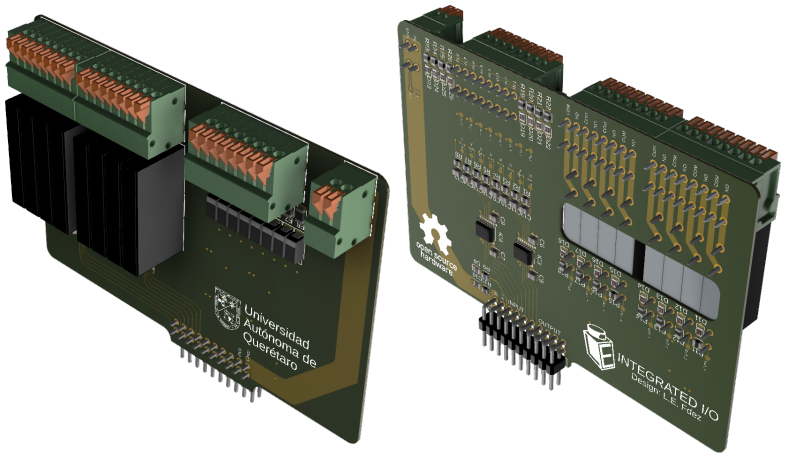
LOW-level Engineering

Integrated Digital I/O Module (Rev. B)

1 Overview

- Parallel Interface Isolated Digital I/O
- 8 Isolated $5V$ Tolerant Input Ports
- 8 Isolated Relay Outputs
- $5V$ Supply Passthrough
- 0.1$inch$ Pin Header Connector Interface
- $3kVrms$ data channel isolation
- 13ns input signal propagation
- 100Hz relay output switching frequency



2 Description

- General purpose digital I/O isolation with 8 channel parallel interface with pin header connectors to be used on the LOW-level Engineering expansion module base as dedicated High-speed I/O.
- The module provides a dedicated directly addressable 8 digital inputs with over-current and over-voltage protection, 8 digital outputs with SPST Relays to interface with up to $6A$ loads and quick connect spring terminals for ease of use.
- LED indicators are provided for the state of each of the inputs and outputs in addition to the supply voltage.
- 1 Additional quick connect spring terminal is provided with supply passthrough to supply the necessary $5V$ signal voltage for inputs.
- The ADUM140E High Speed Digital Isolators are used as main interface IC. Further information can be found in its own **Datasheet**.
- 4 layer PCB stack-up is used to provide power and signal reference plains (Signal, Power, Ground, Signal).

3 Suggested Applications

- General purpose I/O isolation module for control applications.
- High current load switching, up to $6A$ at 100 Hz switching frequency.

- High speed parallel digital input protection interface (up to 13ns).
- Isolated Parallel I/O interface.

4 Technical specification

	Unit	Value		
		Min	Rated	Max
Digital Supply voltage (isolated ground)	V	3.3	5	-
Analog Supply voltage	V	-	5	-
Dimensions	mm	101.93 x 68.81 x 19.63		
Weight	g	-	80	-
Operating Temperature range	$^{\circ}C$	0	-	85
Digital Inputs				
Supply current	mA	-	1	-
Internal Logic Level Voltage	V	-	5	-
Input Logic Level Voltage	V	-	5	6.67 -
Digital Outputs				
Supply current	mA	-	100	350
Internal Logic Level Voltage	V	-	5	-
Relay switching frequency	Hz	-		100

