www.tvbeurope.com

TVBEurope

NewBay

TVBEurope Supplements

August 2017

The power of logical broadcast control

Simplicity is the key in delivering against high production demands.

But simplified control doesn't have to mean simplified creativity - in fact, a well-designed system can add greater flexibility and offer unforeseen benefits

In association with

TSL Products

Supplement

in association with TSL Products

Using smart automation for broadcast control

TSL Products

Consumers expect seamless high quality from broadcasters. They are also increasingly demanding in production values: where once a single camera would suffice, now there is an expectation of multiple cameras, graphics and effects. And this is happening in an environment of increasing budgetary pressure.

If we look to other industries, we see a reliance on automation, particularly for repetitive tasks. It releases staff to carry out the creative and management work. In some areas broadcast has already adopted automation: channel playout, for example. But there are many more areas where smart automation could make operations slick, professional and cost-effective.

The vast majority of broadcast devices have an established and proven control layer. This is independent of the signal path, so it does not matter if you have legacy SDI equipment, IP-connected equipment, or a mixture of the two. Here we are just talking about control.

An obvious example is a production switcher. The control panel may have literally hundreds of buttons, but the connection from the panel to the electronics rack will normally be a single ethernet cable, rather than a very fat multi-core. System control is in software.

The software control layer in multiple devices has been used for playout automation for decades. A central computer issues commands to the server, the switcher, the DVE and the graphics device to make things happen with frame accuracy.

New applications

It is easy to identify other applications where a single system controller could operate multiple pieces of equipment to perform complex tasks. You might want to control remote studios from a central location, for example, with the cameras, lights, microphones and graphics all under one user interface.

Given a sufficiently intelligent logic layer in the controller, and the ability to design appropriate user interfaces, then it is perfectly possible to hit our first target of seamless high quality. There is no reason why a simple unified control system should not deliver the professional output that we expect from fully equipped studios.

But to return to consumer expectations, we should not be trading convenience for creativity. What we should be seeking in a well-designed control solution is the capability to put more functionality under a simple and intuitive user interface, to create greater flexibility. We could make the remote contribution system multi-camera, for example, putting the camera matching and switching at the location but controlled from the central facility.

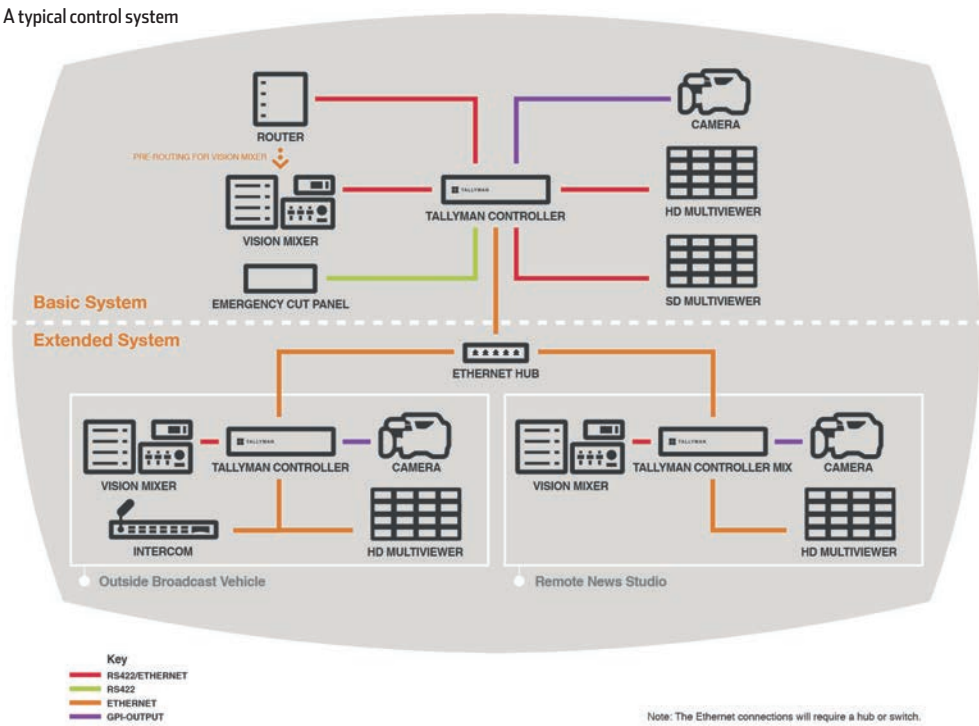
The control layer should also link devices together to further simplify operations. Graphics lower thirds use standard templates with the details entered through the user interface. The captions can be linked to cameras or manually cued. Given the ability to create appropriate control surfaces, a unified control system can ensure creative production freedom and the highest technical quality.

