Classroom

Solutions Guide

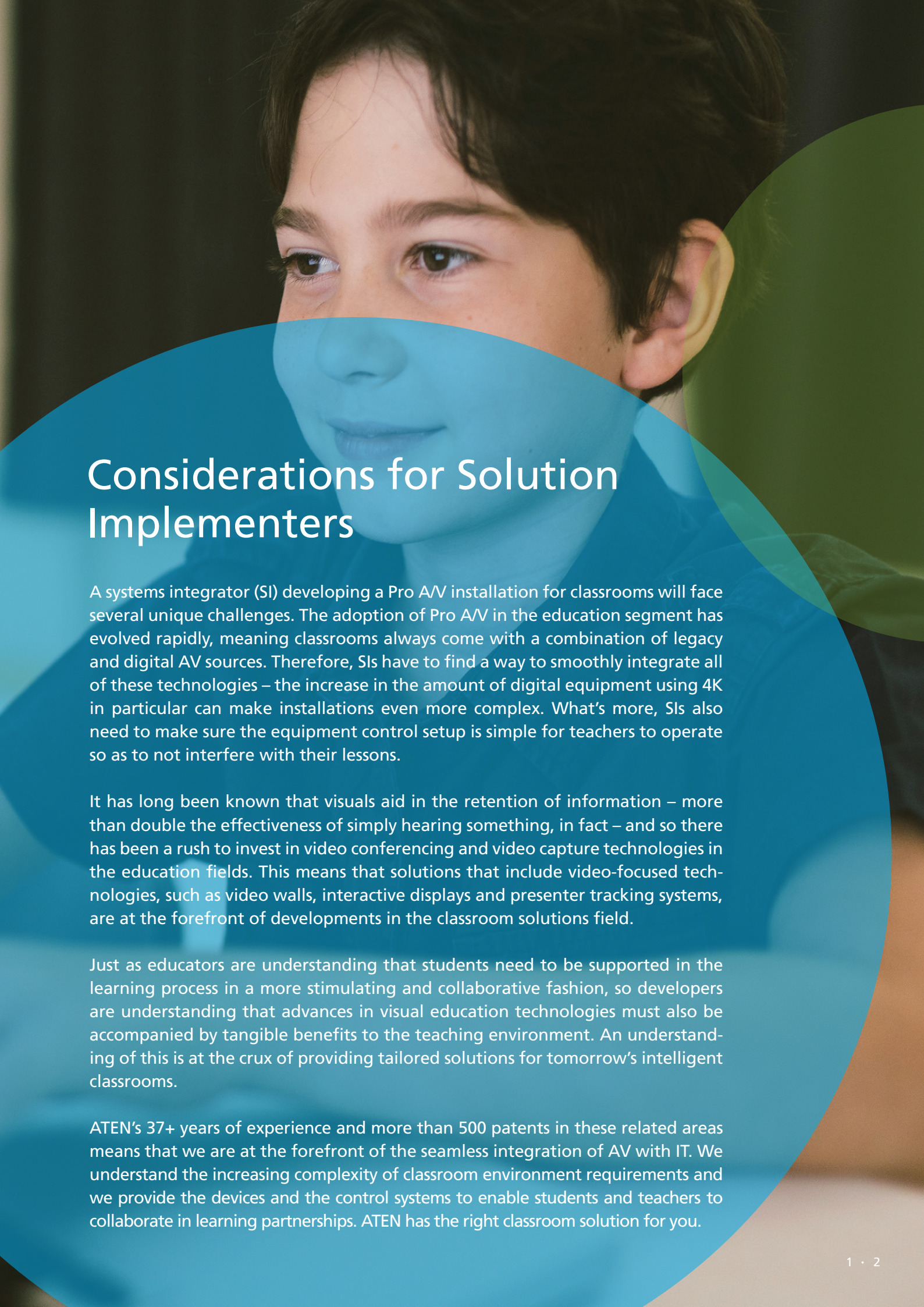
Contents

Intelligent Classrooms

Keeping pace with the changing nature of educational technology is both a challenge and an opportunity, as more and more universities and schools realize the increasing importance of equipping their facilities with classroom solutions that bolster their curriculums in appealing and effective ways.

