A device’s control requirements are often dictated by the device manufacturer. AV devices originate from a variety of different manufacturers and access to their control functions can vary widely.

There are some devices, like laptops, that were never meant to be automated as part of an AV control system, yet they appear regularly as sources within a system. These devices always require some type of local control to make them function. Then there are those components that may only be controlled by the manufacturer who made them. Typically, these devices require a combination of manufacturer specific hardware, software, and infrastructure to make them function appropriately.

Sometimes, AV device control can be difficult because a device that you want to control does not respond to commands or requires special treatment to work as expected. Thankfully, there are AV devices that fall into the control-friendly category, where well-documented control protocols, procedures, and commands make it easier to assemble a fully functioning system. In many cases, a device has only one primary method of control. Yet, when there are multiple ways a device can be controlled, how do you, the designer, decide which method to use?

**Make a Determination**

1. The first step is to determine what you need that device to do within the scope of the AV system.

2. The second step is to determine what functions are available for each method of control.

3. And the last step is to determine which method is going to provide you with the simplest, most reliable way to achieve those goals.

Consider a video conferencing codec. Hardware codecs may be controlled via an IR remote, RS-232 control port, or an Ethernet connection. Let’s assume that each method of control is equally accessible to install.

If the user only desires to emulate the functions available on the IR remote, the simplest solution may be to control the codec via IR.

If the user wants to see an “Incoming Call” notification on the touchpanel, then IR would be eliminated and RS-232 or Ethernet would be required.

If the IT department wanted to place the control system on a separate IP network than the codec, then RS-232 would be the most direct and reliable method to control the codec.

**Where We Find AV Control**

- **RS-232/422/485:** Video Projectors, Commercial Flat Panel Displays, Pro DVD, VTC Codec, Cameras, Matrix Switchers, DSPs, Lighting Controllers
- **IR/Serial:** DVD, Blu-ray, VTC Codec, Switchers, Cameras, Flat Panel Displays, Video Projectors
- **Ethernet:** Video Projectors, VTC Codec, Matrix Switchers, DSPs, Lighting Controllers
- **Relays:** Screens, Projector Lifts, Switchers, Power Controllers, Lighting Controllers
- **Digital Inputs/Outputs:** Motion Sensors
- **Analog Inputs:** Temperature Sensors, Limit Switches, Door Sensors

**Need More Power?**

The IPCP Pro 550 and the IPCP Pro 555 are Extron’s most advanced control processors. They both have eight serial data ports, eight unidirectional IR/serial ports, eight low voltage relay ports, four Flex I/O ports, four switched 12 V power ports, and a gigabit Ethernet port as well as an eBUS port for system expansion. Additionally, the IPCP Pro 555 features an AV LAN port designed to control local AV devices, and safeguard them from outside intrusion or interference. Both the IPCP Pro 550 and the IPCP Pro 555 work with Global Configurator Plus or Professional as well as Global Scripter allowing for streamlined system deployment.
WHERE WE FIND AV CONTROL

1. RS-232/422/485
   Wired bidirectional serial data interface. Commands are formatted and sent between the controller and the device. RS-232 has a maximum distance of 50 ft. (15 m). RS-422, and RS-484 have a maximum distance of 4000 ft. (1200 m).

2. IR/Serial
   IR is a wireless one-way interface that typically uses an IR emitter wired to the controller and affixed to the front of the device. These require an IR driver or the "capture" of the IR remote's codes as a custom driver. IR/Serial ports are software-configurable and can act as a unidirectional serial port in addition to IR.

3. Ethernet
   Bidirectional serial data interface over an Ethernet network. Commands are formatted and sent between the controller and the device. The device can be located anywhere as long as it is accessible over the network. Communications relies on the setup, configuration, and infrastructure of the network.

4. Relays
   Relays interface with devices that provide contact closure interfaces. Relays are simple controls and do not provide any direct feedback. Relays typically control low voltage motor controls like screens, drapes, shades, lifts, and AV devices with contact closure interfaces like AV switches and lighting controls.

5. Digital Inputs/Outputs
   Digital inputs are designed to measure two states: high or low, and are used to introduce devices such as switches or motion sensors into the system. Digital outputs are very similar in function to relays. They can complete a circuit for control like a relay, and can drive LED feedback in the control environment, i.e. mute feedback LEDs.

6. Analog Inputs
   Analog inputs are driven by a change in a voltage from devices such as temperature sensors.