Product Catalog 2014/2015

INSTRUMENTS

SOFTWARE

APPLICATIONS

DEWESoft®
measurement innovation

Mission

AND VISION

THE MISSION of the company is to provide the best possible test and measurement solution working close together with our customers. **THE SOLUTION** starts with having robust mechanical housing and having inside great electronics providing the strong base for different applications.

Instruments

Software

Applications

We will continue to work on one piece of software covering all application areas providing turn-key easy-to-use solution for most demanding tasks. We have seen the great benefit of covering multiple applications from a single instrument so this will definitely stay our guideline.

The best total solution of course doesn't stop there – the global network of people providing local support and service for the customers and fast response time is a foundation of our success. Our motivation and inspiration for our further work lies in the great relation we have established with our customers worldwide.

DEWESoft®
measurement innovation

DEWESoft® handles complete instrument design, development, manufacturing, sales and marketing ... ALL IN ONE HAND.

DEWESoft® was founded back in year 2000 and today DEWESoft® products are being used in many applications by global market leaders all around the world. DEWESoft® positioned itself in the global market with innovations in software and hardware products. We gained trust with our customers by keeping a close contact and tight support on all levels from sales down to technical support.

The DEWESoft® hardware, the perfect match to the already well established DEWESoft® software, offers now the next generation in networked data acquisition. The modular hardware concept with many new technologies like dual core ADC and digital high end isolation shows the clear next DAQ generation.

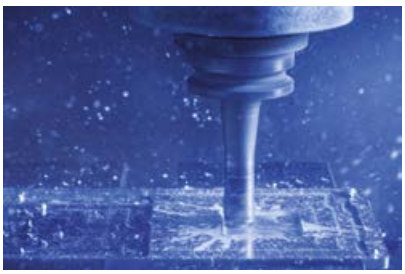
THE PROFESSIONAL TEAMS for software, electronic hardware, machinery center, create the world-best instruments.

What sets DEWESoft® apart from most other DAQ-companies?

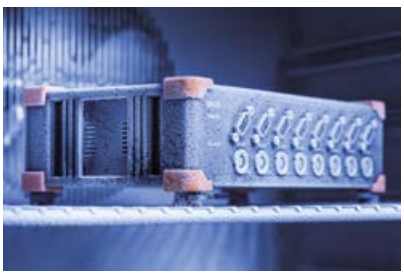
It is the complete development and manufacturing of the mechanics (enclosure), electronics (hardware), software, instruments know-how and customized solutions. This guarantees complete independency of sub suppliers.

The standard products are available with shortest delivery times. Special customized solution can be designed and manufactured on demand.

The high end test center form EMI, ISO - calibration and also for all environmental tests like temperature from -40 to 140 deg. C, vibration and shock test are done in house !





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DEWESoft®
measurement innovation

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Handheld instruments with few channels up to high-end test systems with more than 1000 channels are offered.

SOFTWARE 58

Easy to use data acquisition and analysis software, even for sophisticated applications.

APPLICATIONS 76

Instruments

THE NEXT INSTRUMENT GENERATION

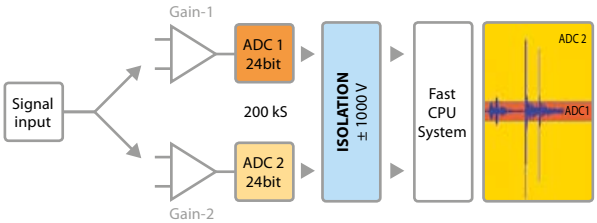
SIRIUS™

THE NEXT INSTRUMENT GENERATION

- *Fast data recorder*
- *High dynamic range up to 160 dB;*
  20 times better than 24 bit systems
- *Isolated input amplifiers for any sensor/signal*
- *Analog output, function generator or file replay*
- *Including DEWESoft® X next generation DAQ software*

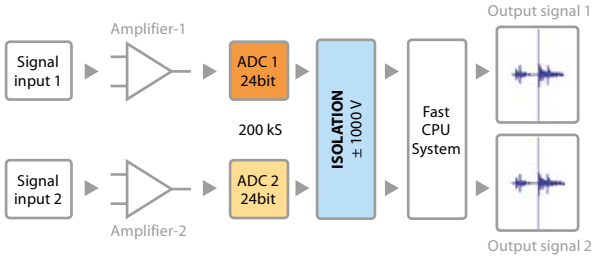
HIGH DYNAMIC DUAL CORE ADC; 2x24 BIT ADC, 200 KS/S; 160 DB DYNAMIC !

This new technology solves the often faced problem that the signal is higher than expected and therefore clipped. DEWESoft®DUALCOREADCtechnology always gives you the full possible measuring range, because the signal is measured with a high and a low gain at the same time!



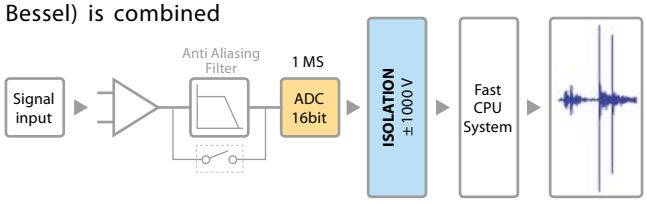
HIGH DENSITY 16 CHANNEL 1x24 BIT ADC, 200 KS/S; ULTRA COMPACT !

For highest channel count this solution offers 24Bit resolution with up to 200 kS/sec sample rate per channel.



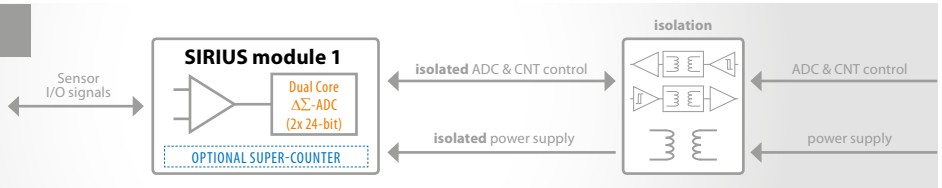
HIGH SPEED 8 CHANNEL 1x16 BIT ADC, 1 MS/S; HIGH BANDWIDTH !

This series combines high bandwidth with alias free acquisition with 16 Bit of up to 1 MS/sec acquisition rate.
The analogue anti-aliasing filter (100 kHz, 5th order, Bessel) is combined with a free programmable digital IIR filter block inside the FGPA. For bandwidth requirement of up to 500 kHz the complete filter chain is bypassed.

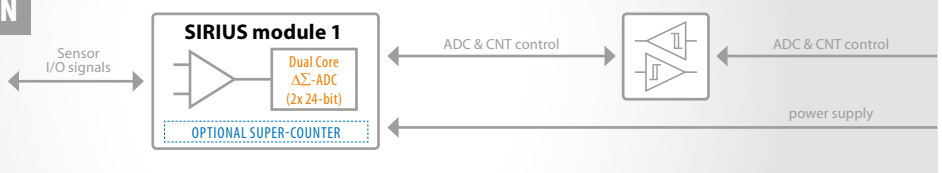


Dual core, high density and high speed SIRIUS slices can be freely combined and synched together. Mixing of technologies inside one slice however is not possible.

ISOLATED VERSION



DIFFERENTIAL VERSION



THE SIRIUS CHASSIS SOLUTIONS:

THE SIRIUS – MODULAR SLICE SOLUTION

- 8 analog input channels / slice
- Stackable with the DEWESoft® click mechanism
- Direct connected via USB to external PC
- or to the powerful SBOX

THE SIRIUS – BOXED SOLUTION

- ONE BOX solution with or without embedded SBOX PC,
- Up to 4 slices / system
- Internal sync and power supply between the slices, less cables needed
- Smallest high channel count system .. 64 channels 216 * 266 * 139mm

THE SIRIUS – RACK SOLUTION: SIRIUS R8

- Up to 8 SIRIUS amplifier slices can be plugged into the SIRIUS R8
- The full data transfer is guaranteed with the powerful SBOX R8:
- 8 SIRIUS HD 16 channel - slice with 200 kS/s
- 8 SIRIUS HS 8 Channel slice with 1 MS/s
- Or ANY combination of different slices HS, HD or standard high dynamic
- Analog output option

THE SIRIUS – RACK DISPLAY SOLUTION: SIRIUS R8D

Same features as the R8, but with

- High brightness 17" FULL HD display
- Multi-touch
- Most compact high channel portable

THE SIRIUS – MOST PORTABLE: SIRIUS R2D

- Up to 2 SIRIUS*r* amplifier slices can be plugged into the SIRIUS R2D
- The full data transfer is guaranteed with the powerful i5 PC
- 2 SIRIUS HD 16 channel – slice with 200 kS/s
- 2 SIRIUS HS 8 Channel slice with 1 MS/s
- Or ANY combination of different slices HS, HD or standard high dynamic

THE SIRIUS – 19" PC SOLUTION: SIRIUS R3

- Up to 3 SIRIUS*r* amplifiers slices can be plugged into the SIRIUS R3
- Full size PC with PCI / PCIe cards expandability
- 19" rack option

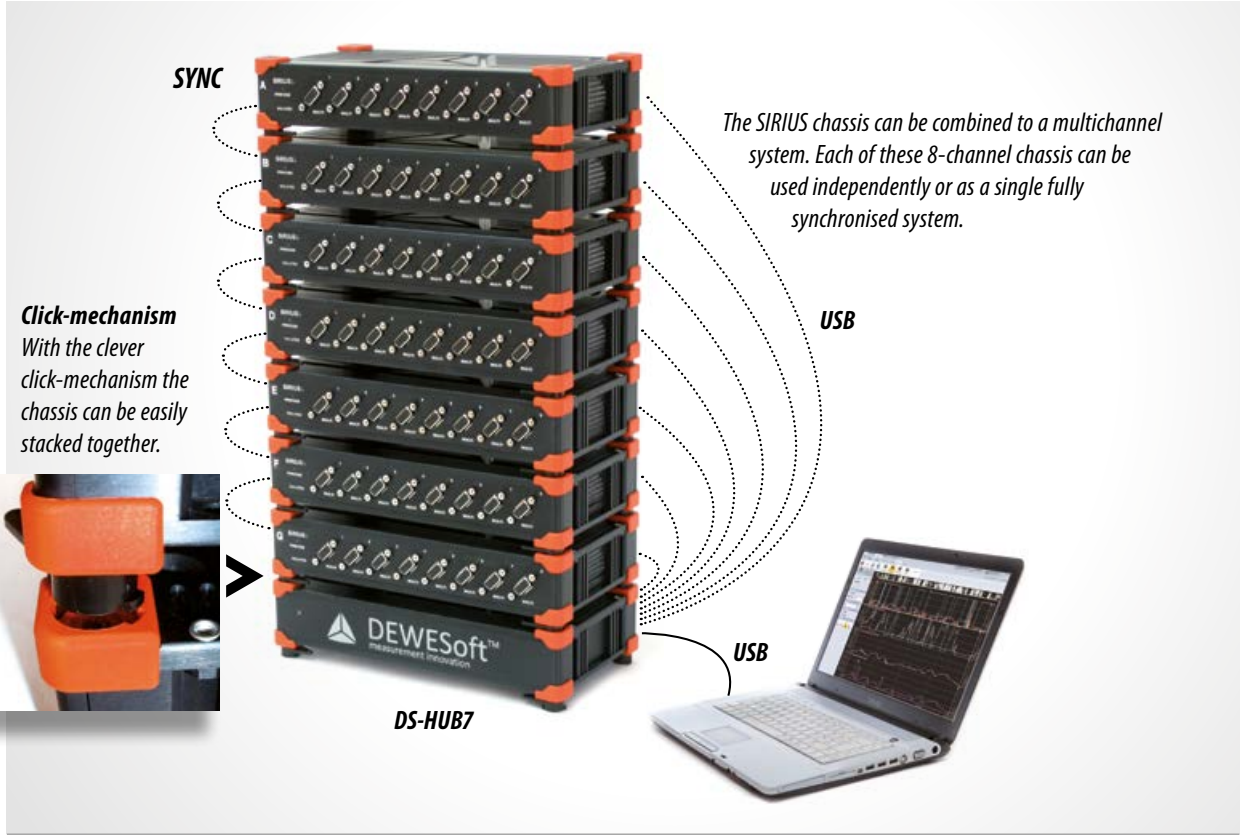
SIRIUS – Modular solution

Typ. Configuration : 1 slice 8 or 16 analogue channels with standard notebook PC.

Typ. Configuration : single or multiple slices(s) combined together with powerful SBOX and new 12″ high brightness Display

SIRIUS USB CHASSIS WITH AN EXTERNAL PC

Multiple chassis can be combined and synced together to get a multichannel system. If you go for the modular solution, due to the clever mounting-system (click-mechanism) you can use the SIRIUS devices separately or stacked together, whatever fits best to the actual measurement task.



SIRIUS – Boxed solution

The most compact solution is offered as the SIRIUS BOXED solution. With or without the SBOX computer it can be configured with 1 to 4 slices. Any slice: standard, high speed 1 MS/s, high density 16 channel / slice or even the 1 ½ height SIRIUS STG+ can be combined to any configuration. The SIRIUS – BOXED solution offers the most compact system:

- *PC only: 266x139x73 (incl. feet)*
- *8 channels: 266x139x109*
- *16 channels: 266x139x145*
- *24 channels: 266x139x181*
- *32 channels: 266x139x216*

CONFIGURATION EXAMPLES

The DEWESoft® CLICK – mechanism allows any combination of MODULAR and BOXED configurations...

SIRIUS 8xACC
2x SIRIUS 8xSTG-L2B7f
SBOX

4 SIRIUS 8xSTG-L2B7f

SIRIUS Rack

MODULAR PLUGIN SYSTEM UP TO 128 CHANNELS

USB DATA THROUGHPUT: 64 AI CHANNELS (DUAL-CORE MODE) @ 200 KS/S

- *Up to 128 analog channels with SIRIUS HD (200 kS/s each channel)*
- *Up to 64 analog channels with SIRIUS HS (1 MS/s each channel)*
- *Up to 8 CAN ports*
- *Up to 64 super-counter*
- *Easy to configure*
- *Any connectors on any slot*
- *Easy expandable to hundreds of channels*
- *High performance i7 SBOX included*
- *Up to 8 SIRIUS slices*
- *Up to 64 analog outputs*

SBOX-R8

- *Base enclosure for rack/standalone solution*
- *Including powerful Core i7 SBOX computer*
- *Provides space for up to 8 SIRIUSr slices*

SIRIUSr AMPLIFIERS

Isolated / differential

- *SIRIUSir 8xACC*
- *SIRIUSir 6xACC,2xACC+*
- *SIRIUSir 8xCHG*
- *SIRIUSir 8xHV*
- *SIRIUSir 8xMULTI*
- *SIRIUSir 8xSTG*
- *SIRIUSir 8xSTGM*
- *SIRIUSr-HD 16xSTGS*
- *SIRIUSr-HD 16xLV*
- *SIRIUSir-HS 8xACC*
- *SIRIUSir-HS 6xACC, 2xACC+*
- *...*

GENERAL SPECIFICATIONS

Interfaces	4xUSB, VGA, GigE, WLAN, 2xsync
GPS	Option: 10Hz/20Hz/100Hz
CPU	i7 INTEL 8 CORE, 2.1 GHz, i7-3612QE, 4 GB RAM
Disk storage	128 GB internal flash + 240 GB removable SSD
Power supply	12-36 VDC
Dimensions	Standalone: 446 x 313 x 165 mm Rack-mount: 489 x 313 x 165 mm
Software	incl. DEWESoft® X Professional

SIRIUS R8D

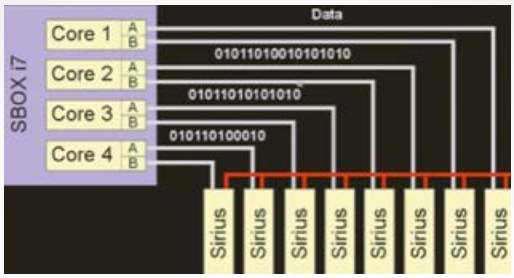
THE MOST COMPACT HIGH CHANNEL PORTABLE

- *For up to 8 SIRIUS slices (128 channels)*
- *17" high brightness display Full HD*
- *Multi-touch*
- *Rack mounting option*
- *Powerful Core i7-PC (SBOX-R8), 4GB RAM*
- *Front 4xUSB 3.0, Rear 1xUSB 2.0 and 3xUSB 3.0*
- *VGA, HDMI, GigE, WLAN, 2x sync*
- *GPS option: 10Hz/20Hz/100Hz*
- *128 GB internal flash + 240 GB removable SSD (960 GB opt.)*
- *12-36 VDC supply*
- *Incl. DEWESoft® X Prof*

Up to 128 analogue input channels only 12kg weight and dimensions easy to carry (446x313x165mm WxHxD) this is the most compact high channel portable on the globe!

The free combination of any SIRIUS slice with DUAL CORE 200 kS/s, high density or high speed (1 MS/s) makes it very easy to configure the system for any application!

i7-PC



The fast SBOX computer equipped with the quad core/8 thread i7 CPU with a native USB port for each of the 8 slots guarantees the fast data throughput:

- *64channel @ 1MS/s, 16 bit – high speed*
- *64 channel @ 200kS/s, 2x24 bit – high dynamic*
- *128 channel @ 200kS/s, 24bit – high density*
- *i7 CPU with up to 960GB SSD*
- *180MB/s data streaming*

CONFIGURATION EXAMPLE

mixed analog channels:

- *24 channel @ 1MS/s, 16 bit – high speed*
- *24 channel @ 200kS/s, 2x24 bit – high dynamic*
- *48 channel @ 200kS/s, 24bit – high density*
- *8 counter*
- *4 CAN BUS*

SIRIUS R2D

THE MOST COMPACT PORTABLE

- *For up to 2 SIRIUS slices (32 channels)*
- *10.6" display Full HD*
- *Touchscreen*
- *Integrated keyboard*
- *Powerful Core i5-PC*
- *3xUSB 3.0, WLAN, 2x sync*
- *SSD disk size options*
- *Up to 2x CAN port*
- *GPS option: 10Hz/20Hz/100Hz*
- *9-36 VDC supply*
- *Incl. Windows 7 Ultimate, Multilanguage*
- *Incl. DEWESoft® X Prof*

Up to 32 analogue input channels only 5kg weight and dimensions easy to carry (312x175x213mm WxHxD).

