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Middle Tennessee State University

Middle Tennessee State University Creates Dynamic Self-Help Interface Using Extron Control

“We often got called out to classrooms for issues as simple as a blank screen caused by a PC or a document camera that wasn’t turned on. Our self-help AV control interface has reduced those kinds of service calls to zero.”

James Copeland
Director – Classroom Technology Client Services
Middle Tennessee State University

Middle Tennessee State University - MTSU - is a public university founded in 1911 with a two-year program for training teachers. Today, it encompasses eight undergraduate colleges and a college of graduate studies, offering more than 300 undergraduate and graduate degree programs through more than 35 departments. MTSU is well known for its degree programs in music and music recording, aerospace, and a one-of-a-kind degree program in concrete industry management.

Challenges

With an undergraduate enrollment of about 20,000 and a 550-acre campus with 55 buildings housing over 420 AV-equipped classrooms, conference rooms, and event spaces, plus more than 1000 university-owned PCs, MTSU’s IT-AV technical support staff is always busy. Many of their help desk calls come from users who need assistance with basic AV system operation or minor troubleshooting. The technical support staff needed a solution that would reduce the number of calls by enabling users to resolve problems themselves.

Design Solution

Thanks in part to Extron Control Professional Certification and training, the team devised an ideal solution. Using Extron Global Configurator® Professional and GUI Designer software, they were able to deploy a TouchLink® Pro touchpanel-based user interface that is both beautiful and intuitive. The interface makes it easy for instructors, students, system installers, and technicians to operate and troubleshoot the AV system. The technical support team also leverages the remote AV system management capabilities of GlobalViewer® Enterprise software to augment the troubleshooting capabilities built into the touchpanel interface.



Start up the AV system by tapping Press to Begin. The University Logo appears in the next screen and fills with blue to indicate startup progress.

Real Time Help That Adjusts Dynamically to the Task

The self-help interface guides non-technical users through routine AV system operations from startup to shutdown in real time with clear, uncluttered interactive GUIs. The GUIs change dynamically for each room, so that all controls available to the user are customized to reflect the makeup of the AV system installed in the room. On-screen hardware status information allows the self-help interface to perform semi-automated interactive troubleshooting sequences for common system issues that can be fixed by users. These can include disconnected cables or forgetting to turn on an AV source device. The following screens show how users are directed through a typical AV system startup sequence.



The logo fills with blue, MTSU's school color, as a progress bar to indicate AV system startup status. Click the **PLAY** icon for an animated demonstration. When startup completes, user selections are performed using the Upper and Lower Dock buttons.

Upper Dock Buttons

- The upper dock buttons select the AV program source.
- Defaults to Instructor PC at AV system startup.
- When the signal from selected source is detected, the red icon turns blue, and the yellow troubleshooting message disappears.

Upper dock buttons select AV program sources. Click the **PLAY** icon for a video that steps through AV program source screens.

- Lower dock buttons select control screens for:
 - Displays
 - Room Lighting & Window Shades
 - Microphones
 - Help
- Control screens are customized for the AV equipment complement in the room
- Buttons to the left & right of the dock:
 - Display Blackout
 - AV System Power Shutdown

Lower Dock Buttons

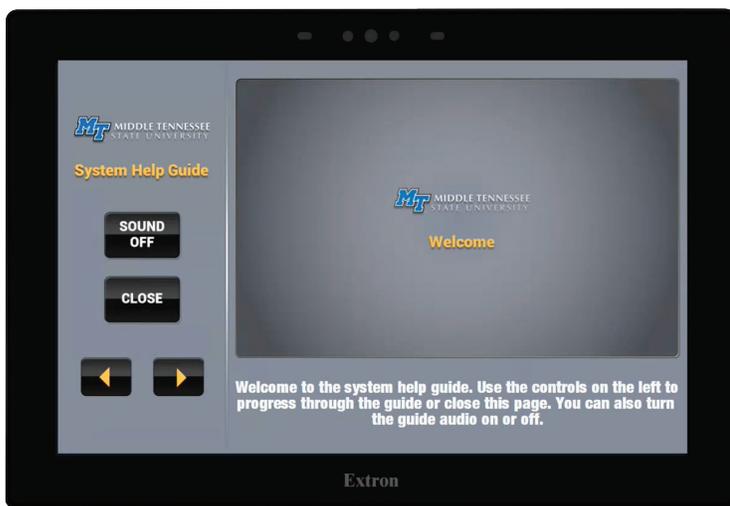
Lower dock buttons navigate to AV system control functions. Tapping Help navigates to the Help screen. Click the **PLAY** icon for a video that steps through the AV control screens.

