

# The ANY-maze Operant interface C



## Overview

The ANY-maze Operant interface C is designed to directly connect ANY-maze to the popular range of Operant conditioning equipment manufactured by Coulbourn instruments.

## General

- Allows ANY-maze to read inputs and control outputs.
- Works as a drop-in replacement for existing Coulbourn Instruments Environment Connection Boards (ECBs).
- Connects directly to the computer via USB; no Coulbourn Habitest Linc interface is required.
- The interface can either be powered from the ANY-maze Operant hub, or from a standalone power supply.

## Inputs

- 4 *Switch* Inputs, which use the same RJ12 connectors as the Coulbourn ECB and are labelled in the same way.
- 1 *Audio* input which replicates an input on the rear of the Habitest Linc interface.

## Outputs

- 2 *Cue* outputs, 2 *Feeder* outputs, 4 *Spare* outputs, 1 *Tone* output and 1 *House light* output. These outputs use the same RJ12 connectors as the Coulbourn ECB and are labelled in the same way.
- 2 Analogue (*Prog*) outputs and 2 *Auxiliary* outputs, these replicate outputs on the rear of the Habitest Linc interface.
- All outputs (except *Prog*) can optionally dim lights or LEDs connected to them.

## Technical specification

<b>Connection to PC</b>									
Connection type	USB (USB1.1, USB2.0, USB3.0 compatible)								
Interface power	The interface itself is powered from the USB bus								
Maximum current drawn from USB	190mA								
<b>Recommended power supply</b>									
Input voltage	90 - 264 VAC								
Output voltage	28 VDC								
Output current	2.5A minimum								
<b>LED indicator</b>									
LED (note 1)	<table> <tbody> <tr> <td>Off</td> <td>No power connected</td> </tr> <tr> <td>Red</td> <td>Connected to 28V power but not to USB</td> </tr> <tr> <td>Flashing green</td> <td>Connected to USB but not to 28V</td> </tr> <tr> <td>Solid green</td> <td>Connected to USB and 28V</td> </tr> </tbody> </table>	Off	No power connected	Red	Connected to 28V power but not to USB	Flashing green	Connected to USB but not to 28V	Solid green	Connected to USB and 28V
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Red	Connected to 28V power but not to USB								
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Solid green	Connected to USB and 28V								
<b>Standard Inputs</b>									
Number of channels	4 in total - 1 on each <i>Switch</i> input								
Input isolation	3750 V <sub>RMS</sub>								
Input voltage range	-28V – 0V								
Connector	Same RJ12 connectors as Coulbourn ECB								
<b>Audio input</b>									
Number of channels	1								
Connector	3.5mm jack, connects directly to <i>Speaker</i> phono output, same as Coulbourn ECB								
<b>Standard outputs</b>									
Number of channels	16 in total: 3 on each of 2 <i>Cue</i> outputs 2 on each of 2 <i>Feeder</i> outputs 1 on each of 4 <i>Spare</i> outputs 1 on <i>Tone</i> output 1 on <i>House light</i> output								
Output isolation	3750 V <sub>RMS</sub>								
Output on voltage (note 2)	-28V								
Output off voltage (note 3)	GND								
Maximum current per output	1.5A								
Light/LED dimming capability	Available on all channels (note 4)								
Connectors	Same RJ12 connectors as Coulbourn ECB								
<b>Auxiliary outputs</b>									
Number of channels	2								
Output isolation	3750 V <sub>RMS</sub>								
Output on voltage (note 2)	-28V								
Output off voltage (note 3)	GND								
Maximum current per output	1.5A								
Connectors	4-way pluggable screw terminal block								
<b>Analogue (Prog) outputs</b>									
Number of channels	2								
Output range	0 – 2.5VDC								
Connectors	2 x 2.5mm jack connectors								

**Notes**

1. LED can be suppressed, which is useful for tests performed in darkness and/or to avoid providing potential cues to the animals.
2. When on, each output signal pin can sink a maximum of 0.5A. The absolute maximum current across all outputs is 2.5A.
3. When off, each output signal pin can source almost no current (it is pulled high through a 10K resistor).
4. Light dimming is performed using Pulse Width Modulation (PWM) at 320Hz.

**Supported Coulbourn Instruments components**

If you have a component that is not listed here please contact us at [support@anymaze.com](mailto:support@anymaze.com) to confirm compatibility.

**Audio stimuli**

- H12-02M-2.9            2.9 KHz high-power tone module - Mouse
- H12-02M-4.5            4.5 KHz high-power tone module – Mouse
- H12-02R-2.9            2.9 KHz high-power tone module – Rat
- H12-02R-4.5            4.5 KHz high-power tone module – Rat
- H12-04M                Mouse buzzer
- H12-05R                Clicker module - Rat
- H12-07                 Seven-tone audio cue
- H12-07MOD-Leuven    Seven-tone audio cue
- H12-08                 White noise generator
- H12-09                 Seven-level audio attenuator
- A12-33 (x10)            Programmable audio signal generator (range set to x10)
- A12-33 (x100)         Programmable audio signal generator (range set to x100)
- A69-20                 Tone/white noise generator

**Doors**

- H10-37                 Runway guillotine door lifter
- H24-01M-CA            Access controlled lickometer - Mouse
- H24-01R-CA            Access controlled lickometer - Rat