Cost efficiency

Along with reliability and high production values, achieving tight budgetary constraints is vital. The most obvious way to do this is by keeping experienced staff engaged in useful, productive and interesting work as much as possible. If we can eliminate repetitive tasks the work will be more fulfilling; if we can achieve high utilisation of staff we will control operational expenditure.

This can be accomplished through a powerful,

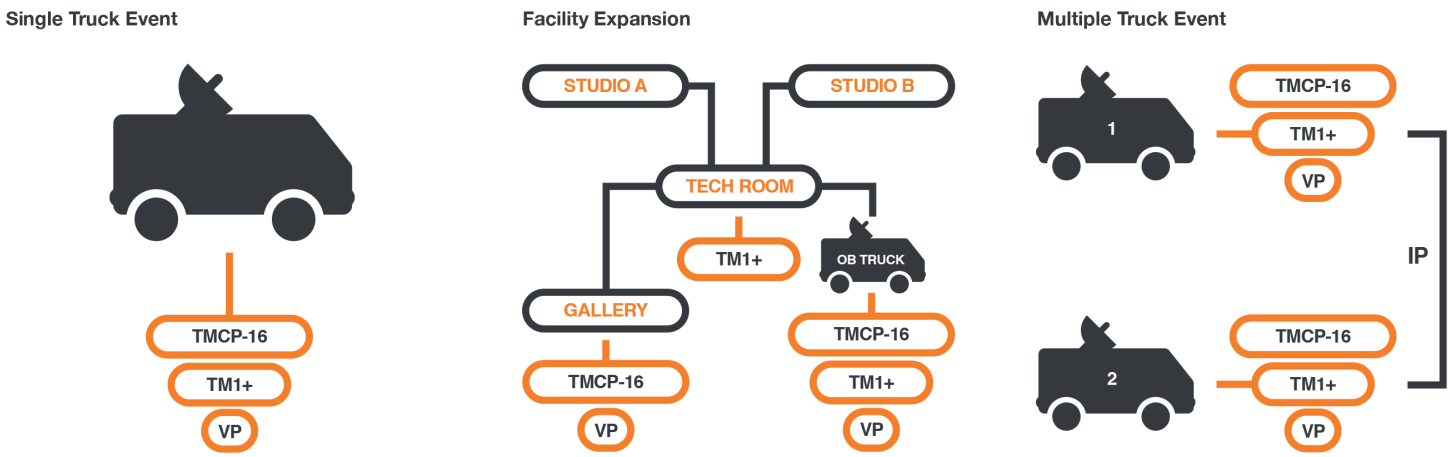
A typical control system



in association with TSL Products

Supplement

Intertruckability



Standalone truck
The TM1+ is the ideal system-in-a-box"

Dockable trucks
Maximise up-time and manage variable demand by simply docking trucks to larger broadcast facilities seamlessly as needed. Delegate control and information while minimising setup time.

InterTruckability
For larger events TallyMan systems quickly and simply interact to share all device information, managing names, control and tally across systems.

Signal patching is reduced as tielines become dynamic, naming problems are eliminated and logic patching is performed virtually.

extremely easy to use unified control system with a control layer capable of anything from direct router control to the creative management of live remote productions or configuring complete outside broadcast trucks at the touch of a button. Its user interface design toolkit should be remarkably simple to use and allow you to customise virtual panels for every user.

Logic

By grouping multi-level actions into a single, simple control surface, you achieve the goal of high production values with low operational costs. The same ability to group actions ensures you reduce errors. By defining the controls you offer the operator, you define what each individual can do. If you want someone to switch cameras but no more, then just give them the direct camera controls: cut or mix; maybe pan, tilt and zoom. Hide more sophisticated control, like black and white balances, ensuring the operator cannot get distracted or make unrequired changes.

