Reconfigurable
Test Controller

Product Overview

Contents

General Information

A multi-purpose tool based on the Reconfigurable Test Controller (RTC) for various test automation:
1. Strength test (electro-hydraulic cylinders control)
2. Hexapod control
3. Vibration test
4. Acoustic test
5. Hardware-software simulators for control system testing
6. Data Acquisition and monitoring

Features:
- Multi-purpose hardware platform for various test types
- Real time operation system
- Installation software for every function
- FPGA
- Ethernet TSN, RS-232, RS-485, and USB interfaces
- Quick operation of analog channels up to 100 KHz
- Unified analog input/output channels
- System Scalability
- Modular structure

Specification

Parameter	Value
Number of slots	10
Interfaces	2xUSB-c, 2xGigabit Ethernet, 1xRS-232, 1xCAN,
Processor	1.91 GHz Quad-Core
Integrated SSD	SATA HDD connection
Power Supply Voltage	220V AC
Ambient temperature	−20 °C to 85 °C

Removable RTC modules*
* Only connected to the RTC controller

Connected modules	Configuration
Analog Input Module (current/voltage)	16 channels, ±10 V/±20 mA, 150 kHz
Analog Output Module	16 channels, ±10 V/±30 V/±100 mV (imitation of thermocouples), 96 kHZ
Digital Input/Output Module	input: 8 channels, 5...24 V output: 12 channels, 1,5...33 V
Hydraulic actuator control module	1 channel, ±10 V/±115 mA, 120kHz
RS-485 Module	5 channels, 921600 bit/s
Dynamic input module	3 channels, ±10 V, 100 kHz
Dynamic output module	2 channels, ±10 V, 96 kHz
ARINC 429 module	4 receiving, 4 transmitting channels
Tensomodule	4 channels, ±125 mV, 39 kHz
LVDT connection simulation module	4 channels, ±10 V, 120 kHz
RTD connection simulation module	5 channels, 30...250 Ohm
Thermocouple simulation module	16 channels, ±100 mV, 96 kHz

RTC Modules

RTC Input / Output Modules

RTC digital input/output module

Parameter	Value
Number of channels DI	8
Signal levels	5...24V
Cut-off voltage	2V
Max. frequency	250 kHz
Number of channels DO	12
Output type	dry contact
Switching voltage range	1.5...33V
Rated current	6A
Max. frequency	4.5 kHz

RTC analog input module

Parameter	Value	Value
Number of channels	16 single-ended	16 single-ended
Signal levels	±10V	±20mA
Resolution	16 bit	16 bit
Max. frequency	150kHz	150kHz
Type of ADC	SAR	SAR

RTC analog output module

Parameter	Value	Value
Number of channels	16 single-ended	16 single-ended
Signal levels	±10V	±30V
Resolution	16 bit	16 bit
Max. frequency	96kHz	96kHz
Type of ADC	SRS	SRS

RTC hydraulic actuator control module

Parameter	Value
Number of analog output channels, pcs.	1
Maximum output range	±10V/±115mA
Number of analog input/ LVDT channels, pcs.	1
Maximum signal range	±10V
Max. frequency	120kHz
Numbers of SSI channels	1

RTC module RS–485

Parameter	Value
Number of channels	5
Connection type	Double wired
Maximum transmission speed	921600 bit/s
Connector type	RJ45/RJ50
Termination resistor	120 Ohm
Protective displacement resistors	1.5 kOhm

RTC module ARINC–429
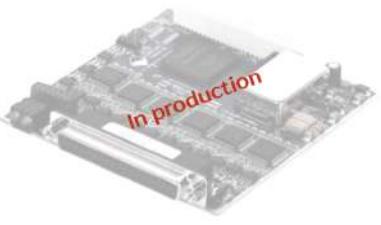
Parameter	Value
Maximum number of receiving channels, pcs.	4
Maximum number of transmission channels, pcs	4
Transmission speed, kbit/s	12.5; 100

RTC vibroacoustic (dynamic) inputs module

Parameter	Value
Number of channels	4
Maximum range of input signals	±10V
Type of signals	AC/DC
ADC bit rate	24 bit
Maximum sampling rate	100kHz
ADC type	Delta-Sigma
Software switch on IEPE	Yes
Maximum sensor supply current	20mA
Maximum sensor supply voltage	24V

RTC vibroacoustic (dynamic) outputs module

Parameter	Value
Number of channels	2
Maximum range of output signals	±10V
Switching scheme	single-ended
ADC bit rate	24 bit
Maximum sampling rate	96 kHz
ADC type	Delta-Sigma

RTC strain gauge module

Parameter	Value
Number of channels	4
Supply voltage	2.5/3/3.3/5V
Maximum range of input signals	±125mV
Switching scheme	6-wire
ADC bit rate	24 bit
Maximum sampling rate	39 kHz
ADC type	Delta-Sigma

RTC Simulation Modules

RTC RTD simulation module

Parameter	Value
Number of channels	5
Possible resistance range	30 ...250 Ohm
Types of simulated thermoresistances	pt100
Temperature setting increment	1 °C
Maximum error	1 °C