Animated User Help Guide with Spotlighting, Written and Spoken Explanations

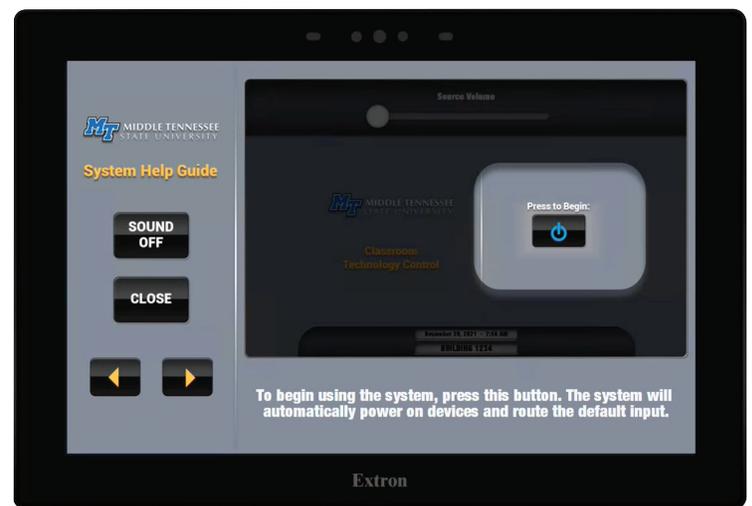
In addition to the real time guidance built into the control system, users can access an interactive Help Guide from the touchpanel. The guide walks people through all the important user interface screens, spotlighting each button or slider to tap next. Each guide screen includes captions and audio narration explaining each step. The Help Guide

obtains hardware status from the AV system servicing each specific room and tailors the content of the guide for that particular room. In this way, the AV system operating instructions presented to the users pertain uniquely to the capabilities of the room they are in. Arrow buttons allow users to navigate forward or back to any page of the Help Guide. The following four screens show some of the Help Guide pages.

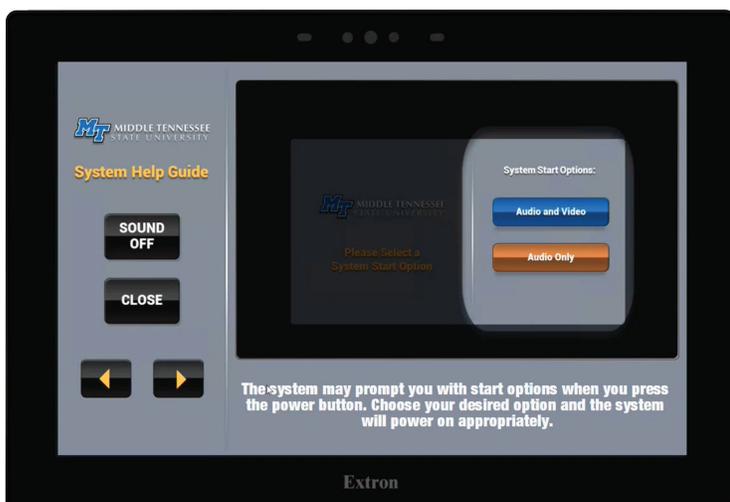
[Click here to watch the System Help Guide video.](#)



