

## Configuration vs. Programming

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### Abstract

When it comes to implementing the system control portion of an A/V project, there are two distinct choices available: configuration or programming. Extron MediaLink®, IP Link®, and now TouchLink Systems are all designed from a configuration approach. For most applications, configurable systems offer significant advantages over programmable systems, and provide benefits for consultants, integrators, end users, and even programmers.

The Extron configuration approach simplifies the development of powerful control systems, and makes them cost-effective in both the short and long terms. With our predesigned application templates, extensive library of Extron Certified device drivers, comprehensive suite of software applications, and ongoing training and support, system designers can quickly and easily deploy advanced control systems that are more profitable, easier to modify, and cost less to own and operate than programmable control systems.

white paper



Figure 1: MLC 206



Figure 3: MLC 226 IP

## I. A Brief History of Configurable Control Systems

Extron has been delivering fully configurable control systems for more than a decade. System switchers and A/V system controllers such as the MediaLink MLC 206, shown in Figure 1, led the market in being easy to configure and flexible enough to meet many of the typical applications for which they were designed.



Figure 2: System 5 IP

The introduction of the IP Link platform of Ethernet based control products enabled the configurable control system to move to the next level of sophistication. The development of the IPL series of products alongside the System 5 IP, shown in Figure 2, and MediaLink MLC 226 IP, shown in Figure 3, defined the next generation of Extron configurable control systems. These products were designed for the specific applications and needs of the educational and corporate markets.



Figure 4: Global Configurator 3.0 Software

To support configuration of these products, Extron developed Global Configurator software to make the process easy, straightforward, and repeatable. See Figure 4.

With the introduction of the TouchLink™ configurable touchpanel control system, Extron intends to revolutionize the way A/V professionals design, install, and maintain touchpanel systems. While the implementation of a touchpanel control system has been historically considered difficult, time consuming, and costly, the new Extron TouchLink system simplifies the process, while offering both extensive flexibility and powerful control features. The fully configurable TouchLink control systems also make for a cost-effective alternative to a programmable touchpanel solution. See Figure 5.



Figure 5: TouchLink Touchpanels

## II. The Benefits of Configurable Control Systems

The Extron configuration approach simplifies the development of powerful control systems, and makes them cost-effective in both the short and long terms. With our predesigned application templates, extensive library of Extron Certified device drivers, comprehensive suite of software applications, and ongoing training and support, system designers can quickly and easily deploy advanced control systems that are more profitable, easier to modify, and cost less to own and operate than programmable systems. As you will see, some of the advantages of configurable systems over programmable systems overlap with others, thereby compounding and extending the advantages to consultants, integrators, end users, and even programmers.

### A. Configurable systems are more profitable

The ability to accurately estimate the number of hours needed to set up a system is critical in designing cost effective, profitable business solutions. While integrators can charge more for programmed rooms, there are many more variables to factor in, often causing margins to be thinner and the risk of cost overruns to be higher than with configured rooms.

Consultants and system integrators alike benefit from systems that can be developed quickly and reliably. Faster implementation and integration allows for more cost effective system designs which directly translates into a more profitable solution. Sometimes this is the difference between the customer deciding to implement the system or cut it from their budget. Furthermore, since a configured system can be reliably installed in a shorter time, more systems can be installed for the same cost to the end user, and higher profit to the system integrator.

### B. Configurable systems are easier to modify

System devices, such as projectors, displays, and DVD players, have finite life spans and need to be replaced or upgraded periodically. With a programmed system, even something as basic as swapping out a projector requires a qualified programmer who can edit and recompile the source code. Just a small sample of the code required is shown in Figure 6. Access to the original source code is necessary to perform any modifications to the system and changing a system is impossible if the code is lost.

Configurable control systems, on the other hand, enable even junior-level A/V technicians with only a few hours of hands-on training to make changes. In addition, changes to a configured system take less time to implement and to replicate. Unlike traditional programmed systems, swapping out a component in a configured system usually involves little more than updating a device driver as shown in Figure 7. With Extron configurable control systems, lost source code is never a possibility. Project files are always extractable from every system.

```

BUTTON_PRESS (TOUCHPANEL, SYSTEM_ON)
//system on macro
{
    SEND_ASCII_STRING (LIGHTS,
        TURN_LIGHTS_OFF); //turn lights off

    SEND_ASCII_STRING (PROJECTOR1, POWER_ON);
        //projector on

    SEND_ASCII_STRING (SWITCHER, INPUT1);
        //switch to input 1

    PULSE_IO (RELAY1); //drop the screen
}