As a place where information is communicated in both a visual and audial manner between multiple individuals, the classroom has been one of the primary sites of development in professional audiovisual (Pro A/V) equipment for decades. Therefore, the education sector in particular forms one vertical that is both strongly impacted by and impacts developments in Pro A/V. As classroom technology becomes more advanced and new approaches to learning increase interaction between teacher and student, the need for unified and collaborative systems in education is more prominent than ever.

But new technology always brings a new set of challenges – solutions must be flexible enough to fit a wide range of teaching methods and philosophies, and must not obfuscate or overshadow the learning process. But, in many cases, frustration leads to expensive equipment being left to gather dust as teachers opt for traditional teaching tools like the whiteboard. ATEN classroom solutions provide the simplicity, video quality, and compatibility that both educators and students need to effectively utilize Pro A/V equipment without a learning curve, thereby saving precious learning time.



Considerations for Solution Implementers

A systems integrator (SI) developing a Pro A/V installation for classrooms will face several unique challenges. The adoption of Pro A/V in the education segment has evolved rapidly, meaning classrooms always come with a combination of legacy and digital AV sources. Therefore, SIs have to find a way to smoothly integrate all of these technologies – the increase in the amount of digital equipment using 4K in particular can make installations even more complex. What's more, SIs also need to make sure the equipment control setup is simple for teachers to operate so as to not interfere with their lessons.

It has long been known that visuals aid in the retention of information – more than double the effectiveness of simply hearing something, in fact – and so there has been a rush to invest in video conferencing and video capture technologies in the education fields. This means that solutions that include video-focused technologies, such as video walls, interactive displays and presenter tracking systems, are at the forefront of developments in the classroom solutions field.

Just as educators are understanding that students need to be supported in the learning process in a more stimulating and collaborative fashion, so developers are understanding that advances in visual education technologies must also be accompanied by tangible benefits to the teaching environment. An understanding of this is at the crux of providing tailored solutions for tomorrow's intelligent classrooms.

ATEN's 37+ years of experience and more than 500 patents in these related areas means that we are at the forefront of the seamless integration of AV with IT. We understand the increasing complexity of classroom environment requirements and we provide the devices and the control systems to enable students and teachers to collaborate in learning partnerships. ATEN has the right classroom solution for you.

Trends in **Classrooms**

Convergence Drives Pro A/V Adoption

The increasing integration of AV and IT technology is driving advancements in classroom technology as well as accelerating its adoption. The use of AV is evolving rapidly in the higher-education space, but experiences vary widely, based on everything from budgets to the types of schools that IT managers work in. Despite some initial concerns about AV/IT integration in the market in terms of both cost and compatibility, the transition has shown to be positive, largely due to the increasing availability of more advanced Pro A/V solutions like those offered by ATEN.

In particular, video walls and intelligent digital displays are becoming an integral part of modern campuses, and solutions that incorporate these technologies – along with installation and design flexibility – are paving for the way for a parallel increase in adoption inside the classrooms themselves. This change is clearly reflected in the fact that educational institutions are allocating substantially larger budgets for AV systems. Another factor to cite is the ongoing simplification of the technology as classrooms move from legacy "one channel, one wire" AV solutions to a fully networked environment, which has in turned increased the reliability of systems by decreasing the number of potential failure points. And more advanced classroom connectivity solutions such as those offered by ATEN have not only made the integration of multiple video sources much easier for SIs, but increased ease of use for teachers utilizing the system as well as made it simpler for students to share and collaborate.

More Tech, More Devices, More Learning

The number of devices seen in the classroom has been increasing steadily over the past few years. According to a Futuresource Consulting report, sales of laptops, tablets, and mobile devices for the education sector grew 18 percent year on year from 2015 to 2016, and that growth is expected to continue. The trend is also helped by dropping prices for consumer electronics, making it much less costly for educators to incorporate devices such as integrated webcams, DVD / Blu-ray players, and HDMI inputs into the classroom. At the same time, educational institutions from the secondary to university level are becoming more open to letting students bring mobile devices with them into the classroom (BYOD).

