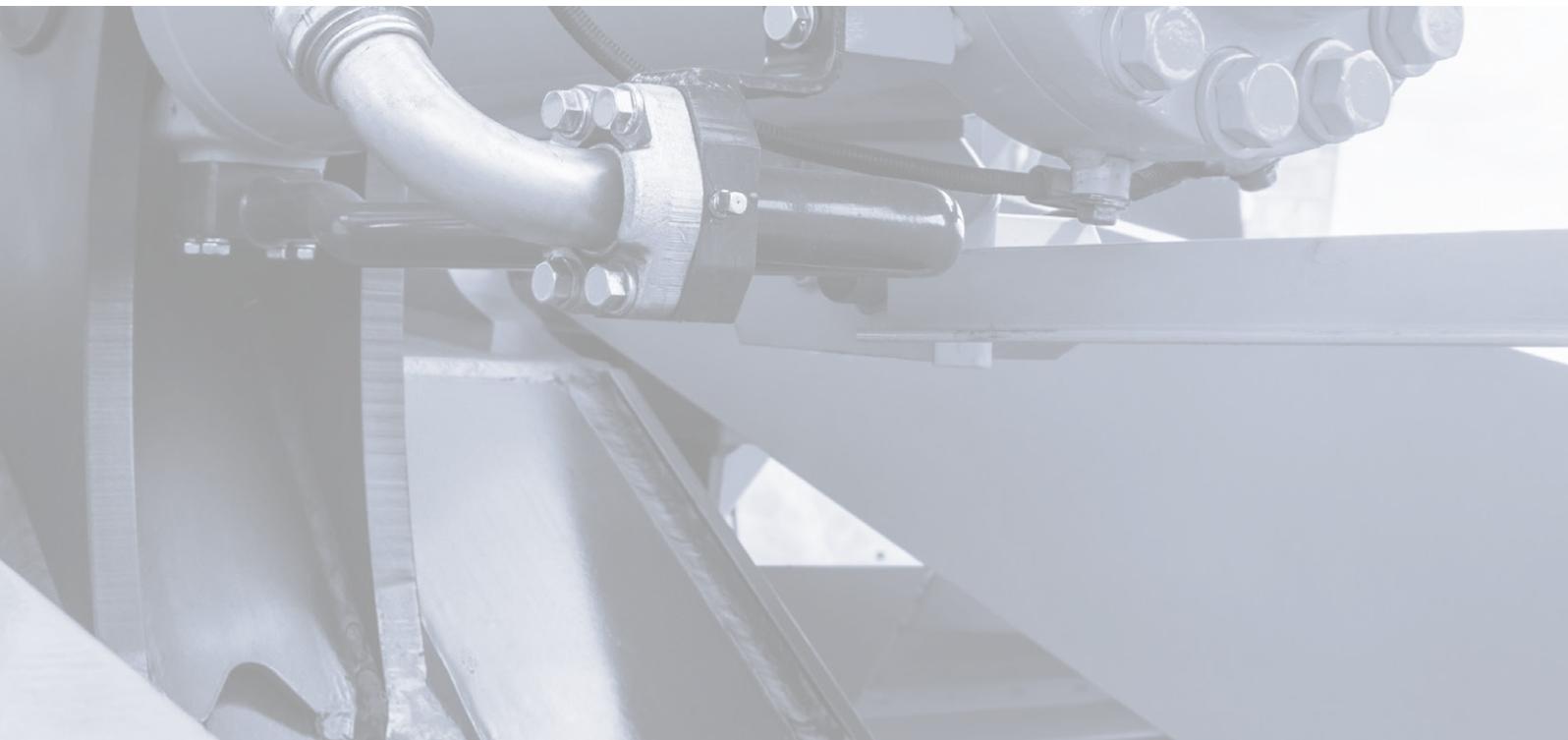


Q.series EC C101  
EtherCAT-based  
Multi-axis Servo Controller



# For Mechanical Testing, Motion Simulation and Automation Solutions

## EtherCAT Slave Module for Multi-axis Servo Control

Measurement and control specialist Gantner Instruments extends its Q.series product family with the Q.series EC C101, an EtherCAT-based module for multi-axis closed-loop control of servo hydraulic, pneumatic or electric systems. The module is designed for test, simulation and automation system integrators in the fields of automotive & transportation, aerospace, energy and civil engineering. Now system integrators can benefit from market-leading control performance, combined with a common, highly integrable platform for control and measurement.



