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Equator controller
Structure, networking, security and support

Equator controller – overview

The Equator controller is a powerful dedicated control system that provides a secure and robust environment for running the Equator gauging system software. It is similar to machine tool control systems, with the added ability to run Equator-specific Windows applications. Designed for Equator, it incorporates all the necessary electronic boards and software in one package.

With high speed custom multi-core assignment technology the Equator controller can deal with very low latency real time control functions, at the same time as giving the user a dependable graphical user interface. It executes a vetted suite of programs that operate the Equator machine, including movement commands for the drives, monitoring of encoder feedback, the 'compare' process and reporting of results. The user can create and execute DMIS measurement programs, change measurement settings and transfer data and programs.

An additional PC is not required when operating the Equator, reducing overall cost to the customer and eliminating the chance of incompatibility or poor performance arising from the wide variation of PC architectures.

Support and maintenance

Periodic updates to the suite of software on the Equator controller are performed with an encrypted update package supplied directly from Renishaw. Updating of Equator software is a straightforward and rapid task, and training is simplified with strict version control in place.

Controller structure

The controller is split into two environments; the control functions environment running a custom low-level operating system and the Equator Manager environment allowing user-interaction with 'locked-down' read-only software applications. This software is read-only at hardware level and no writes can be saved.

Networking

The Equator controller can operate independently or be connected to a network to enable tasks such as file sharing and data backup. Various measures have been taken to give IT administrators the confidence to connect Equator controllers to their secure networks. As with many network devices, it is recommended that the Equator controller is only connected to trusted networks.

The networking facility allows the user to be able to define the IP address and subnet mask for the Equator controller, allowing visibility and access to and from any server on the connected network. There is a specially constructed file transfer and management system that allows safe file manipulation.

Security

The Equator Manager environment is virus-checked before it is released onto the system using an up to date copy of Kaspersky virus-checker. This ensures that there are no viruses present on the Equator controller when it is delivered to the customer.

Corruption is prevented by Equator Manager not allowing the user the option to run anything other than the vetted software suite. The Equator controller does not include an auto-run feature, which means that, for example, infected USB media do not threaten the system as they would do a standard PC. Also, for a virus to remain in the controller, it would need to embed itself into a dependency of the system, such as a service or a start-up group. This is prevented by the registry and all key locations within the file system being read-only.

The user's data is kept separate by making only selected non-operating system folders read-write. This is called the Equator Home Directory and is the only part of the file system the user is able to access. Switching the controller off and on will restore the system back to factory settings while the user's data is saved e.g. measurement programs, results etc.

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