The free combination of any SIRIUS slice with DUAL CORE 200 kS/s, high density or high speed (1 MS/s) makes it very easy to configure the system for any application!

i5-PC

The light weight aluminium chassis make the SIRIUS R2D a very small rugged instrument

SIRIUS R2D TEMPERATURE EXPANSION

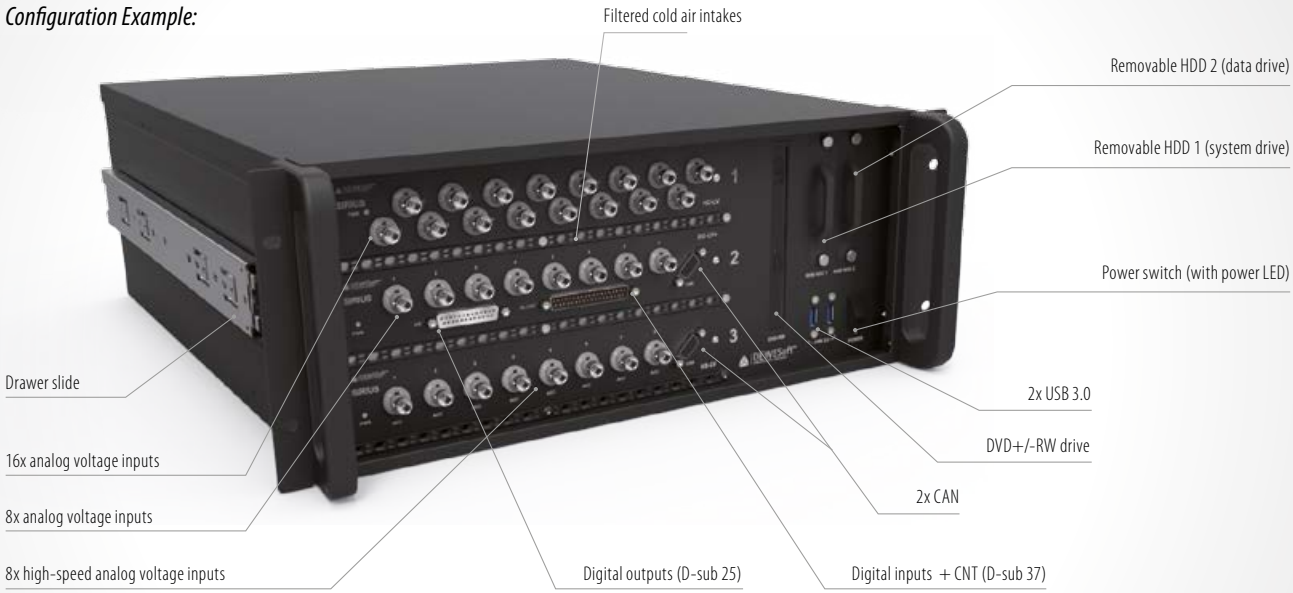
SIRIUS R2D Temperature measurement expansion example: 64 thermocouples 100Hz sampling rate

- *KRYPTON 8xTH, 16xTH*
- *-40 to 85 deg. C ambient temperature*
- *high shock/vibration rating*

SIRIUS R3

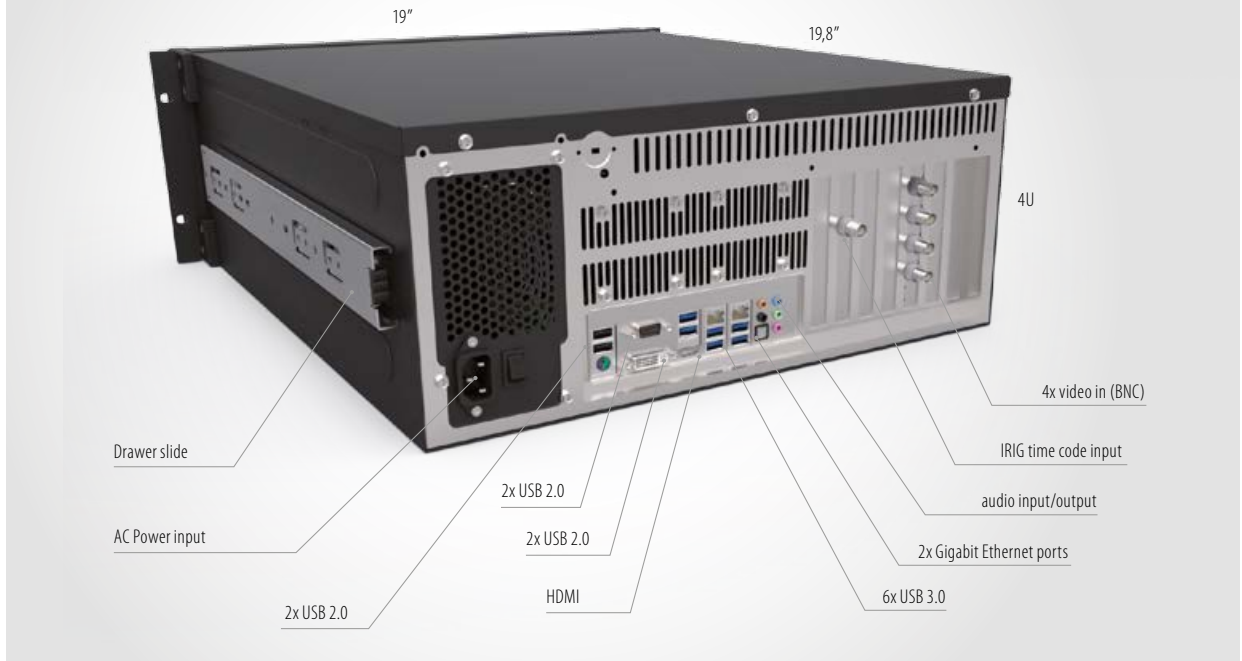
THE FLEXIBLE PC – BASED CHASSIS

Configuration Example:



Up to 3 slices (48 analogue input channels) or any combination of the Sirius slices can be installed. The standard PC offers easy expendabilities with our PPCM cards to a full telemetry system. The 19" brackets are available for Rack installation.

THE REAR SIDE SHOWS THE STANDARD PC – SLOTS:



SIRIUS-SBOX-2

EMBEDDED PC WITH UP TO 4 SIRIUS SLICES IN ONE CHASSIS

SSD WRITE RATE >180 MBYTE/S
USB DATA THROUGHPUT WITH SBOX:
32 AI CHANNELS (DUAL-CORE MODE) @ 200 KS/S

With the SBOX SIRIUS becomes a state-of-the-art compact standalone solution. The front USB 3.0 ports connect up to 4 SIRIUS chassis, which gives up to 64 channels.

FAST SPEED

With typ. 180 MB/s write rate to the flash disk, there is enough capability for e.g. external high-speed cameras with high streaming rates. The USB 3.0 ports allow a nearly 10x faster data throughput than USB 2.0 for quickly transferring your data. And the Core i7 processor allows quick and fluent working even if your setup is loaded with software plugins and math functions.

REMOVABLE SSD

For safe, stable operation we recommend separating the operating system and measurement data. The operating system is installed on a 128GB internal flash disk by asking for the SIRIUS SBOX-FLASH128 option. The measurement data is stored on the removable SSD. This allows easy transportation and archiving of your data.

GENERAL SPECS

Number of measurement channels per system	8 to 64
Up to four chassis for	SIRIUS 8x ACC, 8x MULTI, 8x STG, 8x HV, ... or customized
Interfaces	4x USB3.0, 2x USB2.0, HDMI, VGA, GigE, WLAN, 2x Sync
Operating temperature	0 to 50° C

SBOX SPECS

GPS	Optional: 10Hz/20Hz/100Hz
Power supply	9 - 36 VDC
CPU	i7 2.0 GHz
Chipset	Intel QM57
RAM	4 GB
HDD	240 GB removable SSD option: 960 GB removable SSD option: 128 GB int. FLASH (for OS)

STANDARD SLICE – SELECTION GUIDE

ISOLATED VERSION		DIFFERENTIAL VERSION		CONNECTORS		SIRIUS modular SIRIUS boxed	SIRIUS - Rack R8D, R2D, R3; R8
8 (+) channel SIRIUS (high dynamic) 200 kS/s 2*24bit (160 dB)	analoque output option	8 (+) channel SIRIUS (high dynamic) 200 kS/s 2*24bit (160 dB)	analoque output option	STANDARD	OPTION		
SIRIUS*i* 6xACC, 2xACC+	✓	SIRIUS 6xACC, 2xACC+	✓	BNC, LEMO 1B7f		✓	SIRIUS*r*
SIRIUS*i* 8xACC	✓	SIRIUS 8xACC	✓	BNC		✓	SIRIUS*r*
SIRIUS*i* 8xHV	✓	–	✓	BANANA		✓	SIRIUS*r*
SIRIUS*i* 8xLV	✓	SIRIUS 8xLV	✓	D-SUB 9	BANANA, BNC	✓	SIRIUS*r*
SIRIUS*i* 8xLV+	✓	SIRIUS 8xLV+	✓	D-SUB 9,LEMO 1B7f		✓	–
SIRIUS*i* 8xMULTI	✓	SIRIUS 8xMULTI	✓	D-SUB 15	LEMO 2B16f	✓	SIRIUS*r*
SIRIUS*i* 8xSTG	✓	SIRIUS 8xSTG	✓	D-SUB 9	LEMO 2B10f, 2B7f	✓	SIRIUS*r*
SIRIUS*i* 8xSTG+	✓	SIRIUS 8xSTG+	✓	D-SUB 9,LEMO 1B7f		✓	–
SIRIUS*i* 8xSTGM	✓	SIRIUS 8xSTGM	✓	D-SUB 9	LEMO 2B10f, 2B8f	✓	SIRIUS*r*
SIRIUS*i* 8xSTGM, DB	✓	SIRIUS 8xSTGM, DB	✓	D-SUB 9, 25,37		✓	–
SIRIUS*i* 8xSTGM+	✓	SIRIUS 8xSTGM+	✓	D-SUB 9,LEMO 1B7f		✓	–
SIRIUS*i* 8xCHG	✓	SIRIUS 8xCHG	✓	BNC	TNC	✓	SIRIUS*r*
SIRIUS*i* 6xCHG, 2xCHG+	✓	SIRIUS 8xCHG+	✓	BNC, LEMO 1B7f		✓	SIRIUS*r*
SIRIUS*i* 8xCAN	–	–		D-SUB 9		✓	–
SIRIUS*ir* 9xCAN	–	–		D-SUB 9		–	SIRIUS*r*
8 (+) channel SIRIUS HS (high speed) 1 MS/s 16bit	analoque output option	8 (+) channel SIRIUS HS (high speed) 1 MS/s 16bit	analoque output option				
SIRIUS*i*-HS 6xACC, 2xACC+	✓	SIRIUS-HS 6xACC, 2xACC+	✓	BNC, LEMO 1B7F		✓	SIRIUS*r*
SIRIUS*i*-HS 8xACC	✓	SIRIUS-HS 8xACC	✓	BNC		✓	SIRIUS*r*
SIRIUS*i*-HS 8xHV	✓	–	✓	BANANA		✓	SIRIUS*r*
SIRIUS*i*-HS 8xLV	✓	SIRIUS-HS 8xLV	✓	D-SUB 9	BANANA, BNC	✓	SIRIUS*r*
SIRIUS*i*-HS 8xLV+	✓	SIRIUS-HS 8xLV+	✓	D-SUB 9,LEMO 1B7f		✓	–
SIRIUS*i*-HS 8xSTG	✓	SIRIUS-HS 8xSTG	✓	D-SUB 9		✓	SIRIUS*r*
SIRIUS*i*-HS 8xSTG+	✓	SIRIUS-HS 8xSTG+	✓	D-SUB 9,LEMO 1B7f		✓	–
SIRIUS*i*-HS 8xCHG	✓	SIRIUS-HS 8xCHG	✓	BNC	TNC	✓	SIRIUS*r*
16 (+) channel SIRIUS HD (high density)	analoque output option	16 (+) channel SIRIUS HD (high density)	analoque output option				
SIRIUS*i*-HD 16xLV	–	SIRIUS-HD 16xLV	–	D-SUB 9	BNC	✓	SIRIUS*r*
SIRIUS*i*-HD 16xSTGS	–	SIRIUS-HD 16xSTGS	–	D-SUB 9	LEMO 1B10f	✓	SIRIUS*r*
8 (+) channels-SIRIUS fanless 200 kS/s	analoque output option	8 (+) channels-SIRIUS fanless 200 kS/s	analoque output option				
SIRIUS*if* 6xACC, 2xACC+	–	SIRIUS*f* 6xACC, 2xACC+	–	BNC, LEMO 187f		✓	–
SIRIUS*if* 8xACC	–	SIRIUS*f* 8xACC	–	BNC		✓	–
SIRIUS*if* 8xHV	–	–	–	BANANA		✓	–
SIRIUS*if* 8xSTGM	–	SIRIUS*f* 8xSTGM	–	D-SUB 9		✓	–
SIRIUS*if* 8xSTGM+	–	SIRIUS*f* 8xSTGM+	–	D-SUB 9, LEMO 1B7f		✓	–
SIRIUS*if* 8xCAN	–	–	–	D-SUB 9		✓	–
SIRIUS-SBOX-2						✓	SIRIUS*r*
SIRIUS*f*-SBOX						✓	–
SIRIUS-CUSTOM	✓	✓	✓			✓	SIRIUS*r*

ANY CUSTOMIZED MODULE COMBINATION U I PWM

HIGH DYNAMIC: Dual Core with 2x24Bit

SIRIUS analog input modules types	 SIRIUS-ACC	 SIRIUS-CHG	 SIRIUS-HV	 SIRIUS-LV	 SIRIUS-MULTI	 SIRIUS-STG	 SIRIUS-STGM
version with additional counter / DIO	 SIRIUS-ACC+	 SIRIUS-CHG+	–	 SIRIUS-LV+	 SIRIUS-MULTI	 SIRIUS-STG+	 SIRIUS-STGM+ SIRIUS-STGM-DB
Isolated version i	✓	✓	✓	✓	✓	✓	✓
Differential version	✓	✓	–	✓	✓	✓	✓
Rack version r [1]	✓	✓	✓	✓	✓	✓	✓
Fanless version f	✓	–	✓	✓ [5]	–	–	✓
Analog inputs1)							
Analog inputs per module	1	1	1	1	1	1	1
Data Rate / Channel [Hz]	200k	200k	200k	200k	200k	200k	200k
Vertical Resolution	2 * 24 Bit	2 * 24 Bit	2 * 24 Bit	2 * 24 Bit	2 * 24 Bit	2 * 24 Bit	2 * 24 Bit
Bandwidth	75 kHz	75 kHz	75 kHz	75 kHz	75 kHz	75 kHz	75 kHz
Voltage	±10 Volt, ±500 mV	±10 Volt, ±500 mV	±1200 Volt, ±50 Volt	±200 Volt to ±100 mV	±10 Volt to ±50 mV	±50 Volt to ±100 mV	±10 Volt to ±10 mV
Input coupling	DC, AC 1 Hz (3,10Hz SW)	DC, AC 0.1, 1, 10, 100Hz	DC	DC, AC 1 Hz (3,10Hz SW)	DC	DC, AC 1 Hz (3,10Hz SW)	DC
Sensor Excitation	-	-	-	2..30V bipolar 0..24V unipol. max.0.2A/2W	0 .. 12 Volt, max. 44mA 12 V, 5 V	0 .. 20 V max. 0.1A/0.8W, 0 .. 60 mA	0 .. 12 Volt, max. 44mA
Bridge connection (internal completion)	-	-	-	Full	Full, Half, Qu.120/350Ω 3-wire	Full, Half, Qu.120/350Ω 3 or 4-wire	Full, Half, Qu.120/350Ω 3-wire
Programmable Shunt (default Values)	-	-	-	-	59.88kΩ	59.88kΩ, 175kΩ bipolar	100 kΩ, bipolar
IEPE/ICP Sensors	4 or 8 mA	4, 8 or 12mA	-	MSI	MSI	MSI	MSI
Resistance	-	-	-	MSI	MSI	✓	MSI
Temp. (PT100 to PT2000)	-	-	-	MSI	MSI	✓	MSI
Temp. (Thermocouple)	-	-	-	MSI	MSI	MSI	MSI
Potentiometer	-	-	-	-	✓	✓	✓
LVDT	-	-	-	MSI	MSI	MSI	MSI
Charge	-	100.000 pC, 10.000 pC	-	MSI	MSI	MSI	MSI
Current	ext. Shunt	ext. Shunt	-	ext. Shunt	ext. Shunt	ext. Shunt	ext. Shunt
TEDS interface	✓	✓	-	✓	✓	✓	✓
Advanced functions	Sens. error detection, high dynamic range	Sensor error detection in IEPE and charge mode (injection)	High Voltage High Isolation	High sensor power and multi range	Analog and digital inputs, analog out	Supports all strain types and high input range	Low power, Sensor and Amplifier balance, Bipolar shunt
Analog input connectors							
Connector type (Default)	BNC	BNC	Banana	DB9, BNC, Banana	DB15, L2B16f	DB9, L2B7f, L2B10f	DB9, L2B8f, L2B16f
Digital types (version with addtional counter/digital input)							
Counter (connector)	1 ch(L1B7f)	1 ch(L1B7f)	-	1 ch(L1B7f)	1 ch(DB15) 1 ch(L2B16f)	1 ch(L1B7f) 1ch(L2B10f)[6]	1 ch(L1B7f)
Digital Input (connector)	3 ch(L1B7f)	3 ch(L1B7f)	-	3 ch(L1B7f)	3 ch(DB15) 3 ch(L2B16f)	3 ch(L1B7f) 1ch(L2B10f)[6]	3 ch(L1B7f)
Digital Output (connector)	1 ch(L1B7f)	1 ch(L1B7f)	-	1 ch(L1B7f)	-	1 ch(L1B7f) 1ch(L2B10f)[6]	1 ch(L1B7f)
Additional information							
Isolation voltage [2]	1000 V	1000 V	CAT II 1000V	1000V	1000 V	1000 V	1000 V
Power consumption (max.) [4]	8 W (15 W)	10 W (18 W)	8 W	10 W (25 W)	15 W (25 W)	15 W (25 W)	11 W (20 W)

HIGH DENSITY: 24 Bit, 16 channels per slice		HIGH SPEED: 16 Bit with high bandwidth				
 SIRIUS-HD-STGS	 SIRIUS-HD-LV	 SIRIUS-HS-ACC	 SIRIUS-HS-CHG	 SIRIUS-HS-HV	 SIRIUS-HS-LV	 SIRIUS-HS-STG
–	–	 SIRIUS-HS-ACC+	 SIRIUS-HS-CHG+	–	 SIRIUS-HS-LV+	 SIRIUS-HS-STG+
✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	-	✓	✓
✓	✓	✓	✓	✓	✓	✓
-	-	-	-	✓	✓ 5)	-
2	2	1	1	1	1	1
200k	200k	1 M	1 M	1 M	1 M	1 M
24 Bit	24 Bit	16 Bit	16 Bit	16 Bit	16 Bit	16 Bit
75 kHz	75 kHz	500 kHz	500 kHz	2 MHz	1 MHz	1 MHz
±10 Volt to ±10 mV	±100 V to ±100mV	±10 Volt to ±200 mV	±10 Volt to ±200 mV	±1600 Volt to ±20 V	±100 Volt to ±50 mV	±50 V to ±20mV
DC	DC	DC, AC 1 Hz (3,10Hz SW)	DC, AC 1 Hz (3,10Hz SW)	DC	DC, AC 1 Hz (3,10Hz SW)	DC, AC 1 Hz (3,10Hz SW)
0 .. 12 Volt, max. 44mA	2..30V bipolar 0..24V unipol. max.0.2A/2W	-	-	-	2..30V bipolar 0..24V unipol. max.0.2A/2W	0 .. 20 V max. 0.1A/0.8W, 0 .. 60 mA
Full, Half, Qu.120/350Ω 3 wire	Full	-	-	-	Full	Full, Half, Qu.120/350Ω 3 or 4-wire
100 kΩ	-	-	-	-	-	59.88kΩ, 175kΩ, bipol.
MSI	MSI	4 or 8 mA	4, 8 or 12mA	-	MSI	MSI
MSI	MSI	-	-	-	MSI	✓
MSI	MSI	-	-	-	MSI	✓
MSI	MSI	-	-	-	MSI	MSI
✓	-	-	-	-	-	✓
MSI	MSI	-	-	-	MSI	MSI
MSI	MSI	-	100.000 pC to 1000 pC	-	MSI	MSI
ext. Shunt	ext. Shunt	ext. Shunt	ext. Shunt	-	ext. Shunt	ext. Shunt
✓	✓	✓	✓	-	✓	✓
Low power, Sensor and Amplifier balance	Low power, high input range, high sensor supply	High speed, Sens. error detection,	Sensor error detection in IEPE and charge mode (injection)	High Voltage High Bandwidth	High sensor power and multi range	High speed, Support all strain types and high input range
DB9, L1B10f	DB9, BNC	BNC	BNC	Banana	DB9, BNC, Banana	DB9
-	-	1 ch(L1B7f)	1 ch(L1B7f)	-	1 ch(L1B7f)	1 ch(L1B7f)
-	-	3 ch(L1B7f)	3 ch(L1B7f)	-	3 ch(L1B7f)	3 ch(L1B7f)
-	-	1 ch(L1B7f)	1 ch(L1B7f)	-	1 ch(L1B7f)	1 ch(L1B7f)
500 V	500 V	1000 V	1000 V	CAT II 1000V	1000 V	1000 V
11 W (22 W)	11 W (22 W)	15W (22 W)	10 W (18 W)	8 W	10 W (25 W)	15 W (25 W)

1) Rack version modules not available with extendet height (eg. STG+).
2) Analog input types: Pinout of input connector may limit functionality. Please refer to detailed specification below.
MSI-Option requires DB9 connector on the module or adapter connector or cable.
3) applies only for isolated SIRIUS version
4) One complete slice with same modules
5) Fanless operation only for BNC or Banana version (without excitation)
6) One digital IO per amplifier with Lemo 2B10f connector

SIRIUS HIGH DYNAMIC – 2x 24 Bit, 200 kS/s

This new technology solves the often faced problem that the signal is higher than expected and therefore clipped. DEWESoft®DUALCOREADCtechnology always gives you the full possible measuring range, because the signal is measured with a high and a low gain at the same time!

