Powerful personalized control solution for demanding workflows.

The NV9000 router control system from Grass Valley, a Belden Brand, is the most broad and application-specific system available, offering efficient control paradigms that help operators execute signal routing fast and error free from a highly resilient router controller platform.

The NV9000 panel series includes a wide range of highly adapted panels for superior control. The panel range includes informative and easy to use LCD readable panels, multidestination panels, multimode button per source panels, destination/source (XY) panels, and the powerful RCP-200 smart panel. The Grass Valley panel series is the most comprehensive line of panels meticulously designed to optimize various workflows for the fastest and least error-prone operations, as well as providing multiple options that accommodate cost and restricted space requirements. Connected via Ethernet, these panels not only complement the NV9000 control system, but work equally well with our new GV Convergent SDN control systems.

The NV9000 control system offers a selection of two controllers. A 2 RU enterprise range controller, the NV960 is predominantly used in TV stations and larger installations, and the NV920 compact 1 RU redundant controller is perfectly suited for truck applications. Both controllers offer outstanding robustness, and extremely flexible control to address different facility workflows, even in the most complex facilities.

With outstanding durability and performance, the NV9000 protects your investment over its long life. The controllers also offer highly effective bridging with legacy third-party routers and their control systems for an easier transition to a next generation routing switcher.

A high level of integration with multiviewers and signal processing, as well as production switchers, master control switchers and tally systems, contributes to productive facility operations.
NV9000 Control System

KEY FEATURES

Flexible routing system architectures
- Scalable from small to very large systems
- Supports up to 400 control panels and up to 64 routers per system controller
- Virtual panels provide control from any network PC
- Centralized or distributed router architectures connect via Ethernet

Simplified configuration
- Dynamic changes without system restart for many parameters
- Offline configuration as well as data import and export
- Powerful relational database management so configuration data only needs to be entered once
- Source and destination device aliasing supports multiple name sets

Wide selection of control panels
- XY, multidestination, multimode, LCD relegendable
- Hardware and software versions

Facility-wide router integration
- Rich integration across a facility, with multiviewers, signal processing, production switchers, master control switchers, audio consoles and tally systems — including third-party equipment
- SNMP support

Legacy router integration
- Control system allows simpler, incremental path to 3G/HD routing from third-party legacy router infrastructure, with phased transition to NV900 control

Looking to the future
- Built on Microsoft Windows 10 operating system, provides security and management tools that are familiar to IT managers, including Windows Defender and the latest Microsoft service packs
- Streamlined code base for faster system response times and additional performance stability
- High performance operating system platform for future development

The Most Advanced Control System

Powerful Control Hardware
Grass Valley offers two choices for enterprise-class NV9000 controllers:
- The NV920 can be either a single or dual redundant controller in 1 RU, perfect for all applications in which rack space, low noise and low power/heat considerations are paramount
- The NV960 controllers are 2 RU servers designed for maximum network and router/panel capacity for complex, multi-router/multi-control system applications

Dual redundancy options for both controllers provide hot-standby, mirrored redundancy with live router event logging for continuous, fail-safe operation in the most demanding environments.

Instant Recall Of “System Snapshots”
To improve productivity in production control rooms, the controllers allow saving and recalling of “system snapshots,” which capture the current NV9000 configuration, as well as the current state of the crosspoint image in all the routers in the system. This allows an operator to save configurations for specific productions, and then instantly re-load them when they are required for the next production.

Flexible, Versatile Architecture
Grass Valley NVISION routers offer outstanding control flexibility, and can be configured for centralized or distributed operations. In essence, the system can be readily adapted for different workflows and administration requirements.

The NV9000 control system leverages the power of the Grass Valley Hybrid Routing architecture that offers the convenience of integrated audio processing and simplified cable management with no compromises on reliability.

Advanced Tally Management
The NV9000 control system offers advanced tally management with production switchers and monitor wall systems in control rooms. The system also provides rich integration with third-party tally controllers.

Advanced Tie-Line Management
The system can be configured for very large systems, with up to 400 control panels and up to 64 routers per system controller. Complex interactions with multiple routers can be configured using advanced multi-hop, tie-line management abilities.