**Dry feeders**

- H14-01M                Pellet delivery trough - Mouse
- H14-01R                Pellet delivery trough - Rat
- H14-22M-20            Pellet feeder - Mouse 20mg
- H14-23M                Pellet feeder 20mg - Mouse
- H14-22M-20SP        Pellet feeder 20mg - Mouse on Rat panel
- H14-23M-SP01        Pellet feeder 20mg - Mouse on Rat panel
- H14-22R-45            Pellet feeder 45mg - Rat
- H14-23R                Pellet feeder 45mg - Rat
- H14-23R-97            Pellet feeder 97mg - Rat
- H14-06R                Combination dipper/pellet trough
- H14-10R                Grain feeder

- H14-02M Auto feeder - Mouse
- H14-02R Auto feeder - Rat

### Fans

- H29-05M Fan module - Mouse
- H29-05R Fan module - Rat

### Hand switches

- H21-01 Hand (shaping) switch
- H21-02M Experimenter's manual switch module - Mouse
- H21-02R Experimenter's manual switch module - Rat

### House lights

- H11-01M House light – Mouse
- H11-01R House light – Rat
- H11-01M-LED LED House light – Mouse
- H11-01R-LED LED House light – Rat

### Levers

- H21-03M Response lever - Mouse
- H21-03M-SP01 Response lever - Mouse on Rat panel
- H21-03R Response lever - Rat
- H21-05M Omnidirectional response lever - Mouse
- H21-05R Omnidirectional response lever - Rat
- H23-17M Retractable lever - Mouse
- H23-17MA Retractable lever - Mouse
- H23-17R Retractable lever - Rat
- H23-17RA Retractable lever - Rat
- H23-17R-TIL Transilluminated retractable lever - Rat

### Liquid feeders

- H14-04M Liquid solenoid valve - Mouse
- H14-04R Liquid solenoid valve - Rat
- H14-05M Liquid dipper - Mouse
- H14-05M/R Liquid dipper - Mouse on Rat panel
- H14-05R Liquid dipper - Rat

### Nose poke holes

- H21-09M Nose poke - Mouse
- H21-09R Nose poke - Rat
- H21-09M-W Nose poke all white LEDs - Mouse
- H21-09R-W Nose poke all white LEDs - Rat

- H21-10M Nose poke with light diffuser - Mouse
- H21-10R Nose poke with light diffuser - Rat
- H21-09M-MOD Nose poke with all white LEDs and olfactory inlet - Mouse
- H21-09R-MOD Nose poke with all white LEDs and olfactory inlet - Rat
- H21-09M-CA Nose poke with access control - Mouse
- H21-09R-CA Nose poke with access control - Rat

### Olfactory stimuli

- H15-03 Olfactory stimulus control

### Other response devices

- H22-01 Response wheel
- H25-01 Ceiling chain
- H25-06 Universal ceiling mount bump rod

### Pecking keys

- H21-15R Bird pecking key
- H21-17R Bird pecking key with 3-color cue
- H21-19R Bird pecking key with 7-pattern display

### Photobeams

- H20-93 Single photocell sensor
- H20-93A Single photocell sensor
- H20-94 Single photocell sensor
- H20-95 Photocell sensor bar
- H20-95-X Photocell sensor bar

### Running wheels

- H10-38R Shockable running wheel
- H10-38R-CMT Cage mount shockable running wheel

### Shockers

- H13-01 2-Pole shocker
- H13-15 Precision-regulated shocker
- H13-16 Precision-regulated programmable shocker
- H13-16 REV A Precision-regulated programmable shocker
- H13-17 Precision-regulated programmable shocker
- H13-17A Precision-regulated programmable shocker

### Stimulus lights

- H11-03M Single high-bright cue – Mouse
- H11-03M-RL Single high-bright cue, red lens – Mouse
- H11-03M-LED Single high-bright cue LED – Mouse

- H11-03M-LED-RL Single high-bright cue LED red – Mouse
- H11-03R Single high-bright cue – Rat
- H11-03R-RL Single high-bright cue, red lens – Rat
- H11-03R-LED Single High-Bright Cue LED – Rat
- H11-03R-LED-RL Single high-bright cue LED red – Rat
- H11-05 Bright ceiling-mount light
- H11-05-LED Bright ceiling-mount light LED
- H11-02M Triple cue lamp – Mouse
- H11-02R Triple cue lamp – Rat
- H11-02R-LED LED Triple cue lamp – Rat
- H11-07M Seven-pattern display, red – Mouse
- H11-07M-G Seven-pattern display, green – Mouse
- H11-07M-Y Seven-pattern display, yellow – Mouse
- H11-07R Seven-pattern display, red – Rat
- H11-07R-G Seven-pattern display, green – Rat
- H11-07R-Y Seven-pattern display, yellow – Rat
- H91-16-INT-CTRL In-line light intensity control
- A21-10 Light intensity (and colour) controller

### Syringe pumps

- E73-02 Selectable speed infusion pump

### Miscellaneous components

- H24-05 Contact sensor
- H24-61 Infrared activity monitor (ceiling-mount)
- A24-72 Resistive bridge transducer monitor