# C101

### Fully Integrable High-Performance Servo Controller

The Q.series EC C101 combines powerful System-on-a-Chip computing with the flexibility of EtherCAT communication. The module incorporates a powerful slave interface as per IEC61158, providing instant connectivity to EtherCAT networks. This unique design greatly simplifies the implementation of reliable high-speed multi-axis servo control solutions.

#### Key Features C101 Module

- Low power consumption (10-30 VDC, 6W)
- Maintenance-free design
- Conventional COTS D-SUB connectors
- Configurable PDO mapping for optimal data throughput / efficiency
- Module configuration via SDO or FoE
- Programmable DSP for running custom-designed control loops
- Distributed Clock for precise data synchronization
- Built-in safety line for fail-safe operation

### IO Specification

- **2 × inputs for bridge and inductive sensors**  
load cell, strain gage, pressure sensor, LVDT  
±2000 mV/V max., 8 user-selectable input ranges, 18-bit, selectable DC/CF bridge excitation, 4.8 kHz Carrier Frequency, 500VDC galvanic isolation
- **1 × voltage input**  
potentiometer, external function generator  
±10V, 18-bit, 500VDC galvanic isolation
- **1 × SSI serial interface (RS-422)**  
absolute encoder or Temposonic®
- **1 × servo driver output**  
±160 mA max., 8 user-selectable ranges, ±10 VDC
- **4 × digital inputs and outputs**  
PLC functionality for monitoring system status and switching pilot, low pressure and high pressure levels

### ■ Control on Module

The control loop runs locally on the C101 module instead of on a central processor. Due to its powerful internal computer, very fast response times are achievable with loop frequency of up to 20 kHz per control channel.

### ■ Scalable Multi-axis Control Solution

The C101 modules can easily be grouped together and connected to the EtherCAT network using the Q.series Bus Coupler module. Because of the Control on Module design there is no performance penalty when connecting multiple modules together, even when distributed over longer distances for installation close to the servo actuator.

### ■ Modular and Flexible

The C101 is available in a variety of packaging styles, ranging from compact and distributed DIN-mount modules, to high density 3U rack systems, to robust, portable systems designed for mobile applications.

### ■ Truly Synchronized Control and Measurement

It has never been so easy to create an integrated control and measurement solution using the Q.series EC C101 control module in combination with the Q.series EC measurement modules. The EtherCAT Distributed Clock ensures precise nanosecond time synchronization between control and measurement data within the same network.

## Market-Leading Control Performance

The programmable C101 allows for installing custom-designed control loops that best match the application. The C101 can also be delivered with a pre-engineered control loop, for example a force/position loop for hydraulic servo systems. This control loop is designed with unprecedented functionality that results in highly accurate and stable servo control.

### ■ Multiple Tuning Parameter Sets

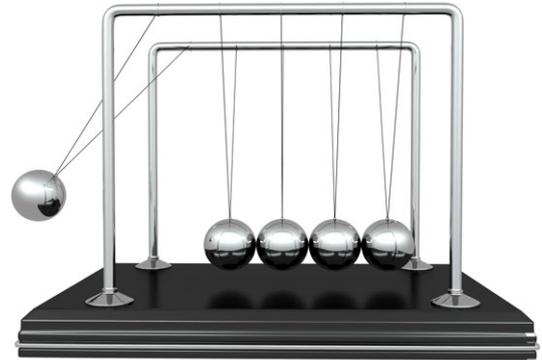
To allow for best possible control performance for each scenario, up to 4 different tuning parameter sets can be stored.

### ■ Structural Decoupling

Cross-coupling effects between actuators that apply force on the same structure introduce unwanted control errors. The C101 hydraulic servo loop includes a feedforward disturbance compensation to eliminate cross-coupling induced errors, increasing test speed.

### ■ Bumpless Control Mode Switching

Bumpless instant mode switching between force, displacement or auxiliary control with selectable switching behavior.



## Key Features Servo Loop

- Individual control modes for force, displacement and auxiliary
- Three stage servo valve control
- Command optimisation through prefiltering
- Piston area compensation, dither
- Boundary control for active hard stop and breakout force limits
- Ki enabled with pressure
- Fail-safe and programmable shut down behavior

## Contact Us

Interested? We are happy to provide you with more information, answer any questions that you may have and create the optimal solution for your servo controller needs.

**Visit the C101 webpage to get in touch!**



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