Advanced Relegendable NV9000 Control Panels
A wide array of control panels is available to address the workflow requirements of different operator positions, including software panels, hardware panels, and new relegendable LCD panels. These panels can all be mixed-and-matched to suit individual station requirements.
NV9000 Control System

NV920S

1 RU single module controller, frame, dual power supplies

The NV920 is a 1 RU enterprise-class box that can be configured to be either a single or a dual NV9000 controller, all in a single 1 RU package. The NV920’s compact design is a great choice for most router control applications, but is ideal for applications in which space and power efficiency is a major concern, like in mobile broadcast and production environments.

NV920D

1 RU dual module controllers, frame, dual power supplies

The NV920 hardware is purpose-built for demanding broadcast applications that require redundant power supplies, service from the front capability, and flexible configuration. The NV920 includes three TCP/IP Ethernet ports per controller, and can support up to 300 control panels, and up to 32 routers.

NV960/NV965/NV967 Router Controllers

NV960

2 RU single CPU controller, dual power supplies

NV965

4 RU dual CPU controllers, each with dual power supplies

NV967

5 RU dual CPU controllers/power supplies and NV9700 remote diagnostic and change-over panel

The Grass Valley NV960/NV965/NV967 router controllers are configured to meet the requirements of the largest and most demanding multirouter, multinetowrk grided broadcast facilities. Featuring six TCP/IP Ethernet ports per controller, the NV960/NV965/NV967 controllers can support up to 400 control panels and up to 64 routers, and the system can be expanded by adding additional router controllers, either as redundant units or router expansion controllers.

The NV960/NV965/NV967 are equipped with redundant power supplies, and speed controlled fans. Front access hard drive for fast repair.

The NV960/NV965/NV967 system controllers are available as a single 2 RU controller, or as a dual, 4 RU redundant control package (order model NV965). With both controllers running, one acts as a primary, and the second as a backup. Both are kept updated with current router status at all times.
NV9700

Remote diagnostic and change-over panel

Physical:
• 1 RU panel

Functional:
• Monitor health and status of redundant NV960 system controllers
• Visual and audible notification of a system fault
• Interface with third-party facility alarm and monitoring systems

Best use:
• Mission critical routing control systems requiring redundancy and health monitoring

Router status monitoring with Web Suite

The Web Suite software tool provides a real-time overview of your routing statuses. It can track statuses of up to 2,048 destinations over 32 levels. Based on HTML-5, Web Suite can be run on any compliant browser with makes it very convenient for troubleshooting over your mobile devices or from anywhere with a simple network access. Web Suite is the perfect tool to monitor your complex routing system with tie-lines and resource management functionality.
Router Control System

NV9000 software includes a comprehensive configuration utility for the NV9000 router control system which offers efficient building and management of router configuration data. The software uses a powerful relational database that effectively manages small and large system configurations. Because you can work on a configuration offline, you don’t have to be connected to the controller to prepare configurations. The software is simple and allows fast configuration of multiple controller instances in parallel.
The NV9000 is a complete and agnostic router control system that fully supports any of the NVISION control panels and all Grass Valley routers, as well as interfacing with the most popular routers and control systems in the market.
### Quick Comparison Chart: Router System Controller