These technologies afford teachers a wide range of platforms to share lesson content to students beyond traditional analog sources such as whiteboards. For example, interactive displays are being seen in more classrooms. These allow both students and teachers shared access to the learning space, and this interactivity encourages participation and discussion.

With the proper AV system in place, teachers now can use presentations, videos, or even content from student-brought devices to support the lesson topic. At the same time, technology also presents more ways for students to engage with learning materials in a personal manner, thereby making learning a more enjoyable experience.

Lecture Gives Way to Active Learning

The need for collaboration is a trend across all AV and control system sectors, and this is especially true in the realm of educational technology. Educators are have always needed to foster teamwork in the learning environment as a basic educational tool, but advances in classroom technologies have widened the scope of what is available to innovate and create environments that incorporate collaboration spaces inside of schools and classrooms.

In the traditional classroom setting, the teacher is the primary source of learning content, with students just receiving the information. New approaches to teaching such as blended learning or "flipped classroom" are changing this approach by having teachers record lectures for students to view before class so that class time can be dedicated to activities or projects. Meanwhile, using collaborative technology in the physical classroom itself allows teachers to share content with students in small groups or individually, and vice versa – students can "share back" text, polls, and even images from PCs or devices in the classroom.

This kind of active participation adds interest, maintains student focus and attention, and encourages more dialogue between students and teachers, creating a much more active, two-way learning environment. These approaches not only force students to think about the lesson materials, but motivate them by creating a closer connection with the content, which in turn inspires them to explore and share new ideas.

ATEN Classroom **Solutions**

ATEN specializes in the design and manufacture of high performance Pro A/V and control systems solutions, helping our customers in the education sector to find the most advanced and intuitive classroom solutions to meet their unique needs. ATEN classroom solutions include:

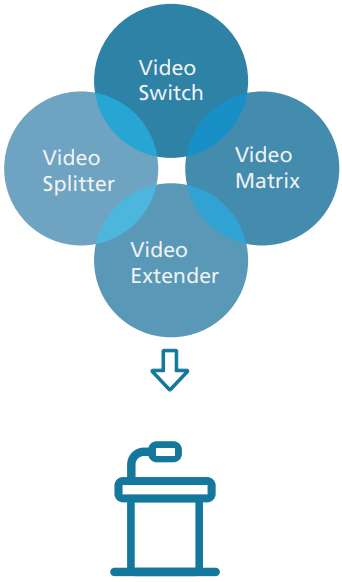
- Lecture Format Solutions (Matrix Switch, Switch, Extender)
- Interactive Learning Format Solutions (Modular Matrix Switch, Controller, Extender)
- 4K Scaling Format Solutions (Matrix Switch, Extender)