5 Connector pinout

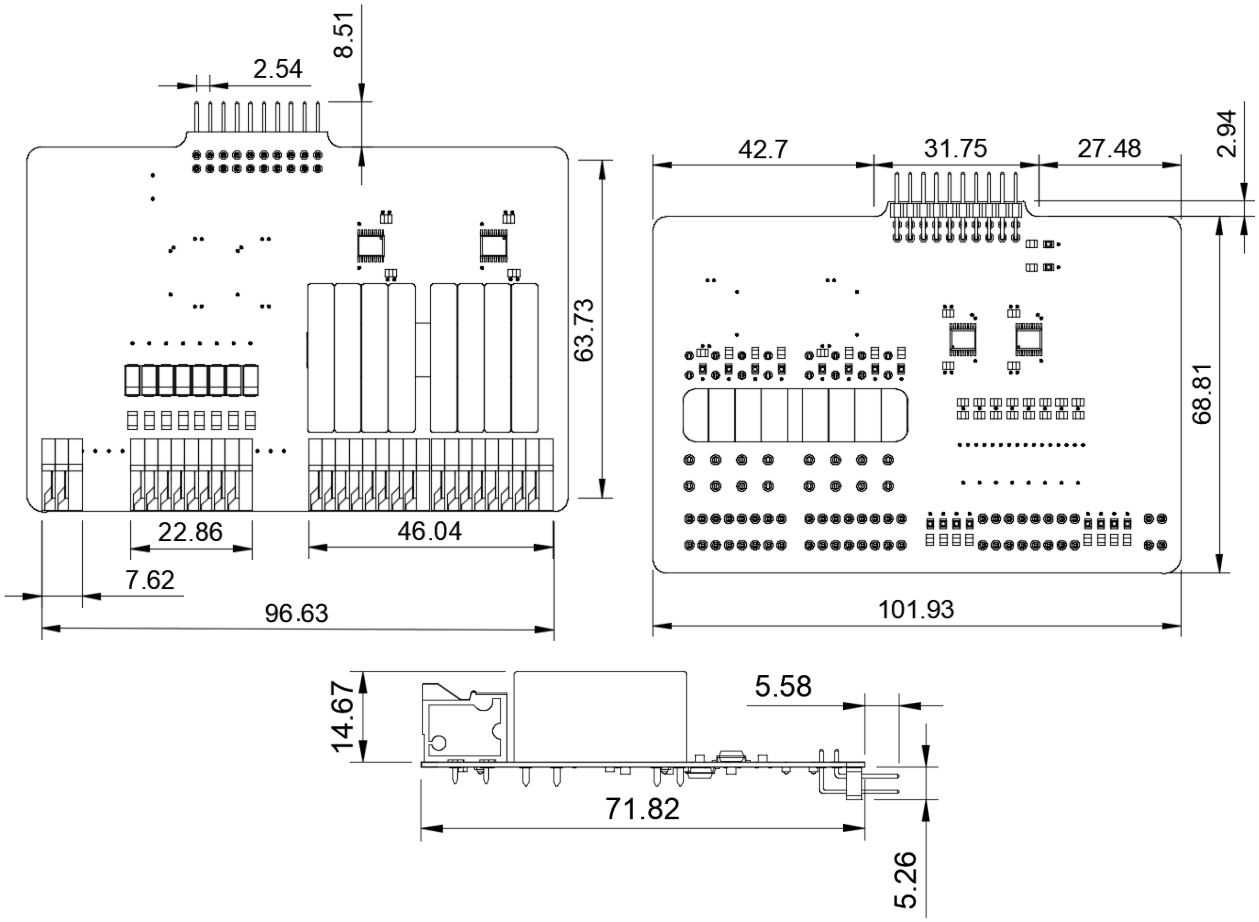
5.1 Pin Header Connector

Pin	Signal
1	$5V$ (referenced to Analog Ground
2	Analog Ground
3	$3.3V$ (referenced to Digital Ground
4	Digital Ground (isolated ground)
5	Digital input #7
6	Digital input #8
7	Digital input #5
8	Digital input #6
9	Digital input #3
10	Digital input #4
11	Digital input #1
12	Digital input #2
13	Digital output #7
14	Digital output #8
15	Digital output #5
16	Digital output #6
17	Digital output #3
18	Digital output #4
19	Digital output #1
20	Digital output #2