```

**Figure 6:** Sample Source Code from a programmed control system

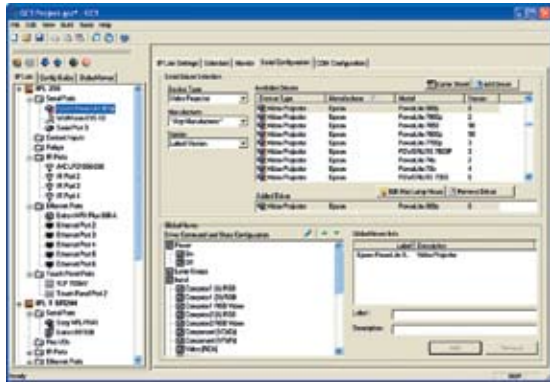


Figure 7: Selecting a device driver in Global Configurator

Once again, the integrator's bottom line profitability is improved because the time to complete a change to one or more completed systems is predictable and much less varied than with a programmed solution. End users can rest assured that changes to their system can be efficiently and quickly performed in the future.

### C. Configurable systems cost less to own and operate

The total cost of system ownership is dictated by the initial cost plus the maintenance cost over the life of the system. With configurable systems, initial deployment costs are easy to control. Over time, some changes to A/V components will be necessary and will require updates to the control system. As previously discussed, the configuration approach makes this process much simpler, faster, and less expensive. So, every time a change is made, the owner of a configurable A/V control system saves money compared to the owner of a programmed system.

In recent years, the ability to connect A/V systems together via a computer network has given system administrators the data and visibility they need to control the costs of power, projector lamps, and more. While both programmed and configurable systems can support this important network connectivity, the configurable approach provides an easier and more cost-effective path. The configuration software's ability to simplify controller setup, system monitoring and scheduling, and Web management deployment provides ongoing savings that directly helps to lower the total cost of ownership.

### D. Configurable systems require less training to use

End users will find that their Extron AV control systems operate consistently from room to room and building to building. This reduces the time and costs associated with training and retraining users on the operation of systems that have been designed by different control system programmers.

### E. Configurable systems free up programmers for other tasks

So how do A/V system programmers benefit from the adoption of configured systems? It frees them up to focus on more complex jobs and provides an opportunity for them to contribute their system expertise to the development of large numbers of configured systems.

Programmers typically have a clear understanding of how all the equipment in the system works together. This in-depth knowledge is what makes them invaluable for many complex, one-of-a-kind, "do everything" types of control systems.

For many applications, programmers can combine their in-depth system knowledge with configuration tools to help system integrators develop and deliver “cookie cutter” room control systems. These configured systems can be then reliably replicated to support installations ranging from 10 to 1,000+ rooms. Asking a programmer not to program might seem strange, but in many situations, the combination of a talented programmer and a fully configurable system can produce astounding results.

### **III. The Advantages of the Extron Approach**

The configurable control system concept started with a few main objectives and expanded to encompass the many growing requirements of typical audio visual installations. Extron configurable control systems are designed to make the most common configuration tasks easy to accomplish in as few steps as possible. To simplify the deployment process, Extron has eliminated the need for programming support and source code by creating a library of tested and documented device drivers, designing powerful, ready-to-use, predesigned application templates for GUI design, and developing a unified platform for configuring all systems. This approach provides integrators with solutions for a wide range of applications while still dramatically reducing the development and deployment time.

#### **A. Thousands of Extron Certified device drivers**

At the core of our configurable solution is a large and extensive library of pre-developed, tested, and documented device drivers. Extron maintains thousands of serial, IR, and Ethernet drivers for A/V devices from dozens of manufacturers. Each driver was written and reviewed by Extron engineers. Certified drivers have been fully tested with at least one of the supported products. In addition to including the control of the device, each driver includes a communication sheet that completely describes the supported capabilities, including how the control port hardware should be wired to the device.

The Extron standardized approach to device driver creation makes replacing equipment easier, ensures that all components will work together, and offers clear advantages to one where untested drivers are developed by and shared among a community of programmers.

#### **B. Ready-to-use templates for touchscreen layout design**

Extron GUI Configurator is an intuitive design tool that makes creating and maintaining Extron TouchLink™ touchscreen user interfaces easy, even for those without graphic design skills. Getting started is fast and simple with ready-to-use, customizable design templates, or you can start from scratch and build your own layout using our comprehensive software. The touchscreen design templates are fully customizable and



Single Display Room



Dual Display Room



Multi Image System



Divisible Room



Video Conference Suite

Figure 8: TouchLink touchscreen templates are designed for the kinds of rooms you install every day.

matched carefully to popular A/V system applications, as shown in Figure 8. Simply select the template that best suits the application. In many cases, all the input sources, display control, and environmental settings are already in place. Each template is fully developed and includes complete, detailed documentation of its application and capabilities. If any modification is required, GUI Configurator software’s user-friendly drag-and-drop interface makes adding or removing a source or other element a snap.