Classroom Devices

ATEN's Three Kinds of Solutions

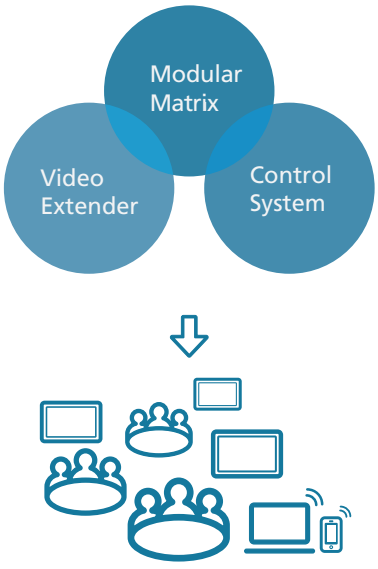
1 Lecture Format Solution

For simple and easy operation



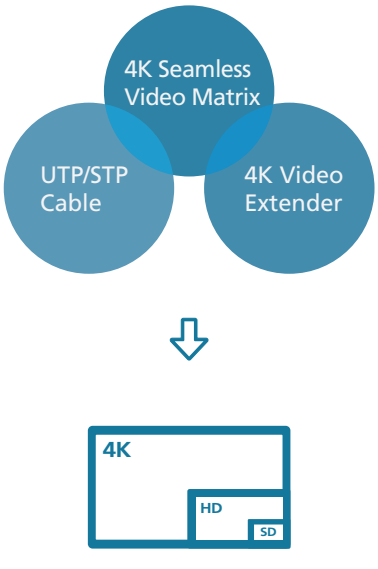
2 Interactive Learning Solution

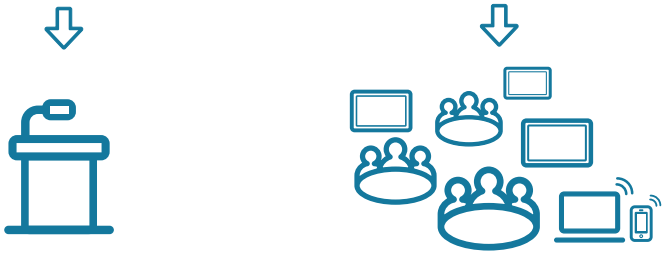
For interactive and collaborative learning



3 4K Scaling Solution

For multiple AV format and 4K image existing





ATEN Classroom Solutions – **Key Advantages**

ATEN's Seamless Switch™ Technology

Seamless Switch™ technology ensures the smoothest possible transition when switching between different video sources with no interruption to the class flow. Teachers can control and change content in real time with instant video switching to deliver full HD video powered by an exclusive seamless engine implemented at each output port.

Easy Control Over Integration

Intuitive control system allows integrators to install and manage without worrying about IP settings, programming skills, or device compatibility.

High Resolutions, Stunning Visuals

Deliver full-featured, attractive and elegant graphics, text, and video content in resolutions up to 4K DCI (4096x2160) and UHD (3840x2160) @ 60 Hz.

Various Sources and Display Devices

ATEN unique up/down scaling technology provides an excellent video experience in classrooms that require the highest possible quality.

HDBaseT™ Solutions

HDBaseT technology is optimized for classroom Pro A/V installations and provides a simple and cost-effective solution that combines uncompressed UHD video/audio, 100Mb Ethernet connectivity, USB 2.0, 100W of power and control signals over a single Cat6/6a cable; fiber and wireless extender solutions are also available.

Centralized Control

ATEN's innovative web control GUI empowers educators without a technical background to easily set and control any device in a classroom with an integrated Pro A/V setup, including projectors, TV, webcams, and lighting. The unique and intuitive interface is mobile device enabled (iOS & Android), allowing teachers to use a tablet or smartphone to control the system.

EDID Expert™

Selects optimum EDID settings for smooth power-up and highest quality display.

Classroom **Scenarios**

1 Lecture Halls

Lecture halls are large scale classroom settings and are used primarily for university classes. The importance of a lecture hall is that, first and foremost, it operates as a centralized presentation space to convey content information to as large an audience as possible all at once. Usually, the main presentation space incorporates a screen and large venue projector, while a secondary display can allow for dual content sources to be shown. Solutions that incorporate cameras into the space can also help to create a truly collaborative and engaging learning environment.

Challenges:

- Display content simultaneously in a large, centralized area
- Possess individual audio and video processing systems
- Cope with wide range of signals such as projectors, video conferencing systems, PCs, and DVD
- Allow presenters to quickly set up and switch between different content sources to save time

ATEN Suggested Solution:

HDMI Matrix Switch

HDMI HDBaseT Extender / HDMI Cat 5 Extender

4K HDMI Splitter

2 Active Learning Classrooms (ALC)

Active learning classrooms are specifically designed to provide both students and teachers shared access to the learning space and to enable them be interactive and collaborative, allowing students to share content from their laptops and mobile devices with the class-room. As active learning is a philosophy as opposed to a type of technology, the very best active learning classrooms have been planned from the start with this approach in mind. And well-designed spaces play a large part in the optimal usage of classroom technologies. For this reason, solutions that incorporate intuitive equipment and require minimal training are the most effective for this kind of technology-rich learning space.