- *Sound and vibration*
- *NVH*
- *No over-range errors (no signal clipping)*
- *Best for high dynamic sensors:*
  Microphones, Accelerometers, Strain gauges

SIRIUSm 4xACC

Analog inputs	4 ch voltage, IEPE, current (with ext. Shunt)
ADC type	24 bit delta-sigma dual core with anti-aliasing filter
Sampling rate	Simultaneous 200kS/sec
Dual Core Ranges (Low range)	±10 V (500 mV), ±500 mV (NA)
Dynamic Range@10kS (Dual Core)	140 dB (160 dB)
Input coupling	DC, AC 1 Hz (3 Hz, 10 Hz per SW)
Input impedance	1 MΩ in parallel with 0.4nF
IEPE mode	4 or 8 mA excitation; Sensor detection (Short: <4 Volt; Open: > 19 Volt)
TEDS	supported in IEPE mode
Overvoltage protection	50 V continuous; 200 V peak (10msec)
Typical power consumption (max.)	4 W, USB powered (2 USB cables)

SIRIUSm 3xACC, 1xACC+

Analog inputs	4 ch voltage, IEPE, current (with ext. Shunt)
	same as SIRIUSm 4xACC, but with additional counters
Digital Inputs	1 counter/3 digital inputs, fully synchronized with analogue data
Input level compatibility	CMOS, LVTTL
Input protection	±25 V continuous
Digital output	1 ch open collector, max. 100mA/30Volt
Typical power consumption (max.)	4 W, USB powered (2 USB cables)

SIRIUSi 8xACC

Analog inputs	8 ch voltage, IEPE, current (with ext. Shunt)
ADC type	24 bit delta-sigma dual core with anti-aliasing filter
Sampling rate	Simultaneous 200kS/sec
Dual Core Ranges (Low range)	±10 V (500 mV), ±500 mV (NA)
Dynamic Range@10kS (Dual Core)	140 dB (160 dB)
Input coupling	DC, AC 1 Hz (3 Hz, 10 Hz per SW)
Input impedance	1 MΩ in parallel with 0.4nF
IEPE mode	4 or 8 mA excitation; Sensor detection (Short: <4 Volt; Open: > 19 Volt)
TEDS	supported in IEPE mode
Overvoltage protection	50 V continuous; 200 V peak (10msec)
Typical power consumption (max.)	8 W (15 W)

SIRIUSi 6xACC, 2xACC+

Analog inputs	8 ch voltage, IEPE, current (with ext. Shunt)
	same as SIRIUSi 8xACC, but with additional counters
Digital inputs	2 counter/6 digital inputs, fully synchronized with analogue data
Input level compatibility	CMOS, LVTTL
Input protection	±25 V continuous
Digital output	2 ch open collector, max. 100mA/30Volt
Typical power consumption (max.)	8 W (15 W)

SIRIUS HIGH DYNAMIC – 2x 24 Bit, 200 kS/s

SIRIUSi 8xCHG

Analog Inputs	8 ch voltage, IEPE, charge, current (with ext. Shunt)
ADC type	24 bit delta-sigma dual core with anti-aliasing filter
Sampling rate	Simultaneous 200kS/sec
Charge mode ranges (low range)	±100 000 pC (5000 pC), ±10 000 pC (500 pC)
Dual Core Ranges (Low range)	±10 V (500 mV), ±500 mV (NA)
Dynamic Range@10kS (Dual Core)	140 dB (160 dB)
Input coupling	DC, AC (0.1 Hz, 1 Hz, 10 Hz or 100 Hz)
Input impedance	1 MΩ in parallel with 0.4nF
IEPE mode	4 or 8 or 12 mA excitation; Sensor detection (Short: <4 Volt; Open: > 19 Volt)
TEDS	supported in IEPE mode
Overvoltage protection	50 V continuous; 200 V peak (10 msec)
Typical power consumption (max.)	10 W (18 W)

SIRIUSi 6xCHG, 2xCHG+

Analog inputs	8 ch voltage, IEPE, charge, current (with ext. Shunt)
	same as SIRIUSi 8xCHG, but with additional counters
Digital Inputs	2 counter/6 digital inputs, fully synchronized with analogue data
Input level compatibility	CMOS, LVTTL
Input protection	±25 V continuous
Digital output	2 ch open collector, max. 100m A / 30 Volt
Typical power consumption (max.)	10 W (18 W)

SIRIUSi 8xHV

Analog inputs	8 ch voltage, current (with ext. Shunt)
ADC type	24 bit delta-sigma dual core with anti-aliasing filter
Sampling rate	Simultaneous 200kS/sec
Dual Core Ranges (Low range)	±1200 V (50 V), ±50 V (NA)
Dynamic Range@10kS (Dual Core)	142 dB (158 dB)
Input coupling	DC
Input impedance	10 MΩ in parallel 2pF
Overvoltage protection	In+ to In-: 4 kVpk-pk (1.2 kVRMS), Inx to GND: 2 kVpk-pk (600 VRMS) CAT II 1000V
Typical power consumption (max.)	8 W

SIRIUSi 8xLV

Analog inputs	8 ch voltage, full bridge strain, current (with ext. Shunt)
ADC type	24 bit delta-sigma dual core with anti-aliasing filter
Sampling rate	Simultaneous 200kS/sec
Dual Core Ranges (Low range)	±200 V (10 V), ±10 V (500 mV), ±1V (50 mV), ±100 mV (5 mV)
Br ranges @ 10Vexc (Low Range)	1000(50) mV/V, 100(5) mV/V, 10(0.5) mV/V
Dynamic Range@10kS (Dual Core)	137 dB (152 dB)
Input coupling	DC, AC 1 Hz (3 Hz, 10 Hz per SW)
Input impedance (100 V range)	10 (1) MΩ between IN+ or In- and GND
Bridge modes	full bridge
TEDS	Standard + MSI adapters, only on DSUB 9 version
Sensor Excitation	2 to 30 V bipolar / 0 to 24 V unipolar, sw programmable (16 bit DAC), max 0,2 A / 2 W
Overvoltage protection	200 V Range: 300 V; All other Ranges: 100V (250 V peak for 10 msec)
Typical power consumption (max.)	10 W (25 W)

** Fanless operation only for BNC or Banana version (without excitation)*

SIRIUS HIGH DYNAMIC – 2x 24 Bit, 200 kS/s

SIRIUSi 8xLV+

Analog inputs	8 ch voltage, full bridge strain, current (with ext. Shunt)
	same as SIRIUSi 8xLV, but with additional counters
Digital Inputs	8 counter/24 digital inputs, fully synchronized with analogue data
Input level compatibility	CMOS, LVTTL
Input protection	±25 V continuous
Digital output	8 ch open collector, max. 100m A/30 Volt
Typical power consumption (max.)	10 W (25 W)

** Fanless operation only for BNC or Banana version (without excitation)*

SIRIUSi 8xMULTI

Analog inputs	8 ch voltage; full/half/quarter bridge strain; current (with ext. Shunt), potentiometer
	same as STGM, but with additional sensor excitation (5V and 12 V), counters and Analog Out
Digital Inputs	8 counter/24 digital inputs, fully synchronized with analogue data
Analog outputs	8 ch 24 bit sigma delta 200 kHz, ±10 V
Typical power consumption (max.)	15 W (25 W)

SIRIUSi 8xSTG

Analog Inputs	8 ch voltage, full/half/quarter bridge strain, current (with ext. Shunt), resistance, temperature, potentiometer
ADC type	24 bit delta-sigma dual core with anti-aliasing filter
Sampling rate	Simultaneous 200kS/sec
Dual Core Ranges (Low Range)	±50 V (2.5 V), ±10 V (500 mV), ±1V (50 mV), ±100 mV (5 mV)
Br ranges @ 10 Vexc (Low Range)	1000(50) mV/V, 100(5) mV/V, 10(0.5) mV/V
Dynamic Range@10kS (Dual Core)	137 dB (152 dB)
Input coupling	DC, AC 1 Hz (3 Hz, 10 Hz per SW)
Input impedance	1 MΩ between IN+ and In- for 50 V Range ; all other Ranges > 1 GΩ
Bridge modes	Full/Half/Quarter Br 120/350Ω 3-wire or 4-wire; internal bridge completion
Internal shunt resistor	59.88 kΩ and 175 kΩ, bipolar to Exc+ or Exc- (others on request)
TEDS	supported on all except SIRIUSi 8xSTG-L2B7f MSI adapters only fit on 9pin DSUB
Excitation Voltage	0 to 20 VDC software programmable (16 Bit DAC), max 0,1 A / 0,8 W
Excitation Current	0 to 60 mA software programmable (16 Bit DAC)
Overvoltage protection	In+ to In-: 50 V Range: 300 V; all other Ranges: 50 V (200 V peak for 10msec)
Digital inputs	SIRIUSi 8xSTG: none SIRIUSi 8xSTG-L2B10f: on 10pin LEMO connector one pin is used for digital I/O -> total 8 dig I/O (open collector)
Typical power consumption (max.)	15 W (25 W)

SIRIUSi 8xSTG+

Analog inputs	8 ch voltage, full/half/quarter bridge strain, current (with ext. Shunt), resistance, temperature, potentiometer
	same as SIRIUSi 8xSTG, but with additional counters
Digital Inputs	8 counter/24 digital inputs, fully synchronized with analogue data
Input level compatibility	CMOS, LVTTL
Input protection	±25 V continuous
Digital output	8 ch open collector, max. 100 mA/30 Volt

SIRIUS HIGH DYNAMIC – 2x 24 Bit, 200 kS/s

SIRIUSi 8xSTGM

Analog Inputs	8 ch voltage, full/half/quarter bridge strain, current (with ext. Shunt), potentiometer
ADC type	24 bit delta-sigma dual core with anti-aliasing filter
Sampling rate	Simultaneous 200 kS/sec
Dual Core Ranges (Low Range)	±10V (500 mV), ±1V (50 mV), ±100mV (5 mV), ±10mV (0.5 mV)
Br ranges @ 10 Vexc (Low Range)	1000(50)mV/V, 100(5)mV/V, 10(0.5)mV/V, 1(0.05)mV/V
Dynamic Range@10kS (Dual Core)	137 dB (152 dB)
Input coupling	DC
Input impedance	10 MΩ
Bridge modes	Full/Half/Quarter Br 120/350Ω 3-wire; internal bridge completion
Internal shunt resistor	100 kΩ, bipolar to Exc+ or Exc- (others on request)
TEDS	supported MSI adapters only fit on 9pin DSUB
Excitation Voltage	0 to 12 VDC software programmable (16 Bit DAC), max 44 mA
Overvoltage protection	In+ to In-: 50V continuous; 200 V peak (10msec)
Typical power consumption (max.)	11 W (20 W)

SIRIUSi 8xSTGM+

Analog inputs	8 ch voltage, full/half/quarter bridge strain, current (with ext. Shunt), potentiometer
	same as SIRIUSi 8xSTGM, but with additional counters
Digital Inputs	8 counter/24 digital inputs, fully synchronized with analogue data
Input level compatibility	CMOS, LVTTL
Input protection	±25 V continuous
Digital output	8 ch open collector, max. 100mA/30Volt
Typical power consumption (max.)	11 W (20 W)

SIRIUSi 8xSTGM-DB

Analog inputs	8 ch voltage, full/half/quarter bridge strain, current (with ext. Shunt), potentiometer
	same as STGM, but with additional dig I/O
Digital Inputs	8 counter/24 digital inputs on DSUB 37pin connectors, fully synchronized with analogue data
Digital outputs	8 ch on DSUB 25pin connector, high side switch to supply voltage, max. 150mA per ch to directly connect relais, short circuit protected
Typical power consumption (max.)	12 W (26 W)

Isolated version i · Differential version · Rack version r · Fanless version f

SIRIUS HIGH SPEED – 1 MS/s, alias free, 16 Bit

This series combines high bandwidth with alias free acquisition with 16 Bit of up to 1 MS/sec acquisition rate. The analogue anti-aliasing filter (100 kHz, 5th order, Bessel) is combined with a free programmable digital IIR filter block inside the FGPA. For bandwidth requirement of up to 500 kHz the complete filter chain is bypassed.

- *Combustion analyzer*
- *Transient recorder*
- *1 MS/s sampling rate*
- *Power applications*

SIRIUSi-HS 8xACC

Analog inputs	8 ch voltage, IEPE, current (with ext. Shunt)
ADC type	16 bit SAR with 100 kHz 5th order analog AAF filter or bypass (500 kHz)
Sampling rate	Simultaneous 1 MS/s
Ranges	±10 V, ±5 V, ±1 V, ±0.2 V
Typ. SNR @ 100 kHz	89 dB
Input coupling	DC or AC (1 Hz)
Input impedance	1 MΩ
IEPE mode	4 or 8 mA excitation; Sensor detection (Short: <4 V; Open: > 19 V)
TEDS	Supported in IEPE mode
Overvoltage protection	50 V continuous; 200 V peak (10 msec)
Typical power consumption (max.)	15 W (22 W)

SIRIUSi-HS 6xACC, 2xACC+

Analog inputs	8 ch voltage, IEPE, current (with ext. Shunt)
	same as SIRIUSi-HS 8xACC, but with additional counters
Digital Inputs	2 counter/6 digital inputs, fully synchronized with analogue data
Input level compatibility	CMOS, LVTTL
Input protection	±25 V continuous
Digital output	2 ch open collector, max. 100 mA / 30 Volt
Typical power consumption (max.)	15 W (22 W)

SIRIUSi-HS 8xCHG

Analog inputs	8 ch voltage, IEPE, charge, current (with ext. Shunt)
ADC type	16 bit SAR with 100 kHz 5th order analog AAF filter or bypass (500 kHz)
Sampling rate	Simultaneous 1 MS/s
Ranges	±10 V, ±5 V, ±1 V, ±0.2 V
Typ. SNR @ 100 kHz	89 dB
Input coupling	DC or AC (1 Hz)
Input impedance	1 MΩ
IEPE mode	4 or 8 or 12 mA excitation; Sensor detection (Short: <4 V; Open: > 19 V)
TEDS	Supported in IEPE mode
Overvoltage protection	50 V continuous; 200 V peak (10msec)
Typical power consumption (max.)	10 W (18 W)

SIRIUSi-HS 6xCHG, 2xCHG+

Analog inputs	8 ch voltage, IEPE, charge, current (with ext. Shunt)
	same as SIRIUSi-HS 8xCHG, but with additional counters
Digital Inputs	2 counter/6 digital inputs, fully synchronized with analogue data
Input level compatibility	CMOS, LVTTL
Input protection	±25 V continuous
Digital output	2 ch open collector, max. 100mA/30Volt
Typical power consumption (max.)	10 W (18 W)

SIRIUS HIGH SPEED – 1 MS/s, alias free, 16 Bit

SIRIUSi-HS 8xHV

Analog inputs	8 ch voltage, current (with ext. Shunt)
ADC type	16 bit SAR with 100 kHz 5th order analog AAF filter or bypass (2 MHz)
Sampling rate	Simultaneous 1 MS/s
Ranges	±1600 V, ±800 V, ±400 V, ±200 V, ±100 V, ±50 V, ±20 V
Typ. SNR @ 100 kHz	85 dB
Input coupling	DC
Input impedance	10 MΩ in parallel 2pF
Overvoltage protection	In+ to In-: 4 kVpk-pk (1.2 kVRMS), Inx to GND: 2 kVpk-pk (600 VRMS) CAT II 1000V
Typical power consumption (max.)	8 W

SIRIUSi-HS 8xLV

Analog inputs	8 ch voltage, full bridge strain, current (with ext. Shunt)
ADC type	16 bit SAR with 100 kHz 5th order analog AAF filter or bypass
Sampling rate	Simultaneous 1 MS/s
Ranges	±100 V, ±10 V, ±1 V, ±100 mV
Br ranges @ 10 Vexc	1000 mV/V, 100 mV/V, 10 mV/V
Input coupling	DC, AC 1 Hz (3 Hz, 10 Hz per SW)
Input impedance (100 V range)	10 (1) MΩ between IN+ or In- and GND
Bridge modes	Full bridge
TEDS	Standard + MSI adapters, only on DSUB 9 version
Sensor Excitation	2 to 30 V bipolar / 0 to 24 V unipolar, sw programmable (16 bit DAC), max 0,2 A / 2 W
Overvoltage protection	100 V Range: 300 V; All other Ranges: 100V (250 V peak for 10 msec)
Typical power consumption (max.)	10 W (25 W)

** Fanless operation only for BNC or Banana version (without excitation)*

SIRIUSi-HS 8xLV+

Analog inputs	8 ch voltage, full bridge strain, current (with ext. Shunt)
	same as SIRIUSi-HS 8xLV, but with additional counters
Digital Inputs	8 counter/24 digital inputs, fully synchronized with analogue data
Input level compatibility	CMOS, LVTTL
Input protection	±25 V continuous
Digital output	8 ch open collector, max. 100m A/30 Volt
Typical power consumption (max.)	10 W (25 W)

** Fanless operation only for BNC or Banana version (without excitation)*

SIRIUSi-HS 8xSTG

Analog Inputs	8 ch voltage, full/half/quarter bridge strain, current (with ext. Shunt), resistance, temperature, potentiometer
ADC type	16 bit SAR with 100 kHz 5th order analog AAF filter or bypass (1 MHz)
Sampling rate	Simultaneous 1 MS/s
Ranges	±50 V, ±20 V, ±10 V, ±5 V, ±2 V, ±1 V, ±0.4 V, ±0.2 V, ±0.1 V, ±0.04 V, ±0.02 V
Br ranges @ 10 Vexc	500 mV/V to 2 mV/V in 8 ranges
Dynamic Range@10kS	87 dB
Input coupling	DC, AC 1 Hz (3 Hz, 10 Hz per SW)
Input impedance	Range <10 V: >1 GΩ / Range >=10 V: 1 MΩ between IN+ and IN-
Bridge modes	Full/Half/Quarter Br 120/350Ω 3-wire or 4-wire; internal bridge completion
Internal shunt resistor	59.88 kΩ and 175 kΩ, bipolar to Exc+ or Exc- (others on request)
TEDS	Supported; MSI adapters only fit on 9pin DSUB
Excitation voltage	0, 1, 2.5, 5, 10, 15 and 20 VDC software programmable (16 Bit DAC)
Excitation current	0.1, 1, 2, 5, 10, 20 and 60 mA software programmable 16 Bit DAC)
Overvoltage protection	Range <10 V: 50 V (200 Vpeak for 10 msec) / Range >=10 V: 300 V cont.
Typical power consumption (max.)	15 W (25 W)

SIRIUSi-HS 8xSTG+

Analog inputs	8 ch voltage, full/half/quarter bridge strain, current (with ext. Shunt), resistance, temperature, potentiometer
	same as SIRIUSi-HS 8xSTG, but with additional counters
Digital Inputs	8 counter/24 digital inputs, fully synchronized with analogue data
Input level compatibility	CMOS, LVTTL
Input protection	±25 V continuous
Digital output	8 ch open collector, max. 100 mA/30 Volt
Typical power consumption (max.)	15 W (25 W)

Isolated version **i** · Differential version · Rack version **r** · Fanless version **f**

SIRIUS HIGH DENSITY – 16 CHANNELS / SLICES

SBOX with 64 channels

SBOX-R8 with 128 channels
(8 x SIRIUSr-HD 16xSTGS)

- *Highest possible channel density (max. DSUB9 housing width 14.9 mm)*
- *Competitive price*

SIRIUS HD 16xSTGS

- *16 channels in one slice*
- *Strain, voltage, current input*
- *Internal half/quarter bridge completion*
- *2 internal shunts*
- *Programmable sensor excitation*
- *24 bit A/D converter, 200 kS/s*
- *TEDS, MSI support*

SIRIUS-HD 16xSTGS

MSI

Analog inputs	16 ch voltage, full/half/quarter bridge strain, current (with ext. Shunt)
ADC type	24 bit delta-sigma with anti-aliasing filter
Sampling rate	Simultaneous 200 kS/sec
Ranges	±10 V, ±1 V, ±100 mV, ±10 mV
Br ranges @ 10 Vexc	1000 mV/V, 100 mV/V, 10 mV/V, 1 mV/V
Dynamic Range@10kS	137 dB
Input coupling	DC
Input impedance	10 MΩ
Bridge modes	Full/Half/Quarter Br 120/350Ω 3-wire; internal bridge completion
Internal shunt resistor	100 kΩ, bipolar to Exc+ or Exc- (others on request)
Excitation voltage	0 to 12 VDC software programmable (16 bit DAC), max 44 mA
TEDS	Supported, MSI adapters only fit on 9pin DSUB
Overvoltage protection	IN+ to IN-: 50 V continuous; 200 V peak (10 msec)
Typical power consumption (max.)	11 W (22 W)
Available front connectors	DB9, L1B10f (others on request)

SIRIUS-HD 16xLV

Analog inputs	16 ch voltage, full bridge strain, current (with ext. Shunt)
ADC type	24 bit delta-sigma with anti-aliasing filter
Sampling rate	Simultaneous 200 kS/sec
Ranges	±100 V, ±10 V, ±1 V, ±100 mV
Br ranges @ 10 Vexc	1000 mV/V, 100 mV/V, 10 mV/V
Dynamic Range@10kS	137 dB
Input coupling	DC
Input impedance	1 MΩ for 100 V range, all other ranges 10 MΩ
Bridge mode	Full bridge
Excitation level unipolar	0 to 24 VDC software programmable (16 Bit DAC), max 0,2 A / 2 W
Excitation level bipolar	2 to 30 V software programmable (16 Bit DAC), max 0,2 A / 2 W
TEDS	Standard + MSI adapters, only on DSUB 9 version
Overvoltage protection	100 V Range: 300 V; All other Ranges: 100V (250 V peak for 10msec)
Typical power consumption (max.)	11 W (22 W)
Available front connectors	DB9, BNC, L1B10f (others on request)

SIRIUS *f*anless

THE FANLESS VERSION COVERS ALL THE HARSH APPLICATIONS WITH DUST, ETC...

