



# STAGE

## TECHNOLOGIES

## Maxis SI

### digital position control system

### GENERAL INFORMATION

Our third-generation motion control and drive solution is built around the Siemens Simotion control system. This is a digital, high capability, integrated solution, designed for demanding industrial applications. Systems that are based on industry standard components from large manufacturers generally have a longer lifetime than custom solutions and have the added benefit of worldwide, year-round spare parts availability.

Maxis SI architecture is scalable from a few to hundreds of motors and can control motors of any size or power. The totally integrated nature of the system allows engineers to view the complete system status, from motor drive current and voltage, through I/O to processors and networks, all from a single interface running on a PC. This can be viewed either locally or remotely over a secure Internet connection and allows for much faster diagnostics, without the need for multiple pieces of software and hardware.

The heart of the system is an advanced motion processor; the Simotion D4x5. Processors are linked together, via a separate synchronous Profinet link, to provide seamless synchronisation and error reporting. The processor provides for a high level of additional programming capability allowing advanced features to be added to the system. These can be used to implement Sculptor 3D performer flying moves and anti-sway technology as well as many other real-time features that can be added to expand and enhance the system.

In standard systems with external position controllers, the control system is connected to the drives through an electrical interface. Not only does this interface require more cabling and connections but it also allows only a limited number of alarms or warnings to be reported. Connected to the control system over a digital link, Maxis SI offers full access to drive diagnostics and provides a lower-storage control solution with minimal cabling requirements.

### FEATURES

- Motion processors link to the Stage Technologies range of control desks via an industrial Ethernet connection. The complete range of control desks can interface to the system, either singly or in any multiple combination. When multiple control desks are used a central server is required to synchronise show data, and axis locking between differing consoles.
- All processors and drives are supplied by Siemens. This allows full monitoring, programming and diagnostics for the system from a single network connection point, or via remote access across VPN.
- Motion processors link to individual drive modules via an industrial Profibus link. Drive modules can be supplied in a very wide range of sizes from 0.7kW to 120kW and above.
- SIL3 functionality is provided by a separate monitoring processor, connected to remote I/O providing encoder position feedback and remote shutdown of equipment in the case of error detection.
- An emergency stop system is provided by an additional safety PLC. This is a special processor and I/O system that is able to provide emergency stop system functionality to SIL3 level, independent of any other system.
- Compact Windows-formatted flash cards contain all data, making it faster than ever before to replace information, send data remotely or roll back code to a previous state. If a Simotion control unit or Sinamics drive fails, all data can be instantly transferred to a replacement unit using the flash card. For complete data access or back up all that is required is a laptop.
- As Maxis SI is housed in a contained unit, this means that comprehensive factory testing is possible before installation.
- Siemens Profinet protocol enables the synchronous movement of drives without any time lag.
- A handheld controller can be connected directly to Maxis SI as a separate control network for backup.
- Digital, analogue, and encoder I/O is provided via separate modules, which are networked to the main power stack via Siemens custom Drivecliq network. This allows cabinets to be laid out in a logical manner, separating low voltage signals, from the high power drive component.

## Example Maxis SI system architecture (below)

An industrial Ethernet backbone is used for inter-desk communications with the server, and to interface with the motion control processors. If configured, a remote VPN link also has access to this network to allow secure diagnostics from a remote location. High-specification Ethernet switches are used to provide redundant trunk connections across the network.

Motion control processors handle motion commands from the desks and manage the closed-loop control of positioning axes. These axes can vary from integrated Sinamics servo drives to external inverter systems and hydraulic actuators.

Regardless of the device moving the axis, Maxis SI has an interface option to allow seamless control with other technologies in the system. Flexibility is key, whilst not compromising the power available to the operator through the eChameleon desk software.

## Maxis SI Control

The base Maxis SI system uses a number of processors, each controlling up to 24 drives, that may be physically distributed in varying locations around an installation.

If synchronisation between axes is required, a Profinet synchronisation network is installed, connecting the motion controllers together to a secondary control processor. Extra processors may be used for EN61508/SIL3 compliance or for software applications.

For simple, non-technical equipment maintenance or in the unlikely event of a desk failure, an optional backup control network is available, which provides access to all motors, position feedback and full diagnostics.