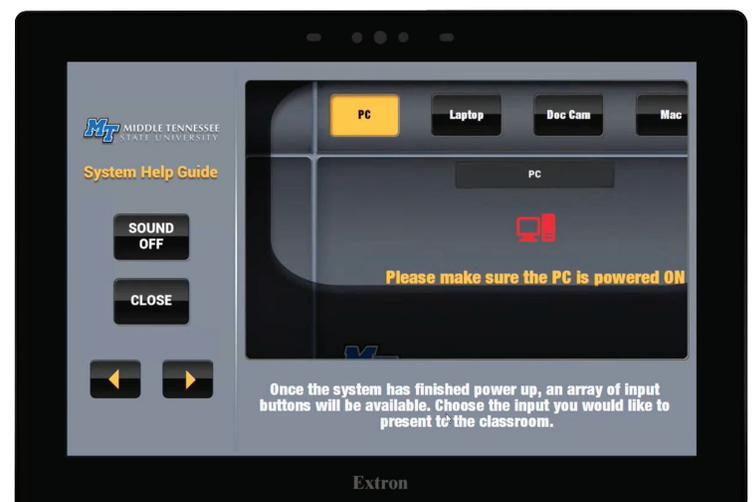
Help Guide opening Welcome screen.



Help Guide Start screen.



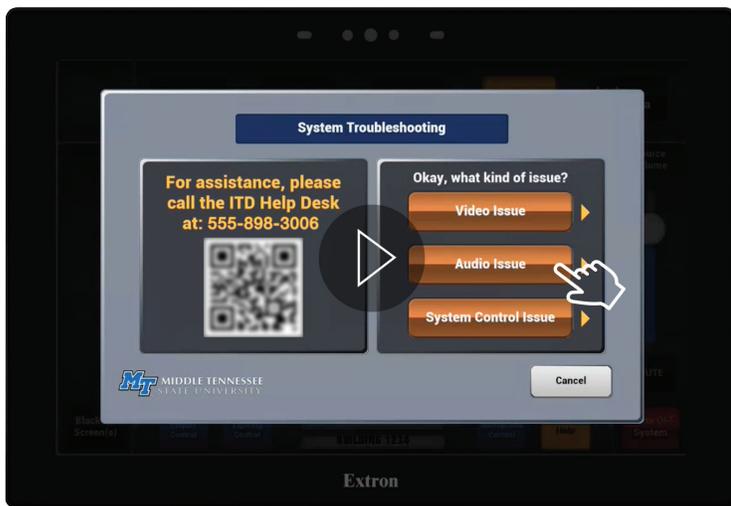
Help Guide AV System Start Options demonstration screen. Audio and Video or Audio Only.



Help Guide Source Selection demonstration screen. PC selected.

Semi-Automated Troubleshooting

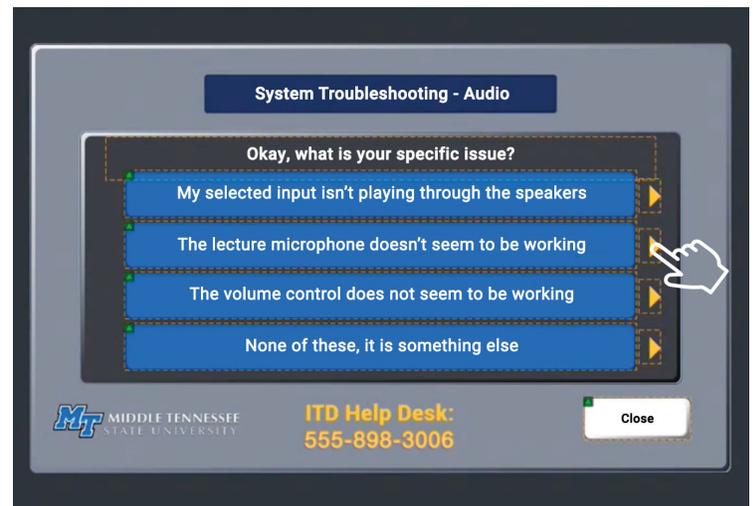
The MTSU technical support staff used Global Configurator Professional to develop an extensive library of troubleshooting macros that save time and money. When triggered by user responses to interactive troubleshooting GUIs on the touchpanel, the macros perform signal tracing to localize the points of possible interruptions in the video or audio signal paths. The macros send commands to the AV system to inject a test signal into the path under test, and monitor status returned from the hardware in the path to detect signal presence. Each node in the signal path is interrogated in this manner until the point of signal loss is located.



