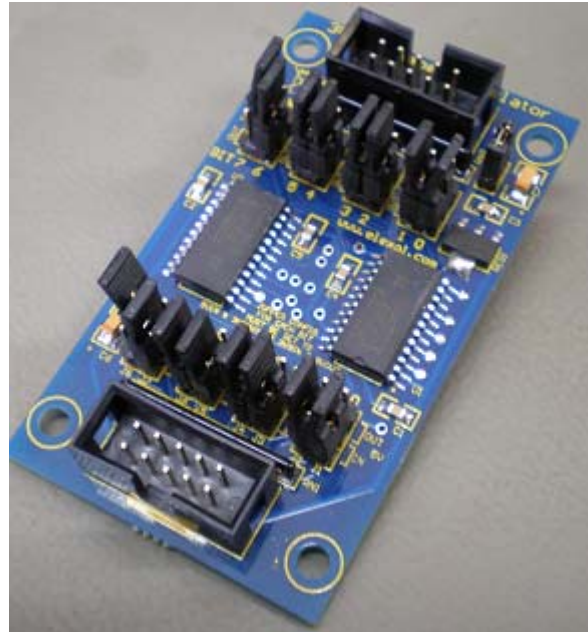


VOLTAGE TRANSLATOR BOARD

FEATURES

- 2 X 74LVC4245 Bus Transceivers for voltage translation
- 2 x I/O ports matching configuration of I/O 24
- Selectable jumper pins for the direction of voltage translation
- Onboard Voltage Regulator to supply the 3V3 side.
- Easy connection to the I/O port via a 10-way box header that suits a standard IDC connector.
- 72mm Standard width for DIN Rail Modules



GENERAL DESCRIPTION

The Voltage Translator Board is an accessory board that performs level conversion of a 5V interface (I/O24 or microcontroller) to a 3V3 or lower interface. This board can be connected to a single port on the existing I/O 24 Range. The Elexol I/O 24 Range consists of Ether I/O 24 R, Ether I/O 24 DIP R, USB I/O 24 R and the USB I/O 24 DIP R.

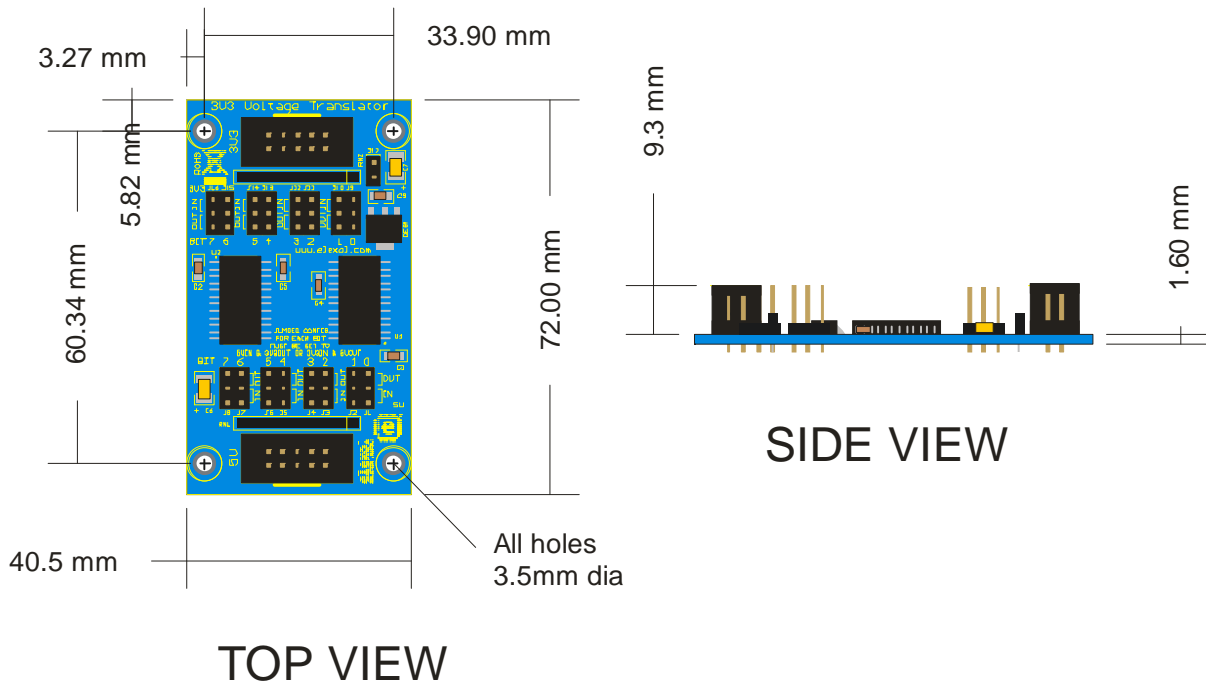
The board consists of two 74LVC4245 Bus Transceivers that are used for the level conversion. Each device is configured for a set level conversion of either 5V to 3V3 or 3V3 to 5V for a single 8 bit port.

