DIGITAL INDUSTRIES SOFTWARE

Simcenter SCADAS Mobile and Lab ESO64 EtherCAT Output module

Simcenter/ESO64/2406/20240625

Product Information Sheet

Summary

EtherCAT digital networks

The main advantage of the EtherCAT control protocol is to apply Ethernet technology for automation applications which require short data update times (low latency) with ultra-low communication jitter for synchronization purposes.

Supported transducers

Typical application

ESO64 is supported in simcenter testlab turbine testing workbooks and simcenter testlab time data acquisition workbook.

BENEFITS

- Connect your SCADAS system with the EtherCAT digital bus
- Up to 64 channels (freely selectable) can be streamed in real time to the EtherCAT network
- Streaming to EtherCAT in parallel with high-speed high sample rate throughput to host PC running Simcenter Test.

FEATURES

- Data transmission up to 80 m through a single CAT6 type shielded twisted pair cable.
- Optimized solution for: rig testing closed loop testing, real-time applications, hardware in the loop testing.

Low latency
In control systems, it is essential to reduce latency to an absolute minimum. Upon an

EtherCAT request, each selected channel sends one sample to the EtherCAT bus.

Synchronization
Each sample that is made available on the EtherCAT bus is fully synchronized with the EtherCAT bus cycle. Advanced asynchronous resamplers provide the bridge between SCADAS internal sampling rate and the EtherCAT requests for data.
The normal data acquisition process runs independent from the real-time EtherCAT sampling process.

Product Information Sheet

Specifications ESO64	
Input	
Description	Simcenter SCADAS Mobile and Lab ESO64 EtherCAT Output module
Input function	64 channel EtherCAT (write) interface module
Input connector	Two RJ45 connectors for CAT6 type shielded Ethernet cables with length up to 80 m
EtherCAT short latency filters	
	Configurable low-latency digital 4th order Bessel filter with 1dB cutoff frequency that can be set between 20Hz and 1000Hz in 1-2-5 steps
Real-Time throughput	
	Up to 64 Real-time signals can be sent to the EtherCAT network at 12 kHz maximum in parallel with up to 64 signals at 204.8 kHz sent to the host PC running Testlab
Sampling frequency	
	204.8 kHz/channel (So ESO64 modules cannot be used in combination with SCM-V24-II or SCM-DB8III(c) modules)
Data format	
	Signals are provided in 32bit floating point format (e.g. double, float …) and described in XML file
Latency	
	Less than 400 µs, including EtherCAT bus transfer, but excluding latency caused by the Bessel filters.
	-1dB cutoff frequency (phase delay in ms): 1000Hz: 0.2ms; 500Hz: 0.4ms; 200Hz: 1ms; 100Hz: 2ms; 50Hz: 4ms; 20Hz: 10ms; 10Hz: 20ms
Accuracy	
	Jitter less than 20 ns @ 100 MHz clock speed
Phase match	
	Between real-time channels better than 0.2° for signal frequencies up to 100Hz
Front panel indication	
	Color coded LED indicating EtherCAT connection status.
Protection	

ESD protection	According to EN61000-4-2, level 2 and ISO10605
EMC protection	Comply with CE-EMC directive, when installed in a SCADAS Mobile frame
Shock protection	MIL-STD-810G specified in MIL-STD-810G method 516.5, Shock Amplitude: 60 gpk.
Vibration protection	MIL-STD-810G method 514.5, procedure 1, Category 24: RMS 7.694 g
Ambient operating temperature range	-20 ºC to +55 ºC
Storage temperature range	-20 °C to +70 °C
Housing	
Dimensions	One SCADAS slot

Ordering information

Support of Simcenter SCADAS Frames and Modules may be restricted in specific Simcenter Testlab application workbooks.

Please check with your local representative for full details.

SCM-ESO64: Simcenter SCADAS Mobile EtherCAT interface module

SCL-ESO64: Simcenter SCADAS Lab EtherCAT interface module

Prerequisites

ESO64 requires data from EtherCAT compatible input modules.

All xx-RT conditioning modules needs to run at a sampling frequency of 204.8 kHz in order to create minimum latency to the EtherCAT network.

EtherCAT ESO64 is supported in Simcenter Testlab Turbine Testing application (relevant licenses: Simcenter Testlab Turbine Test Recording) and Simcenter Testlab Time Data Acquisition.

Simcenter SCADAS Mobile and SCADAS Recorder frames delivered in 2010 or before do not support EtherCAT functionality. EtherCAT communication affects total throughput of measured data to Testlab. Please contact your Siemens representative for a configuration of SCADAS systems in combination with an ESO64 module and EtherCAT.

Following modules can provide (next to standard high speed data stream) signals to ESO64 in real time:

Signal conditioning modules with digital EtherCAT output

SCL-RV4-RT: Simcenter SCADAS Lab 4-ch torsional vibration module

SCL-T8-RT: Simcenter SCADAS Lab 8-ch thermocouple input

SCL-V8-RT: Simcenter SCADAS Lab 8-ch V/ICP/TEDS (CAMAC) input module

SCL-V8B-RT: Simcenter SCADAS Lab 8-chV/ICP/TEDS (BNC) input module

SCL-VB8II-RT: Simcenter SCADAS Lab 8-ch universal NVH input module

SCL-VB8III-RT: Simcenter SCADAS Lab 8-ch universal input module

SCL-VBDS4-RT: Simcenter SCADAS Lab 4-ch V/ICP, dynamic strain input module

SCM-RV4-RT: Simcenter SCADAS Mobile 4-ch torsional vibration module

SCM-T8-RT: Simcenter SCADAS Mobile 8-ch thermocouple input module

SCM-V8-RT: Simcenter SCADAS Mobile 8-ch V/ICP/TEDS (CAMAC) input module

SCM-V8B-RT: Simcenter SCADAS Mobile 8-ch V/ICP/TEDS (BNC) input module

SCM-VB8II-RT: Simcenter SCADAS Mobile 8-ch universal NVH input module

SCM-VB8III-RT: Simcenter SCADAS Mobile 8-ch universal input module

SCM-VBDS4-RT: Simcenter SCADAS Mobile 4-ch V/ICP, dynamic strain input module

Included Accessories

2m CAT6 type FTP cable