

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

International patent application [WO2013014260](#) "Control of radiation therapy devices via PLC technology" nationalized in Europe ([EP2736597](#)) and USA (US14/235,229).

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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