +1.8V for CPU core supply. The +5V and +3.3V power supply is also accessible near the prototyping area.

Jumper J9 (PER_Vcc) selects power supply voltage for the MAX3232 circuit, push buttons and potentiometer. Voltage can be 3.3V or 5V, depending on CPU.

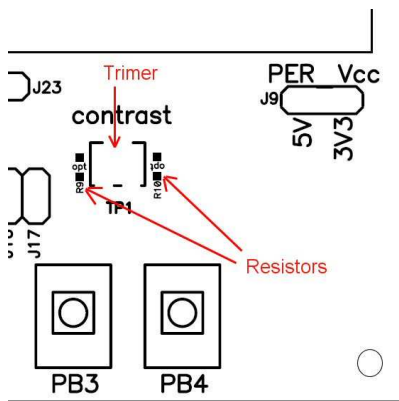
Pin Assignment for EDT EW162B0GLY LCD

Pin No.	Symbol	Function
1	GND	Ground Terminal
2	Vdd	Supply Terminal
3	Vo	Power Supply for LCD Driver
4	RS	Register Select Signal
5	R/W	Read/Write Selection
6	E	Enable Signal
7	DB0	Data Bus Line (Not used)
8	DB1	Data Bus Line (Not used)
9	DB2	Data Bus Line (Not used)
10	DB3	Data Bus Line (Not used)
11	DB4	Data Bus Line
12	DB5	Data Bus Line
13	DB6	Data Bus Line
14	DB7	Data Bus Line
15	BL+	LED Backlight Power Supply
16	BL-	LED Backlight Ground

Verify polarity of LED backlight on your LCD display!

LCD Contrast potentiometer

If you are using other display you need to mount optional SMD type potentiometer for adjusting LCD contrast. Contrast can also be adjusted using two SMD resistors. See picture below.



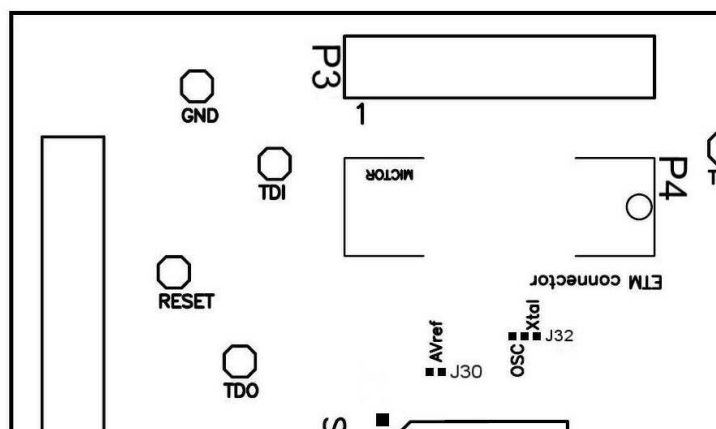
Serial port

The ITSTR9 provides an on-board standard DB-9 female connector (P6) for RS-232 serial communication. The On-board P6 connector connects to the UART0 of the STR912FW44 controller and it incorporates all features provided by the CPU. The table below shows the connection between the CPU and the P6 connector. All four signals can be disconnected using jumpers J12, J13, J18 and J19.

PIN	Signal	CPU	Jumper
1	-	-	-
2	TX	P3.4	J12
3	RX	P3.0	J13
4	-	-	-
5	GND	-	-
6	-	-	-
7	CTS	P2.0	J19
8	RTS	P3.3	J18
9	-	-	-

JTAG and ETM Debug Ports

Two debug connectors are available on the board for debugging. The first connector (P3) is a standard 20-pin JTAG connector, where the debugger connects, for instance (iSYSTEM iC3000 with debug ARM9 iCARD). Additionally, the CPU features on-chip trace (ETM), which can be used when real-time debugging is required. In that case, 38-pin Mictor (P4) is used to connect the development tool to the target. iSYSTEM offers iTRACE PRO and iTRACE GT development tools supporting ARM ETM.



20-pin JTAG Debug Connector (P3)

3V3	1	2	3V3
TRST	3	4	GND
TDI	5	6	GND
TMS	7	8	GND
TCK	9	10	GND
RTCK	11	12	GND
TDO	13	14	GND
RESET	15	16	GND
Not used	17	18	GND
Not used	19	20	GND

An external JTAG debug tool can be connected to a 20-pin P3 debug connector.