RTC LVDT simulation module

Parameter	Value
Number of channels	4
Maximum amplitude of reference signal	±10V
Maximum frequency of the reference signal	10kHz
Maximum frequency of the reference signal	±10V
Sampling rate of the output signals	120kHz

RTC thermocouple simulation module

| Parameter	Value
Number of channels	16
Maximum output signal range	±100mV
Switching scheme	single-ended
ADC bit rate	16 bit
Maximum sampling rate	96 kHz

Software

Hydraulic software

Tasks performed by the software:
- functional checks;
- check of external tightness;
- obtaining the dependence of the adjustment pressure change on the flow rate;
- control of regulation smoothness;
- determination of the adjustment range;
- measurement of reduced pressure when changing inlet pressure;
- determination of dependence of reduced pressure change on flow change;
- measurement of liquid flow through the control valve;
- determining the dependence of the flow rate on the pressure difference between inlet and outlet;
- determination of pressure gain;
- zero drift;
- control and measurement of internal leaks;
- determination of flow gain;
- hysteresis determination;
- polarity determination.
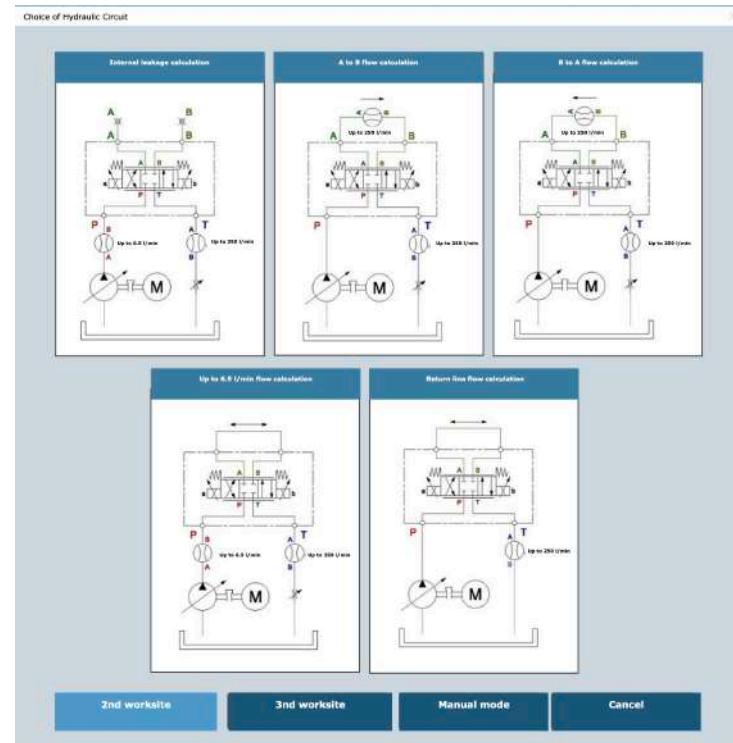
The program interface is customized individually by selecting the parameters display: analog indicator or graph. The availability of the drop-down menu of indicators and graphs makes it possible to display only the required parameters and dependencies.

Vibration suite

The package is intended for adjusting of the controller in the fatigue testing on the frequency altering in a specific band and also for the defining of the dynamic properties of the testing object.

Modes:
- Pre-Test;
- Resonance Search;
- Random;
- Sine on Random;
- Classical Shock;
- Sine;
- Waveform Replication.

Acoustic testing control

The package is intended for adjusting of the controller in the systems for sound pressure levels generation and vibration control systems. Controller with this package allows controlling the sound pressure and perform analysis of the data from the vibroacoustic transducers.

Control of the acoustic signal generation in accordance with the predefined parameters;
Analysis and processing the data from the vibroacoustic transducers.
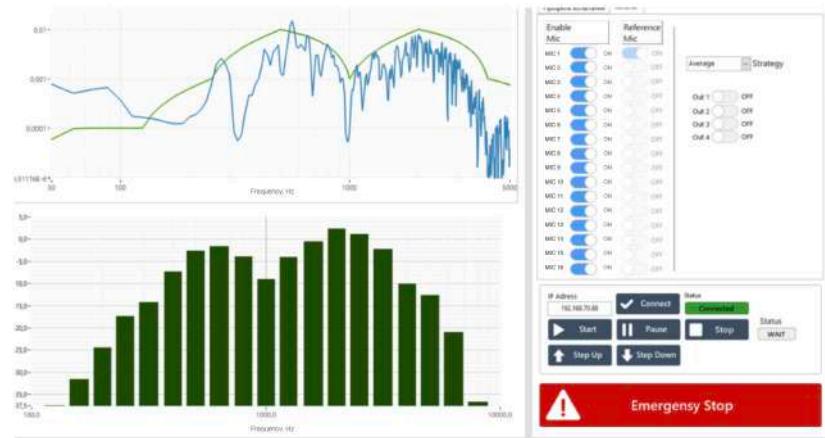
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