SoftMC Product Overview

Multi-axis motion control software and hardware package, offering extensive programming capabilities for a variety of general purpose automation and robotics applications.

- The softMC runs a collection of application programs, that are controlled by events and I/Os. These programs generate a sequence of motion profiles.

- LINUX OS with real-time extension - PC based as well as a multiplatform solution

- Available with or without the industrial PC hardware

- The softMC complements, and is designed to work with, the Servotronix CDHD servo drives.
Proven Applications

**Solar panel manufacturing:**
Delta robots with an inverse dynamic model

**Wood-cutting machine:**
6-axis machine for the wood truss industry

**Scara/ 6-axis pick and place robots:**
High speed with special kinematics

**Tabletop milling machine:**
5-axis CNC milling machine with special interpolation of non-Cartesian axes

**Gear inspection machine:**
Complex multi-dimensional matrix computation

**Rehabilitation equipment:**
4-axis robot with dedicated algorithms and custom hardware
Proven Applications

And more:

- **Testing and measuring systems:**
  Including optical systems for vision inspection

- **Large flat glass machines (display industry):**
  Laser scribing, Laser edge isolation, handling and automation

- **High accuracy printers** for solar cells and solar cell test machines

- **Wet chemistry machines**

- **Li-Ion battery cell production machines:**
  Web processing, laser processing.
softMC Benefits

State-of-the-Art Motion Controller
- Mature & field-proven
- Up to 64 Axes (software limit; can be higher)
- EtherCAT® Ethernet-based motion bus

Powerful Programming
- Open architecture
- Advanced MC-BASIC language
- Multi-tasking user application environment
- Powerful debug and monitor tools

Intensive Motion Features
- Axis and group motion
- Robot kinematics
- Dynamic motion profiles
- Camming, gearing, fast position based I/Os
- Compensation tables for mechanical inaccuracies
- Multi-axis motion blending
Powerful Robot Controller

Two Delta Robot Synchronization

- 6 EtherCAT® CDHD servo axes
- 2 robots are controlled by the same controller
- Advanced algorithms for coordination and synchronization of dual robots
- Very fast and accurate motion
Hardware Architecture

- The MC is a “soft” controller based on a standard off-the-shelf industrial PC, that is qualified by Servotronix.
- The industrial PC has all the required HW

**TCP/IP connection to host**

**ATOM CPU**
- 2 x Ethernet ports (one for EtherCAT)
- 2x CAN ports (specific models)
- VGA and keyboard

**RJ45 EtherCAT connection to CDHD servo drives**

**Optional CAN bus connection to servo drive and I/Os**
Back in the 90s, the MC was developed as a soft controller over PC (x86) architecture.

PC architecture provides:
- Scalable power
- Modern updated computing platform
- Plenty of interfaces and almost “unlimited” memory
- Choice of operating systems

The 2014 softMC supports multiple interfaces:
- EtherCAT
- CANopen

MC EtherCAT can use a standard off-the-shelf industrial PC
Software Architecture

User Compiled C Lib

BASIC Task

Partner / Customer PLC / Motion Language

Basic-VM (Virtual Machine)

Core Software

Process Data (Command, Controls and Feedback)

Fieldbus Abstraction Layer

Driver

Motion Bus

Linux RT
**softMC Sub-Elements**

- **ControlStudio development environment**
  - Graphical user interface: configuring, developing and debug.
  - In most cases – runs on a remote computer under Windows OS.

- **Application code**
  - Script written with the programming language of the controller - compiled or interpreted.
  - Dictates the machine operation
  - Advanced application language based on BASIC

- **Firmware**
  - The compiled MC code - understands and executes the application code.
  - Firmware includes all file management, language interpreter, task scheduler and interface to hardware and external devices. **The Firmware is the MC.**

- **Motion**
  - A set of algorithms which develop a path in space and distribute commands to the drives.
  - Motion can be simple – each motor works on its own - or advanced - coordinated move of group of Axes. Motion is part of the firmware.
  - Advanced and unique motion capabilities
Future Features

- Configurator software: for easy configuration and diagnostics of the network, the system and the servo drives
- ModBus TCP/IP connection to standard HMIs
- OPC-UA server connection to standard HMIs
- PLC language programming
- Additional Application / Motion functions
- Teach Pendent support
- Customization to suit customer’s specific needs