TraNET® FE 408 DP

Data Acquisition Instrument

The family of modular TraNET® data acquisition instruments provides turnkey solutions to many complex measurement problems. TraNET® data acquisition systems are flexible, compact and portable. They can be used to solve in situ problems in many different applications like blast, ballistics, automotive, power or transportation systems. With the Continuous Data Recorder mode, a long duration event can be stored to disk, gap free in real-time, and analysed later. The powerful application software TranAX not only helps to quickly configure many acquisition channels, but also provides the right post-processing tools to analyse complex waveforms.

The TraNET FE 408 DP is the largest device of the TraNET family and allows device configurations up to 32 channels in a very compact chassis. The Dust Proof (DP) chassis is optimized for dusty and muddy environments which makes it very suitable for outdoor blast measurements.

The TraNET FE 408 DP can be equipped with up to four TPCE-8016-8S-DP or TPCE-2016-8S-DP or up to two TPCE-2016-8S-SG-DP data acquisition boards.

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Content

General Specification

Connection	Ethernet 1 GBit, RJ45 front connector
Harddisk	400 GB SSD
Power Supply	24 V DC Powerplug: SFV 40 0 (IEC 60130-9)
Power Consumption	~ 30 - 60 W (depend on the installed DAQ card)
Operating Conditionw	0 .. 35 °C Higher temperature possible when free air flow is applied over the instrument. Rel. Humidity: - Up to 31°C: < 80% , - 31°C ..45°C: decreasing to < 50% Max. Operating Elevation: 2'000m
Storage Temperature	-20 .. 60 °C
Channel Configuration	TPCE-2016-8S-DP or TPCE-8016-8S-DP: 8 / 16 / 24 / 32 single ended TPCE-2016-8S-SG-DP 8 / 16 voltage inputs (single ended) + 8 / 16 strain inputs
Recording Modes	Scope, Multi Block, Continuous, Event Controlled Recording (ECR), Dual Sampling Rate (with ECR only)

Max Streaming Limits Due to the limited hardware per-formance of the built-in CPU, the following limits must be observed for continuous recordings: (unused channels turned off!)		# of active Channels	Max. Sampling Rate
		1 Channel	40 MS/s
		4 Channels	10 MS/s
		8 Channels	6 MS/s
		12 Channels	4 MS/s
		16 Channels	2.5 MS/s
		24 Channels	2 MS/s
		32 Channels	1.25 MS/s

|	
Digital IO's (TTL)	Trigger In, Trigger Out, External Timebase In, Disarm In, Armed Out, SyncClock Out Optional: 8 Digital Marker Inputs
Synchronisation	SyncLink Port, Pulse per Second Sync Optional: GNNS (GPS, GLO, GAL, BDS)
Software	TranAX 4 LE, TranAX 4 LabVIEW Instrument Driver C++/C#/Python API
Mechanical Specification	330 x 115 x 289 mm 6.1 kg (32 channels)

TraNET® FE 408 DP Rear Side

The TraNET FE 408 DP has no fans to the outside and is completely passive cooled. Heat spreaders on the top and on the backside helps to keep the device temperature low.

Data Acquisition Cards

Analog Input Card TPCE-2016-8S-DP & TPCE-8016-8S-DP
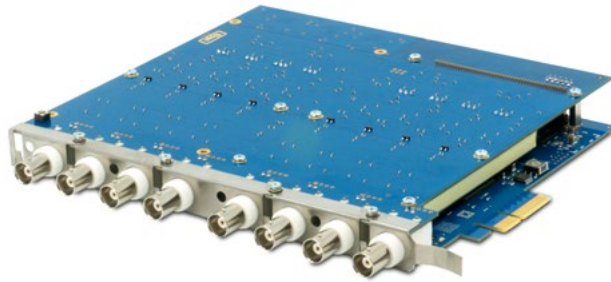
TPCE-2016-8S-DP & TPCE-8016-8S-DP

The data acquisition cards TPCE-2016-8S-DP and TPCE-8016-8S-DP are specially designed for the 408 Dust Proof device. They are optimized for low power consumption which is necessary for the dust proof chassis and high channel count of up to 32 channels.

Each channel is equipped with a programmable ICP/IEPE current source for powering active pressure or acceleration sensors. A status LED beside each BNC input indicates if ICP/IEPE is turned on and if a sensor is connected properly.

The DP series data acquisition card is available with either 20 MS/s or 80 MS/s sampling rate per channel and 14/16 bit resolution. The input range of each input can be configured individually from ±100 mV up to ± 25 V or 0−200 mV up to 0−50 V. The on-board memory size is 64 MS per channel. For long time measurements, the signal can be streamed directly to the hard disc with the help of the continuous measurement mode. More complex triggered long time measurements with even dual time base can be done with the Event Controlled Recording mode (ECR).