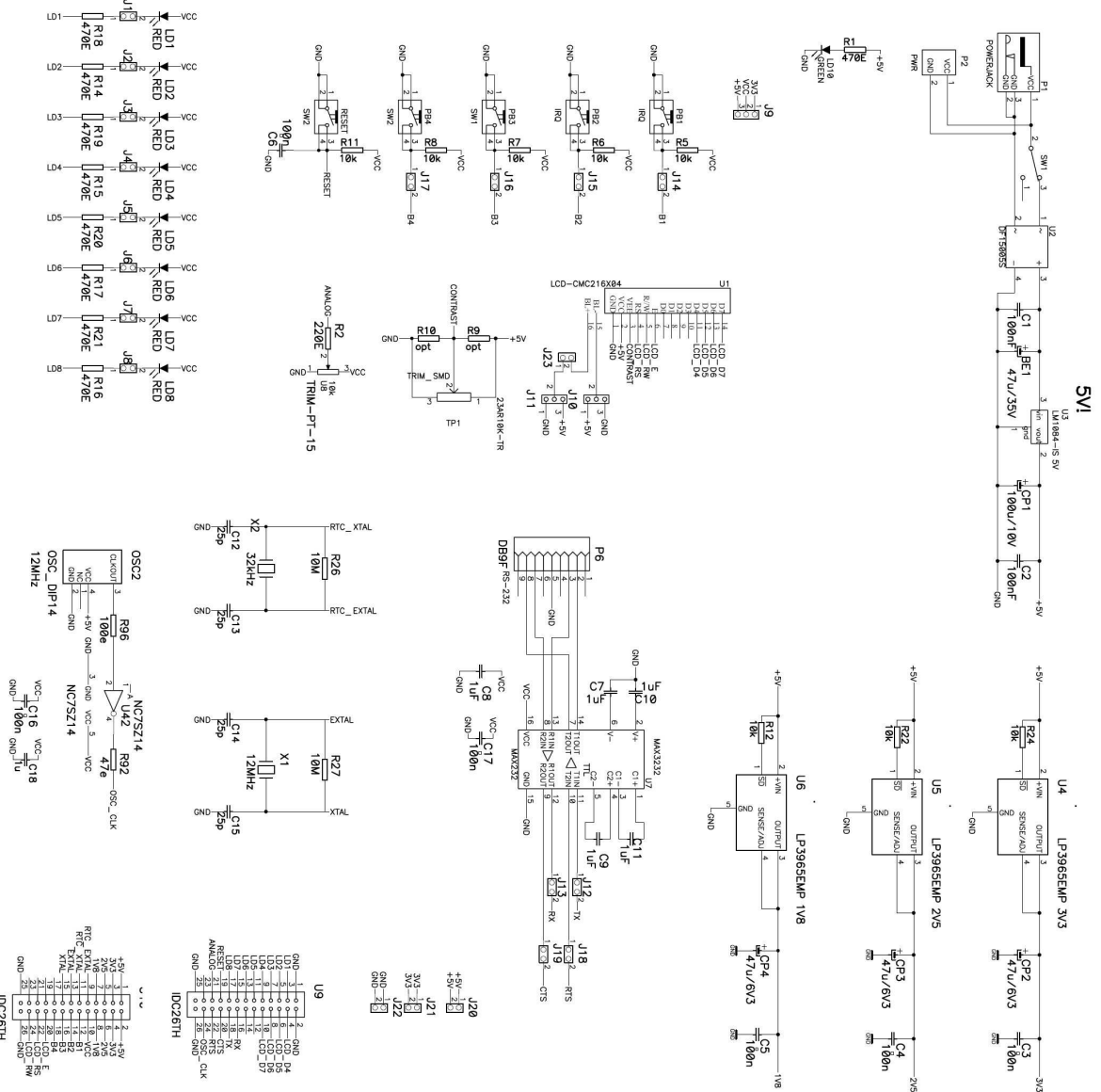
38-pin Mictor JTAG Debug & ETM Trace Connector (P4)

