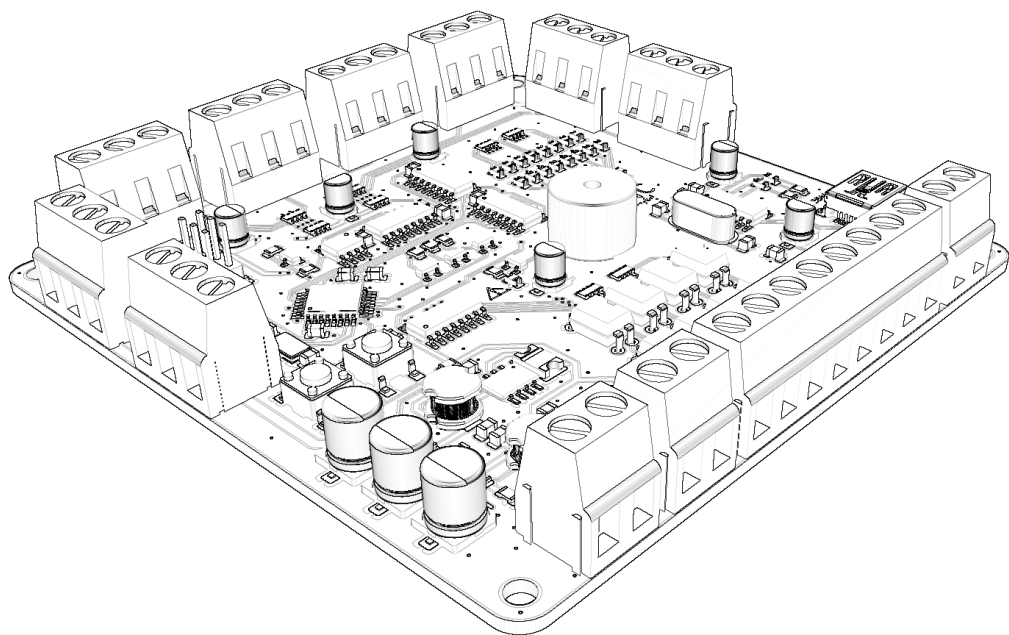


USER GUIDE



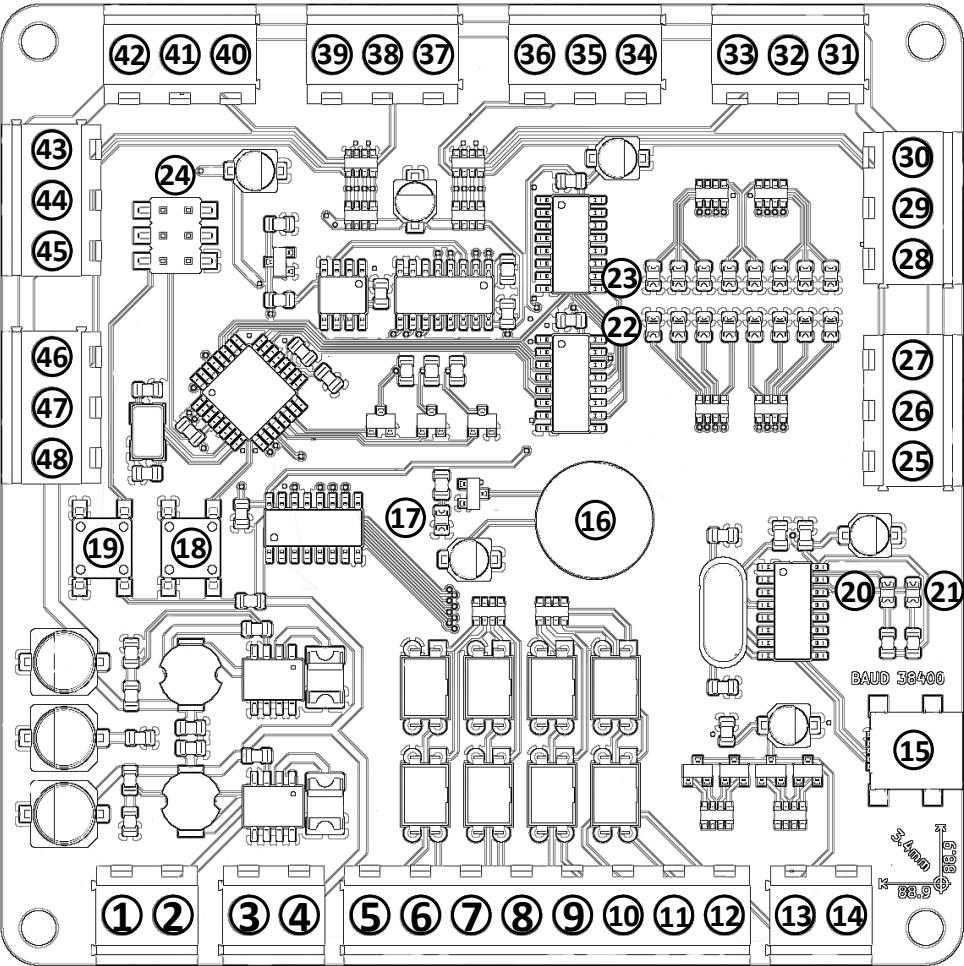
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Features

