

STAGE MANAGER G6 CONTROL SYSTEM

Generation 6 of Stage Manager control system is based on the same proven technology as our previous generations and also takes advantage of new, faster processors and ethernet networks. It's strengths have been and are still *ease of use, safety and availability*.

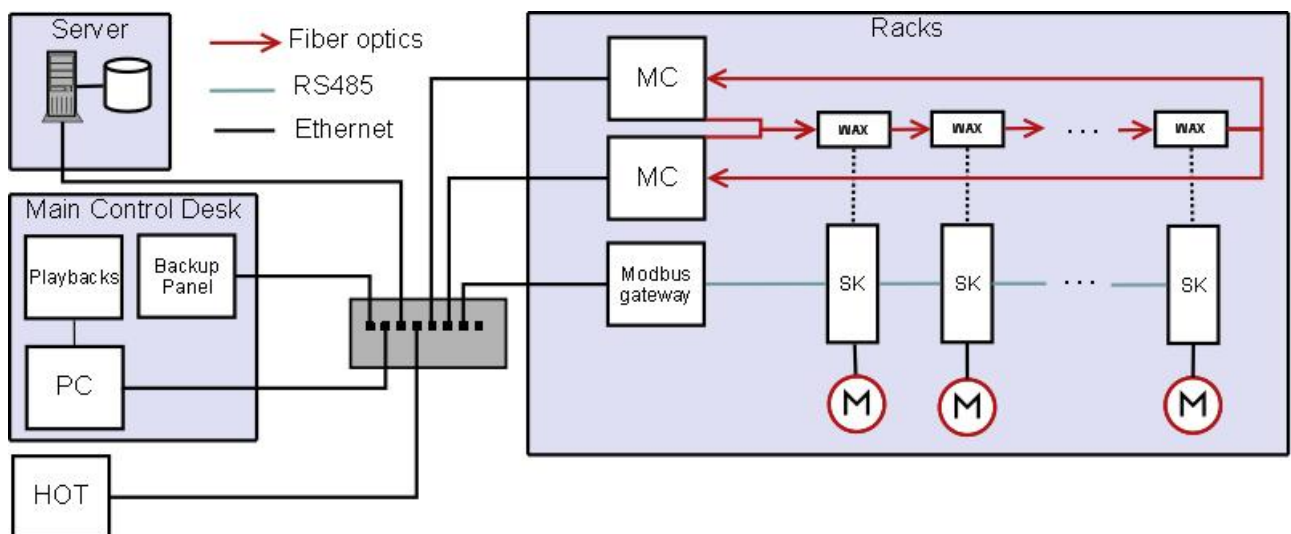


Illustration 1: Overview

Ease of use

The show programming and user interfaces have been designed from the beginning to target the needs of professional show stages. Basic operation of stage machinery can be learned in minutes as all tools are immediately and easily available and are located where they should be. Visual Stage software works with the operators, stage manager and the director to quickly test and realize planned effects and settings on stage. Current setting of stage as well as errors and activated safety devices are visualized in 3D representation of the stage. The 3D visualization allows immediate understanding of problems and their causes.

In addition to the user interfaces capable of 3D visualization, Stage Manager G6 system has touch screen based backup panel which can be used to directly control the drives. The user interface of the touch screen backup panel is modeled after traditional, simple and effective push button panel.

Safety

Stage Manager G6 control system uses MC400 real time computers designed for industrial automation and for applications requiring high precision. System status and all controlled scenery is monitored in real time and transition into safe state in case of error or deviation is triggered in milliseconds – much faster than damage or harm can occur.

All active components controlled by the real time computer observe and detect eventual problems in bus communications and stop movement independently and immediately.

The Commander SK drives monitor motor health and speed and stop movement independently and immediately in case of problems.

Safety critical components such as brakes are controlled by from three levels: real time computer, axis connection unit and the drive.

Availability

Axis control units and in fact all modules in the field loop are optically isolated by using a fiber optic field loop. This prevents electrical problems from propagating in the field loop.