*E.g. SIRIUS*f* 8xSTGM*

- *SIRIUSm-4xACC and 3xACC,1xACC+*
- *SIRIUSif-8xACC and 6xACC,2xACC+*
- *SIRIUSif 8xHV*
- *SIRIUSif 8xLV and 8xLV+* [1)]
- *SIRIUSif 8xSTGM and 8xSTGM+*
- *SIRIUSif-HS 8xHV*
- *SIRIUSx-HS 8xLV and 8xLV+* [1)]

Whenever you need an instrument without cooling fan we offer the SIRIUS fanless version. It fits perfectly for heavy industrial applications with dust, or for sound measurements. You may choose between the slice + notebook version or the slice and the SBOX fanless computer.

SEALED CONNECTORS

Rubber sealing of USB connector

SIRIUS*f*-SBOX-1

CPU option for even more power (SIRIUS-SBOX-2)

- *I7-3612QE*
- *Third generation, 4 cores (8 threads)*
- *Power consumption <20 W*
- *0 +40 °C operation*
- *I7 ULV (3517UE) better graphics*

1) Fanless operation only for BNC or Banana version (without excitation)

Isolated version i | Differential version | Rack version r | Fanless version f

CUSTOMIZED SIRIUS SOLUTIONS

Choose your amplifier configuration:

CUSTOM SPECIFIC CONNECTORS POSSIBLE ON REQUEST

CUSTOMIZED SLICE

Example: 3xHV, 1xACC+, 2xACC, 2xMULTI

ACC+

Same input as ACC, with additional counter/digital inputs

STG

Strain, ±50V, current, resistance, temperature, potentiometer

ACC

Voltage signals up to ±10V, and IEPE sensors (sound and vibration)

HV

High voltage inputs with voltages up to +/- 1600V

STG-M

Strain, ±10V, current, potentiometer

In addition to the standard slice solution, the 8 amplifiers per chassis can also be configured freely (customized solution).

GENERAL SPEC.

MISC	
Power Supply	6...36V_{DC}
Operating Temperature	-10 to 50°C (40°C for fanless series[1)])
Storage Temperature	-40 to 85°C
Humidity	95% RH non condensing @ 60°C
Shock & Vibration	Sweep sinus (EN 60068-2-6:2008); Random (EN 60721-3-2: 1997 - Class 2M2); Shock (EN 60068-2-27:2009)
EMC	EN 61326-1, EN 61000-3-2, EN61000-3-3

COUNTER/DIGITAL INPUTS	
Modes	Counting, waveform timing, encoder, tacho, geartooth sensor
Compatibility	TTL/CMOS
Timebase	102.4 MHz
Time base accuracy	Typical: 5 ppm, Max: 20 ppm
Max. Bandwidth	10MHz
Input Filter	500 ns, 1µs, 2µs, 4µs, 5µs and 7.5µs

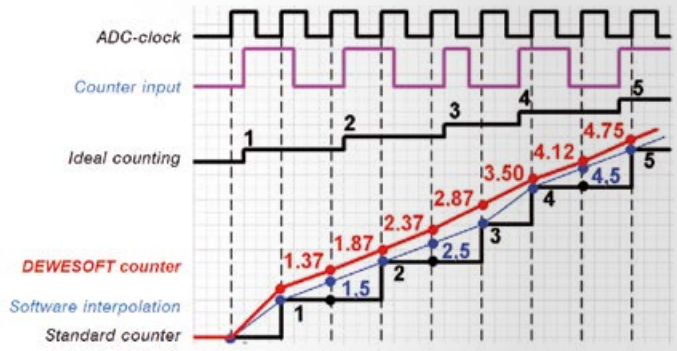
SYNCHRONISATION	
Delay between slices	50 nsec
max. Sync-cable length	100 m (Master/Slave), 200 m (IRIG)

1) 50°C with airflow of 3m/sec

DEWESoft® "SUPER-COUNTERS"

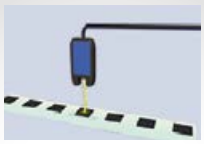
Counters are mainly used for measuring RPM and angle of rotating machines. DEWESoft® super-counters work on a 102.4 MHz internal time base, ALWAYS, independent of the current sample rate. In comparison to standard counter, which only output whole numbers like 1,1,2,2,3,4, … one sample later, DEWESoft® is able to extract the accurate values like 1.37, 1.87, 2.37, … fully time- and amplitude-synchronized! This is done by measuring the exact time of the rising edge of the signal with an additional counter.

COUNTER



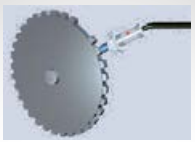
DEWESoft® SUPPORTS A LOT OF DIFFERENT SENSORS

Encoder with 1, 2 or 3 tracks (A, B and Z reset signal)



Linear pulses and pulse encoder

With an optical tacho probe (1 pulse per rev) an a reflective sticker angle and RPM can be calculated.

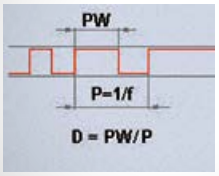


The typical automotive sensor, geartooth with missing teeth (e.g. 60-2) or double teeth, CDM, CDM with zero, CDM with TRG

DIGITAL INPUTS

Each counter input consists of 3 digital inputs. They can also be used seperately.

WAVEFORM TIMING



period, pulsewidth and duty cycle

EVENT COUNTING

- *Basic event counting*
- *Gated event counting*
- *Up/Down counting*
- *Basic encoder counting*

WHAT DOES 160 dB DYNAMIC MEAN?

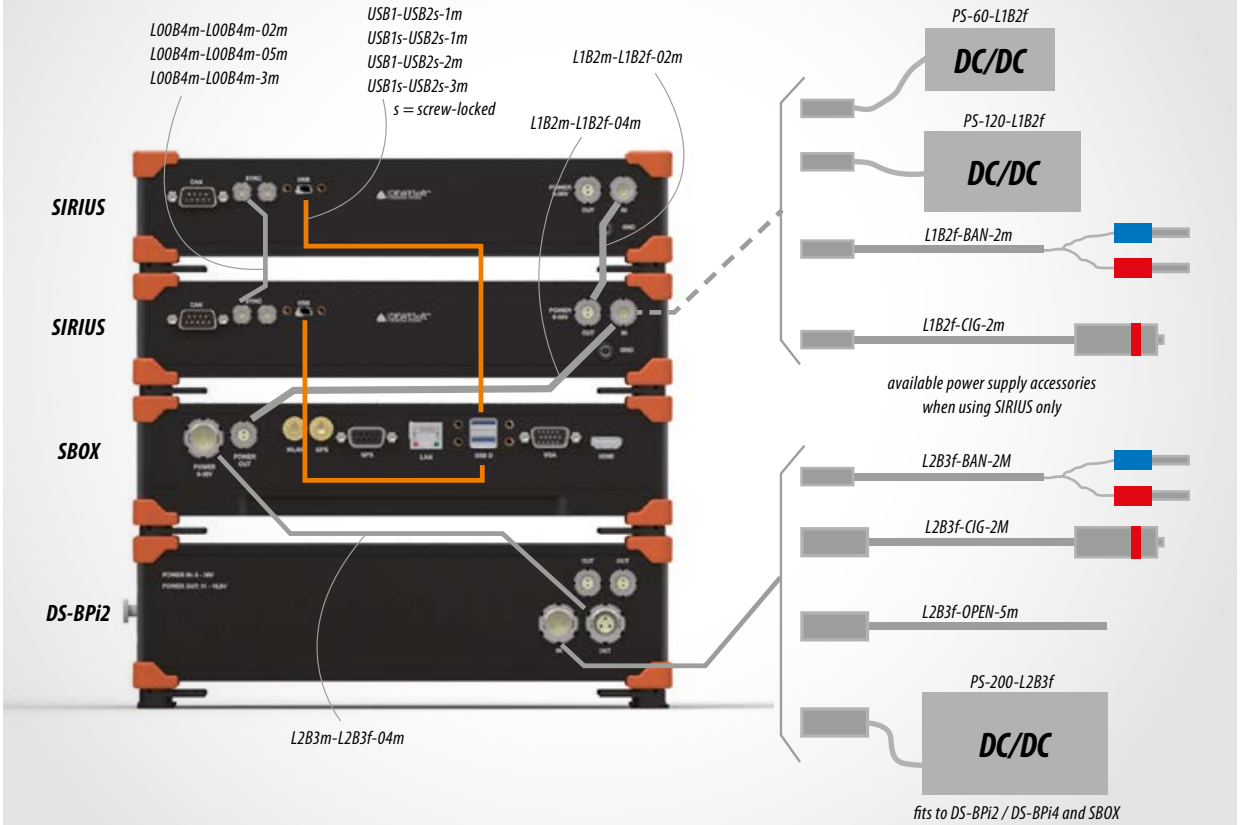
… LET'S WATCH THE KENNEDY AIRPORT IN NEW YORK FROM THE MOON… WHAT CAN YOU SEE?

40 dB (8 bit) Oszilloscope | *60 dB (12 bit) Recorder* | *80 dB (16 bit) DAQ system* | *120 dB (24 bit) Analyser* | *160 dB (2 x 24 bit) SIRIUS*

Even in the biggest range you can see every detail!

ACCESSORIES – SUITABLE FOR ALL DEWESoft® INSTRUMENTS

SIRIUS CABLE LABELING



BATTERY PACKS FOR MOBILE SOLUTIONS

BP2i

- *For SBOX and up to 4 SIRIUS slices*
- *Supports 2 Li-Ion batteries each 96 Wh (total capacity: 192 Wh)*
- *Hot-swap functionality*
- *Status display*
- *Maximum output power: 160W*
- *Input voltage range: 10-36VDC*
- *Output voltage: 21V (powered), 11-16V (battery)*
- *Wrong polarity protection*

BP4i

- *For SBOX and up to 8 SIRIUS slices*
- *Supports 4 Li-Ion batteries each 96 Wh (total capacity: 384Wh)*
- *Hot-swap functionality*
- *Status display*
- *Maximum output power: 250W*
- *Input voltage range: 12-36 VDC*
- *Output voltage: 24V (powered), 11-16V (battery)*
- *Wrong polarity protection*

Calculation example for system:
DS-BP4*i* (384 Wh) and **1x SBOX** (60 W) and **4x SIRIUS*i*** **– 8x ACC** (4x 15 W) **= 3 hours operation**

DS-DISP-12

- *12 " industrial grade display*
- *1280x800 HD resolution*
- *Rugged housing*
- *Multi-touch*
- *700 cd/m² high brightness*
- *-40 ... 80 deg. C operating range*

DS-IRIG-ACDC

- *Converts IRIG AC signal to IRIG DC*
- *Useful for clocking Sirius, DEWE-43 and DS-NET*
- *Can act as a converter from 4 pin Lemo to 2 pin Lemo (HW sync between Sirius and DS NET)*
- *Can act like a converter from BNC IRIG DC to 4 and 2 pin Lemo for sync*

DS-TACH01

- *Converts analog tacho signal to TTL*
- *Fits to COUNTER input (Lemo 7pin) on DEWE-43 and SIRIUS*
- *±100V input isolated, trigger threshold adjustable ±10mV . . . ±2V*

USB-EXTENDER1

16 remote AI channels over 50 m Ethernet cable (and 50 m sync cable) @ 185 kS/s

- *Well-tested solution for USB extension*
- *Extends USB up to 100 m (328 ft.) over UTP cable*
- *Hub 4 x USB (supports USB 2.0 and USB 1.1)*
- *Transmits signals up to 480 Mbps*
- *Uses inexpensive CATx cable you may already have installed in your building*
- *True plug and play—no drivers needed*

DS-HUB7

For more than 4 SIRIUS on one system, DEWESoft® offers a ruggedized USB hub.

- *7 USB ports with USB 2.0*
- *Lockable connectors*

Total data throughput
4 MS/s DUAL CORE (160 dB)
8 MS/s SINGLE CORE (120 dB)

CAN INSTRUMENTS

2 CHANNEL CAN: DS-CAN2

- *2 high speed CAN interfaces (isolated)*
- *Synchronization with all DEWESoft® products*
- *Up to 8 CAN interfaces per system*
- *Incl. DEWESoft® X-Prof.*
- *-20° ... +60° C operating temperature (fanless)*
- *No external power supply needed if CAN operation only*

4 CHANNEL CAN: SIRIUS*im* 4xCAN

- *4 high speed CAN interfaces (isolated)*
- *Sync with all DEWESoft® instruments*
- *5V / 500mA sensor supply on each connector*
- *USB powered only (2x USB cable)*

8 CHANNEL CAN: SIRIUS*i* 8xCAN

- *8 high speed CAN interfaces on front side (isolated)*
- *+1 high speed CAN interface on rear side (isolated)*
- *Sync with all DEWESoft® instruments*
- *5V / 500mA sensor supply on every front connector*
- *12V / 200mA sensor supply on the rear connector*

MULTI SENSOR INTERFACE

The versatile MSI adapters convert any DEWESoft® instruments DSUB9 analog input into whatever is needed. E.g. Add ICP inputs to your DEWE-43 by connecting th MSI-ACC. The adapter is automatially recognized by TEDS and all the settings are done in DEWESoft® X Software accordingly.

MSI-ACC

Isotron (constant current powered) adapter
Excitation current 4 mA@21 V, highpass filter 1.5 Hz, BNC connector
Automatic adapter identification

MSI-V-200

± 200 V input adapter
Differential input configuration, BNC connector
Automatic adapter identification

MSI-RTD

Pt100, Pt200, Pt500, Pt1000 and Pt2000 adapter
2, 3 and 4 wire connection methods, 5-pin Binder 710 series connector
Automatic adapter identification

MSI-CH-x

Charge input interface
Range up to 50000 pC, AC coupled with 0.07 Hz, BNC signal connection
Max. 100 kHz bandwidth (depending on the max. bandwidth of the amplifier)
Automatic adapter identification

MSI-TH-x

Thermocouple type K / J / T adapter
High accuracy cold junction reference measurement
1 m thermo cable with Mini TC connector
Automatic adapter identification

MSI-20mA AND MSI-5A

MSI-20 mA: 20mA current input adapter with internal shunt 50 Ohm, 0.05%, use for sensors with 4…20 mA output
MSI-5 A: 5 A current input adapter with internal shunt 0.1 Ohm, 0.05% both with screw terminals in housing for cable fixing
both with Automatic adapter identification

MSI-LVDT

Generates 4 or 10 kHz excitation to be able to connect to LVDT sensors, phase adjustment with potentiometer, output 1 V = 1000 mV/V
Automatic adapter identification

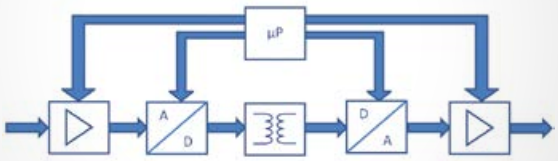
OPTION: ANALOG OUT – 4 FUNCTIONS

8 BNC connectors on rear side
for analog output (on request also available on front side)

Applications

- *Standalone Digital Signal Amplifier*
- *Control channel*
- *Replay*
- *Function generator (Modal/shaker control)*
- *Available for standard slices with 200 kS/s or HS-slice with 1 MS/s*

FUNCTION 1: STANDALONE DIGITAL SIGNAL AMPLIFIER



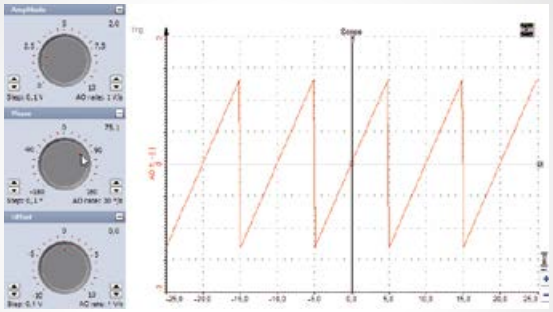
Principle of internal architecture

With the AO8 option the DEWESoft® instrument can be used as a pure, standalone signal conditioner. No DEWESoft® software is needed, no USB cable connected. Any physical input signal is converted to an output voltage of max. ±10 V.

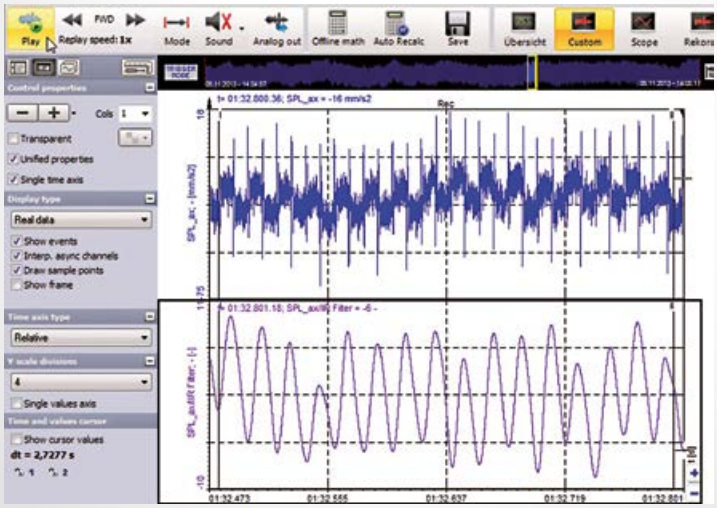
- *Any input*
- *Signal conditioning*
  - *Linearization*
  - *Scaling*
  - *Offset*
  - *Gain*
- *Redundant DAQ system*
  - *Mathematic functions*
- *Standalone operation possible*

FUNCTION 2: FUNCTION GENERATOR (MODAL/SHAKER CONTROL)

No need for additional analog out hardware any more! The Function generator is able to put signals like sine, triangle, rectangle, saw or even an arbitrary table out. This can be done continuously or in Sweep / step sweep / burst / … and many more. A fine-tuning can be done LIVE during measurement.



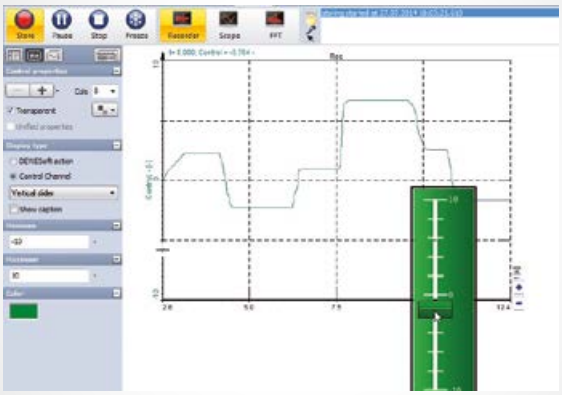
FUNCTION 3: FILE REPLAY TO ANALOG

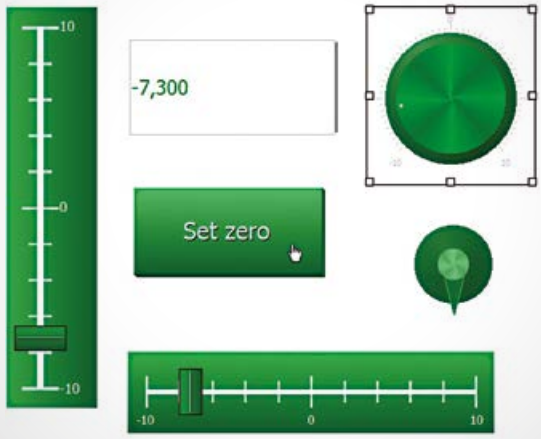


After the measurement is done, replay your data file and put out the conditioned channels on the rear side BNC connectors for post-analysis. Use SIRIUS to feed a test-bed and simulate e.g. the vibrations during a test drive.