Central to a successful control system, then, is the logic engine. This must support complex, multi-stage dependencies defined by the system architect, while at the same time be readily understood. It is far better for the logic to be defined by the facility's engineer rather than relying on the vendor, because the engineer will have a better understanding of the needs of the overall system and its operations.

The system should be supplied with a comprehensive set of APIs covering all the equipment likely to be controlled. So at the logic engine level the designer does not have to worry about specific commands, simply what needs to be controlled. The system should also support common standards such as SNMP for monitoring and control.

Once you get a feel for what can be achieved with a coherent control system, more and more applications suggest themselves. A simple system might configure a router and monitor wall. Sources could be identified in under-monitor displays, and outputs fed to lines, servers and loggers. Selection of incoming lines could also steer satellite downlinks.

A playout centre could need regular reconfiguration, perhaps with a night shift taking on more channels from the same room. Build the configurations into the logic engine and all you need is a single button press at shift change. The duty engineer would have the ability to drill down to look at the details of the configuration and make any changes that might be necessary.

Outside broadcast operators use the Control Sytem to configure their trucks. One key press sets all the routers, production mixers, monitor walls and video servers, putting the right names and tallies on the UMDs. For very large events requiring multiple trucks, then the system installations in each truck can talk to each other, passing routing information from truck to truck, for example.

Control surface

The logic design is the first level of implementation. On top of that sits the user interface. Here the challenge is to make it as clear as possible, which often means making it as familiar as possible.

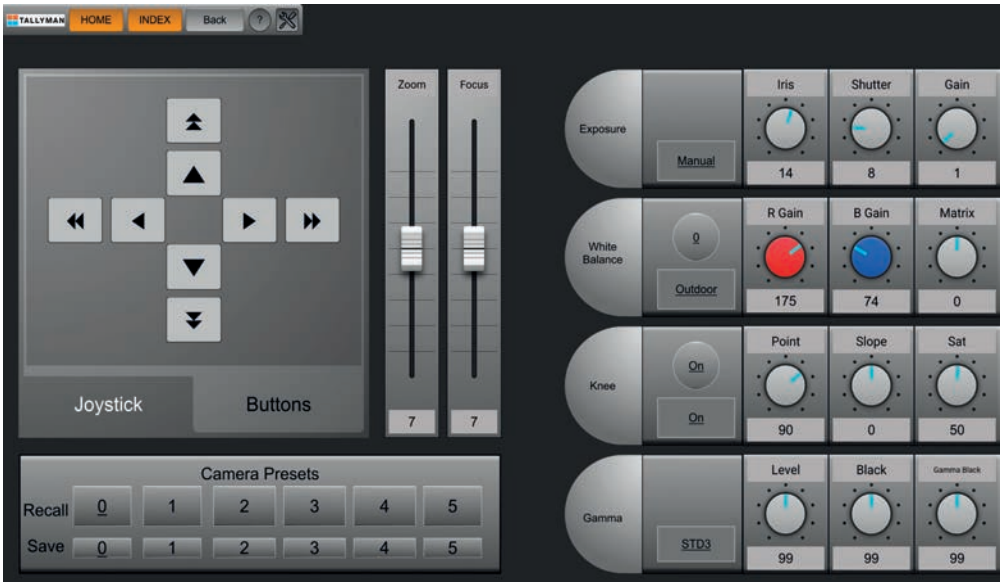
So you may have a complex routing network that involves multiple switches, perhaps format conversion and audio-follow-video, and SDI and IP connectivity. But for many users, the best way of controlling it is using traditional router control: a 1U panel with buttons for source and destination.

When you are bringing together more complex operations, though, then there is the opportunity to move away from multiple conventional control panels and just put the functionality you need on a single screen, or maybe a couple of linked screens. So there is a need to design user interfaces exactly the way you want them to look, to support as many interface screens as you need, to link them where necessary, and to control access to them so that users can only access the controls relevant to them.

Broadcast operators, though, are used to tactile control, pressing buttons and moving faders to do what is needed. While it is impractical

Supplement

in association with TSL Products



and inflexible to build hardware panels for every application, it is perfectly possible to create touch-screen applications to achieve a good mimic.

Via a user interface designer which includes a complete library of graphics, the system engineer can determine what functionality is required and chooses a control for each. The control elements are simply dragged and dropped into place on the design screen. Where you need repeated elements – screens in a monitor wall, for example – you drag a list of destinations and it is automatically formatted into the array of buttons.