The jumpers on the board are used to route the direction of the signal for the voltage translation. Each jumper needs to be configured in the correct direction for the board to operate. 5V IN to 3V3 OUT and 3V3 IN to 5V OUT.

The connection between the I/O 24 module and the Voltage Translator board is via a 30 cm IDC connection cable. This cable is provided with the board.

The board has been designed to a 72mm standard width so that it can easily be mounted in DIN rail mounting modules.

LAYOUT AND MECHANICALS



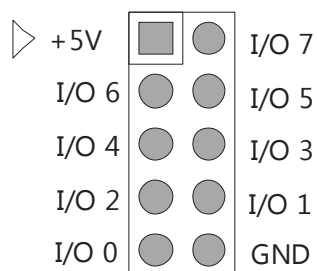
Dimensions: 1.59 X 2.8 X 0.43 inches (40.5 X 72 X 11mm)

PINOUTS AND BOARD CONNECTIONS

10 PIN BOX HEADER

Shown in the diagram below is the I/O port Connector for each of the Ports on the module.

I/O 24 Port Connection



Note: Pin1 Marked on I/O Accessory with ▷

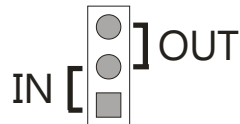
10 PIN BOX HEADER CONNECTIONS

PIN #	SIGNAL	TYPE	DESCRIPTION
1	+5V	PWR	+3.3V to +5V drawn from I/O module powers (Supplies power to the connected I/O Board)
2	I/O 7	I/O	Input / Output pin 7
3	I/O 6	I/O	Input / Output pin 6
4	I/O 5	I/O	Input / Output pin 5
5	I/O 4	I/O	Input / Output pin 4
6	I/O 3	I/O	Input / Output pin 3
7	I/O 2	I/O	Input / Output pin 2
8	I/O 1	I/O	Input / Output pin 1
9	I/O 0	I/O	Input / Output pin 0
10	GND	PWR	Ground signal from I/O module

VOLTAGE TRANSLATOR DIRECTION CONFIGURATION (IN or OUT)

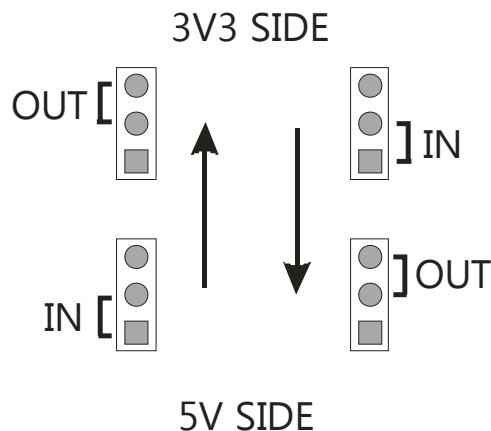
There are 16 direction jumpers in total, located on the Voltage Translator Board. These jumpers are split into two lots of eight, with one lot of eight for the 5V side and the other eight for the 3V3 side. Each jumper sets the direction of the pin to an INPUT (IN) or OUTPUT (OUT).

Voltage Translator Direction Configuration Jumper



The jumper direction needs to be set correctly in order for the device to work.

Voltage Translator Direction Setup



Any other configurations the device will not work.

EXTERNAL VOLTAGE FOR LEVEL CONVERSION (J17)

The device is setup so that external voltages can be supplied to the voltage translator so that different level conversions can be used. When the jumper is placed, the power to the voltage translators is provided by the 3v3 regulator located on the board which is fed from the 5V supply from the I/O 24. With the jumper removed external power will need to be supplied to the 3V3 pin on the 10 pin box header or directly to the jumper pin. The minimum external voltage that can be provided to the translators is 1.8V DC.

