

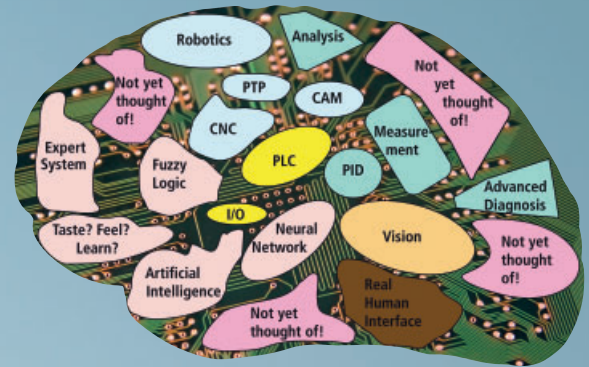
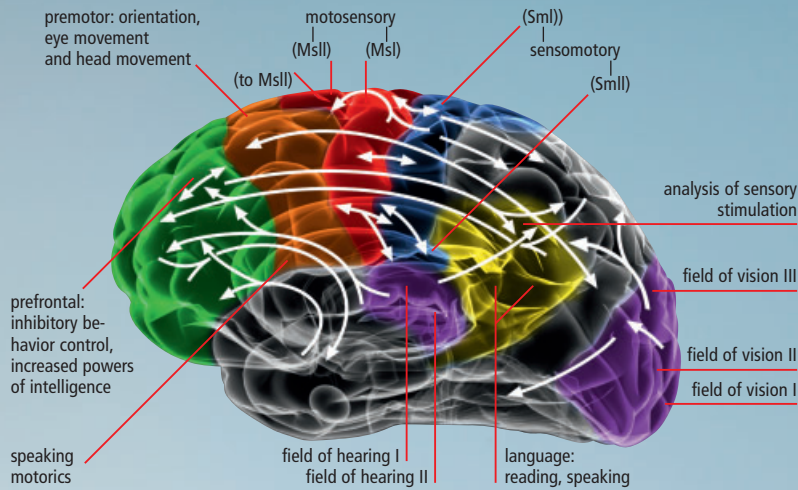
Condition Monitoring and Robotics become an integral part of PC-based control

The concept of Scientific Automation is being constantly pursued and advanced with innovative hardware and software products. Additional solutions were presented at Hanover Fair 2009. Various new EtherCAT Terminals expand the Beckhoff system with high-precision measurement technology and Condition Monitoring. With TwinCAT Kinematic Transformation software, robotics also becomes an integral part of the PC-based control solution from Beckhoff.

Additional solutions for Scientific Automation



Functions for Scientific Automation: The separation into areas of the functions of an automation task is comparable to the illustration of separate function areas in the human brain. This corresponds to a central control technology with optimal, fast communication between the individual technology components.



The power of the PC Control philosophy offers sufficient capacity to integrate numerous advanced functions beyond standard control. Scientific Automation complements the conventional areas of control technology such as PLC, Motion Control and control technology, for instance, with precise and fast measurement technology and the associated engineering algorithms.

The Beckhoff PC-based control technology provides the necessary basic foundation with powerful CPUs, fast I/O, the fast EtherCAT bus system and TwinCAT software.

The concept of Scientific Automation serves as the prerequisite to enable functions such as Condition Monitoring or robotics for a wide range

CPU power, advanced and familiar control algorithms – such as neural networks – may become suitable for industrial applications. However, more complex machines require more diagnostics and maintenance. More advanced systems with sophisticated diagnostics will make life easier for the end user. New input and output options such as voice input will simplify machine operation.

Another developing area is artificial intelligence. Until now, no intelligence to equal human intelligence has been replicated. It might certainly be possible to come closer to achieving this dream in the future with several cores and extreme computing power. In future computer generations, gestures, voice and image recognition procedures will be

Scientific Automation is the integration of automation software with findings from engineering science which go beyond the limits of conventional control. The basis for this is the continually increasing performance of PCs.

of PLC programmers in a familiar format. The aim is to integrate the functions from the traditional “black box” into a standard PC-based software environment.

Since machine concepts will undoubtedly change in coming years, Scientific Automation is reaching out even further to the future. Developing trends are moving towards increasingly complex PLC programs and ever shorter cycle times. The number of axes to be controlled synchronously will increase further, and the type of coupling between the axes will become more complex. Moreover, the number of electronic cam plates and electronic gearboxes will increase. In the future, many axes will be operated based on interpolation. However, in a few years' time, an advanced CPU will easily be able to cope with this. Integrated vision and robotics systems are implemented in software. With sufficient

able to access terabytes of local data and at least provide support as highly sophisticated systems. In industry, this can be used for improving process operation, more human interaction, faster troubleshooting and ensuring product quality. Each system component or machine module could be allocated to a core, so that parallel processing with high clock frequencies might become possible.

Scientific Automation from Beckhoff is available in products in real terms and offers enough further potential for future developments and visions.

www.beckhoff.com/Scientific-Automation