Alongside buttons, the graphics library should include rotary controls and linear faders. These respond with virtually zero latency, allowing the operator to make very precise adjustments as required. All on-screen controls are dynamic, changing the legend and the background colour to respond to settings.

Not only should the layout of the screen be completely customisable, the background and surrounds of the screen should be determined at the time of design. You might have a common user interface for a number of remote studios, for example, with a different background colour to make it immediately obvious where you are. You could even put graphics into the background, for example to show where the studios are geographically located.

If you want to go beyond the supplied graphics, then you can create your own controls, or add logos, simply by creating them in a standard software in common formats such as SVG and PNG and dragging them in to your design.

Best of breed

The need to provide simple, co-ordinated control has to sit alongside the need of the engineer to build systems which match requirements. Broadcast facilities have traditionally chosen best-of-breed equipment, which can be translated as the right balance of functionality, quality and cost for each application.

Each of the individual components which make up a complete functional system is likely to have its own control panel. The traditional approach is to mount all of the panels onto a desk and trust that the operator can find a way around it in the heat of a production.

As a solution, this fails on all counts. Each device's control panel is likely to offer access to all functionality, so there is a risk of adjusting a control in error: initiating a camera white balance, for example. So quality is at risk. Equally, it is operationally complex, requiring more training and experience from staff. Finally, it increases the system cost, because each of those control panels has to be bought, installed and cabled.

The solution is to provide the single point of contact for all devices. To do this, it has to understand how to talk to each system.

Vendors will have developed APIs for their devices. Because TSL Products is an independent company, generally not in competition with the manufacturers of cameras, switches, graphics and so on, the industry feels comfortable in providing those APIs and other interconnectivity information.

More important, where there are issues with those APIs, then TSL Products is able to raise the matter with a reasonable expectation that it will be heard. There may be a function, for example, which is not envisaged by the developer of the point of release but which would be useful in a unified system. A direct way of initiating the function could be added to the API to simplify the interface.

Future formats

One of the great benefits of having an overall, coherent, unified control layer for broadcast hardware is that you can retain exactly the same operations – without moving a single button – while the underlying technology changes. It also means you can use the technology in unusual and complex ways without disturbing the operator.

With interest growing in Ultra HD, already some facilities are experimenting with 4K production. Such signals need to be routed, evaluated and monitored. In an IP-connected facility this is not a problem, but in the SDI world it is.

While some vendors are proposing new ways of handling 12 gigabit per second SDI signals, for many facilities 4K video is best handled as four HD-SDI signals. This requires four paths through a router, to be switched in synchronisation.

Using TallyMan, it is simple to set up a set of rules to handle 4k signals. Not only will a 4k source be automatically routed through four ports of a router, but the same click on a TallyMan control surface will also ensure that it is only routed to a 4k destination, or it is sent via a down-converter on its way to an HD device.

The goal of such a design is that the operator does not need to think through the implications of handling 4K signals, but carries out decisions and operations in exactly the same way that an HD signal would be handled. If you select a source and want to see it in a specific position on a multi-viewer, for example, you set it up on the control panel and it will appear, whether the source is SD, HD or 4K, passing through internal and external converters as needed.

Transition to IP

The principle of the operator performing the same, perfectly logical actions, whatever the underlying technology also applies as infrastructures move from SDI to IP. You establish the technology and operational practices to give you the best possible way of working. You want that to remain even if you change some or all of the processing hardware.

Research suggests that one of the brakes on the transition to IP-connected, software-defined technology is the potential for disruption

in association with TSL Products

Supplement

during the transition. Good economic practice means that you want to replace key hardware only when it is life-expired, according to earlier capital purchase decisions. That means that, in an ideal world, you want to replace your systems piecemeal, as you have in the past.

Vendors supplying the underlying technology platforms will have strategies about interfacing between SDI and IP kit, but that is essentially a one-off problem for the system architects. A much more pressing, day-to-day issue is that you have operational staff and they know how to carry out the business of television creation and delivery. You do not want to risk your outputs and therefore your revenues because the practical workflows have changed and are therefore more prone to operator error and technical failure.

By isolating the control from the underlying technologies, it is practical to replace the hardware without changing the operation. Provided there is an API route into the new, software-based device, then the system engineer can adjust the logic and present operations in exactly the same way, without even the need to change the control panel.