FUNCTION 4: CONTROL CHANNEL

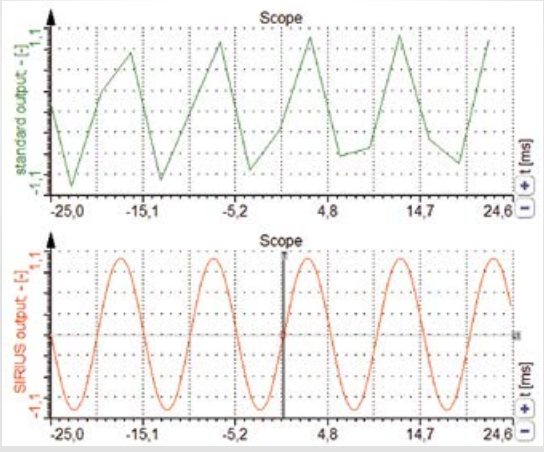
With the ControlChannels plugin it is now possible to directly access the analog outputs and manually assign a value LIVE during measurement! This can be used for controlling peripheral hardware. Choose out of many different instruments like bar, turn knob, button or text box…





OUTPUT OVERSAMPLING

Similar to the Sigma-Delta converter on the input the analog output uses a special oversampling technology, to still be able to get higher frequencies correctly put out.
Although the maximum SIRIUS sample rate is 200 kHz, the output looks like sampled with 1 MHz!

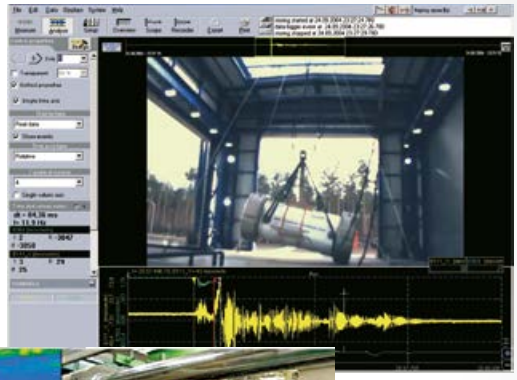


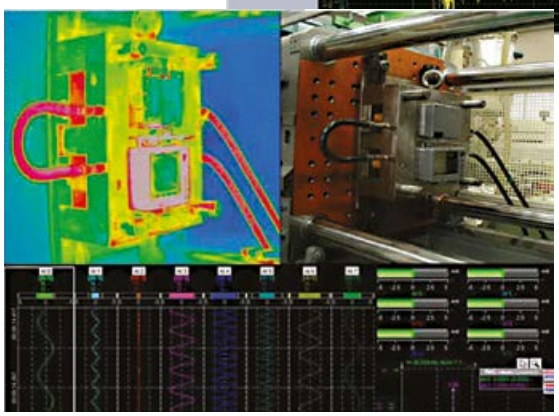
DEWESoft® CAMERAS

SYNCHRONIZED TO A/D CONVERTER

For applications requiring video which is truly synchronized to the dynamic sample rate, there is support for DS-Cameras. A high quality image with automatic shutter speed (selectable) is controlled directly by the A/D card, which generates a pulse to drive the camera. The result is a stunning correlation between each frame and the data.
Thermo cameras are supported from FLIR, NEC and MICRON, and high speed cameras from Photron which can acquire more than 100000 frames per second.

Video Input
Synchronized video acquisition from web-, thermo- and high speed cameras





DS-CAM-88c: *640x480 @ 88 FPS, 320x240 @ 167 FPS, 160x120 @ 289 FPS*

DS-CAM-300bw/c:
1920x1080 (HD) @ 100 FPS, 640x480 (VGA) @ 300 FPS
DS-CAM-600bw/c:
1920x1080 (HD) @ 300 FPS, 640x480 (VGA) @ 600 FPS

DS-CAM-88 + DS-CAM-120

- *88 / 120 fps @ VGA (640x480)*
- *Auto-Shutter*
- *Auto-Gain*
- *Auto-White-Balance*
- *Color*
- *Power-over-Ethernet option*

DS-CAM-300 + DS-CAM-600

- *300 / 600 fps @ VGA*
- *Full HD resolution (1920x1080)*
- *Real-time onboard JPEG compression*
- *Power-over-Ethernet*
- *Best performance with SIRIUS SBOX*
- *IP67 version available*
- *Color and monochrome*

APPLICATIONS

- *Machine diagnostics*
- *Product quality check*
- *Non destructive testing*
- *Research and development*
- *Automotive crash testing*
- *Impact tests*
- *Logistics & transportation*
- *Preventive maintenance*
- *Manufacturing*

All DS-CAM cameras were designed to be high-shock and vibration resistant.
The DS-CAM cameras can run in triggered (sync) and free-run mode. The video is captured by real-time data streaming, even at full resolution! Therefore a Gigabit-Ethernet port is required.

SYSTEM REQUIREMENTS FOR GigE CAMERAS:

- *Gigabit Ethernet LAN port*
- *DEWESoft® 7.1 or X*
- *(Clock possibility)*
- *Core2Duo CPU*





	DS-CAM-88	DS-CAM-120	DS-CAM-300	DS-CAM-600	Webcam
GENERAL					
Color option	DS-CAM-88c	DS-CAM-120c	DS-CAM-300c	DS-CAM-600c	Yes
Monochrome option	-	-	DS-CAM-300bw	DS-CAM-600bw	Yes
OPTICAL SPECIFICATION					
Image sensor	Sony ICX414	Sony ICX618	CMOSIS CMV2000 2E5M1PP		various
Sensor type	CCD		CMOS		CCD/CMOS
Resolution	VGA resolution 640x480		Full HD resolution 1920x1080		1280x720
FPS	88 FPS @ 640x480 167 FPS @ 320x240 289 FPS @ 160x120	120 FPS @ 640x480	300 FPS @ 640x480 100 FPS @ 1920x1080	600 FPS @ 640x480 300 FPS @ 1920x1080	30 FPS
Optical size	1/2"	1/4"	Diagonal 12.7 mm (2/3")		various
Pixel size (in µm)	9.9 x 9.9	5.6 x 5.6	5.5 x 5.5		various
Dynamic range	35 dB autogain function	32 dB autogain function	60 dB		various
Shutter	Full frame		Electronic Global Shutter		–
Shutter time	26 ns - 60 s (autoshutter function)	58 µs - 60 s (autoshutter function)	210 ns - 90 s		–
Color correction	auto white-balance		DS-CAM-300c: yes DS-CAM-300bw: no	DS-CAM-600c: yes DS-CAM-600bw: no	Yes
MECHANICAL SPECIFICATIONS					
Operating temperature	+5..+45°C		-5..+40°C		0..+45°C
Operating humidity	25% - 80% (no condensation)		25% - 80% (no condensation)		25% - 80% (no condensation)
Dimensions	86.4 x 44 x 29mm (3.40 x 1.73 x 1.14in)		54 x 40 x 92mm (2.13 x 1.57 x 3.63in)		various
Lens mount	C-mount		C-mount (1" 32G thread)		–
Connectors	Screw mount GigE RJ45; EIAJ (Hirose) 12 pin		Gigabit Ethernet: RJ45		USB
Conformity	CE, FCC, RoHS, GigE Vision, GenICam (PoE IEEE 802.3at)		CE, EN55022, class A; EN61000-4-2; EN61000-4-3; EN61000-4-4; EN61000-4-6; FCC Part 15, class A RoHS, GigE Vision 1.2		Direct X
ELECTRICAL SPECIFICATIONS					
Supply voltage	+8 to +30 VDC		Power-over-Ethernet (42-57V)		USB (5V)
Power-over-Ethernet	optional		yes		–
Power consumption	3.6 W		6W		2W

CAM-BOX1

Adapter box for connecting up to 4 DS-CAM-88/120 to the DEWESoft® instrument. Combines Sync and Power to the camera connector. External GigE switch required.

CAM-BOX2

Distribution box for connecting up to 4 x DS-CAM-88/120 to the DEWESoft® instrument. Wide range supply input (9-36V DC), integrated GigE switch

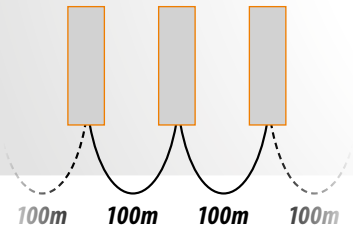
CAM-BOX3

Distribution box for connecting up to 4 x DS-CAM-300/600 to the DEWESoft® instrument. Wide range supply input (9-36V DC), integrated GigE switch with 4 x PoE; SIRIUS chassis with 1.5 U height

KRYPTON™ the Ethercat modules

THE INDUSTRIAL DISTRIBUTED INSTRUMENTS:

- *Ethercat technology*
- *Up to 100 m module / to module*
- *IP67 dust and water proof*
- *Operating temperature -40 . . . 85 °C*
- *Fast and slow sampling rates*
- *Fully synchronized combinable with DEWESoft® hardware*
- *Based on DEWESoft® amplifier technology*



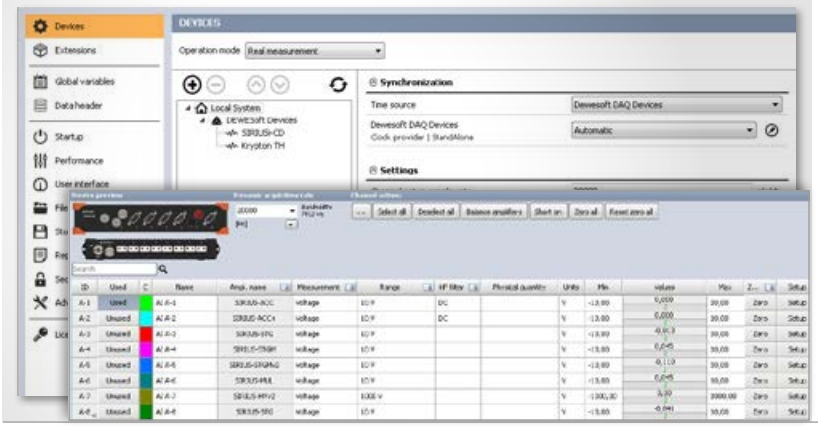
ETHERCAT ADVANTAGES:

- *Fully compatible with ETHERNET hardware*
- *Power supply and data lines and*
- *Hardware A/D - synchronization in ONE cable*

KRYPTON THE ETHERCAT MODULES

KRYPTON: 8x TH and 16x TH universal Thermo-couple module

DEWESoft® USER ADVANTAGE:



Easy plug and play hardware recognition.

NO IP address search.

ONE USER INTERFACE for all DEWESoft® hardware.

	KRYPTON 8XTH, 16XTH	KRYPTON 4XLV, 8XLV
		
Input channels	8 (16) isolated universal thermocouple and voltage	4 or 8 isolated voltage
Input signals	TC types: K, J, T, R, S, N, E, C, U, B / Voltage: 1V and 100mV	+/- 100V
Input connector	mini Thermocouple connector (cooper)	BNC
Sampling rate	Maximum 100 Hz per channel (software selectable)	10 kHz per channel (software selectable)
ADC type	24 bit sigma delta	24 bit sigma delta
Input impedance	>100 MΩ	1 MΩ
Isolation voltage peak	1000 V channel/ground & channel/channel	1000 V channel/ground & channel/channel
Resolution	<0.001 deg. C	0.01 mV
Accuracy	TC: ±0.02% of reading ±0.5 °C ±10µV Voltage: ±0.02% of reading ±10µV	±0.03% ±5mV
Gain drift over temperature	typ. 3ppm/K (max. 10 ppm/K)	typ. 10ppm/K (max. 20 ppm)
Offset drift over temperature	0.03µV/K	10µV/K
Noise	0.25µVrms (=0.007°Crms@Type K)@10 S/s 0.7µVrms (=0.02°Crms@Type K)@100 S/s	0.7 mVrms
Interface	LEMO 1B Ethercat cable (single cable connection power + sync + data)	LEMO 1B Ethercat cable (single cable connection power + sync + data)
Data rate	100 Mbit bus speed	100 Mbit bus speed
Power supply voltage	6 to 50 V DC	6 to 50 V DC
Power consumption	3 Watt (8xTH), 4 Watt (16xTH)	2.5 Watt (4xLV), 3 Watt (8xLV)
Dimensions	200x50x30 mm (8xTH) / 200x50x45 mm (16xTH)	200x50x30 mm (4xLV) / 200x50x45 mm (8xLV)
Weight	Typically 650 g (8xTH) / Typically 900 g (16xTH)	Typically 650 g (4xLV) / Typically 900 g (8xLV)
Environmental rating	IP67	IP67
Shock & Vibration Rating	> 100 g	> 100 g
Temperature range	-40 … 85 deg. C	-40 … 85 deg. C
Supported Software & Hardware Platforms	Software: DEWESoft® X2 / Hardware: KRYPTON modules synchronize with all DEWESoft® Hardware	Software: DEWESoft® X2 / Hardware: KRYPTON modules synchronize with all DEWESoft® Hardware

DEWE-43A

MUST HAVE FOR EVERY ENGINEER

8 ANALOG INPUTS

- *Multi-sensor input for Voltage, Bridge, IEPE, Temperature, Charge*
- *Simultaneous sampling*
- *200 kHz/channel*
- *24 bit, alias-free*
- *10 V, 1 V, 100 mV, 10 mV ranges (200 V with MSI adapter)*
- *± 5 V, 12 V sensor supply*
- *Isolated power supply as standard*

8 COUNTER INPUTS 24 DIGITAL INPUTS

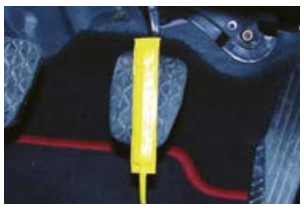
- *Counting, Waveform timing, Encoder, Tacho and Geartooth sensors*
- *Digital inputs*
- *Fully synchronized with analog data*

2 CAN BUS PORTS

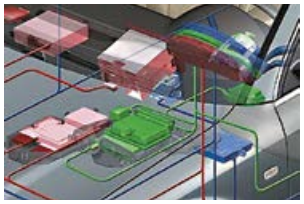
- *optical isolation*
- *Vehicle CAN, OBDII, J1939*
- *CAN sensors support*
- *CAN 2.0b up to 1 MBit/sec*

DEWESoft®

- *DEWESoft® X included*
- *Synchronous data acquisition of different sources*
- *Full support of DEWE-43A, GPS and video camera*



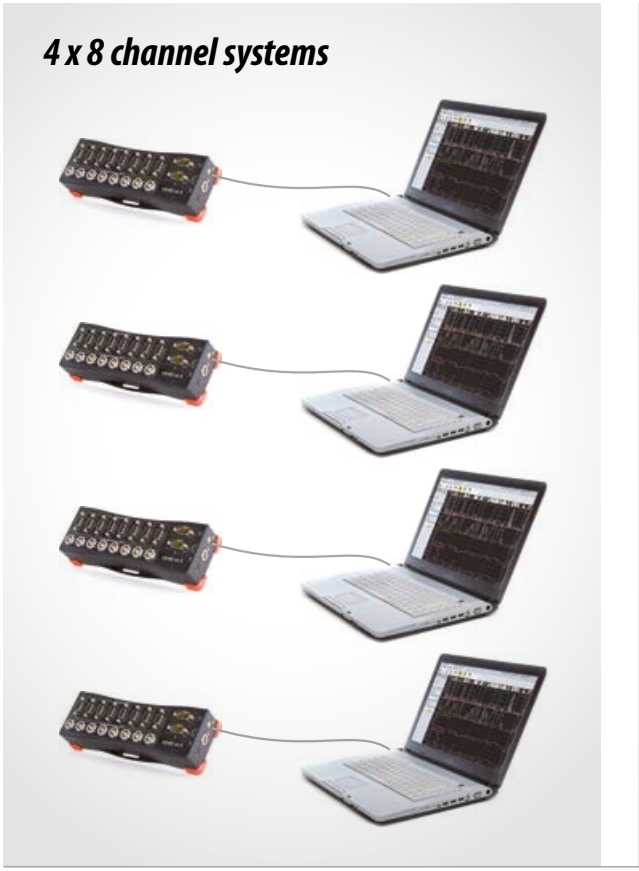



DEWE-43A SYSTEM CONFIGURATIONS

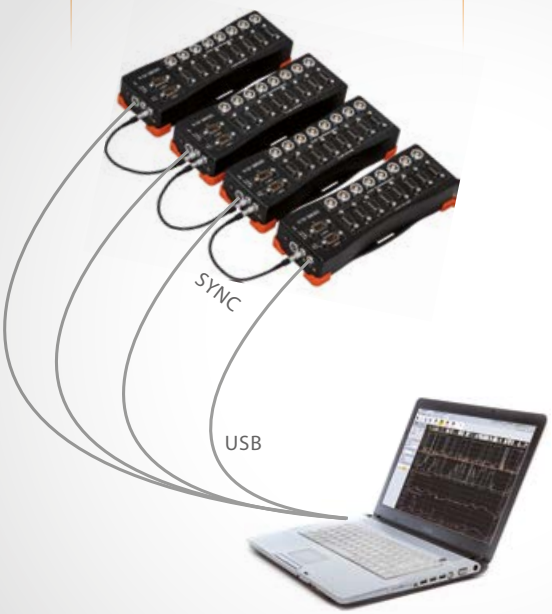
ANY combination up to 32 analog, 32 counter and 8 CAN bus channels.

