

Control of radiation therapy devices via PLC technology (P-996)

Key Facts

- Real-time control of collimator, ray positioning, and patient positioning system.
- Use of programmable logic controllers (PLCs) for improved compatibility, flexibility, reliability, maintainability and cost-effectiveness of radiation therapy devices

Abstract

Common therapeutic devices for treating a patient with rays, particularly accelerator devices on the market, typically comprise a plurality of controlling units for controlling subsystems such as linear accelerator (LINAC), multi-leaf collimator, gantry system, patient support system and x-ray beam generation system. Synchronization and control of all subsystems at the same time is difficult to establish, particularly with hard real-time requirements. Dynamic and 4D treatment methods are very often limited due to non-open standard solutions. Since combinations with third party vendors are rarely possible, known therapeutic devices for treating a predefined body part of a patient with rays and known methods for controlling these devices and their uses are disadvantageous and detrimental in several ways.

Technology

The technology comprises a control unit consisting of standardized programmable logic controllers (PLCs) for real-time operation of at least the collimator, the ray positioning system and the patient positioning system of a radiation therapy device. Thus, the technology allows precise and dynamic patient treatment with high time resolution.

Development Stage

A prototype of the PLC controlling individual leaves of a MLC was realized and has been tested successfully in pilot studies.

Applications and Commercial Opportunity

The technology can be used for developing and distributing a new generation of especially com-

pact radiation therapy devices, where PLCs control the main operating system.

Advantages

- Coordinated real-time control of all radiotherapy device components for precise and dynamic patient treatment
- Usage of reliable and inexpensive PLCs guarantees a high degree of compatibility and maintainability
- Control unit can be located off-site

Inventors

The invention was jointly conceived by Steffen Seeber and Klaus Schewiola, Electronic Development Laboratory (E073).

Intellectual Property

An international patent application [WO2013/014260](#) "Control of radiation therapy devices via PLC technology" was filed July 27, 2012.

Further Information

No other public information is currently available, but further information (speaking with the inventor) is available under a signed Confidential Disclosure Agreement (CDA).

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