

### STR9 LCD extension board

#### Introduction

This user manual describes STR9 LCD extension hardware. As well as the block diagram and schematics of the extension, a bill of materials and assembly instructions are also included.

The STR9 LCD extension provides a graphic or character-based output to an application using the STR9 Dongle. The switches allow the pinout of the extension to be configured for use with different types of LCDs.

**Figure 1. STR9 LCD extension board**



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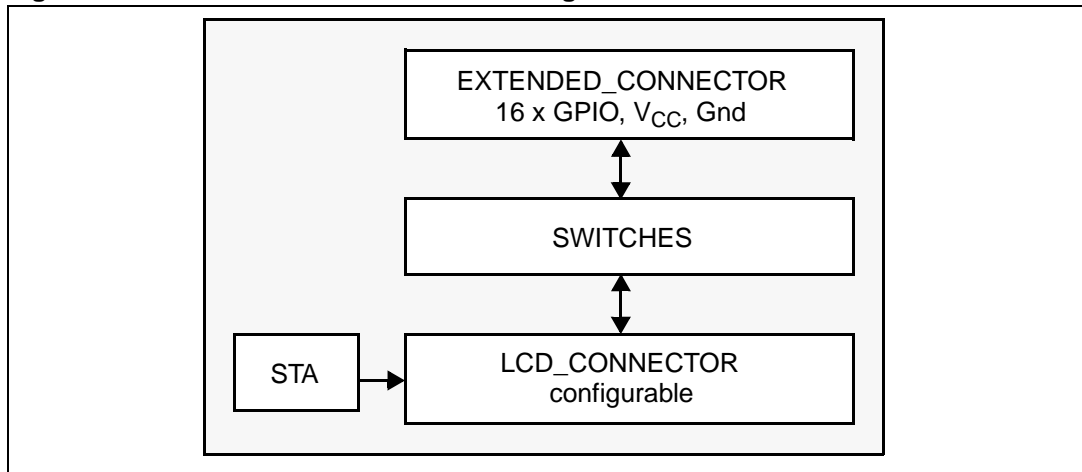
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# 1 STR9 LCD extension

## 1.1 Block diagram

This board is designed for use with the STR9 Dongle.

**Figure 2. STR9 extension board block diagram**

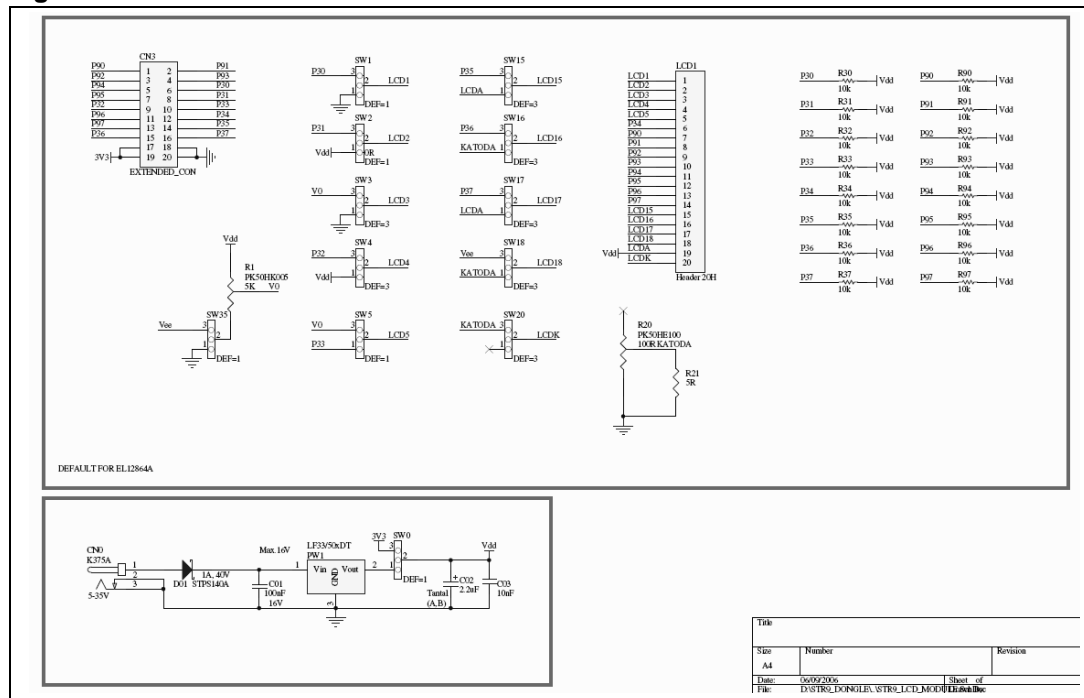


### Main board features:

- Jumpers allowing the extension board to be connected to many types of LCDs.