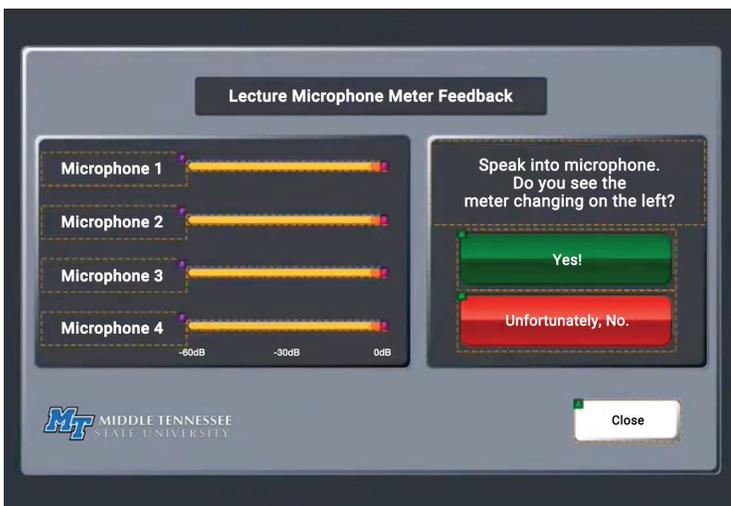
AV System Troubleshooting start page. Flashing buttons prompt users to select type of issue. Example: tapping “Audio Issue” launches System Troubleshooting – Audio screen. Click the **PLAY** icon for an animated demonstration.

Once the point of signal loss is pinpointed, the macro either sends a command to correct the problem or displays a message to the user suggesting how to proceed. The macros emulate the troubleshooting steps and decision branching that a tech support person would perform. If a problem cannot be resolved by the applicable troubleshooting macro, a telephone number and QR code appear on the touchpanel GUI, advising the user to contact tech support at the Help Desk. Tech support can coach the user through manual troubleshooting using the touchpanel, or tech support can take control remotely via GlobalViewer Enterprise. The following four screens depict troubleshooting of an audio issue.

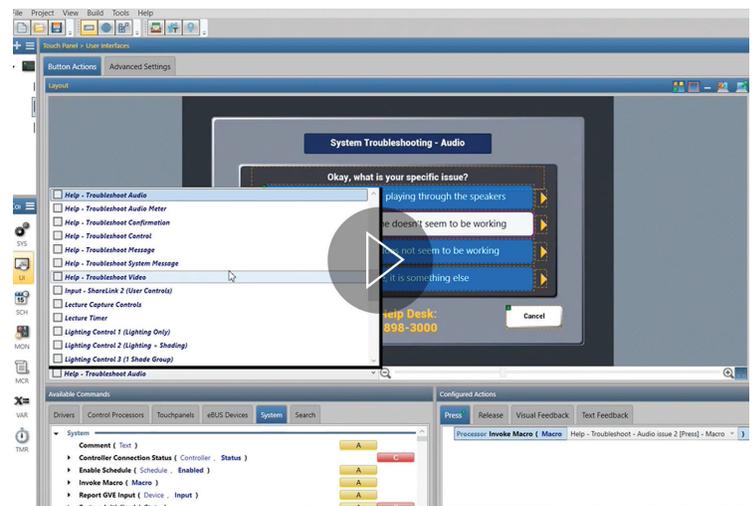
[Click here to watch the Troubleshooting Process video.](#)



System Troubleshooting – Audio screen. This screen presents options for troubleshooting audio issues. Example: tapping “The lecture microphone doesn't seem to be working” triggers a troubleshooting macro.