<table>
<thead>
<tr>
<th>NV9000 System Controller Feature Comparison Matrix</th>
<th>NV920 series</th>
<th>NV960/NV965/NV967</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet control of NVISION routers</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Virtual levels, level sets</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Category/index/suffix device selection</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>User IDs, Panel naming</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Free source</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Sophisticated machine control router support</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Source master</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Broadcast</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Manual/Semi-automatic/Automatic</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Lock/Protect/Release/Force Release</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Chop</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>System salvos</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Local salvos</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Multiple source devices on a port</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Logging</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Source device aliasing</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Serial control on NVISION routers</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Third-party router control</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>ES-BUS and Pro-Bel interfaces</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>TCP/IP and NVISION serial protocol interfaces</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Support for NV9660 and the QMOC</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Control and status GUIs</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>GPI interfaces</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>PIN number access control</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Multidestination control surfaces</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Previous source</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Optional Tie-line support</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Multiple destinations on a port</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Virtual crosspoints</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Remote monitoring and SNMP</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Persistent logs</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Dynamic device renaming</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Maximum number of routers</td>
<td>32</td>
<td>64</td>
</tr>
<tr>
<td>Maximum number of physical levels</td>
<td>150</td>
<td>250</td>
</tr>
<tr>
<td>Maximum number of virtual levels</td>
<td>256</td>
<td>512</td>
</tr>
<tr>
<td>Maximum number of devices</td>
<td>16,384</td>
<td>32,768</td>
</tr>
<tr>
<td>Maximum router size</td>
<td>Supports maximum NVVISION matrix size</td>
<td>Supports maximum NVVISION matrix size</td>
</tr>
<tr>
<td>Maximum number of system salvos</td>
<td>255</td>
<td>255</td>
</tr>
<tr>
<td>Number of commands per system salvo</td>
<td>2,048</td>
<td>2,048</td>
</tr>
<tr>
<td>Maximum number of panels</td>
<td>300</td>
<td>400</td>
</tr>
<tr>
<td>Kaleido multiviewer integration</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Imagestore IS750 integration</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Imagestore-Modular integration</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>TCP/IP network ports</td>
<td>3 per controller</td>
<td>6 per controller</td>
</tr>
<tr>
<td>Serial ports</td>
<td>1 port, expandable via Ethernet to 16 with optional EC9421 or 32 with EC9423 or via option card to 8 serial ports with the EC9420</td>
<td>1 port, optionally expandable via Ethernet to 16 with EC9421 or 32 with EC9423 or via option card to 8 serial ports with the EC9420</td>
</tr>
<tr>
<td>USB ports</td>
<td>2 on rear for each module</td>
<td>4 on rear, 2 on front</td>
</tr>
<tr>
<td>Size</td>
<td>Height: 1 RU single or redundant Depth: 50.8 cm (20 in.)</td>
<td>Height: 2 RU single, 4 RU redundant (5 RU if using optional NV9700) Depth: 53.3 cm (21 in.)</td>
</tr>
<tr>
<td>Power consumption (nominal)</td>
<td>275W single or redundant</td>
<td>240W single / 480W redundant</td>
</tr>
<tr>
<td>Voltage input</td>
<td>100-240 VAC / 47-63 Hz</td>
<td>90-250 VAC / 50/60 Hz</td>
</tr>
<tr>
<td>Weight</td>
<td>NV920S: 9.6 kg (21 lbs.) NV920D: 11.6 kg (25.5 lbs.)</td>
<td>14.1 kg (31 lbs.) per controller</td>
</tr>
</tbody>
</table>
NV9000 Control System

ORDERING

The NV9000 control system is an advanced platform for routing control. Different configurations of the system controllers are available to address a broad range of requirements with regards to features, function and redundancy. NV960 uses a single 2 RU system controller; NV965 uses a pair of 2 RU system controllers to offer full redundancy. NV967 includes a pair of system controllers, RS-485 port cards, NV9700 remote diagnostic and change-over panel, as well as all cables required to connect the included components together.

NV920 is the latest enterprise-class controller hardware, which offers single or redundant configurations in a 1 RU rack size. The NV920 runs the same NV9000 software as the NV960 platform, and includes many of the same options, but fewer TCP/IP ports and less serial control functionality. The NV920 is ideal for most applications, especially when rack space, heat emission and power consumption are concerns.

Controllers
NV920S 1 RU single module controller, frame, dual power supplies
NV920D 1 RU dual module controllers, frame, dual power supplies
NV960 2 RU single CPU controller, dual power supplies
NV962 Redundancy upgrade for a single NV960 controller
NV965 4 RU CPU controllers, each with dual power supplies
NV967 5 RU dual CPU controllers / power supplies and NV9700 remote diagnostic and change-over panel