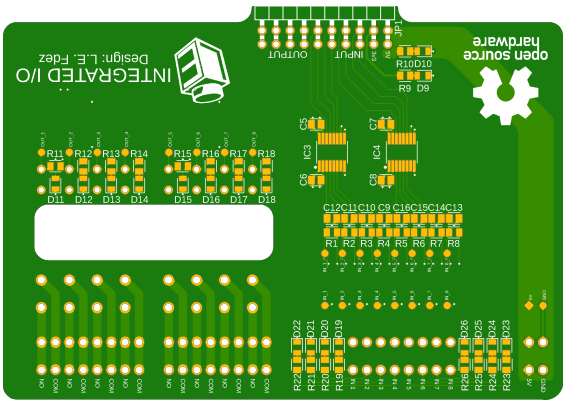
5.2 Quick Connect Terminals

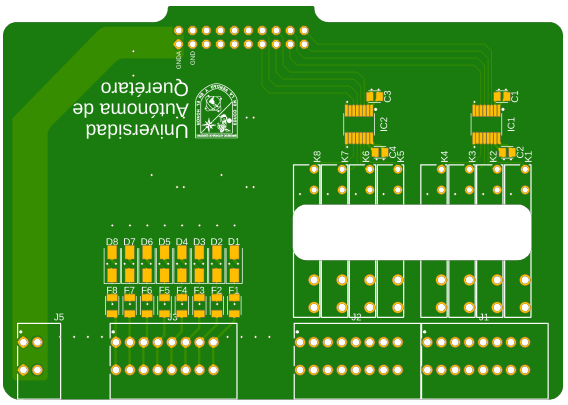
Pin	Signal
$5V$ Supply passthrough	
1	Power $5V$
2	Ground
Digital Inputs	
1	Digital input #1
2	Digital input #2
3	Digital input #3
4	Digital input #4
5	Digital input #5
6	Digital input #6
7	Digital input #7
8	Digital input #8
Digital Outputs	
1	Digital output #1
2	Digital output #2
3	Digital output #3
4	Digital output #4
5	Digital output #5
6	Digital output #6
7	Digital output #7
8	Digital output #8