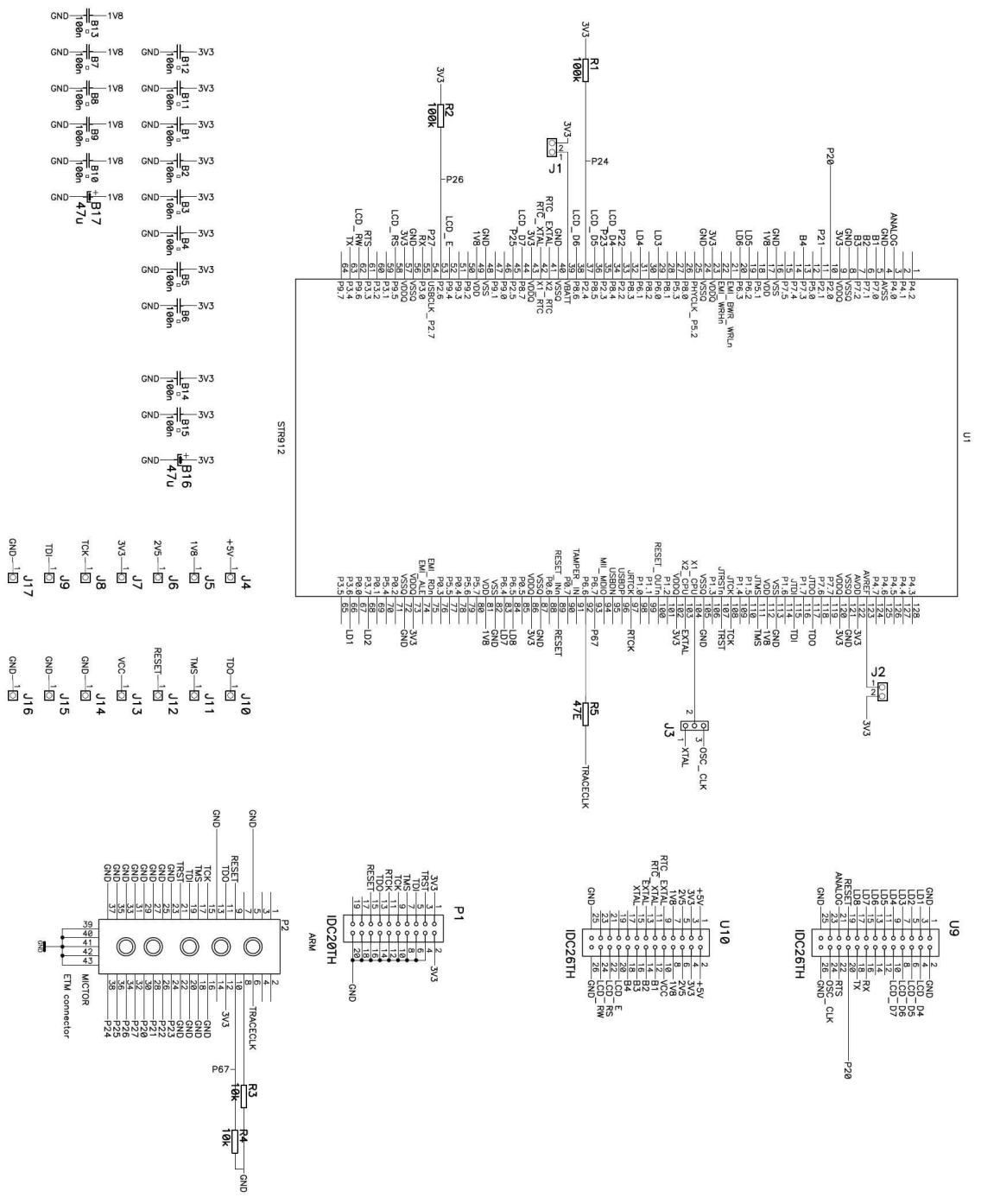
Signal	Pin	Pin	Signal
Not used	1	2	Not used
Not used	3	4	Not used
GND	5	6	TRACECLK
Not used	7	8	
RESET	9	10	
TDO	11	12	3V3
GND	13	14	Not used
TCK	15	16	GND
TMS	17	18	GND
TDI	19	20	GND
TRST	21	22	GND
GND	23	24	P23
GND	25	26	P22
GND	27	28	P21
GND	29	30	P20
GND	31	32	P27
GND	33	34	P26
GND	35	36	P25
GND	37	38	P24

Jumper Descriptions

- **J1 – J8:** Enables LED's
- **J9:** Select peripheral voltage (3.3 or 5V)
- **J10, J11:** Jumpers for selecting backlight LED polarity (pins 15 and 16 on LCD connector)
- **J12, J13, J18, J19:** Enables connection of serial port
- **J14 – J17:** Enables push buttons
- **J20, J21, J22:** Power supply voltage for prototyping
- **J30:** Connects Vref CPU pin to 3.3V power supply
- **J36:** Connects CPU Vbatt pin to 3.3V power supply

Schematic





Notes:

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