Core System Options — Hardware
NV920-PRI NV920 primary module
NV920-SEC NV920 secondary module
NV920-FME NV920 frame and dual power supplies
NV920-PS NV920 replacement power supply
EC9412 Additional 10/100Base-T card for NV960 controller
EC9414 Additional 10/100Base-T dual NIC card for NV960 controller
EC9417 Additional 10/100/1000Base-T quad NIC card for NV960 series (FR0040-4x)
EC9425 Spare power supply for NV960 controller
EC9420 EIA-485 8 port card for NV960 controller
EC9421 EIA-485 16 port card for NV960 or NV965 controllers
EC9426 EIA-485 8 port card for NV9000 (FR0040-40)
EC9415 24 port Ethernet switch
EC9422 Y cable to support EIA-485 functionality for EC9420
EC9423 EIA-485 32 port device for NV920 or NV960 controllers
EC9424 Y cable to support EIA-485 functionality for EC9421 and EC9423
NV9500 Enhanced node controller IF

Core System Option — Software
EC9349 NP service for NV9000
EC9720 Web suite option for NV9000
EC9407 Multihop tie-line management software
EC9620 NV9000 — 64-bit multihop tie-line license
EC9613 Remote diagnostics software (includes modem)

Third-party router and controller routing interface protocols
EC9523 Encore control system interface
EC9531 Jupiter bridge interface
EC9536 Grass Valley SMS 7000 MPCU bridge interface
EC9720 Grass Valley SMS 7000 router serial interface
EC9537 NP Service for SMS 7000
EC9520 Philips router interface
EC9521 Utah router interface
EC9522 Horizon router interface
EC9524 Pro-Bel router interface
EC9525 Sony router interface
EC9527 Pesa router interface
EC9529 ISIS router interface
EC9530 Datatek router interface
EC9532 Sierra video router interface
EC9533 Euphonix router interface
EC9534 Nexus/StageTek router interface
EC9538 Sony RPT-16 interface

Automation/external interface protocols
EC9526 Serial control interface, ESBUS protocol
EC9528 Serial control interface, Pro-Bel protocol via SW-P-02

Windows 10 64-bit Third-party router and controller routing interface protocols
EC9620 NV9000 — 64-bit multihop tie-line license
EC9621 NV9000 — 64-bit Jupiter (ESBUS) RTR license
EC9622 NV9000 — 64-bit Utah-RCP1 RTR license
EC9623 NV9000 — 64-bit Horizon RTR license
EC9624 NV9000 — 64-bit Encore RTR license
EC9625 NV9000 — 64-bit Probel RTR license
EC9626 NV9000 — 64-bit Sony RTR license
EC9627 NV9000 — 64-bit Jupiter (ESBUS) EXT IF license
EC9628 NV9000 — 64-bit Pesa RTR license
EC9629 NV9000 — 64-bit Probel EXT IF license
EC9630 NV9000 — 64-bit ISIS RTR license
EC9631 NV9000 — 64-bit Datatek RTR license
EC9632 NV9000 — 64-bit Sierra Video RTR license
EC9633 NV9000 — 64-bit EUPHONIX RTR license
EC9634 NV9000 — 64-bit NEXUS/STAGETEC RTR license
EC9636 NV9000 — 64-bit SONY ROT 16 license
EC9640 NV9000 — 64-bit Panasonic RTR license
EC9641 NV9000 — 64-bit NP EXT IF license
EC9650 NV9000 — 64-bit Lineine license
EC9790 NV9000 — 5 client JAVA GUI license

Windows 10 Upgrade options
EC9644 NV9000 Win 10 Upgrade FR0040-30 STANDALONE
EC9645 NV9000 Win 10 Upgrade FR0040-30 REDUNDANT
EC9646 NV9000 Win 10 Upgrade FR0040-40 STANDALONE
EC9647 NV9000 Win 10 Upgrade FR0040-40 REDUNDANT
EC9648 NV920 Win 10 Upgrade STANDALONE
EC9649 NV920 Win 10 Upgrade REDUNDANT

All system controllers are rack mounted and come with redundant power supplies. Customers must supply all monitors, keyboards or mice to be connected to the system controller platforms. All software preloaded, including drivers, to control any Grass Valley routers including NVVISION series, Trinix and Apex as well as including drivers to interface with Encore, Jupiter and SMS-7000 controllers.

Optional software is available to control Phillips/BTS, Utah Scientific, Horizon, Snell (Pro-Bel), Pesa, Sony, ISIS, and Datatek systems.

Third-party interfaces are available for SNMP, Snell (Pro-Bel) and SMS-MCPU Bridge. Other core system options include tie-line management software and remote diagnostics software.

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