4 x 8 channel systems



1 x 32 channel system

8 MS/s total = 40 AI channels @ 200 kS/s



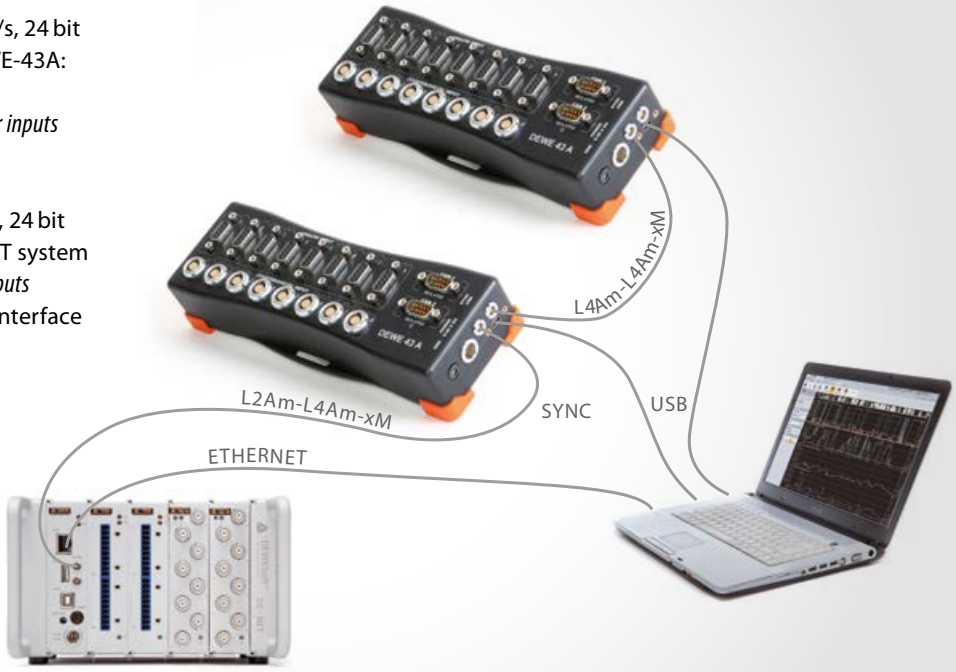
DEWE-43 + DS-NET= ETHERNET DAQ SYSTEM

Mixed signal data acquisition
Example configuration:

16 channel fast 200 kS/s, 24 bit each channel, 2 x DEWE-43A:
- *For ACC vibration sensors*
- *16 channel super-counter inputs*
- *4 CAN bus*

32 channel slow 2 kS/s, 24 bit each channel, 1 DS-NET system
- *Mixed signals isolated inputs*

With DEWESoft® user interface



DEWE-43A – TECHNICAL SPECIFICATIONS

ANALOG INPUT

Number of channels	8 (simultaneously sampled)
Measured values	Voltage, full bridge (IEPE, charge, thermocouple and RTD with MSI adapters)
Resolution	24-bit
Type of ADC	Sigma-Delta with anti-aliasing filter
Sampling rate	200 kS/s
-3 dB bandwith	76 kHz @ 200 kS/s

AMPLIFIER CHARACTERISTICS

Input ranges	**Voltage**	±10 V; ± 1 V; ± 100 mV; ± 10 mV
	Voltage via MSI-V200	up to ±200 V
	Full bridge @ 10 Vexc	±10 mV/V, ±100 mV/V, ±1000 mV/V
	Half or quarter bridge	With external bridge completion
	IEPE via MSI-ACC	±0.1 V, ±1 V, ±10 V
	Thermocouple via MSI-THx	Full range of thermocouple type (isolated thermocouple only)
	Pt100, Pt200, Pt500, Pt1000, Pt2000 and resistance via MSI-RTD	-200°C to 1000°C and 0 to 6.5 kOhm
DC accuracy	10 V range: 0.1 % of value, +1 mV 1 V range: 0.1 % of value, +0.5 mV 100 mV range: 0.1 % of value, +0.1 mV 10 mV range: 0.1 % of value, +0.1 mV	
Input impedance	10 MΩ||33 pF (common mode), 20 MΩ||47 pF (differential mode)	
CMRR	>80 dB	
Sensor supply voltage	±5 V 0.1 % @ 100 mA, 12 V @ 400 mA per channel	
Voltage mode coupling	DC	
Input overvoltage protection	±70 V	

DYNAMIC CHARACTERISTICS

Signal to noise @ fs<1000 Hz	< -100 dB
Crosstalk	< -100 dB

COUNTER/DIGITAL INPUTS

Number of channels	8 counters or 24 digital inputs (per software each counter can be selected to be 3x digital input)
Counter modes	Event counting, encoder input, period, pulsewidth, duty cycle, frequency measurement
Resolution	32-bit
Time base	102.4 MHz
Signal levels	TTL/CMOS
Input voltage protection	30 V

CAN PORTS

Number of channels	2 (optically isolated)
Specification	CAN 2.0b up to 1MBit/s
Physical layer	High speed

ENVIRONMENTAL

Operating temperature	-20 to 50°C
Storage temperature	-20 to 70°C
Relative humidity	10 to 90 %
Vibration	MIL-STD 810F 514.5, procedure I
Shock	MIL-STD 810F 516.5, procedure I

PHYSICAL

Dimensions (L x W x H)	223 x 78 x 45 mm (7.78 x 3.08 x 1.77 inch)
Weight	0.72 kg (1.58 pounds)

POWER REQUIREMENTS

Supply voltage	6 to 36 V_{DC}
Supply overvoltage protection	80 V
Negative input voltage protection	-30 V
Typical power consumption	5 W
Maximum sensor consumption	6 W

SYSTEM REQUIREMENTS

Operating system	Microsoft WindowsXP® Microsoft Windows Vista® Microsoft Windows 7®
System	PC with DEWESoft® software
Interface	USB 2.0

IN THE PACKAGE

DEWE-43A
DEWESoft® X - Professional Edition (DSA upgrade available) incl. CAN option
MINI USB cable (equipped with special lock-in screws for secure connection)
Carrying bag
Device ground cable

DEWE-43A INPUTS

	No of analog channels	8
	Samplerate / channel	200 kHz
	Vertical resolution	24 bit
	Input type	differential

INPUT TYPES

U	**Voltage**	8 ch
	Max. Range	± 10V ± 200 V MSI option
	Input coupling	DC
	IEPE/ICP Sensors	8 ch MSI option 4 mA, max 21V
	Sensor supply per system	± 5V 100 mA 12V 400 mA
	Bridge connection type	8 ch 4 wire
	Bridge completion with MSI adapter	full bridge, half bridge 1 kOhm quarter bridge 120 and 350 Ohm
	Super-counter	8 ch
	TEDS supprt without MSI adapters	yes
	Charge input with MSI adapter	up to 50000 pC
	Potentiometer	with MSI adapter
	Pt100.. Pt2000	with MSI adapter
	Thermocouple	with MSI adapter
	CAN bus ports	2 ch (isolated)

CONNECTORS

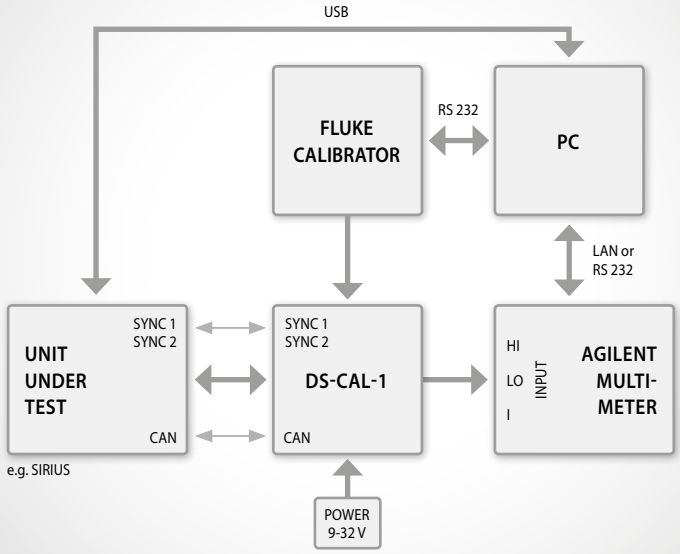
	DSUB 9	8 + 2
	LEMO 7pin	8
	BNC, Binder and others	MSI adapter

DEWESoft® Calibration

WITH DEWESoft® OR FLUKE MET CAL PROCEDURES AVAILABLE

The ISO standardization process requires a periodic check of the measurement equipment. You can either annually send back your DEWESoft® instrument to the factory for inspection, or – if you own a large number of measurement channels – build up a new or extend your existing calibration lab.

CALIBRATION SETUP



Required hardware:

- *Fluke calibrator 5500, 5520, 5700, 5720 or 5502 series*
- *Agilent Multimeter 34410A (LAN) or 34401A (RS232)*
- *DS-CAL-1*

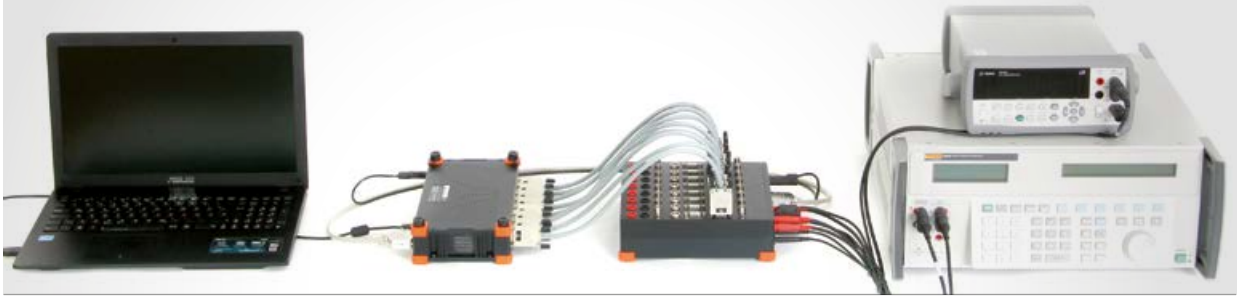
The calibrator generates reference signals, which are measured by the DEWESoft® instrument, while the multimeter checks the outputs, e.g. analogue out or excitation voltages. The DS-CAL-1 ensures the correct routing and additional functionality check such as bridge completion, shunt, sync check etc…

DS-CAL-1

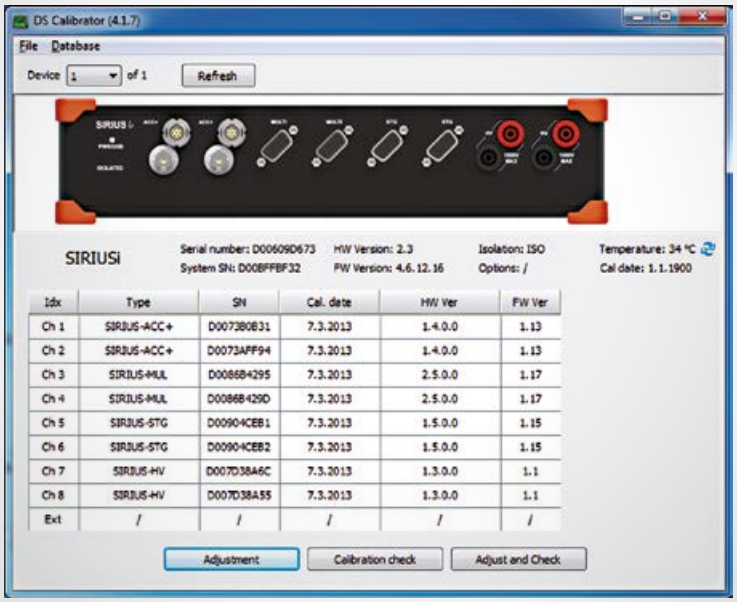
The DS-CAL-1 is a special device for automated calibration and additional functionality check of DEWESoft® instruments (e.g. SIRIUS, DEWE-43). It's standard routines contain the check of:

- *Analogue ranges*
- *Excitations*
- *Counters*
- *power supplies*
- *bridge completion*
- *shunts*
- *analogue output*
- *sync*
- *CAN*

TYPICAL HARDWARE CALIBRATION SETUP



DEWESoft® CAL – SOFTWARE



The ease of use "DS Calibrator" software checks and adjusts the DEWESoft® instrument's amplifiers. If all channels pass, it will update the calibration date in the device and create a professional report in PDF format.

Then you just print the Calibration Certificate …

ORDERING INFORMATION

1. CAL-SIRIUS-PACKAGE

Calibration Set including DS-CAL-1 with all cabling, adapters and accessories, DEWESoft® calibration software, supports FLUKE calibrator 5500, 5520, 5700, 5720 or 5502 series, supports Agilent Multimeter 34410A Supports SIRIUS, DEWE-43

2. CAL-SIRIUS-PACKAGE-PLUS

The PLUS package adds certified METCAL routines to the CAL-SIRIUS-PACKAGE

FLUKE METCAL® PROCEDURES AVAILABLE

DEWESoft® WORLDWIDE ON SITE CALIBRATION SERVICE AVAILABLE IN

- *DEWESoft® Slovenia*
- *DEWESoft® Austria*
- *DEWESoft® France*
- *DEWESoft® USA*
- *DEWESoft® CHINA*

FACTORY CALIBRATION:
Standard: *factory calibration with ISO traceable certificate*
OPTION: *worldwide accepted ANSI/NIST traceable certificate: (CAL-SIRIUS-ISO)*

DS-NET

ETHERNET SOLUTION

DS-NET is a measurement and control system designed for many demanding applications, especially in the fields of

- *Component Testing*
- *Engine Testing*
- *Process Performance Testing*
- *Structural Monitoring*

The DS-NET system is rugged and scalable from e.g. a two channel control unit to a large synchronized measurement grid with thousands of channels. It is as flexible as being a stand alone data logger, a channel expansion of DEWESoft® instruments, an Ethernet based distributed measurement system or a full-featured independent data acquisition instrument.

The completely modular architecture ensures always a perfect fit of the system configuration for the application at hand. A wide range of DS-NET modules is available to support almost any type of input and output signals. These multi-function modules can be combined in countless ways and provide top-notch data recording and process control.

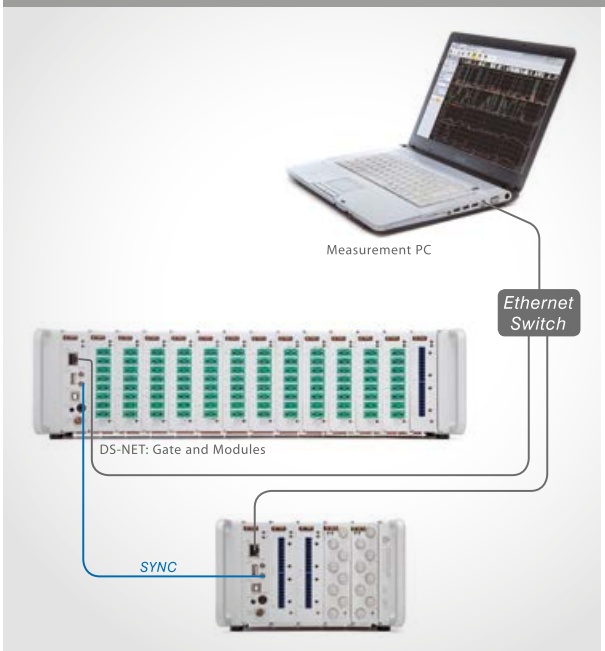
The system is designed for practical industrial appliance and thus is comprised of all metal housings and robust electronics offering galvanic isolation. Popular connector options enable convenient sensor connection and in combination with the easy-to-use software this ensures a time saving system setup.

Considering all these facts, DS-NET will serve you many years and is a safe investment.

- ***Medium speed data acquisition up to 10 kS/s/ch***
- ***Distributed data acquisition, Ethernet based***
- ***Stand alone data logging***
- ***Complete instrument running local DEWESoft® software***
- ***Customized LabVIEW™ based solution***
- ***Channel expansion for DEWESoft® instruments***
- ***Completely modular and thus very flexible in configuration***
- ***Scalable from two to several thousand channels***
- ***Portable and 19″ rack-mount lines***
- ***REAL-TIME performance***
- ***Redundant data storage***
- ***Operating temperature -20° C to +60° C***

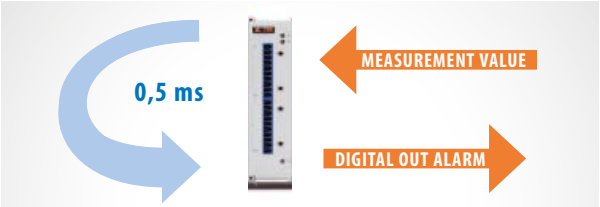
APPLICATION AREAS

ETHERNET DATA ACQUISITION SYSTEM



DS-NET is a very flexible and compact Ethernet based data acquisition system. There is a portable line as well as a 19" rack-mount line. Both lines offer very precise galvanically isolated signal conditioning and enhanced features and reliability. Usually the DS-NET system is connected to a host computer running DEWESoft® online data acquisition software. Up to 160 kS/s can be received from a single DS-NET system and then be processed, visualized and stored on the host computer.

But DS-NET also offers real-time performance! Since Microsoft Windows® is no real-time operating system it can not guarantee certain reaction times. DS-NET runs its own internal real-time operating system and can handle output and alarm functions directly inside the instrument. Thus accurately defined response times are guaranteed - completely independent of any PC.



FIXED LATENCY TIME

Alarm handling inside module

STAND ALONE DATA LOGGING

Every DS-NET system is ready to be used as a rugged stand-alone data logger - without any additional costs! The logging process is configured by a single click in DEWESoft® software. Measurement data and calculated values can be stored to a USB memory-stick: up to a limit of 32 GB.

For triggered storing an aggregate sampling rate of max. 160 kS/s and up to 2 million samples per trigger event are the limit.

For continuous storing an aggregate sampling rate of max. 20 kS/s is the limit. Data is stored into files of max. 2 million samples each without any gap between the files.

USB sticks can be hot-swapped during measurement without losing any data thanks to the internal buffer memory.

Data analysis can be done offline in DEWESoft® software.

REDUNDANCY IN DATA ACQUISITION

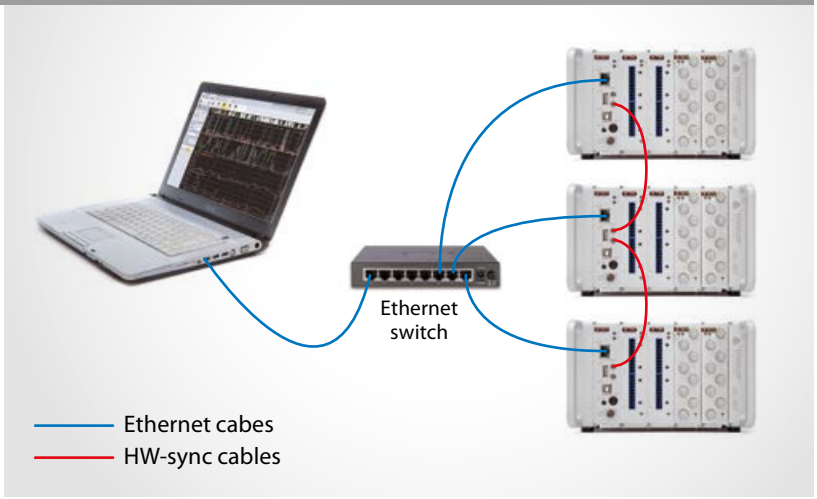
The combination of the data logging feature and DEWESoft® online recording software gives you redundancy in data acquisition for maximum reliability. Both, a USB stick and a measurement PC (via Ethernet), are connected to the DS-NET system in parallel. Data is logged to the USB stick while you are using DEWESoft® to process, analyze and store the very same data at the same time!

As a result, even if your Ethernet connection should break during a measurement, your data is safe, since it is logged to the USB stick.

DS-NET SYSTEM ARCHITECTURE:

1. ETHERNET BASED DAQ – SYSTEM : DS NET MODULES + GATE + PC:

The DS NET system starts with one DS GATE as the base interface between up to 16 DS NET modules and the computer. Data with a total sampling rate of 160 kS/s can be transferred from each DS – GATE. The GATE HS can transfer up to 1.6 MS/s. The number of channels can be easy expanded with DS- NET systems up to 1000 channels. The distance between the gates can be up to 100 meter with Ethernet cables, or 1000m with optic Ethernet links. The synchronization between the DS NET systems can be done by software, hardware cable or GPS links without cables.



	DS GATE	DS GATE-HS
PC - Interface Ethernet	Ethernet	Gigabit/s Ethernet
Max. module support	16	64
max. total data transfer rate	160 ks/s	800 kS/s
typ. transfer for 100 channels	1 kS/s	8 ks/s
RS485 interfaces	2	4

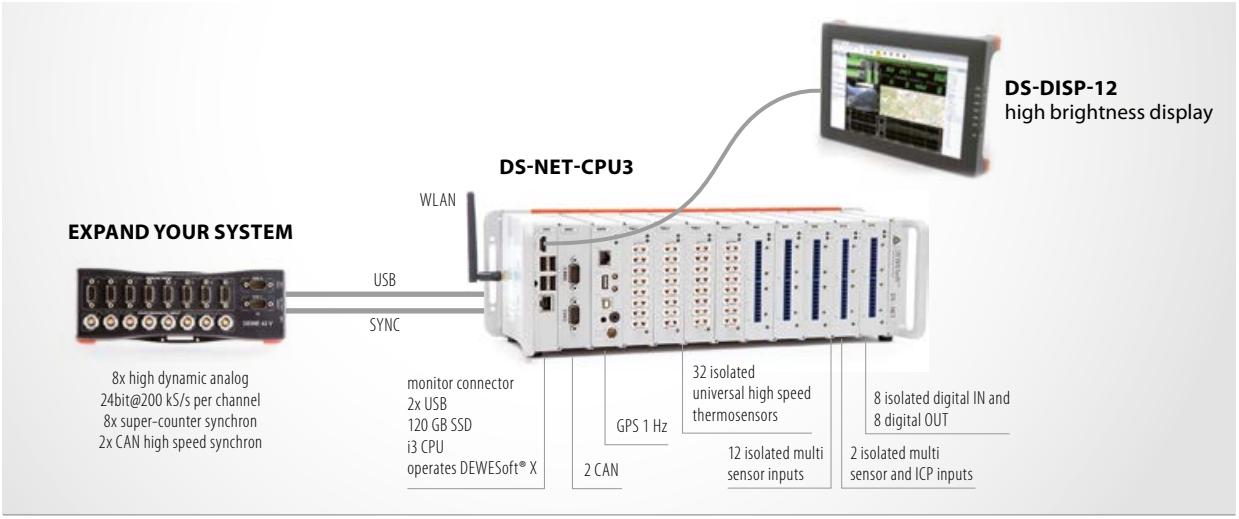
DS GATE

DS GATE-HS

2. ALL IN ONE ETHERNET BASED DAQ – SYSTEM : DS NET MODULES + GATE + DS-NET-CPU3:

Just add the powerful DS-NET- CPU3 to your DS NET system and enjoy the ALL IN ONE DAQ system with the powerful DEWESoft® user interface. If you need additionally dynamic data channels, just add the powerful SIRIUS or DS 43 DAQ modules with 200kS/s or even 1 MS/s. All data from DS NET SIRIUS or DS43 Hardware are fully synchronized!