Vendors of software-based systems will themselves talk about systems orchestrators, providing the control path. But as with traditional hardware, the independent approach allows engineers to continue to choose best fit solutions from multiple vendors, further underlining the independent approach of TallyMan.

Commercial benefits

There is much debate in the industry about the move from a capital expenditure basis, built on large, expensive hardware architectures, to an operational expenditure basis, relying rather more on software licences. Competing voices argue in favour of capex and opex, but in truth media businesses prefer to minimise their expenditure either way, and chief engineers tend to get tasked with achieving more while simultaneously saving money.

A unified control system delivers both capex and opex savings, and sits equally comfortably within a traditional environment, a software-defined architecture, or a hybrid transitional system.

In terms of capex, TallyMan offers the ability to reduce the amount of hardware you need to buy. Most obviously, you minimise the number of operational control panels you have to purchase and install, as any functionality on any controlled system can be managed from TallyMan's unified control.

Further, you can potentially reduce the number of systems you need, where you can share technology between multiple locations. You might have four occasional use remote studios, each fitted with multiple cameras. But you only need one set of camera control equipment, production switcher and audio mixer at base, managed through the unified control system and switched to the appropriate studio when it is required.

The simplification and centralisation of control, even in complex production environments, is a major contributor to savings in opex. By putting just the appropriate amount of control under the hands of a single operator you inherently reduce staffing levels, and minimise reworking through errors.

The operational staff also have more time to undertake different tasks. To look at the remote studio example again, if it is needed for a five minute interview then the operator will need to be working with it for no more than 15 minutes. Compare that with the need to send staff to the remote location.

Remember that this is just the control layer. It provides simple and intuitive operations, whatever the equipment under control. As the facility moves from traditional broadcast hardware to a software-defined architecture (and possibly from capex to opex) the control layer does not change. Staff do not need to be retrained: the operation still looks the way it always has.

The commercial case for unified control is strong. It allows production values to rise while limiting the need for staff to be retrained and to devote time to complex operations. ■

Supplement

in association with TSL Products

Case study: control for nation-wide remote production

TallyMan, as a long-established control system in use around the world with major players including BBC, CCTV, SABC and Globosat, solves issues from a simple routing and monitoring requirement to automating complex workflows in large facilities and quick reconfiguration of fleets of outside broadcast trucks.

Due to its highly configurable structure, TallyMan can be individually set up to specific requirements - such as establishing a set of news contribution studios around a national network as required by a major international broadcaster.

The customer wanted to allow correspondents and interviewees to appear without the need to travel to the home base. Traditionally such studios would require staffing, even if they were only used occasionally. The broadcaster wanted them to operate unstaffed, yet still deliver full broadcast quality and control.

Working in close partnership with our customer, we devised a solution to control every aspect of the remote studio, from working lights to camera shading, so that an operator need only open one screen on a controller to be able to setup the sound and vision.

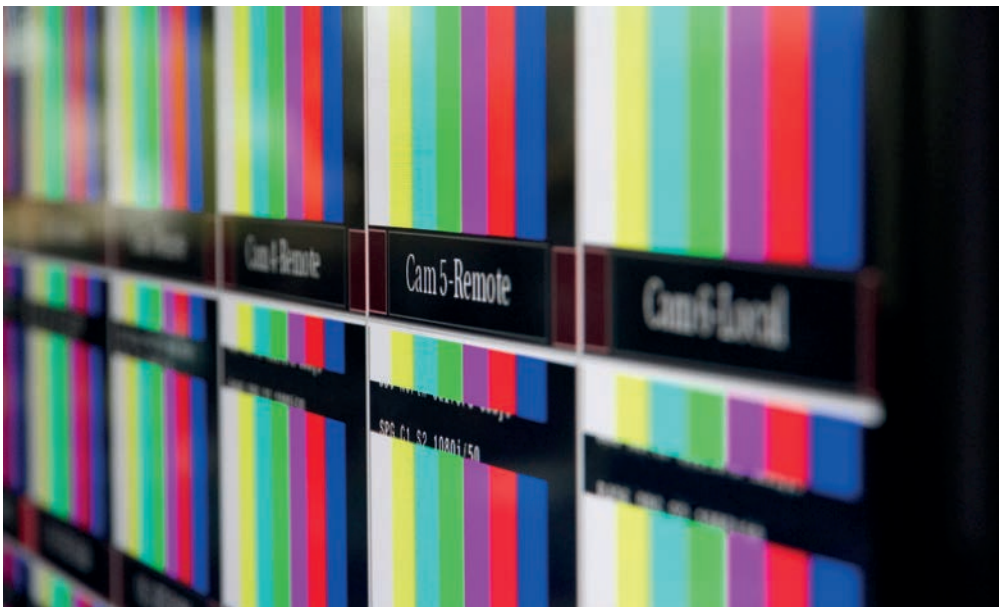
Simple keys on the touchscreen allow the studio to be set for one or two guests, adjusting the lighting and positioning remote cameras as appropriate. Talkback routing is set automatically, and production sound can be routed to earpieces as required.