COMMUNICATIONS

SETTING UP THE PORT ON THE I/O 24 FOR THE VOLTAGE TRANSLATOR BOARD

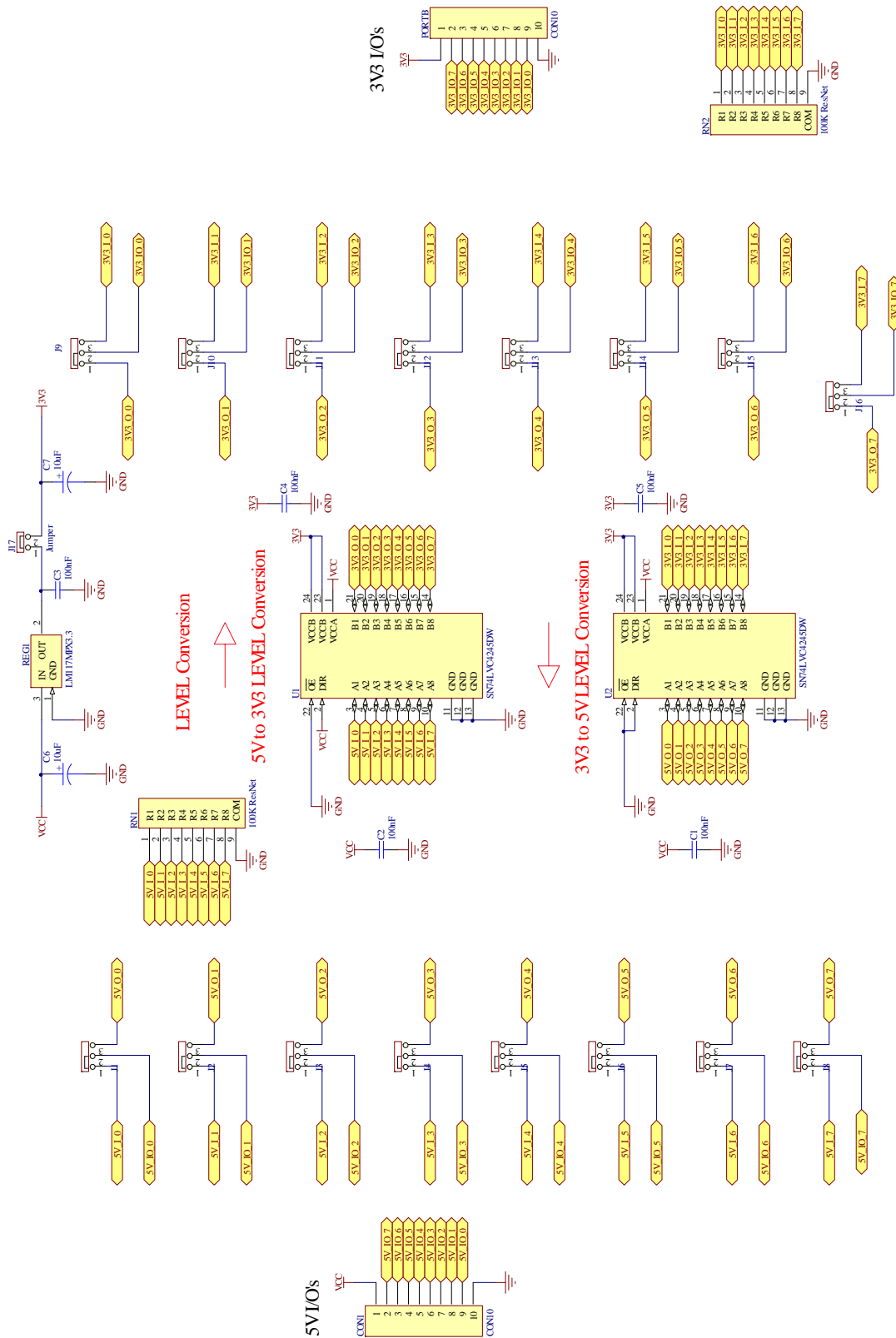
The Port on the I/O 24 can either be set as input or output to use the Voltage Translator board. Care needs to be taken to match the port directions on the I/O 24 so that they correspond to the direction jumpers on the Voltage Translator board.

CODING EXAMPLES

For code on how to set the I/O 24 port states please refer to the individual datasheet for the device.

The datasheets for the I/O 24 range are available for download from our website www.elexol.com

SCHEMATIC



ABSOLUTE MAXIMUM RATINGS

74LVC4245

In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND (ground = 0 V).

Symbol	Parameter	Conditions	MIN	MAX	UNIT
V_{CCA}	Supply Voltage 5V Port		-0.5	+6.5	V
V_{CCB}	Supply Voltage 3V port		-0.5	+4.6	V
I_{IK}	Input clamping current	$V_I < 0V$	-50	-	mA
V_I	Input voltage		-0.5	+6.5	V
I_{OK}	Output clamping current	$V_O > V_{CC}$ or $V_O < 0V$	-	± 50	mA
V_O	Output voltage	Output HIGH or LOW state	-0.5	$V_{CC} + 0.5$	V
		Output 3-state	-0.5	+6.5	V
I_O	Output current		-	± 50	mA
I_{CC}	Supply current		-	100	mA
I_{GND}	Ground current		-100	0	mA
T_{stg}	Storage temperature		-65	+150	C
P_{tot}	Power dissipation	$T_{amb} = -40\text{ C to }+125\text{ C}$	-	500	mW

Reference: Data supplied from NXP 74LVC4245 datasheet

NOTE: Care will need to be taken when connecting this device to the USB I/O 24 as you may exceed the maximum current draw allowed via the USB specifications.

FURTHER READING

Information about the 74LVC4245A can be found on the NXP (Phillips) product datasheets for the device. These can be downloaded from the NXP website at http://www.nxp.com/documents/data_sheet/74LVC4245A.pdf

DOCUMENT REVISION HISTORY

- Voltage Translator Board Datasheet Revision 1 – Initial document created