The real time computers are installed as 2x100% allowing the operator to change to the second computer in case the first one has problems. This change can be done in seconds.

Stage Manager G6 user interface architecture is based on flexible structure where main control desk and the portable terminal can be used in exactly the same operations, including running and programming the shows. Almost any laptop can also act as a spare control desk computer. The architecture also allows for simultaneous use of multiple main control desks.

All changing data in the system is stored in one relational database. Taking backups of this database and in fact the whole system can be done easily and quickly from one location. The architectural flexibility allows any PC attached to the system to take role of the installed main server.

In case the main control desk brakes down, the operation can be continued in seconds from any other user interface computer or for example a laptop configured as a spare. As all information is stored in the server, even setting up a new control station from a completely new computer can be done in minutes.

If for some reason both real time computers are broken or no user interface PCs are available, the units can still be moved from the touch screen backup panel.

Other Features

- In Stage Manager G6 system, shows can be programmed also by using Visual Stage OFFLINE management software. Visual Stage OFFLINE management software allows shows to be programmed, tested and even rehearsed off line independently of location. The tool can also be used to model the scenery in 3D. 3D modeled scenery helps giving idea of the available space and movements of the scenery even before the operator has seen the actual stage. Visual Stage OFFLINE management software is also an important tool for new user training.
- Depending on selected configuration, the shows can be run from the main control desk or in different combinations by using portable user interfaces and the control desk. Any user interface can either run cues from the main show or they can run whole sequences or sub shows controlled completely from the their user interfaces.
- The shows are programmed as cues. One cue can have up to 12 units. Every unit in the cue can have their own movement profile with parameters like acceleration, deceleration, speed, target and delay. The cues can be triggered either manually or in different ways automatically. The main control desk can execute 4 different cues at the same time. The number of cues in one show or the number of shows has not been separately limited.
- The user interface can be customized for each user and control station. The modified user interface is saved automatically and is immediately usable in control stations with similar hardware.

Tools for service and maintenance

As one of the new features, the system has self diagnostics functions. The self diagnostics can automatically verify that critical components are healthy and execute the required operations correctly. We are constantly improving the self diagnostics and new diagnosed combinations are added in cooperation with our customers.

OPTION. As an optional part of Stage Manager systems we can provide remote assistance. Remote access allows us to see system status, logs and user interfaces. The remote connection can also be used to make updates and to take backups of the whole system including shows and system parameters.

One of the most important tools for maintenance is the system logs which contain information about all operations in the system. They can be used to verify system operation and to find causes for problems after they have happened.

OPTION. In addition to and supporting the logs, Stage Manager G6 system has data logger software which stores and visualizes time series data. Examples of stored data is motion errors, limit activations, communication errors and used real time computers and operating stations. Any parameter from individual drives can also be saved as time series. The time series can be combined and visualized into graphs for maintenance reports and trouble shooting. For example generating a view of last two weeks of all time series related to single unit can immediately reveal it's condition - faulty or not.

The drives are connected to the ethernet network and all of them can be programmed from one place and even through the optional remote assistance internet connection.

Stage Manager G6 system, key components

- Server: PC with 2x1.6Ghz processor, no moving parts or fans, keyboard, mouse and display
- Main control desk PC: 2x 1.6GHz processor, no moving parts or fans. 17" touch screen and 24" wide screen display, keyboard.
- Playback controls: 5 joysticks, 12 illuminated led push buttons. Led illuminated dead mans switch. Safety bypass key switch, emergency stop button, emergency stop reset button, safety device reset button.
- Portable 3D HOT terminal: 12" touch screen. Joystick, dead mans switch, emergency stop button, on off switch.
- Backup panel: 12" touch screen display, emergency stop, on off switch.
- 2 Pcs MC400 real time computers
- ModbusTCP ModbusRTU gateway
- WAX 2A I/O modules with own continuous diagnostics and watch-dog