Specification

	TPCE-2016-8S-DP		TPCE-8016-8S-DP	
Number of Input Channels	8			
Max. Sampling Rate (all channels are sampled simultaneously)	20 MS/s		80 MS/s	
Amplitude Resolution	16 Bit		16 Bit up to 20 MS/s 14 Bit up to 80 MS/s	
Memory per (Module)	8 x 64 MS			
Input Amplifier				
Input Ranges	±100 mV, ±200 mV, ±500 mV, ±1 V, ±2.5 V, ±5 V, ±12.5 V, ±25 V Offset Settings: 0 - 100 %			
Input Impedance	1MΩ (± 0.2 %) // 42 pF (± 5 %)			
Input Coupling	DC / AC / ICP (IEPE)			
ICP / IEPE Current Settings	4 - 20 mA software setable per channel			
Bandwidth	10 MHz		20 MHz	
Slew Rate (10 – 90 %)	50 ns		12.5 ns	
Low Pass Filter	100 kHz / 1 MHz 2nd Order Low Pass, software selectable per channel			
DC Range Error (±)	< 1 ‰ (after autocalibration)			
Offset Error (±)	< 1 ‰ (after autocalibration)			
Offset Drift (±)	< (0.100 ‰ + 0.1 mV) per °C			
Input Noise (± 100 mV Range) @ max. Sample Rate @ 5 MHz Sample Rate @ 1 MHz Sample Rate @ 100 kHz Sample Rate @ 10 kHz Sample Rate	< 50 µVrms < 30 µVrms < 20 µVrms < 9 µVrms < 5 µVrms		< 100 µVrms < 30 µVrms < 20 µVrms < 9 µVrms < 5 µVrms	
Signal to Noise Ratio SNR: @ max. Sample Rate @ 10 MHz Sample Rate @ 5 MHz Sample Rate @ 1 MHz Sample Rate @ 100 kHz Sample Rate @ 10 kHz Sample Rate	± 2.5 V 69 dB 72 dB 74 dB 80 dB 85 dB 87 dB	± 5 V 66 dB 69 dB 71 dB 76 dB 81 dB 81 dB	± 2.5 V 63 dB 72 dB 74 dB 80 dB 85 dB 87 dB	± 5 V 61 dB 69 dB 71 dB 76 dB 81 dB 81 dB
Channel Crosstalk @ 1 MHz	> 74 dB		> 74 dB	

TPCE-2016-8S-SG-DP

The data acquisition card of type -SG extends the range of functions of the standard DP card. Each input channel has an additional input connector to connect strain gauges directly.

Full, half and quarter (120 Ohm) bridges can be used as strain gauges. Excitation voltages of 5 and 10 V are available.


	TPCE-2016-8S-SG-DP
Number of Input Channels	8
Max. Sampling Rate (all channels are sampled simultaneously)	20 MS/s
Amplitude Resolution	16 Bit
Memory per (Module)	8 x 64 MS
Voltage Input	
Input Ranges	±100 mV, ±200 mV, ±500 mV, ±1 V, ±2.5 V, ±5 V, ±12.5 V, ±25 V Offset Settings: 0 - 100 %
Input Impedance	1MΩ (± 0.2 %) // 42 pF (± 5 %)
Input Coupling	DC / AC / ICP (IEPE)
ICP / IEPE Current Settings	4 - 20 mA software setable per channel
Bandwidth	10 MHz
Slew Rate (10 – 90 %)	50 ns
Low Pass Filter	100 kHz / 1 MHz 2nd Order Low Pass, software selectable per channel
Strain Gauge Input	
Input Connector	7-Pol LEMO
Input Ranges	±0.2 mV/V, ±2 mV/V, ±10 mV/V, ±20 mV/V, ±50 mV/V, ±100 mV/V, ±500 mV/V, ±1000 mV/V,
Bandwidth	> 1.5 MHz > 600 kHz for Input Range ±0.2 mV/V
Slew Rate (10 - 90 %)	< 300 ns < 700 ns for Input Range ±0.2 mV/V
Gain Error	< 0.2 % < 0.6 % or Input Range ±0.2 & ±0.4 mV/V
Isolation	none, 1MΩ to GND.
Bridge Modes	Full, ½-Bridge, ¼-Bridge 4 and 6 wire
¼-Bridge internal Resistance	120 Ω (other values on request)
Excitation Voltage	DC 5V / 10 V ±0.1%
Additional Features	Auto-Offset
Connector Type	Lemo 7-Pol, FGG.1B.307.xx

TranAX® 4

TranAX® 4 is the universal data acquisition software from Elsys designed for all types of data acquisition cards and the turnkey TraNET® data acquisition instruments.