Challenges:

- Simplify management of multiple devices
- Feature simultaneous displays that can switch between multiple sources frequently and without lag
- Provide multiple inputs and outputs and ability to centrally control content from anywhere
- Integrate different audio and video interfaces including legacy VGA devices

ATEN Suggested Solution:

- **ATEN Control System**
- **HDMI Matrix Switch with Scaler**
- **USB DVI Multi-View/Audio KVMP Switch**
- **HDMI HDBaseT-Lite Extender**
- **Power Distribution Unit**

3 Multiuse Learning Spaces (Lab)

Multiuse learning spaces (Lab) support several different types of classrooms, including blended classrooms, whole classes and small groups. This approach has come to be seen as much more rewarding than other classroom designs and solutions should be focused on providing a transforming learning experience and facilitating multiple learning modes such as flipped classrooms and even one-on-one learning. This kind of environment often features live demonstration and hands-on practice, requiring video displays to allow all the students in the room to be able to see the teacher's demonstration from anywhere in the room.

Challenges:

- Seamlessly switch between live-view camera feeds
- Integrate different devices with various interfaces
- Provide multiple input and output sources
- Provide highest quality video to ensure precise viewing of teaching content

ATEN Suggested Solution:

- **HDMI Matrix Switch with Scaler**
- **HDMI HDBaseT Extender / HDMI Cat 5 Extender**
- **3G-SDI to HDMI/Audio Converter**
- **VGA/Audio to HDMI Converter**

ATEN Classroom **Solutions in Action**

Lecture Halls

Lecture halls continue to be the most important facility on any college campus. Add to that a new generation of students who have grown up using IT technology, it's no surprise more and more universities across the world are investing considerable resources to upgrade their AV systems. Lecturers must use the systems to simultaneously display content such as presentations or videos in a large centralized area, which often includes multiple smaller displays (mirroring content) so that every student can see properly.

