BAC V

Immersive Entertainment Controller

Quick Start Guide

Welcome

From the entire team at Escape Room Techs, we'd like to express our deepest thanks for placing your trust in our BAC V controller for your next immersive entertainment project. We're excited our products are about to bring smiles to guests at your facility!

We've created this guide to help you get up and running quickly, but this is just the tip of the iceberg: we have a full manual, FAQ, and a rapidly growing library of instructional videos on our Knowledge Center at https://learn.escaperoomtechs.com/.

But we're also a small business with real human beings on the other end of the computer, and we're also seasoned escape room and puzzle enthusiasts – so we strongly encourage you to reach out to us, even if it's just to say hi and let us know what you're using the BAC for or to brainstorm puzzle ideas! We promise a real engineer in our Seattle office will read and respond to your message, and we'll do everything possible to offer advice or troubleshooting steps as quickly as possible.

Our business only succeeds if yours does as well, so please treat us as an extension of your team and don't hesitate to ask questions, even if you feel they might be answered elsewhere in the documentation. Our documentation is a work in progress as many issues were historically solved through 1:1 conversations, so knowing where you're getting stuck is valuable to us because it helps improve our learning resources for everyone.

Contacting Us

The best way to reach us is via e-mail at escape@escaperoomtechs.com .

We respond to e-mail around the clock and unless we're asleep or in the lab, you will likely receive an initial response within a few hours. You're always welcome to send additional messages at any time asking for an update on your support request.

If you have a more time sensitive question, or just want to chat a bit about how best to solve a problem, we also offer instant messaging support at https://m.me/escaperoomtechs with prompt responses during our core business hours.

Many customers ask if we have an inbound phone number, and the answer is currently no. The primary reason is that screenshots and logs are worth a thousand words: by including photos of your installation and screenshots of any software errors or issues you're encountering upfront, we can often solve your issue in minutes. Text based support also allows us to help multiple customers at once – many troubleshooting steps require rewiring or reconfiguration, and to borrow a programming term, using 'asynchronous' means of text based communication means we can be working on two or more issues at the same time!

If you'd like dedicated 1:1 time devoted to your project, we do offer affordable consulting hours available for purchase on request – many past customers have found these services valuable, especially because in a consulting arrangement we are often able to assist with setup and configuration of your entire room, not just our own products. This can also be a good option for those working on a tight deadline that requires realtime collaboration. Please contact us first to discuss your needs and request a quote.

Getting to know your BAC

The BAC V is a general purpose escape room controller, with 8 inputs, 6 outputs, and 2 relays.

Power

The BAC operates on 12-24V and requires a minimum of 1A of power supply capacity. We strongly recommend you choose 12V as your operating voltage, as it maximizes the potential compatibility with other props and products we sell. We also strongly recommend a 2A power supply, ideally one from a major manufacturer with appropriate safety certifications.

Warning: As escape room circuits are often hand built and potentially hazardous if constructed incorrectly, never leave your props running when you are not physically present. Always remove power from your controllers using an external switch before leaving each day.

Inputs

The BAC's inputs allow you to connect buttons, switches, or external props to your game. The inputs can be configured to detect when an input is HIGH (12V) or LOW (GND).

Four of the inputs (0-3) are routed through a special component called an optocoupler, which isolates the BAC from electrical interference using light. By default, this component is bypassed, but you can change settings by moving a small block inside the BAC to enable this isolation feature.

To connect a simple switch to the BAC, wire one end to the DOT terminal on the input block, and wire the other end to an input. When the switch is closed, the 12V source from the dot terminal will be connected to the input, and the HIGH ("On") value on the input will be detected. When the switch is open, the input will detect a LOW ("Off") value.

Outputs

The outputs are a big part of what makes the BAC special. We invest in a special output driver chip designed for automotive use that creates 6 highly robust output channels. This output driver chip protects against overcurrent and overvoltage situations, so if you accidentally create a short circuit, there is internal protection on the BAC against that scenario to protect your investment.

All six outputs can supply up to 500mA at 12A, up to the maximum of your power supply. This is enough to power a small cabinet sized mag lock, but not quite enough to power a spring loaded solenoid or large door sized mag lock. Make sure to track and add up your power consumption budget, and to verify that your power supply has enough capacity to handle your needs.

To wire an output to the BAC V, connect the red/positive wire to the output, and connect the black/negative wire to GND (-). This configuration is called "high side drive" and is the default setting on your controller.

If you are upgrading to the BAC V from previous revisions, you may recall that prior revisions were wired as "low side drive" – e.g. the positive terminal was connected to 12V and the negative terminal was connected to the input. This is still possible – you can change the configuration by clicking the I/O Configuration button on the Hardware tab in BAM. This configuration is a bit more confusing, so it's no longer the default, but it can be a great option if you are switching inductive loads that might introduce noise into the system.

Relays

In addition to 8 outputs that supply 12V power, the BAC includes two relays. These relays do not supply any power on their own – they are simply a computer controlled switch, which works by energizing a magnet which moves a switch contact from open to closed.

When the relay is OFF, C and NC ("Normally Closed") are connected. When the relay is ON, C and NO ("Normally Open") are connected.

You can use the relays as simply an extra output by wiring your circuit to the 12V and GND terminals onboard, or you can use them to control external devices or high current door locks/solenoids. Unlike the regular outputs, relays can even switch devices controlled by other power supplies!

A frequently asked question is whether these relays can switch a 110V AC load. While this is technically possible and within the ratings of the circuit board and relays, we strongly recommend against it: 110V power sources are highly dangerous, and we recommend all wiring connected to them be entirely enclosed and concealed.

There is a product available called the "IoT Relay" that allows you to switch a standard plug-in outlet using the BAC. We strongly recommend investing in one if you need to switch a 110V load, and they are quite affordable and available in our store or direct from the manufacturer.

Setting up and configuring your BAC

To get started with your controller:

- Install the provided terminal blocks. These terminal blocks only insert one direction and should press snugly into the sockets provided on the top of the controller. Each terminal ships closed, so you will need to unscrew the screw on the top fully before you can insert a wire to make a connection.

- Connect an Ethernet cable to your router or switch. The best network configuration is a cable running directly from the BAC to your router or to a switch connected to your router.

  Many customers ask us if they can connect their BAC directly to their computer's onboard Ethernet port. This is not a recommended configuration, because in this setup there is no central source assigning addresses to devices. BAM will attempt to connect in this configuration, but you may experience problems discovering the device.

  If you'd like to connect your BAC over a wireless connection, a low-cost travel router can be a good solution; they can join your existing wireless network and act as an extender, creating a wired Ethernet port that is connected to your main router. More information on this solution and recommended products are available on our web site.

- Install BAM, our management software. You can download the latest version from https://learn.escaperoomtechs.com/

- Open BAM. If BAM does not open its main window automatically, check our web site for troubleshooting advice.

- Find your controller in the list, then open its settings and verify it is running the version of software you need.

  There are multiple versions of our controller software with different games and network types supported. Your controller ships by default with Standard games and MQTT network connection for use with Mythric Mystery Master.

  To select a different version, visit our web site and download the appropriate file, then use the Local update feature on the System tab to perform the update. For more information, visit our web site.

  All software versions include "Room Controller" mode, which is the default and allows direct control of inputs, outputs and relays over the network and through the onboard 'Events' system. This mode is also active even when another game is configured.

- Refer to our online manual for additional help with configuring game settings and exploring your controller.

  Or, if you get stuck, reach out to us for help using the contact information from the beginning of this manual.