Lecture Microphone troubleshooting screen. When the troubleshooting macro completes, the user is prompted to verify and confirm results.



Sample Global Configurator Pro screenshot showing troubleshooting macro triggered to control hardware actions that trace status of lecture microphone audio signal. Click the **PLAY** icon to view a video overview of Global Configurator Pro system configuration performed by MTSU's system AV technical support staff.

System Configuration Control Panels for Maintenance and New System Commissioning

A separate set of system configuration control panel touchscreen GUIs is available for advanced AV system troubleshooting, maintenance, and new system commissioning. These GUIs are used by MTSU's tech support technicians to observe the status of AV system equipment, inject video and audio test signals, and perform initial configuration of the AV system components. Third party AV system integrators use the GUIs to program, configure, and commission new systems in accordance with parameter specifications spelled-out in MTSU's commissioning checklists. Similar

to the other self-help touchpanel user interface GUIs, these change dynamically for each room, based on the makeup of the AV system installed in the room. For example, either one or two sets of projector controls are shown on the projector control GUI, depending on whether the room contains single or dual projectors. All the functions contained in these GUIs are also available through GlobalViewer Enterprise, allowing technicians to access these tools from the Help Desk, saving a trip to the room. The following four screens show a sample of the configuration control GUIs that have become major time savers for MTSU's tech support team and outside AV system integrators.



AV system configuration home screen. From this screen, technicians can navigate to setup screens for mics, audio functions, video functions, projector functions, etc.



Audio functions setup screen.



Video functions setup screen.



Projector functions setup screen.

Hardware Standardization Makes MTSU's Self-Help User Interface Development Practical

As the preceding descriptions illustrate, the self-help interface is extensive and dynamic. It can go through many permutations and combinations based on interactive user selections, branching within troubleshooting logic flows, and the quantity and types of components that comprise the AV system in any given room location.

[Click here to watch the Global Configurator Implementation Tutorial for the MTSU Self Help User Interface.](#)

Much of the branching logic performed by the self-help interface programming is based on the AV signal routing performed by the AV switcher. To reduce the time and effort required to program the self-help interface and the overall control system, the MTSU tech support team made a strategic decision to standardize on one AV switcher for all new AV systems. The team determined that the DTP CrossPoint 84 4K 8x4 Scaling Presentation Matrix Switcher offers the best solution in a tradeoff between price and functionality requirements.

Results

The vision that MTSU's IT-AV technical support staff had when they embarked on development of the self-help user interface was to automate as many manual processes as possible and provide instructors, students, and other non-technical users with tools to solve minor AV issues quickly on their own.

According to James Copeland, who heads-up the MTSU IT-AV Team as Director – Classroom Technology Client Services, the self-help user interface made practical by Global Configurator Professional has shown its value for end users and for his own service team. James notes, "Previously instructors would often call us out to the classrooms for issues as simple as a blank screen caused by a PC or document camera that wasn't turned on. Now, the touchpanel prompts them with 'Please Power-on the PC', and when the system then detects an active signal, the touchscreen confirms with 'PC Signal Detected'. Something this simple has reduced such time-consuming service calls to zero."

Copeland goes on to say "Student workers who help us in tech support roles have a high turnover rate driven by their class schedules. We were constantly training new people. The self-help user interface helps reduce the learning curve, allowing us to make efficient use of this transient workforce." In addition to these benefits, the self-help interface system commissioning tools make third party installers more self-sufficient.

The self-help AV control user interface is a success story that has prompted the justifiably proud development team, comprised of James Copeland, Dustin Cunningham, Aaron Dill, Jonathan Moore, and Dustin Smith, to seek ways to share the knowledge and techniques they've developed with their peers in the educational AV field and the broader AV community. This article is the first step toward that goal.

The Extron logo is rendered in a bold, blue, serif font.

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