Key Features

- Configures quick and easy many analog input channels, no programming required
- Data visualization in Multi-Waveform displays
- Several cursor for easy data readout and reporting
- X-Y data display
- FFT Analysis
- Spectrogram and Waterfall diagrams
- Measurement data - video synchronization
- More than 40 scalar functions to measure any significant waveform parameter on time or FFT curves
- Powerful formula editor for more than 60 mathematics functions, syntax highlighting, for-loops, array calculations, string manipulations, etc.
- Python integration
- Measurement Flow Control macro's for easy to set up, fast automated measurements
- Documentation Generator
- English, German and Chinese version
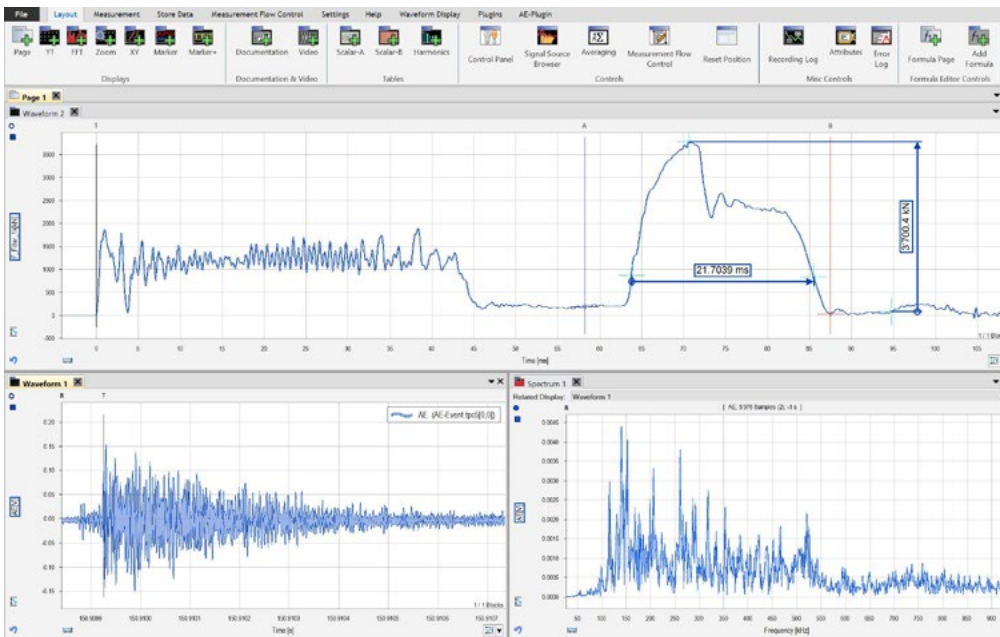
TranAX® Waveforms

The measurement curves can be displayed individually without any programming effort. Any number of curves can be displayed per waveform. The waveforms can in turn be arranged on a page.

The envelope curve algorithm running in the background calculates reduced data sets, allowing even very large files of several GB to be displayed quickly.

Control Panel
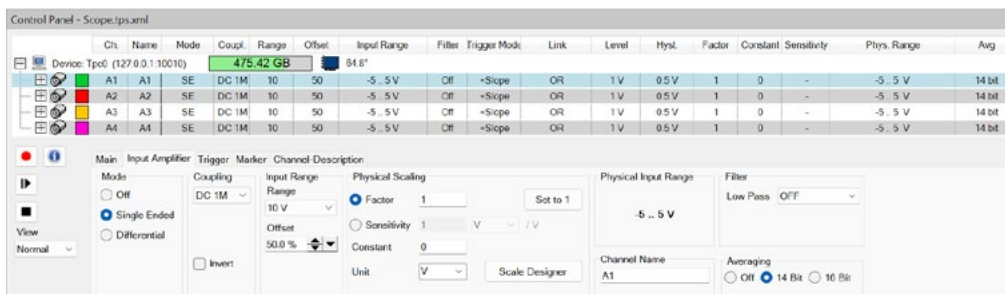
Additional Tools and APIs

- Waveform Viewer
- Excel TPC5 Importer
- File Converter Tool
- ActiveX/.NET Remote
- LabVIEW Instrument Driver
- C++/C#/Python API
- Excel Report Generator

Additional Accessories

Digital Input/Output BNC Box
The BNC break-out box simplifies access to the additional digital control and marker signals.

Available Signals:
Trigger In, Trigger Out, Armed Out, Disarm In, Ext. Timebase In, Ext. Start In, 8x Marker In

Precision High-Voltage Attenuators
The precision attenuators allow measurements up to 1000 V with a much higher precision than standard oscilloscope probes.

- 20 : 1, 100 : 1 and 1000 : 1 attenuators
- 2 or 3 channel per box
- up to 1000 V Vmax

SyncLink Box
To connect several TraNET® FE, EPC or PPC devices to a large measuring system, the devices must be synchronized with each other. The SLB-8 connects up to 8 TraNET devices. All connected devices run with a sample accurate reference clock. In addition, trigger events are signaled, which means that each measurement input can be used as a trigger source for the remaining inputs on all connected devices.