In production, the pan, tilt and zoom of the cameras is adjusted to suit the guests. Video or graphics are sent from the central facility to in-vision monitors in the remote studio and colour corrected. Cameras are switched from buttons on the touchscreen, and virtual linear faders control the microphone levels.

Once the interview or piece to camera is recorded and the visitors leave, the controller and all central equipment is released, to be used by another studio.

In this way, sophisticated multi-camera studios can be operated, entirely remotely. Rather than sending an operational team to the remote location, a single operator uses intuitive controls on a panel designed for the application. The result is that production values are increased, costs are controlled and staff focus on productive, engaging tasks.

Q & A with Dan Bailey, Product Manager, Control Systems



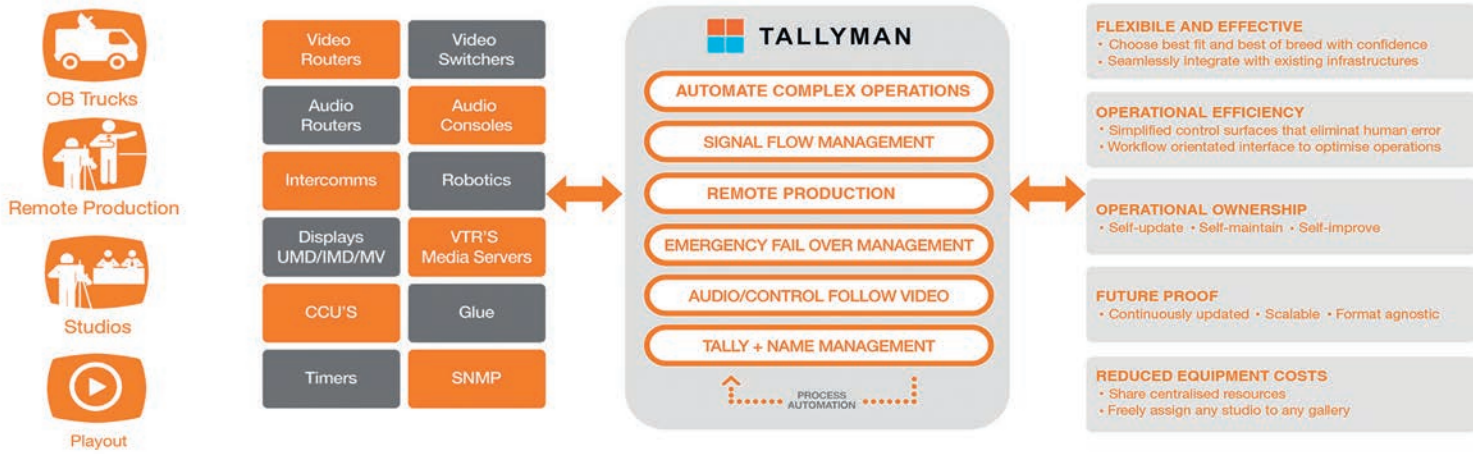
Why add a control system when all equipment already comes with controllers?

The primary reason is to simplify operations and broaden the reach of operators. In a broadcast centre you frequently need to perform tasks that involve a range of equipment acting in unison. The two most powerful capabilities of of a control system are to fully automate background operations, removing the need for user input and to reduce complex user tasks to a single press of a button, physical or virtual, to allow the operator to concentrate on the production not on the mechanics.