## 1.2 Schematics

Figure 3. STR9 extension board schematics



## 1.3 Configuration

Table 1. Extension board configuration according to LCD types

SWITCH POS.			CONF. A		CONF. B		CONF. C		CONF. D		CONF. E	
NAME	1-2	2-3	PIN	SW	PIN	SW	PIN	SW	PIN	SW	PIN	SW
SW1	GND	P30	GND	1-2	GND	1-2	GND	1-2	CS1^	2-3	GND	1-2
SW2	VDD	P31	VCC	1-2	VCC	1-2	VCC	1-2	CS2^	2-3	VCC	1-2
SW3	GND	V0	V0	2-3	V0	2-3	V0	2-3	GND	1-2	V0	2-3
SW4	VDD	P32	RST	2-3	RST	2-3	RS	2-3	VDD	1-2	DB0	2-3
SW5	P33	V0	RW	1-2	E1	1-2	RW	1-2	V0	2-3	DB1	1-2
-	P34		E	-	E2	-	E	-	DI	-	DB2	-
-	P90		DB0	-	RW	-	DB0	-	RW		DB3	-
-	P91		DB1	-	A0	-	DB1	-	E		DB4	-
-	P92		DB2	-	DB0	-	DB2	-	DB0		DB5	-
-	P93		DB3	-	DB1	-	DB3	-	DB1		DB6	-
-	P94		DB4	-	DB2	-	DB4	-	DB2		DB7	-
-	P95		DB5	-	DB3	-	DB5	-	DB3		CS1	-
-	P96		DB6	-	DB4	-	DB6	-	DB4		CS2	-

**Table 1. Extension board configuration according to LCD types (continued)**

SWITCH POS.			CONF. A		CONF. B		CONF. C		CONF. D		CONF. E	
NAME	1-2	2-3	PIN	SW	PIN	SW	PIN	SW	PIN	SW	PIN	SW
-	P97		DB7	-	DB5	-	DB7	-	DB5		RST	-
SW15	A	P35	DB6	2-3	DB6	1-2	CS1	2-3	DB6	2-3	RW	2-3
SW16	K	P36	DB7	2-3	DB7	1-2	CS2	2-3	DB7	2-3	DI	2-3
SW17	A	P37	A	1-2	A	1-2	RST	2-3	RST	2-3	E	2-3
SW18	K	Vee	K	1-2	K	1-2	Vee	2-3	Vee	2-3	Vee	2-3
-	A		-	-	-	-	A	-	A	-	A	-
SW20	-	K	-	-	-	-	K	2-3	K	2-3	K	2-3
SW35	GND	Vee	GND	1-2	GND	1-2	Vee	2-3	Vee	2-3	Vee	2-3

**Table 2. Supported displays (provided by ELATEC)**

Configuration	Displays
CONF. A	<b>TEXT:</b> EL0801x, EL0802x, EL1601x, EL1602x, EL1604x, EL2002x, EL2004x <sup>(1)</sup> <b>GRAPHIC:</b> EL16032x
CONF. B	<b>GRAPHIC:</b> EL12232A
CONF. C	<b>GRAPHIC:</b> EL12864A
CONF. D	<b>GRAPHIC:</b> EL12864B
CONF. E	<b>GRAPHIC:</b> EL12864H

1. \* Not all LCD displays have a 20-pin connector. If these cases, the board should be connected from the left-most pin (viewed from top). This may leave some pins unconnected, noting that A / K are not obligatory.

Any LCD (3.3 or 5 V) which is compatible with this pinout can be used. Software adaptation for each type of LCD is required.