6 Physical dimensions

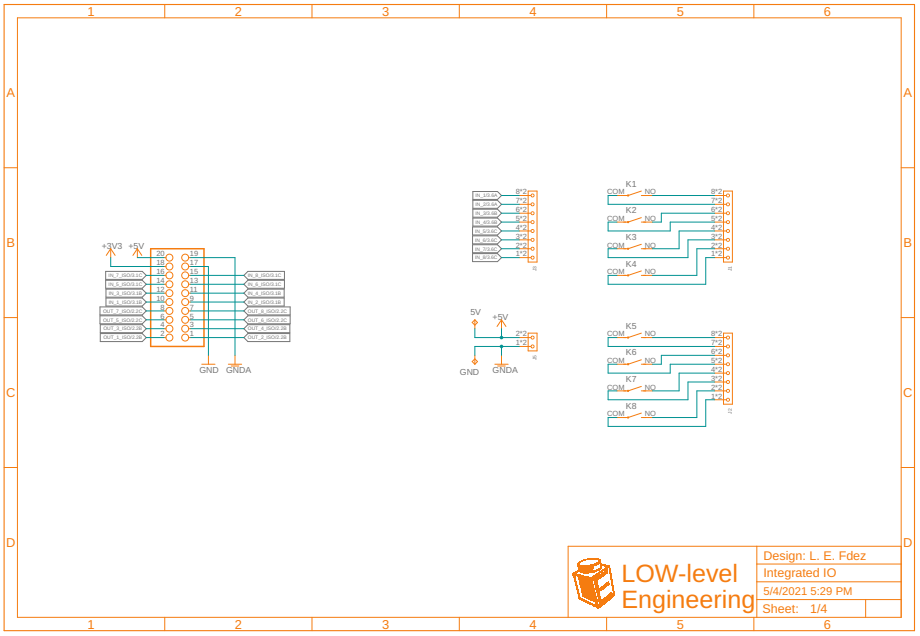


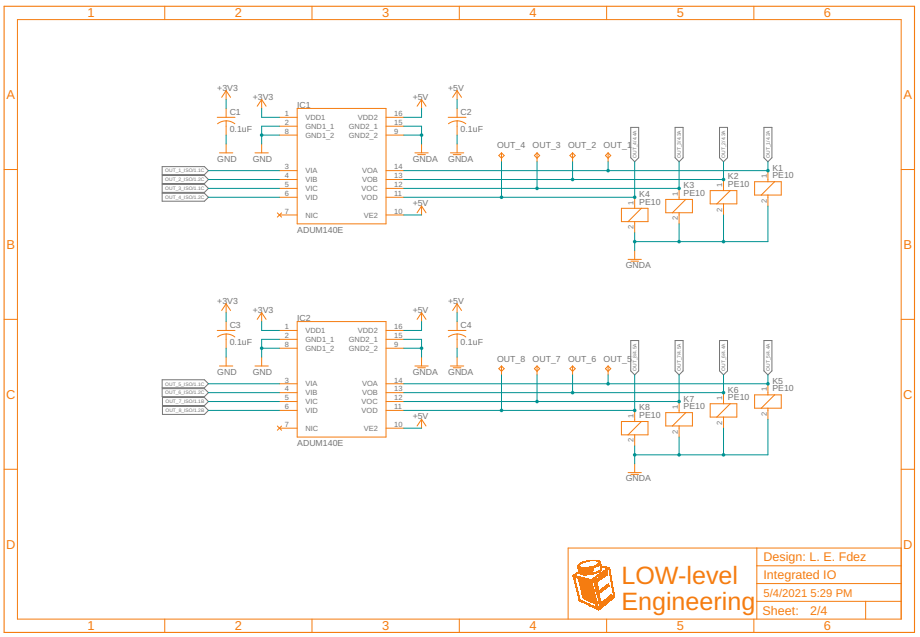
7 Printed circuit board

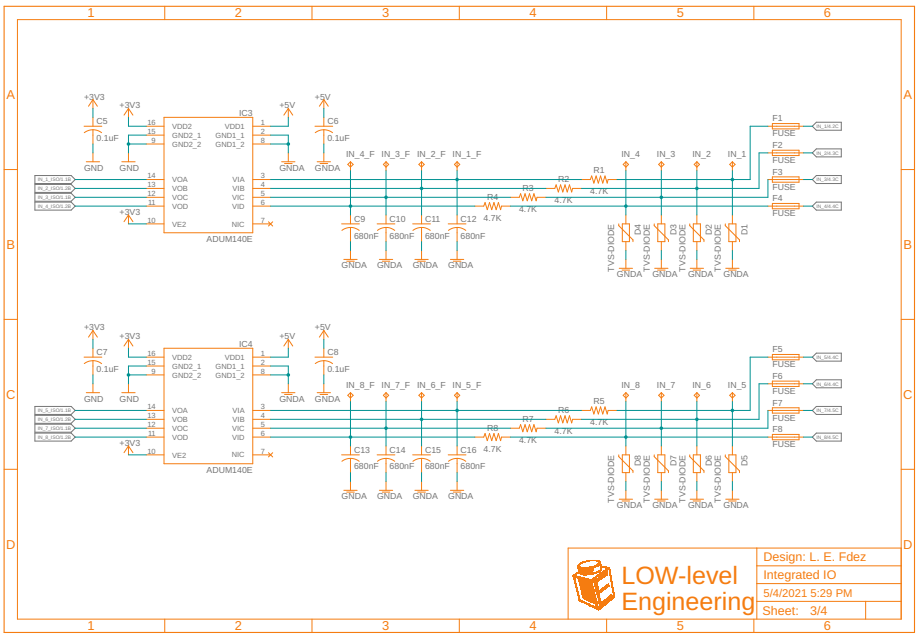




8 Schematic diagram






IC3
IC4
ADUM140E
C5
C6
C7
C8
0.1uF
C9
C10
C11
C12
C13
C14
C15
C16
680nF
R1
R2
R3
R4
R5
R6
R7
R8
4.7K
F1
F2
F3
F4
F5
F6
F7
F8
FUSE
D1
D2
D3
D4
D5
D6
D7
D8
TVS-DIODE
+3V3
+5V
GND
GNDA
IN_1_F
IN_2_F
IN_3_F
IN_4_F
IN_5_F
IN_6_F
IN_7_F
IN_8_F
IN_1
IN_2
IN_3
IN_4
IN_5
IN_6
IN_7
IN_8
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Integrated IO
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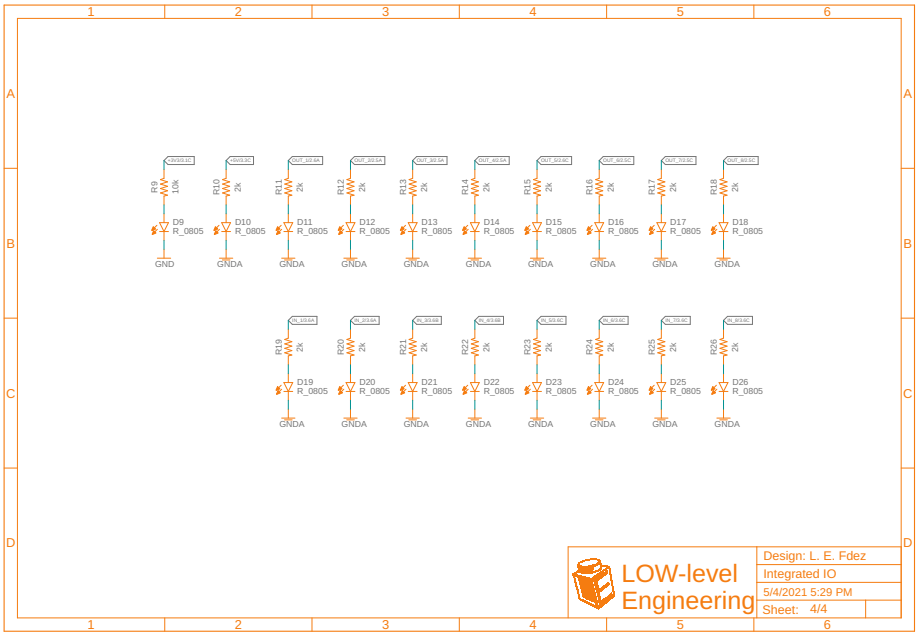
R9
10k
R10
R11
R12
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2k
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GND
GNDA
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