**GUI Configurator includes ready-to-use templates created for the following popular A/V system applications:**

- Single Display Room
- Dual Display Room
- Divisible Room
- Multi-Image System
- Video Conference Suite

...and more will be added to [www.extron.com](http://www.extron.com) soon.

**GUI Configurator touchscreen templates are:**

- Broadly Applicable – Our templates are matched carefully to the most common A/V applications installers and integrators are likely to encounter
- Intuitive to Use – Readily learned and understood with clearly labeled buttons and logical page flows
- Easy to Edit – The object appearance properties of every GUI element is easily changeable, including shape, color, label, and operation

Since system designs vary, our templates can be customized to suit the specific needs of any application. GUI Configurator’s intuitive design environment enables a wide variety of design choices for buttons, colors, logos, font styles, and more.

**C. Single software platform for all configurable controllers**

Anyone familiar with configuring MediaLink® or IP Link® Systems using Extron Global Configurator software will be comfortable configuring a TouchLink system. Global Configurator was developed as a single unified software platform for all configurable controllers in the Extron product line. Once you are familiar with configuring one controller type, all but the most complex and demanding A/V control applications are easy to accomplish in just a few steps.

Global Configurator is a simple-to-use, yet comprehensive software application that allows non-programmers to configure a wide range of Extron IP Link-enabled products, including TouchLink Systems. It provides an integrated environment for defining A/V

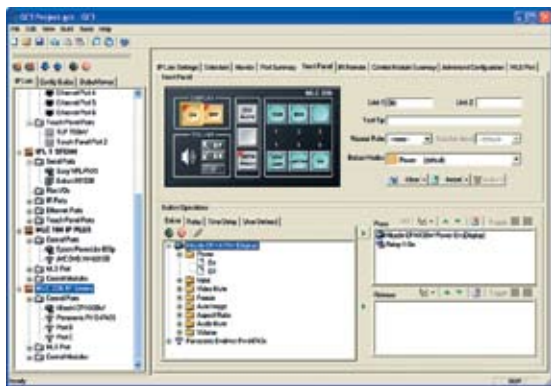


Figure 9: Global Configurator 3.0 Software

control and monitoring system functionality from an easy-to-use graphical user interface, as shown in Figure 9. It's simple enough to be used for configuring a single room controller, yet powerful enough to facilitate building a Web-based A/V resource management and remote monitoring system for hundreds of devices in multiple locations.

Creating a system using Global Configurator has additional benefits such as the drag and drop environment, reduced training requirements, and eliminating control system debugging. Extron's configuration software uses many common Windows® conventions and this makes it much easier for those of varying technical levels to learn and master. This means system integrators have access to a larger pool of resources from which to draw upon. Building this capability in-house ensures that you have full control over your customer's needs and sense of urgency.

#### IV. The Final Analysis

Time is a valuable commodity. As equipment costs drop, the labor cost of an integrated AV system is becoming fifty percent or more of the budget for a typical project. System designs not only need to be energy efficient but also easily and quickly installable. There are two choices available for implementing A/V control systems: configurable systems or programmable systems. In today's cost-sensitive environment, configurable control systems are the hands-down winner for reliability, repeatability, and budget conscious installations.

#### **With a configurable system design approach, everyone wins:**

- Systems can be designed and deployed more consistently
- Accurate estimates for development and update tasks are easier to prepare
- Post-installation tasks can be easily accomplished by field technicians

There are many aspects of the configuration approach that make it appealing and cost effective. The introduction of the TouchLink series of touchpanels, with ready-to-use templates for common system applications, is the world's first truly configurable system that can provide a high quality user interface and control project costs at the same time.

Extron Electronics, headquartered in Anaheim, CA, is a leading manufacturer of professional AV system integration products. Extron products are used to integrate video and audio into presentation systems in a wide variety of locations, including classrooms and auditoriums in schools and colleges, corporate board rooms, houses of worship, command-and-control centers, sports stadiums, airports, broadcast studios, restaurants, malls, and museums.

For additional information, please call an Extron Customer Support Representative at: 800.633.9876 (inside USA and Canada only) or 714.491.1500 for Extron USA; +800.3987.6673 (inside Europe only) or +31.33.453.4040 for Extron Europe; +800.7339.8766 or +65.6383.4400 for Extron Asia; +81.3.3511.7655 for Extron Japan.

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