- Supports 12V NPN/PNP Proximity sensors, NO/NC switches, 0-12V analog signals
- Optically isolated active Low/High open collector outputs
- Simple programmable Boolean logic
- Remappable outputs
- Programmable input threshold and hysteresis
- Acoustic signals and alarms
- +12V and +5V outputs with up to 2A each
- Simple serial interface
- 10 Kilohertz sampling rate per input
- Isolated configuration and run modes

Board overview



Connectors And Indicators

1	+16 to +24V	25	GND
2	GND	26	Input: A
3	+12V	27	+12V
4	+5V	28	GND
5	Output: A	29	Input: B
6	Output: B	30	+12V
7	Output: C	31	GND
8	Output: D	32	Input: C
9	Output: E	33	+12V
10	Output: F	34	GND
11	Output: G	35	Input: D
12	Output: H	36	+12V
14	Ext. Voltage	37	GND
14	Ext. Ground	38	Input: E
15	USB Mini-B Serial	39	+12V
16	Buzzer	40	GND
17	Alarm	41	Input: F
18	Config	42	+12V
19	Reset	43	GND
20	RX	44	Input: G
21	TX	45	+12V
22	Output Indicators	46	GND
23	Input Indicator	47	Input: H
24	ISP header	48	+12V

Powering the board

The board can be powered with 16V to a maximum of 30V (1), the total current draw for all input sensors should not exceed 2A. If the 12V output is used to power external devices their current must be summed with the current of all inputs.

TL;DR A 2A 18V or 24V power supply should work in most cases.

Connecting Sensors

Proximity Sensors

NPN

PNP

Switches

NC

NO

Other

Connecting Outputs

Self-Powered Target

Board-Powered Target

Serial Connection

A serial connection can be established via the USB Port (15), on Windows this requires the correct driver to be installed.

Serial Configuration

Chip	CH340G
Baud rate	38400
Data	8bit
Parity	None
Stop bits	1
Flow Control	None
Connector	USB Mini B

The serial connection is only enabled if the board is powered. When powered the TX Indicator (21) should light up briefly, even if the board is not connected to a PC or other device.

Compatible driver: CH341SER.

Compatible terminal software: Tera Term, Putty, etc.

Serial Commands

After powering up the board will immediately switch into run mode and not respond to normal serial commands. There are 2 ways to switch into configuration mode.

1. Enter “\$C” and confirm with enter
2. Push config (18)

All valid changes are saved immediately and take effect after the next power cycle, reset or mode switch.

Command overview

\$	Show help	–	R
\$P	Switch to run mode	–	R
\$C	Switch to configuration mode	–	R
\$\$	View settings	–	R
\$S	View input status	–	R
\$RST	Reset	–	W
\$100	Serial output	1/0	RW
\$101	Buzzer	1/0	RW
\$2N0	Input N threshold	0–100	RW
\$2N1	Input N hysteresis	0–100	RW
\$2N2	Input N inverted	1/0	RW
\$3N0	Output N active	1/0	RW
\$3N1	Output N expression	Expr.	RW

System Commands

Show Help “\$”

Displays a list of commands and examples.

Switch to run mode “\$P”

This command causes the board to unload the current context, reset and to switch into run mode.
Only available while in configuration mode.

Switch to configuration mode “\$C”

This command causes the board to unload the current context, reset and to switch into configuration mode.
Only available while in run mode.

View Settings “\$\$”

Displays current configuration values.

View input status “\$S”

Reads all input pins and displays their current state in a semicolon separated list.

A	B	C	D	E	F	G	H
100;	100;	100;	100;	100;	100;	100;	100;

Configuration Reset “\$RST”

Resets the selected configuration.

- \$ – Restore defaults and reboot
- S – Restore system defaults and reboot
- I – Restore input defaults and reboot
- O – Restore output defaults and reboot
- E – Restore expression defaults and reboot

Serial debug output “\$100”

Enables the continues serial output of input states.
This option is only meant for debugging and will affect performance drastically.

Acoustic signals “\$100”

Enable acoustic feedback whenever an output is triggered.

I/O control

I/O commands control the behavior of each input or output. The first digit of an I/O command describes the port, the second the target pin and the third digit the selected register. All I/O registers are read/write meaning they can be individually written to or read back.

\$20X	Input: A	\$30X	Output: A
\$21X	Input: B	\$31X	Output: B
\$22X	Input: C	\$32X	Output: C
\$23X	Input: D	\$33X	Output: D
\$24X	Input: E	\$34X	Output: E
\$25X	Input: F	\$35X	Output: F
\$26X	Input: G	\$36X	Output: G
\$27X	Input: H	\$37X	Output: H

Operation: "\$310=1" Enable output B

Port: Output

Pin: B

Property: active

Parameter: 1

Response: OK

\$310=1		
3	1	0
Port: Output	Pin: B	Property: State
OK		

Operation: "\$310" Get the status of output B

Command: \$310

Port: Output

Pin: B

Property: active

Response: 1

\$310		
3	1	0
Port: Output	Pin: B	Property: State
1		

Input Threshold “\$2N0”

Switching Modes

Resetting the Configuration