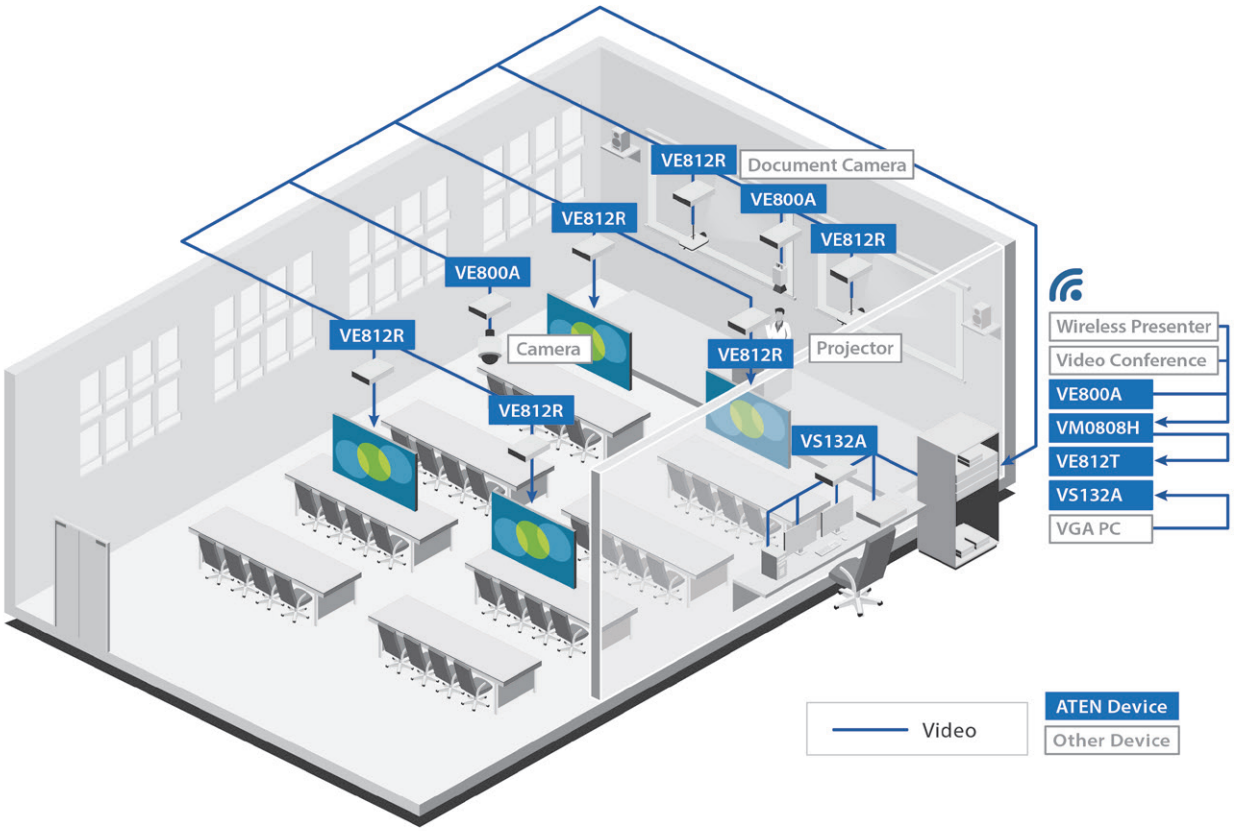
University, Japan

A major Japanese university was undertaking a project to upgrade infrastructure for education and research facilities in its newest building, which was completed in January 2009. This included a full makeover of the school's original AV system to transform the university into a truly hi-tech educational institution. They needed an AV solution to be implemented throughout all the large and small classrooms, conference rooms, and seminar rooms that could cope with a wide range of different signals going to every room.

ATEN Solution

Offered an advanced, simple, and cost effective way to send high quality HDMI content to any of the HDMI displays and switch seamlessly between them, allowing professors to start classes without wasting a moment.

VM0808H – 8x8 HDMI Matrix Switch
VE812 – HDMI HDBaseT Extender
VE800A – HDMI Cat 5 Extender
VS132A – 2-Port VGA Splitter



Active Learning Classrooms

Active learning classrooms take advantage of the latest IT technology along with that technology's high adoption level among younger students to encourage a new kind of participation in learning. Due to the high number of sources in this kind of classroom setting, installations will require multiple inputs and outputs as well as the ability to centrally control the content from anywhere. Solutions also need to feature simultaneous displays that can switch between multiple sources frequently and without any lag.