	DS-NET-CPU3
Software	DEWESoft® X2
CPU	i3
solid state HDD	120 GB
RAM	4 GB
WIFI	802.11g
DISPLAY INTERFACE	Mini HDMI



DS-NET MEASUREMENT MODULES:

Module type	ACC2	CFB2	BR8	BR4	BR4-D	V8	V8-B	V8-200	V4	V4-B	V4-HV	TH4	TH8	TH8-C	DIO8	AO4
Max. Samplerate[Hz]	10k[4]	10k	10k	10k[4]		10k		10k	10k		10k	10k	100[5]		10k	10k
Isolation Voltage [V][6]	500[7]	500[7]	500[7]	500[7]		500[7]		500[7]	1.2k[8]		1.2k[8]	1.2k[8]	500[7]		500[9]	500[7]
ANALOGUE INPUT TYPES																
Voltage	2			4	4	8	8	8	4	4	4	4	8	8		
max. Range	±60V			±10V	±10V	±10V	±10V	±200V	±10V	±10V	±1kV	±80mV	±80mV	±80mV		
Current Range (0..25mA)	2			4	4	8[10]	8[11]		4[11]	4[11]						
Resistance	2			4	4											
Potentiometer	2			4	4											
Pt100, Pt1000	2			4	4											
Thermocouple	2[12]			4[12]	4[13]							4	8[12]	8		
Full, ½, ¼ bridges	2[14]	2[15]	8	4[16]	4[17]											
Inductive full ½ bridges		2														
LVDT		2														
IEPE/ICP Sensors	2															
DIGITAL INPUT TYPES																
Frequency															4	2
Pulse Width															4	2
Counter															✓[18]	✓[19]
Time															4	2
Status	2	4				2									8	4
ANALOGUE OUTPUT SIGNAL																
Voltage (±10V)		2														4
Current (4…20mA)																4
DIGITAL OUTPUT SIGNAL																
Frequency															8	4
Pulse Width															8	4
Status	2	4				2									8	4
CONNECTORS																
✓ **standard connectors,** ✓ **optional connectors**																
Screw	✓	✓		✓		✓		✓	✓				✓		✓	✓
BNC	✓[20]				✓[21]		✓			✓	✓					
DSUB 9			✓		✓											
Thermocouple														✓		
Spring Terminal												✓				
MISCELLANEOUS																
Sensor supply [V]					<=12											
Approx. Weight [g][3]	400	400	800	400	450	400	500	400	400	500	600	400	400	500	400	400
Approx. Power Consumption [W]	2	2.5	2.5	2.5	2.5	2	2	2	2	2	2	2	2	2	2	2

4) only 8Hz for thermocouples
5) only 8Hz with active mains rejection
6) isolation voltage: channel/channel, to power supply and to interface (unless otherwise noted on the module specifications)
7) 1kVDC peaks, 500VDC for some minutes, 250VDC permanent
8) 1.2kVDC permanent
9) isolation voltage between group/group (connector/connector): 1kVDC peaks, 500VDC for some minutes, 250VDC permanent
10) V8-SHUNT adapters are available as option
11) with external shunt (no adapter available)
12) external CJC adapters are available as option (see TH8-CJC, BR4-CJC, ACC2-CJC)
13) differential temperature measurement only (no CJC adapter available)
14) ¼ bridge completion adapters ACC2-120/ACC2-350 are available as option
15) ¼ bridge completion adapters CFB2-120/CFB2-350 are available as option
16) ¼ and ½: bridge completion adapters BR4-120/BR4-350 are available as option
17) ¼ and ½: bridge completion adapters BR4-D-120/BR4-D-350 are available as option
18) only 2 quadrature four wire counters can be used, or 4 standard, up/down or quadrature two wire counters
19) only 1 quadrature four wire counter can be used, or 2 standard, up/down or quadrature two wire counters
20) possible with optional adapter: ACC2-BNC (only for IEPE measurement)
21) possible for BR4-D module with optional DSUB-BNC adapter (only for voltage measurement)

DS-NET MEASUREMENT MODULES:

DS-NET-ACC2

Multiple Input Module

2 galvanically isolated universal analog input channels	voltage: ±60 V, ±10 V, ±1 V, ±100 mV current: 0..25 mA potentiometer, resistance: 100 kΩ, 4 kΩ, 400 Ω Pt100 & Pt1000: -200..850 °C thermocouple types: B, E, J, K, L, T, U, N, R, S bridge: ±2.5 mV/V, ±50 mV/V, ±500 mV/V (@ 2.5 V excitation) IEPE sensors: ±10 V; constant current 4 mA
Resolution	24-bit
Sampling rate	10 kHz per channel (thermocouple 8 Hz)
2 digital I/O channels	input: state, tare, memory reset / output: state alarm, threshold / voltage: max. 30 V
Signal processing	linearisation, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
TEDS	class 1 and class 2, according IEEE 1541.4
Galvanic isolation	of I/O-signals (each channel), power supply and interface isolation voltage 500 V

DS-NET-CFB2

Carrier Frequency and AC/DC Bridge Module

2 isolated analog input channels	Strain gauge and inductive measuring bridges (full, half, quarter), LVDT, RVDT
DC and carrier frequency (CF) principle	DC excitation, 600 Hz CF excitation, 4.8 kHz CF excitation for bridges
2 analog output	Voltage ±10 V, 10 kHz
Resolution	24 bit
2 digital I/O channels	input: state, tare, memory reset output: state, alarm, threshold
Signal processing	linearisation, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
Galvanic isolation	of I/O-signals (each channel), power supply and interface isolation voltage 500 V

DS-NET-BR4

Multiple Input Module

4 galvanically isolated universal analog input channels	voltage: ±10 V, ±1 V, ±100 mV current: 0..25 mA, potentiometer, resistance: 100 kΩ, 4 kΩ, 400 Ω Pt100 &Pt1000: -200..850 °C thermocouple types (not for BR4-D): B, E, J, K, L, T, U, N, R, S bridge: ±2.5 mV/V, ±50 mV/V, ±500 mV/V (@ 2.5 V excitation)
Resolution	24 bit
Sampling rate	10 kHz per channel (thermocouple 8 Hz)
Signal processing	linearisation, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
Galvanic isolation	of I/O-signals (each channel), power supply and interface isolation voltage 500 V
Option	D-SUB connectors model: DS-NET BR4-D / Lemo 10 pin

DS-NET-BR8

Bridge Input Module

8 strain gage input channels	+/-1 mV/V, +/-5 mV/V quarter bridge +/-2 mV/V, +/-10 mV/V half-, full bridge excitation: 2V, 4V selectable selectable shunt: 100 kOhm full, half and quarter bridge 3-, 4-, 5-, 6-wire
Resolution	24 bit A/D with AAF filters 1 kHz
Sampling rate	10 kHz per channel
Signal processing	linearisation, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
Galvanic isolation	of I/O-signals (each channel), power supply and interface isolation voltage 500 V
Option	adapter for screw terminal available

DS-NET-V4

High Isolation Voltage Module

4 galvanically isolated input channels	Voltages at high potential, ranges 100 mV, 1 V, 10 V current via an external shunt
Resolution	24 bit
Sampling rate	10 kHz per channel
Signal processing	linearisation, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
Galvanic isolation	1200 V short-term 5 kVpk
Option	BNC connectors model: V4-B

DS-NET-V4-HV

High Voltage Module

4 galvanically isolated input channels	Voltages, range 40 V, 120 V, 400 V, 1000 V
Resolution	24 bit
Sampling rate	10 kHz per channel
Signal processing	linearisation, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
Galvanic isolation	1200 V short-term 5 kVpk
Option	HV BNC connector cable

DS-NET-V8

Voltage Module

8 galvanically isolated input channels	differential voltage ±10 V , current via shunt 25 mA (V8-SHUNT - not for V8-B), common mode voltage: 100 V permanent
Resolution	24 bit
Sampling rate	10 kHz
2 digital I/O channels (not for V8-B)	input: state, tare, reset output: state alarm max. 30 V
Signal processing	linearisation, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
Galvanic isolation	of I/O-signals (each channel), power supply and interface / isolation voltage 500 V
Option	BNC connectors model: DS-NET V8-B

DS-NET-V8-200

Voltage Module

8 galvanically isolated input channels	isolated differential input voltage ±200 V
Resolution	24 bit
Sampling rate	10 kHz
Signal processing	linearisation, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
Galvanic isolation	of I/O-signals (each channel), power supply and interface isolation voltage 500 V

DS-NET-DIO8

Digital Input/Output Module

8 digital inputs and 8 digital outputs	configurable as counter, frequency, PWM and time inputs, frequency or PWM output, state in or output
State in- and outputs	process- and host controlled, programmable threshold
Frequency in- and outputs	frequency measurement up to 1 MHz (Chronos method), frequency output up to 10 kHz
Counter	forward/backward counter, quadrature counter with reference zero recognition (reset/enable), up to 1 MHz
PWM in- and outputs	measurement of duty cycle and frequency, output with variable frequency and/or duty cycle
Time measurement	
Galvanic isolation	of I/O-signals (group/group), power supply and interface isolation voltage 500 Veff

DS-NET-AO4

Analog Output Module

4 galvanically isolated analog outputs	voltage ±10 V, current 4..20 mA selectable
DAC resolution 16 bit	10 kHz sample rate
4 digital input and 4 digital output channels	configurable as 2 counter, 2 frequency, or 2 PWM inputs, 2 frequency or PWM output, state in- or output, max. 30 V
Frequency in- and outputs	frequency measurement up to 1 MHz (Chronos method), frequency output up to 10 kHz
Counter	Forward/backward counter, quadrature counter with reference zero recognition (reset/enable), up to 1 MHz
PWM in- and output	measurement of duty cycle and frequency, output with variable frequency and/or duty cycle
Time measurement	
Outputs freely scalable	
Galvanic isolation	of I/O-signals (each channel), power supply and interface isolation voltage 500 V

DS-NET-TH4

High Isolation Thermocouple Module

4 galvanically isolated input channels	for non-isolated thermocouples at high potential
Cold junction compensation	internal
Dynamic linearisation	Optimum positioning of interpolation points in selected range, types B, E, J, K, L, T, U, N, R, S programmable
Resolution	24 bit
Sampling rate	10 kHz per channel
Signal processing	digital filter, average, scaling, min/max storage, arithmetic, alarm
Galvanic isolation	1200 V short-term 5 kVpk

DS-NET-TH8

Thermocouple Module

8 galvanically isolated input channels	thermocouples and voltages in the range of ±80 mV, common mode voltage: 100 V permanent
Cold junction compensation	DS-NET TH8-C: internal DS-NET TH8: TH8-CJC connectors available (option)
Dynamic linearisation	Optimum positioning of interpolation points in selected range, types B, E, J, K, L, T, U, N, R, S programmable
Resolution	24 bit
Sampling rate	100 Hz per channel (~8 Hz with activated mains rejection)
Signal processing	digital filter, average, scaling, min/max storage, arithmetic, alarm
Galvanic isolation	of I/O-signals (each channel), power supply and interface isolation voltage 500 V
Option	DS-NET TH8-C: with integrated CJC

DS-NET OPTIONAL MODULES:

DS-NET-CAN2

CAN Bus Input Module

2 high speed CAN interface channels, up to 1MBit/s
Isolated CAN input 500V
OBDII, J1939, CAN output
Supports CAN 2.0b standard
Functions: send, receive, listen (silent), buffer
max. 2 modules connected to one DS-NET CPU

DS-NET-SUPPLY / - BNC

Sensor Power Supply Module

4 galvanically isolated DC sensor supply voltages	+5 V, +12 V, +15 V, +24 V
Voltages combinations	the voltages can be can be connected to get any possible voltage combination (e.g. 17 V, 20 V, ...)
Supplied Power	5 W per output voltage
Galvanic isolation	each voltage is galvanically isolated with 1.5 kV

Only one SUPPLY module can be used per DS NET system.

DS-NET OPTIONAL CONNECTOR – ADAPTERS:

CFB2-120

Module: CFB2
1 channel quarter bridge completion adapter 120 Ω

CFB2-350

Module: CFB2
1 channel quarter bridge completion adapter 120 Ω

TH8-CJC

Module: TH8
4 channel thermo-couple adapter with integrated CJC

ACC2-120

Module: ACC2
1 channel quarter bridge completion adapter 120 Ω

BR4-D-120

Module: BR4-D
1 channel quarter and half bridge completion adapter 120 Ω

BR4-CJC

Module: BR4
2 channel thermo-couple adapter with integrated CJC

ACC2-350

Module: ACC2
1 channel quarter bridge completion adapter 350 Ω

BR4-D-350

Module: BR4-D
1 channel quarter and half bridge completion adapter 350 Ω

ACC2-CJC

Module: ACC2
1 channel thermo-couple adapter with integrated CJC

BR4-120

Module: BR4
2 channel quarter and half bridge completion adapter 120 Ω

DSUB-BNC

Module: BR4-D
1 channel DSUB9 to BNC adapter for voltage input

ACC2-BNC

Module: ACC2
1 channel screw to BNC adapter: ICP® input

BR4-350

Module: BR4
2 channel quarter and half bridge completion adapter 350 Ω

V8-SHUNT

Module: V8
4 channel shunt connector for current measurement (25 mA)

POWER SUPPLY ACCESSOIRES:

DS-CAR-UPS

Small uniterruptable power supply for in car use: Input: 12V (typ. Cigarette lighter connector). Output: power connector (LEMO) for DEWE-43, DS-NET, DS-DISP-12

9 to 36 V_{DC} Vehicle power supply

DS-CAR-UPS 1: 58 Wh / 4A, 12V

9 to 36 V_{DC} Vehicle power supply

DS-CAR-UPS 2: 108 Wh / 4A, 12V

Software

Software

MEASUREMENT INNOVATION WITH DEWESoft® X

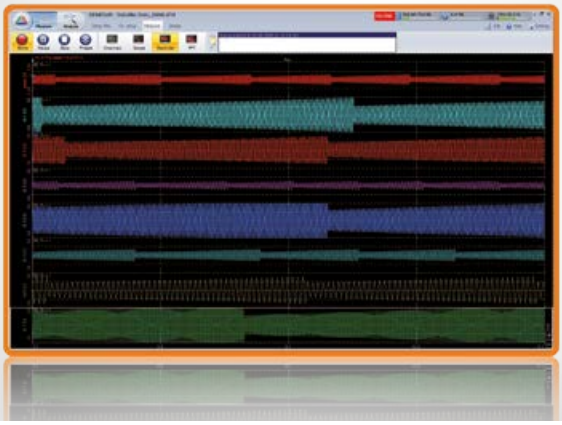
DEWESoft® data acquistion software is the solution to acquire signals simultaneously from different sources (even with different sampling rates), display and store them in one file. With the post-processing feature, all the powerful mathematic and analysis functions can also be used for the already stored data.
With the focus on our own powerful hardware, the release of the innovative DEWESoft® X software leads to improved, intuitive operability, shortened setup time and reduced setup mistakes. This avoids repeating measurements, which saves time and money.

Data Acquisition

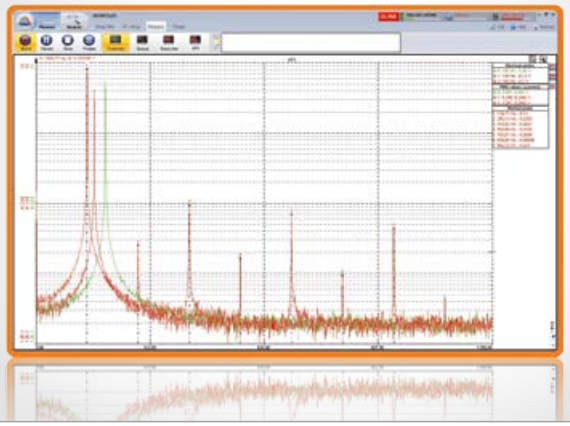
FREELY CONFIGURE YOUR INSTRUMENT SCREEN:

Digital and Analog Meter

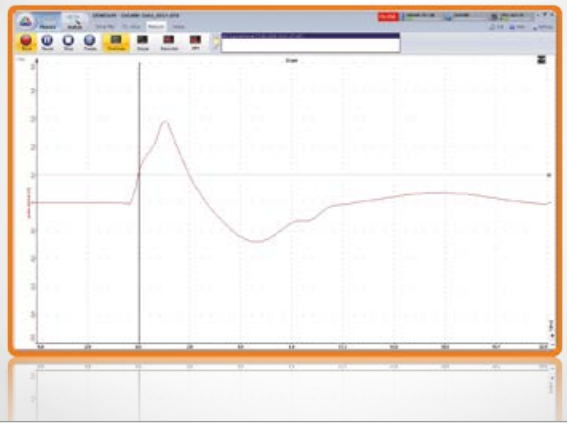
Recorder



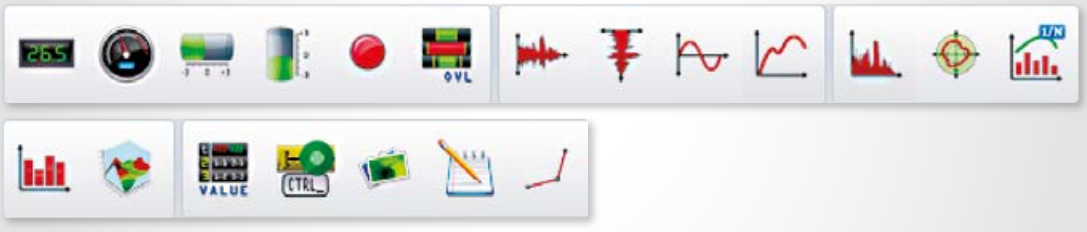
FFT Analyzer



Scope Mode/Trigger



CHOOSE FROM A WIDE VARIETY OF INSTRUMENTS:



In- and Outputs

ANALOG INPUTS

Voltage, current, temperature, vibration, strain gages

DEWESoft® X offers the interface to all DEWESoft® instruments like DEWE-43A, DS-NET, SIRIUS. The perfect match of DEWESoft® hardware and software allows powerful technology like high dynamic dual-core AD, auto-detection, TEDS and many more. Up to 2000 analog channels with sampling rates from kS/s to MS/s up to 24 bit vertical resolution are supported.

VIDEO INPUT

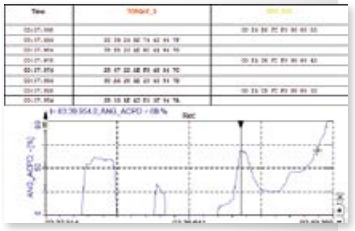
Synchronized video acquisition from web-, thermo- and high speed cameras

For applications requiring video which is truly synchronized to the dynamic sample rate, there is support for DS-Cameras. A high quality image with automatic shutter speed (selectable) is controlled directly by the A/D card, which generates a pulse to drive the camera. The result is a stunning correlation between each frame and the data.

Thermo cameras are supported from FLIR, NEC and MICRON, and high speed cameras from Photron which can acquire more than 100000 frames per second.

VEHICLE BUS INTERFACES

CAN, OBDII on CAN, J1939 and J1587 interface support



One of the most important vehicle buses today is the CAN (controller area network) bus. DEWESoft® X supports following CAN devices: DEWE-43A, DS-NET, DS-CAN-2 and SIRIUS. Today the CAN bus is present in cars, trucks, boats, tanks, tractors, harvesters and basically anything which has a modern engine built in.

GPS INTERFACES

Advanced GPS support and capabilites

GPS technology is used in three main application areas: to find the position on earth, to determine the velocity of an object and to get precise absolute time information.
DEWESoft® X uses all three areas. For basic positioning, DEWESoft® supports NMEA GPS interfaces. If you have a GPS receiver which sends the data according to NMEA specification, it will work in DEWESoft® up to a real-time rate of 500 Hz.

