



TQC-PC[®] Controller Upgrade for D70

The TQC-PC[®] controller transcends the same performance, reliability, hardware stability, and return on investment as your existing TQC-86.

As a direct replacement for TQC-86 controllers, the TQC-PC controller interfaces easily with the existing electrical panel and PLC machine controls. The upgrade provides the user with improved operations data presentation and enables communications to factory host systems.

The TQC-PC also provides:

- A Universal Customer Interface (UCI) allows the user to implement custom features and capabilities without special modifications
- Micro-Tech Industrial Machine Controller with Microsoft[®] Windows IoT Enterprise LTSB 64-bit operating system, enabling better presentation and factory communication
- Ethernet port for connecting machine to plant network
- Drop-in replacement for obsolete TQC-86
- Same code base as ASTEC machine controller





Architecture Overview

TQC-PC Includes the Following Components and Features:

- Industrial machine controller, with keyboard and mouse
- Uniformity Control Processor (UCP) - Real-time executive for tire uniformity measurement and process control
- Rack Function Processors (RFP) - Real-time low-level uniformity measurement and process control
 - * 4 Standard
 - * 1 Grinder
- Commercial Interface - Flexible interface to PLC or Remote I/O devices
- Opto 22 High Density SNAP I/O for Legacy PLCs or Direct Ethernet interface to Allen-Bradley ControlLogix and Siemens S7
- Machine Control Hardware PLC
- Industry-proven data acquisition - Instrumentation signal and conditioning hardware
- Industrial enclosure with side-mounted air conditioner
- Allen-Bradley PanelView HMI
- Signal Conditioning, with measurements as follows:
 - * Radial Force – Analog Input
 - * Lateral Force – Analog Input
 - * Radius – Analog Input
 - * Carriage Drive – Analog Input
- 1024 Pulse Spindle Encoder Kit
- Documentation for installation, setup, calibration, and maintenance

The new computer based controller provides for more flexibility, expandability, additional memory, and the ability to connect to networks. The machine controller is designed with an industrial motherboard, providing more stability than a consumer grade personal computer. The machine controller includes a utility to back up the tire type database, registry, and can be configured to back up other files located on the system.

The architecture is designed to support and interface with many hardware PLC's such Allen-Bradley, Siemens, and other brands. Please consult with your local sales representative for details.



Operational Features

The TQC-PC controller provides several standard functions for the Tire Uniformity machine as follows.

As Directed by the PLC, the TQC-PC will Control:

- Flex positioning of grinders, probes, and chuck width
- Automatic loading and inflation to computer controlled set points
- Automatic advance and retract of probes
- Customer-programmed testing of the tire includes:
 - * Measure forces and run-outs
 - * Compute peak-to-peak and harmonic magnitudes
 - * Grade
 - * Harmonic Mark
 - * Grade Mark
 - * Sort
 - * Display, Output for printing, Output for Host

To Support the User, the TQC-PC Includes the Ability to:

- Setup (Configure)
- Edit
- Calibrate
- Maintain and Diagnose.
- Functions supported also include:
 - * Automatic Shoulder and Center grinding
 - * Hydraulic SAM and Run-out function
 - * Automatic Adjustable Width Chuck (AAWC)
 - * Computer controlled inflation
 - * Computer controlled tire load
 - * Geometry measurement
 - TGIS FS
 - TGIS SL[®] with AkroSCAN[™]
 - TGIS FPL[®]

The User Interface Provides:

- Machine Setup - Establishes process set points for automatic operation
- Machine Edits - Editing of machine measurement and process parameters that are not tire specific
- Machine Calibration - User prompted procedures for calibration of instrumentation and measurement devices
- TIGRE (Tire Grading Executive) - Basic program that establishes what tire uniformity measurements will be acquired and how they will be communicated to the outside world
- Recorder Outputs
- Tire Type Editor - Editing and storing of tire specific parameters important for tire uniformity measurement
- Viewing of machine diagnostic information
- Display of real time UCP / RFP process states
- Plant Network Communications, RS232, Ethernet
- Network Printing
- Database Support: SQL and Microsoft[®] ACCESS

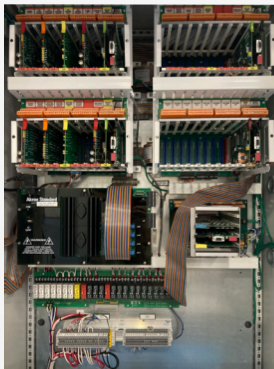


Universal Customer Interface

A Universal Customer Interface is available for the TQC-PC to provide an application programming interface (API) to the controller. An API enables the user to implement internally designed custom features and capabilities without special controller software modifications.

Uniformity Control Processor (UCP) and Rack Function Processors (RFP):

- Handle real time processes involved in uniformity measurement and process control.
- Utilizes Intel technology.
- Processes are executed as real time interrupt driven state machine procedures on UCP and all RFP's.
- Manages all data acquisition processes.
- Responsible for tire uniformity process control loops such as inflation control, spindle speed control, load wheel positioning control, grinder control, probe control, and more.



Upper Internal
Cabinet TQC-PC



Lower Internal
Cabinet TQC-PC

Commercial Interface

For legacy machines, the commercial interface connects the TQC-PC application to the Machine Control Hardware PLC through the Opto 22 Snap I/O. The interface connects to a large array of PLC's and remote I/O devices and effectively decouples the PLC type from the TQC-PC applications. Doing this, enables the TQC-PC to be used with a broad range of PLC's and remote I/O without the need for software change. The interface is Ethernet to the Snap I/O which interfaces to the hardware PLC. AB ControlLogix and Siemens S7 PLC's can be connected directly via Ethernet bypassing the requirement for the Opto 22 hardware.

With more than 105 years of innovation behind us,
we continue pushing leading-edge tire measurement systems forward.
Micro-Poise[®]. Better by every measure.

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MP USA

Tel: +1-330-541-9100
Fax: +1-330-541-9111

MP Europe

Tel: +49-451-89096-0
Fax: +49-451-89096-24

MP Korea

Tel: +82-31-888-5259
Fax: +82-31-888-5228

MP China

Tel: +86-20-8363-4768 Ext 108
Fax: +86-20-8363-3701

MP India

Tel: +91-44-6699-5700
Fax: +91-44-6699-5721