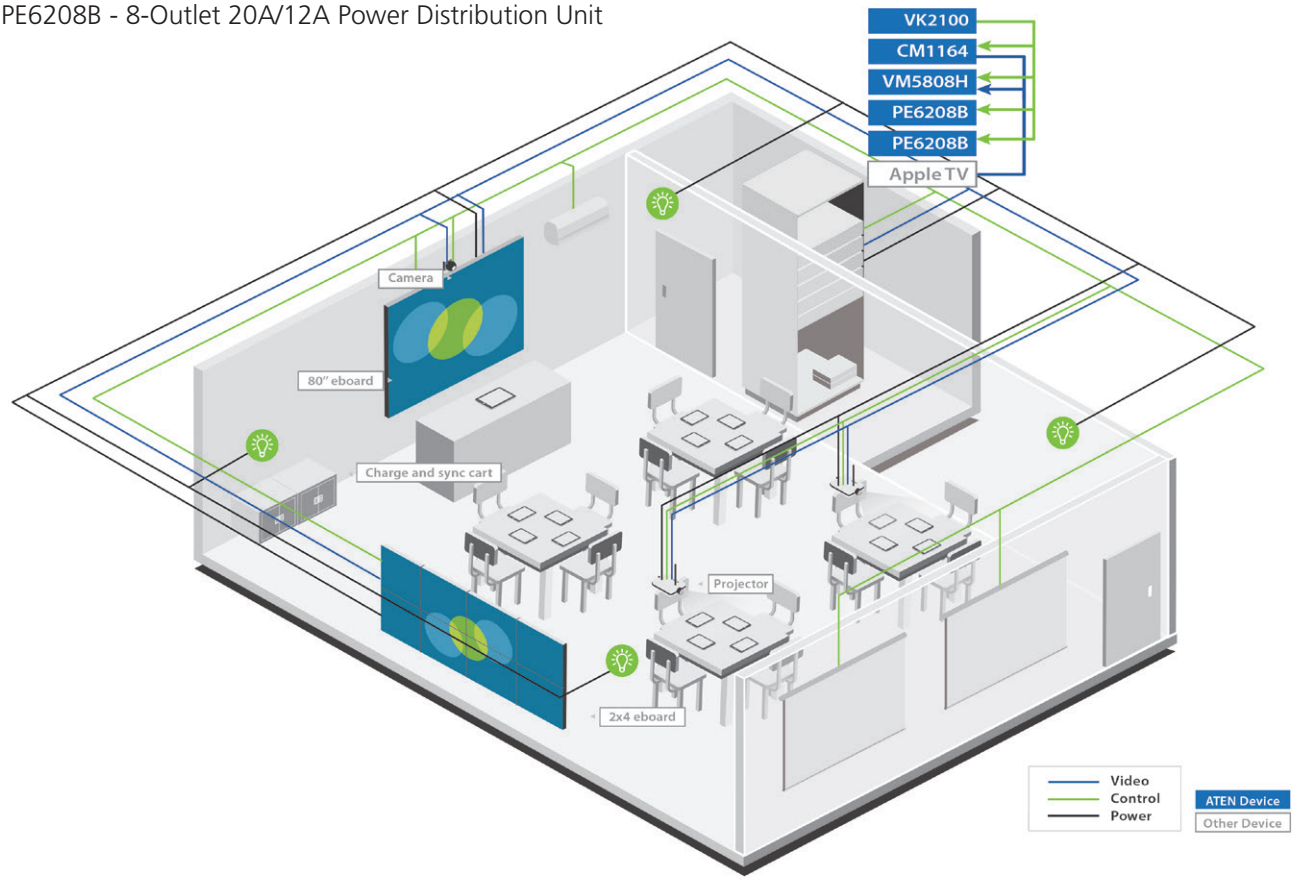
eFuture Classroom, Taiwan

Nan-Hu Elementary School in Taipei was looking for a major upgrade to its aging e-Future classroom. The school wanted to solve the device control issues presented by having multiple individual remote controls and deliver the best video quality while integrating multiple audio and video interfaces. In addition to improving the interactive learning experience, the solution had to provide a multi-view function for conferencing and long distance learning.

ATEN Solution

Provided simple, centralized control of the e-Future classroom from an iPad including everything from lighting to air conditioning to switching of predefined user scenarios that let students show their answers on a 2x4 video wall.

VK2100 - Control Box
VM5808H – 8x8 HDMI Matrix Switch with Scaler
CM1164 - 4-port USB DVI-D KVMP Switch
VE801 - HDMI HDBaseT-Lite Extender
PE6208B - 8-Outlet 20A/12A Power Distribution Unit



Multiuse Learning Spaces

The multiuse learning space is often used in specialized trades such as cooking that require students to observe teaching demonstrations precisely in order to replicate them. The high number of video monitors in this learning environment necessitates multiple input and output sources. And since students need to be able to view the teacher's movements with total accuracy, the video has to be of the highest 4K quality so that no details are missed.