### 1.4 PCB layout

Figure 4. Top view

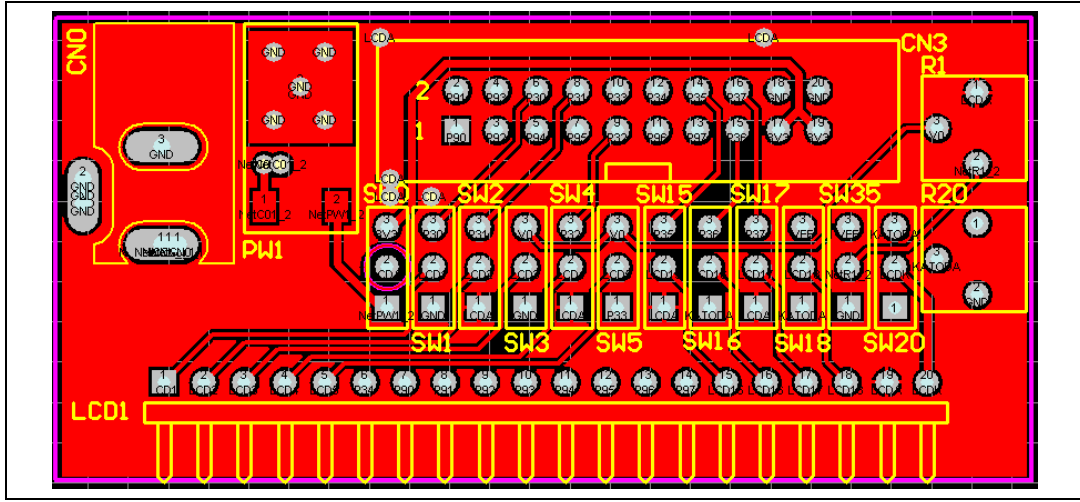
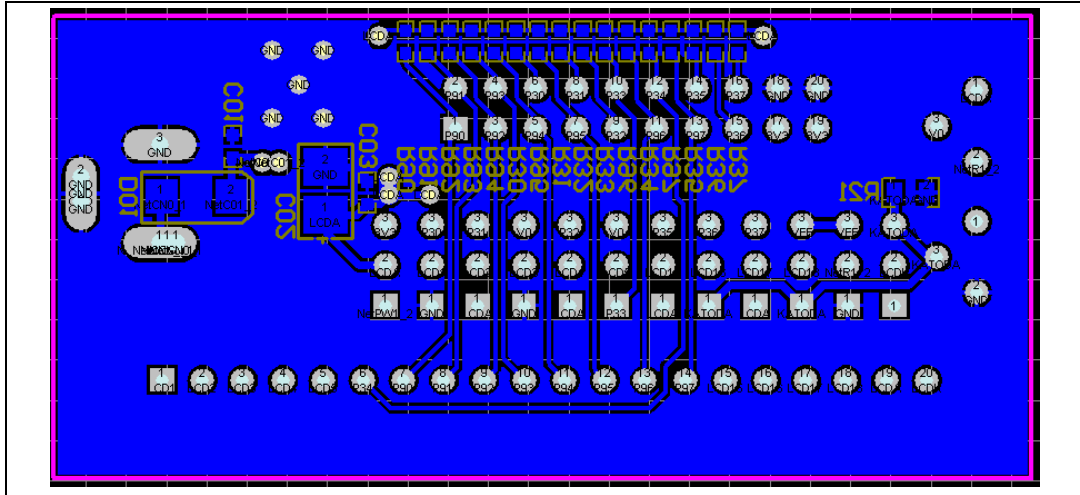


Figure 5. Bottom view



## 1.5 Bill of materials

**Table 3. Bill of materials**

Label	Package	Comment	Order code
C01	0603	100 nF	Farnell: 422-6859 (X7R, 16 V)
C02	3528_AB_REV2	2.2 $\mu$ F	Farnell: 757-720 (STD, 10 V)
C03	0603	10 nF	Farnell: 422-6938 (X7R, 50 V)
CN0	DC10B	5-35 V	GM: K375A
CN3	HDR2X10	EXTENDED_CON	GM: MLW20G
LCD1	HDR1X20H	Header 20H	GM: S2G20
D01	SMA2	STPS140A	ST: STPS140A
PW1	DKAK	LF33/50xDT	ST: LF33/50xDT
R1	TrimrPK50	PK50HK005	GM: PK50HK005
R20	TrimrPK50	PK50HE100	GM: PK50HE100
R21	0805	5R	
R30-R37 R90-R97	0603	10k $\Omega$	GM: R0603-10k $\Omega$
SW0-SW5, SW15-SW18, SW20, SW35	HDR1X3	-	GM: S1G36 (36pins=12*3)

## 2 Revision history

**Table 4. Document revision history**

Date	Revision	Changes
19-Jan-2007	1	Initial release.
09-Oct-2007	2	Updated order code for CN3 in <a href="#">Table 3: Bill of materials</a> .



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