Controlling a range of equipment from a single control surface, whether physical or virtual, frees desk space and brings everything within reach, making operational areas tidier, more compact and easier

in association with TSL Products

Supplement



OVER 1,000 INSTALLATIONS WORLDWIDE

to understand at a glance. The need to instruct new operators on different control interfaces from multiple vendors is removed and risk is reduced considerably. Training new operators becomes quick and easy with an interface created with their specific role, priorities and capabilities in mind.

Does the decision to use TallyMan control limit your choice of equipment?

It was very important to us when designing the system that there should not be any limitations on the systems it will work with. Legacy equipment should all be supported, and any choices for future hardware should not be constrained.

One of the advantages of TSL being an independent company with a background in systems integration is that we are known and trusted by all the vendors in the industry. We have already built APIs for the commonly used equipment into the TallyMan platform, and we readily add new interfaces as they become available.

The key feature is that it is a completely vendor agnostic system. There is no restriction on your choice of sub-systems.

Does TallyMan need a lot of consultancy and support during installation?

This comes down to the choice of the user. The heart of the system is its user configurable engine. Documentation is targeted towards self-configuration and our online resources describe third party interface configuration with common hints and tips for new users. World-wide a large network of System Integrators provide expert TallyMan configuration and support, installing and maintaining powerful systems for many years. The majority of our customers configure and maintain their own systems but for those who would prefer to have the system installed we provide full consultation, configuration and training. Support is available via email, phone and with remote connections.

Built into the system is a very simple, drag-and-drop user interface designer. Most users create their own control screens, often customising the look to match their corporate identities.

What controllers are available?

Hardware control panels, with dynamically assignable buttons and rotary encoders are available and are the right choice for many applications, particularly when switching or monitoring.

Virtual control panels with their user-friendly interface designer allow you to import your own graphics, and drag and drop controls and monitors, to tailor the screen to the location. These can be controlled by keyboard, mouse or touchscreen and provide intuitive interaction with the system.

What hardware is required?

The system database and engine are housed in a small, 1RU dedicated rack-mounted box provided by TSL. Dependent upon the scale of the installation, additional controllers share work load and extension chassis provide additional IO. The back panels have ethernet, serial ports and GPI to connect to any remote equipment.

The 'plus' models incorporate dual hot-swappable power supplies for on air applications and isolated relays for areas where power and grounding are uncertain such as Outside Broadcast vehicles. The database and logic settings are stored in non-volatile solid state memory for very high reliability.

Does the system support open standards?

TallyMan is a control layer and does not handle signals directly but controls the devices using those signals. Where open standards include a control layer this is implemented in TallyMan; where the standard does not include a control layer, direct comms are established via the target devices own API to inform it how it should be managing its signals.

How does it support the transition to IP?

TallyMan operates similarly whether the individual products it is controlling are handling IP video and audio or baseband. It simply controls how they operate and how they interconnect.

As such, it is an ideal choice for the transition to IP, because it allows operators to continue to use the same workflows as they always have done, regardless of whether the hardware beneath the control actions is SDI or IP.

What are the business benefits of TallyMan?

It ensures high quality output by reducing errors, since the operation is simplified and tailored to the specific user.

It drives production values up, because greater functionality can be controlled, and automated where possible, under the control of a single operator.

And it reduces costs, in terms of installed hardware which can be shared between multiple users and allocated as required. It also reduces costs by allowing operators to concentrate on creative, productive work and eliminating dull and repetitive tasks.

Finally, in many installations it reduces the capital expenditure by eliminating the need for dedicated control panels for every device, with the consequent saving of desk and rack space.

TALLYMAN

Simplify Complex Workflows

- Maintain seamless, high quality production values.
- Cost control and release human resources to tasks that matter.
- Automate reptitive, mundane tasks across workflows.

OB Trucks

Remote Production

Studios

Playout

Third Party Integration

TallyMan is supplied with third party protocols that allows you to choose best of breed and best fit with confidence and integrate seamlessly with new and existing systems.

Powerful Control Engine

Built using a powerful built-in logic engine, TallMan takes the efficiency found in automated systems and multiplies it to dramatically reduce production costs.

Intuitive Design Interface

Fully customisable user interface enhances operational workflow to bring flexibility to outside broadcast and transmission facilities worldwide.

Used in over 1,000 installations worldwide.

Contact our International Sales Team today to find out more:
www.tslproducts.com/wheretobuy

E: enquiries@tslproducts.com | T: +44 1628 564 610 | f in

TSL Products