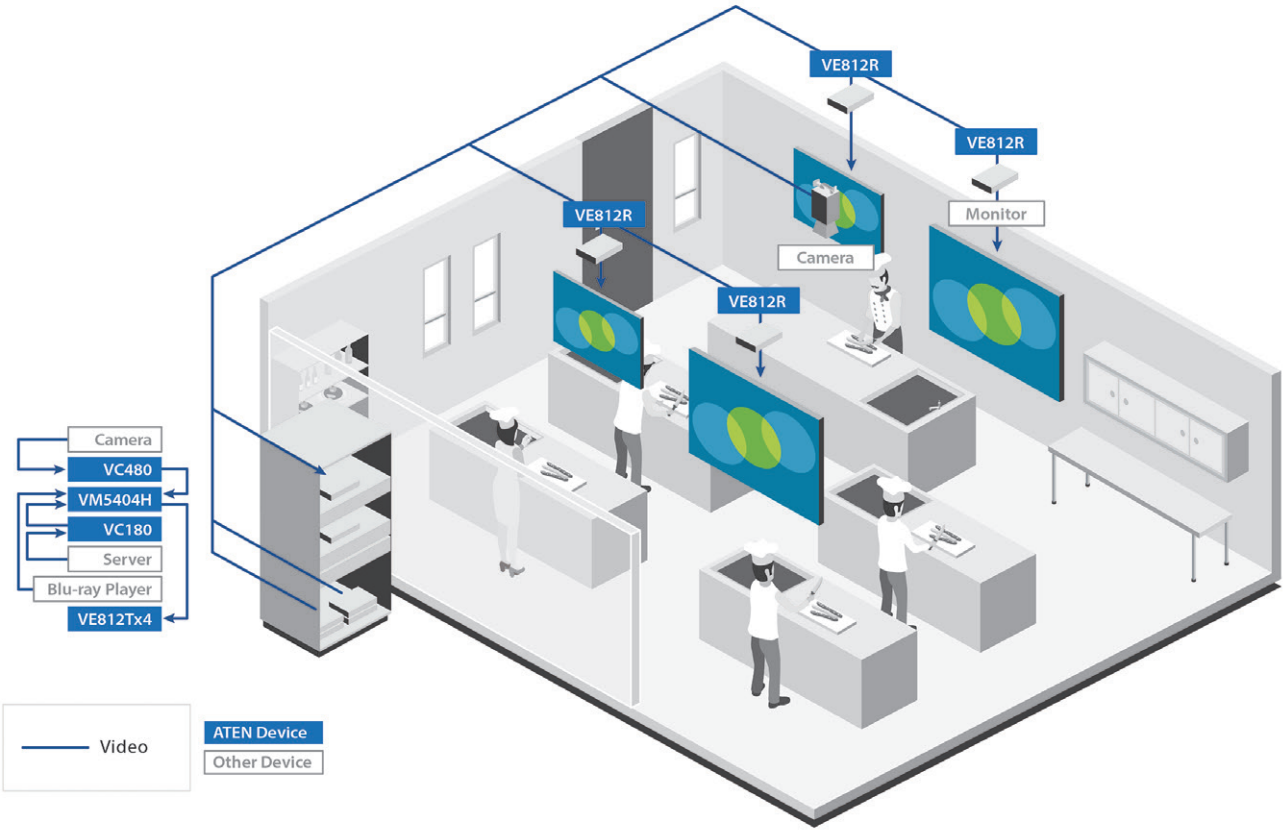
Cooking School, Japan

In order to enhance the teaching-learning experience, a cooking school in Japan decided to use cameras to transmit close-up video of what the instructor is cooking and broadcast it to monitors for students to see. The teacher also needed to switch to a real-time view of digital recipes, so a seamless switch between cameras and data on a PC was critical.

ATEN Solution

ATEN's Seamless Switch™ Technology provided ultra-low latency video switching for students to see everything without missing any steps while implementing HDBaseT™ extension technology that allowed the school to display long-distance video anywhere.

VM5404H – 4x4 HDMI Matrix Switch with Scaler
VE812 – HDMI over Single Cat 5 Extender
VC480 – 3G-SDI to HDMI/Audio Converter
VC180 – VGA/Audio to HDMI Converter



ATEN Featured **Products**

ATEN Lecture Format Solution

HDMI HDBaseT-Lite Matrix Switch
VM3909H

HDMI HDBaseT-Lite Extender with POH
VE802

HDMI Switch with Dual Output
VS482

ATEN Interactive Learning Solution

Modular Matrix Switches with Video Wall Processor
VM1600 / VM3200

Control Box
VK2100

HDMI HDBaseT Extenders
VE812/VE814

ATEN 4K Scaling Solution

4K HDMI Matrix Switch with Scaler
VM6404H

HDMI HDBaseT Extenders
VE812/VE814

ATEN
Simply Better Connections

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About ATEN

ATEN International Co., Ltd., established in 1979, is the leading provider of IT connectivity and management solutions. Offering integrated KVM, Professional Audiovisual, and Intelligent Power solutions, ATEN products connect, manage, and optimize electronics in corporate, government, industrial, educational, and retail environments. ATEN has 500+ issued international patents and a global R&D team that produces a constant stream of innovative solutions, resulting in a comprehensive portfolio of products available worldwide.

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