AEROSPACE INTERFACES

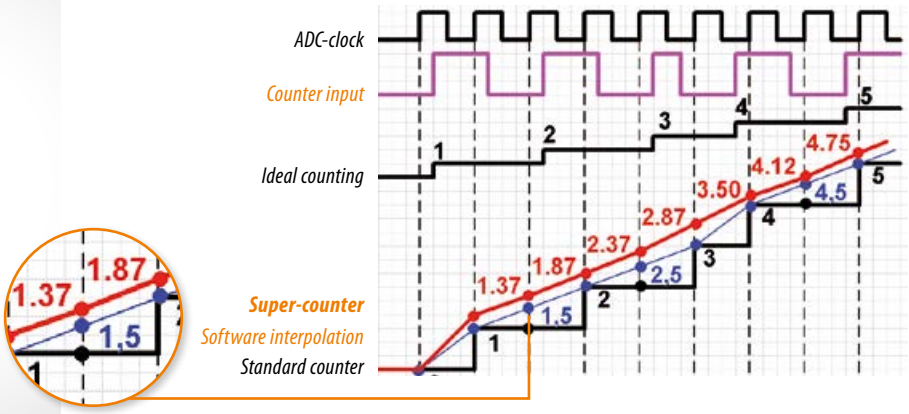
PCM telemetry, ARINC, chapter 10 and MIL-STD-1553 interaces support

Aircrafts as well as space vehicles such as the US Space shuttle acquire on-board data, digitize them, then send the data to ground stations. They do this via pulse code modulated data stream, also known as PCM. DEWESoft® supports the Ulyssix Tarsus PCM-01 card to decode, visualize and store this PCM data. The data is equipped with an IRIG clock time stamp and therefore can be matched to the analog FM channels, video channels, and other data sources. For more info, see the PCM data solution report.

COUNTER INPUTS

From basic counting to advanced counter modes

The so called super-counters (DEWE-43A, SIRIUS, etc…) allow a very precise timing and counting measurement. The counting is performed on an internal 102.4 MHz time base, no matter which sampling rate is currently used.



DEWESoft® KEY FEATURES

- *Perfect sync of analog, digital, counter, CAN, GPS, Video, ARINC, 1553 data … and even more*
- *Fast and easy setup of all kinds of input channels*
- *Failsafe and simple sensor setup by TEDS or sensor database*
- *Powerful online data processing, MATH functions, filters, statistics, reference curves*
- *Attractive online display of all kinds of data, creation of displays is a matter of seconds*
- *Various storing strategies, stream data to hard disk (160 MB/s and more), triggered storing or database storing*
- *Analog, digital or CAN data output, powerful function generator, alarms, CAN messages*
- *Build test procedures in a form of workflow diagram by means of our sequencer*
- *Fast data analysis, reload GB files in seconds*
- *Post processing the data files is possible on any computer, even without any license*
- *Ready to use applications, Power calculations, Combustion analysis, Torsional Vibration, Order tracking, Sound analysis, Frequency response function, Human vibrations, Balancing ...*

Recording/Control Solutions

The DEWESoft® KRYPTON data recorder are widely used for high speed and low speed signals from mHz to MHz. DEWESoft® offers a wide range of signal amplifiers and A/D converters in different chassis. The DEWESoft® software offers ease of use and sophisticated online and offline mathematic functions.

The flexible DS NET system even offers real time control solutions with guaranteed response times (no Windows® operating system involved). Simple PLC or sophicticated PID controller applications are available.

MAIN FEATURES: RECORDING

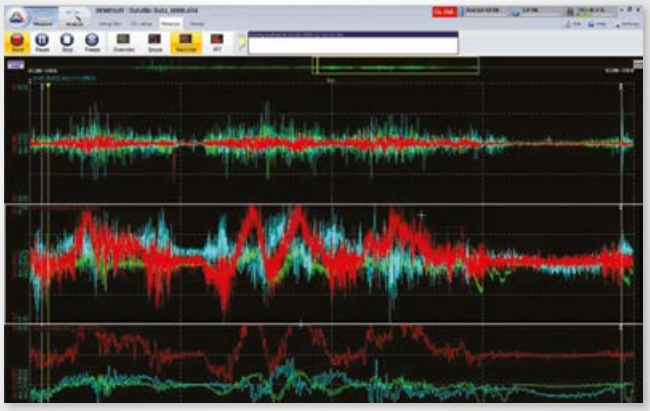
- *Multi sensor input*
- *Distributed systems*
- *Easy to use software*
- *Advanced triggering to capture events*

MAIN FEATURES: CONTROL

- *Real time alarms, PID*
- *Fixed low latency*
- *High speed (10 kHz)*
- *Stand alone operation*
- *Reliable*

DATA RECORDING

Instead of printing to paper, your data are streamed directly to a hard drive. DEWESoft®'s unique capability to store the data with over 160 MB/s will never let you lose your data even when recording hundreds of channels at the same time. You can start storing as easily as pressing the STORE button, or as elaborately as having separate - even multiple, triggers on each input channel. Recorder chart screens in DEWESoft® can be either vertical or horizontal, it's your choice.



TRIGGERED STORING

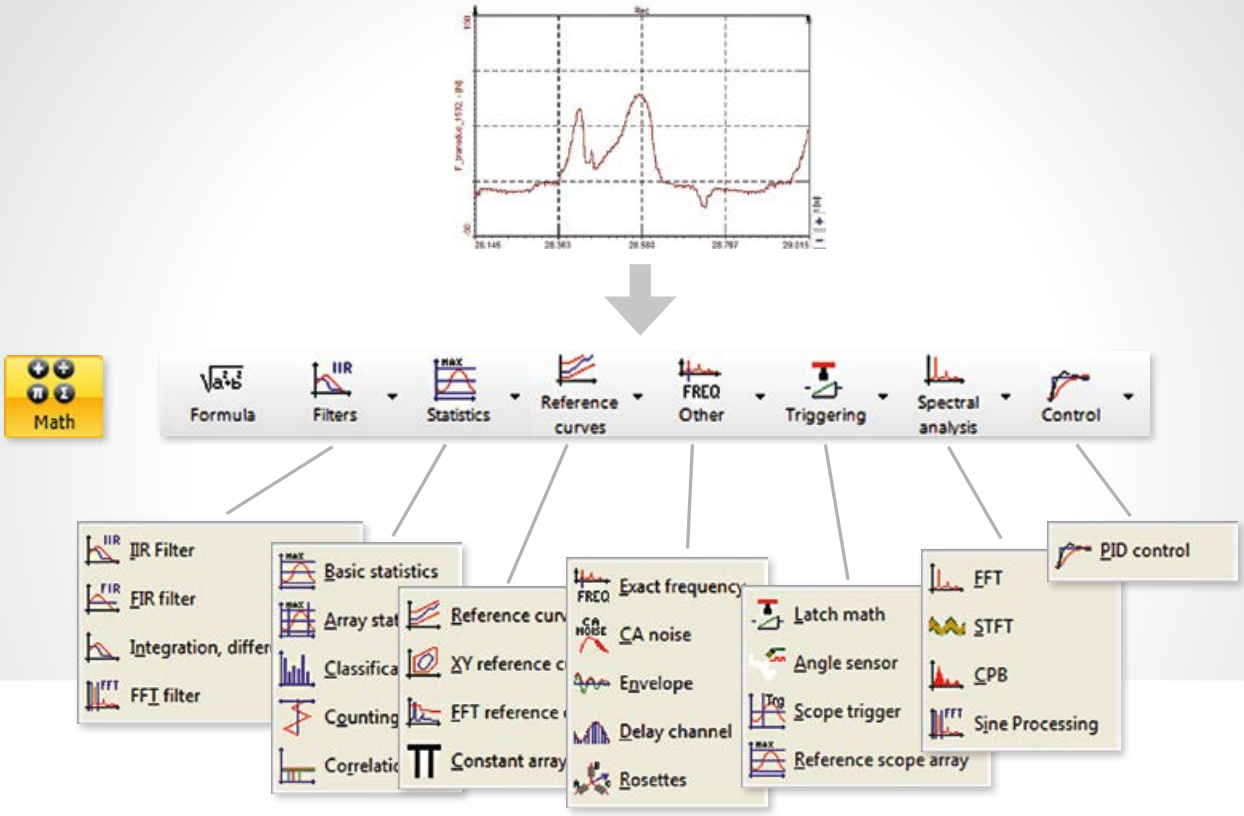
Quite often the system needs to monitor the data for several days or weeks, looking only for very specific events. Store all the data to the hard drive and then searching for these events is of course a bad idea. To avoid this DEWESoft® offers an extensive triggering feature– we can use start/stop triggers and use pre/post time for triggering. The trigger conditions can be:

- ***Simple edge:*** *either rising or falling slope*
- ***Filtered edge:*** *edge plus rearm level - either slope*
- ***Window trigger:*** *two levels - entering or leaving logic*
- ***Pulsewidth trigger:*** *longer or shorter than duration logic*
- ***Window and Pulsewidth:*** *completely selectable as above*
- ***Slope Trigger:*** *either rising or falling slope with steepness selection*

SOLUTIONS FOR TYPICAL RECORDING APPLICATIONS

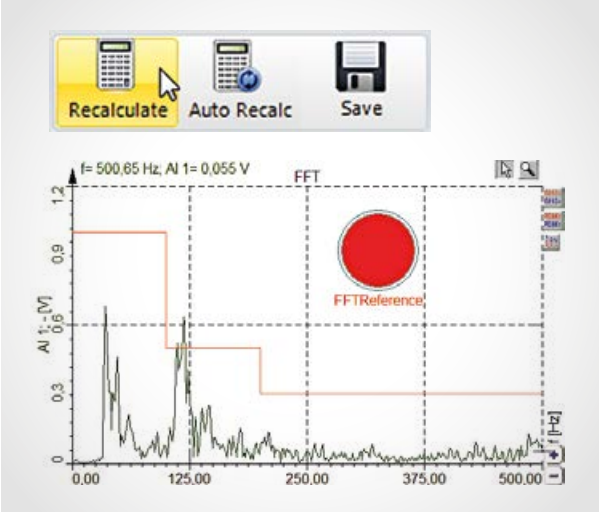
Application	*Description*
Automotive	In-vehicle: ride handling, brake tests, steering performance, evapo, fuel efficiency, passanger comfort, ...
Military	Portable recording and troubleshooting, system performance, shock and vibration, ...
Industrial	Machine diagnostics, advanced triggering on failure conditions
Paper/Pulp	Tension monitoring, (also use camera to record machine operation)
Metals	Monitor power systems, closed-loop systems test, process monitoring and recording
Power	3-phase analysis (50, 60, 400 Hz), circuit breaker & fault monitoring
Medical	Chemical tests, pharmaceutical manufacturing, process monitoring

Data Processing Capabilities

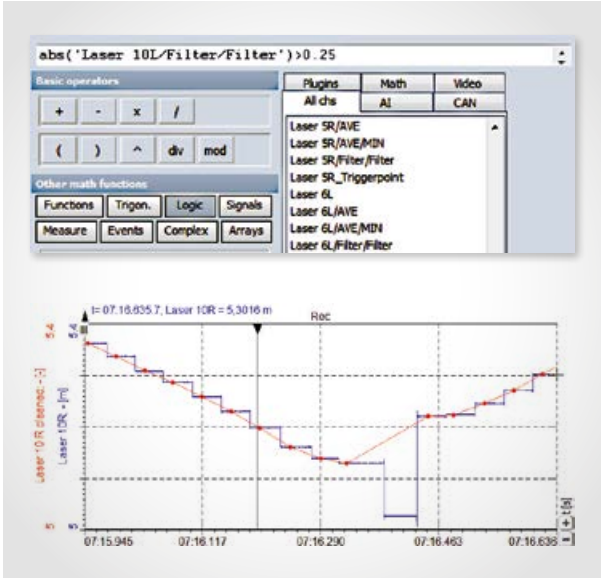


Over the past years we have covered lots of application areas with expert modules, so that the user is only a click away from the total solution. But also the standard mathematic is very powerful, and sometimes underestimated.

With the new post-processing capability, the data processing power can also be used on already stored data files. Just record raw data and apply the mathematics later!



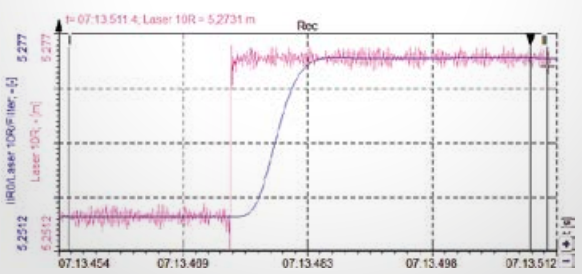
Imagine you have a big data file of a long-term battery test. With the formula mathematics you can define logical conditions (e.g. if current > 10A AND temperature > 70°C) to quickly find the positions you are interested in. By the way, it's also possible to exclude faulty data points, such as spikes, just by defining logical conditions.

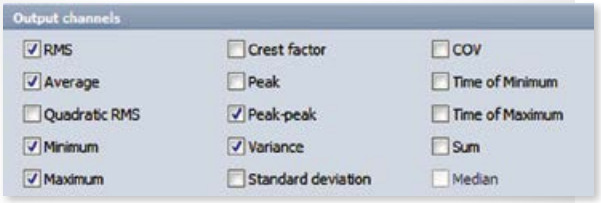


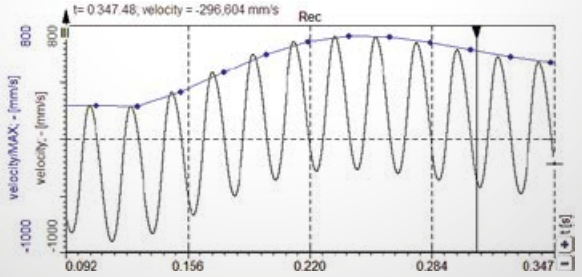
Furthermore, often used functions like delta time measurement between two signal edges, counting how often conditions appear, or holding the signal value on a condition and many more are already prepared. Use the complex section to split a signal into real and imaginary part, while the array section is used e.g. to cut arrays or determine min/max and their positions.

Sometimes, when you experience noisy sensor output or when the desired signal band is overlapped by other major frequencies, filtering appears on the scene. The major advantage of the FIR filter is no phase delay in pass band, the IIR filter is used for doing integration (acceleration -> velocity -> displacement) or derivation, the FFT filter completes the picture.

Statistical function are mainly used for calculating RMS, AVG, MIN, MAX... on time or sample base, or overall. Variance, standard deviation and higher sophisticated functions such as classification and counting are also supported; even working with array data – which can come e.g. from an FFT analysis.







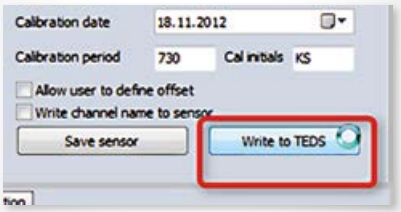
MATH FEATURES

- *Filtering (FIR, IIR, FFT filter, integration, derivation, …)*
- *Logical conditions*
- *Basic Statistics (RMS, AVG; Min, MAX, …)*
- *Advanced Statistics (Std deviation, variance, classification, counting …)*
- *Reference curve (time, XY and frequency domain)*
- *Converting time-based to angle-based domain (resampling)*
- *Envelope function*
- *Delay channel (previous value, delta-calculation)*
- *Latching (hold value on certain condition)*
- *Angle sensor math (convert analog input signal from tacho probe to freq. + angle)*
- *Scope trigger*
- *Spectral Analysis (FFT, STFT, CPB, SineProcessing)*

DEWESoft® X Features

CREATING SMART SENSORS (TEDS)

Now it is possible to create "smart sensors" inside DEWESoft®. Just equip the sensor with a chip, and store scaling, offset, calibration data … according to the TEDS standard – and beyond! DEWESoft® X additionally stores the amplifier settings to the chip: just connect the sensor, everything is set up and you can start the measurement!

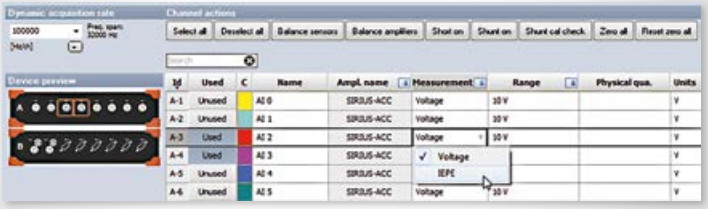


AUTO-DETECTION OF HARDWARE

When plugging in the USB connector, the power and synchronization status of the system is checked and displayed. This self-check helps identifying if all cabling is done correctly.

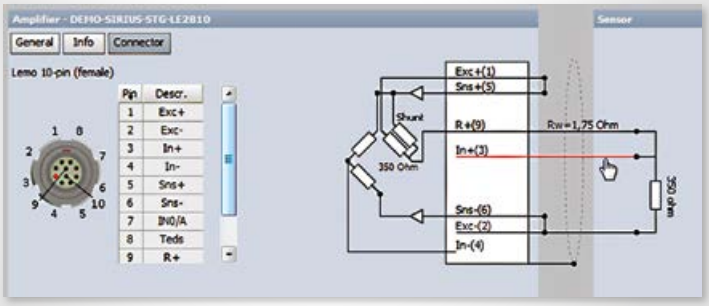
CHANNEL SETUP GRID

Just double click one amplifier in the picture of the system configuration shown on the left: the channel setup will open. Select multiple channels to set them to e.g. IEPE mode. In bigger systems use the search field to quickly find the wanted channel.



CONNECTOR WIRING DIAGRAMS

Depending on the used amplifier and operation mode, the correct connector pinout and the needed connections to the sensor are shown. No need to search for additional documents.



Many more small features are built in.
Go to http://www.dewesoft.com/download and get a 30-days-evaluation license with all features.

Fast Data Storing

Through the entire history of DEWESoft® the performance in storing was one of the most important issues. The PC technology has advanced through the years and we are using all possible resources to get more from the system. We achieve more than 160 MB/second sustained stream rates. Even with such high rates, DEWESoft® prepares the data to be reloaded in a matter of seconds.

STREAMING

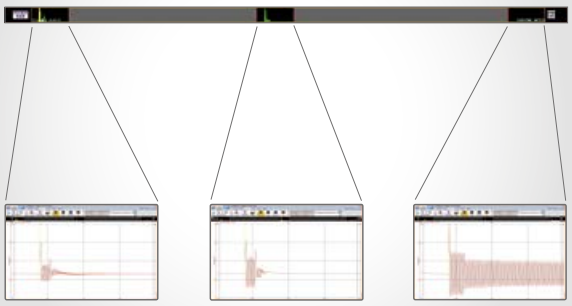
With a very specific data file structure we can write the channel setup, display setup, all the events, fast analog data and slow asynchronous data from different sources in a single file. For long term measurement DEWESoft® offers to roll-over the file automatically when certain file size is reached or after a specified time (for example after 24 hours the current file is closed and a new one is created automatically). DEWESoft® makes sure that no data is lost during the file roll-over.

TRIGGERED STORING

Quite often the system needs to monitor the data for several days or weeks, looking only for very specific events. Store all the data to the hard drive and then searching for these events is of course a bad idea. To avoid this DEWESoft® offers an extensive triggering feature – we can use start/stop triggers and use pre/post time for triggering.

We can also use math formulas to create combined trigger conditions. When the trigger event happens, data is stored with the fast sampling rate (with pre- and post-time), while otherwise only reduced data (min, max, average, RMS) is stored. This reduces the file size in long-term measurements.

Multiple Triggers



Trigger Types

Simple edge
(either rising or falling slope)

Window trigger
(two levels; entering or leaving logic)

Pulsewidth trigger
(longer or shorter than duration logic)

Window and Pulsewidth
(completely selectable as above)

Slope Trigger
(rising or falling slope with steepness selection)

DATABASE STORAGE

For applications which require long term storage and off line post processing, DEWESoft® offers a database storage solution where accumulated data is sent to a remote database server. The slow speed data is stored continuously and in case of a trigger event the full speed data is acquired and stored. Database storage is mainly used for distributed applications.

Distributed Acquisition with DEWESoft®-OPT-NET

With the OPT-NET option your measurement system can be controlled remotely with ease of use you couldn't imagine before. OPT-NET also serves as the center of Distributed Data Acquisition systems where you have multiple systems located either together or scattered across an entire continent. IRIG and GPS time will take care that data will stay synchronized, no matter how long the acquisition runs. OPT-NET offers three basic modes of operation (1:1 mode, x:1 mode, 1:x mode). With these three modes almost any application can be covered. From single channel expansions over remote control to distributed measurements over hundreds of kilometers - everything is possible.

1:1 MODE

1:1 mode works with single measurement system and single client. In this mode there are two types of operation: full remote control and data view only. In full remote control the client computer acts as the master of the measurement system. When the master client changes to the setup screen, the measurement system also changes to setup screen.

Single Measurement Unit, Single Client

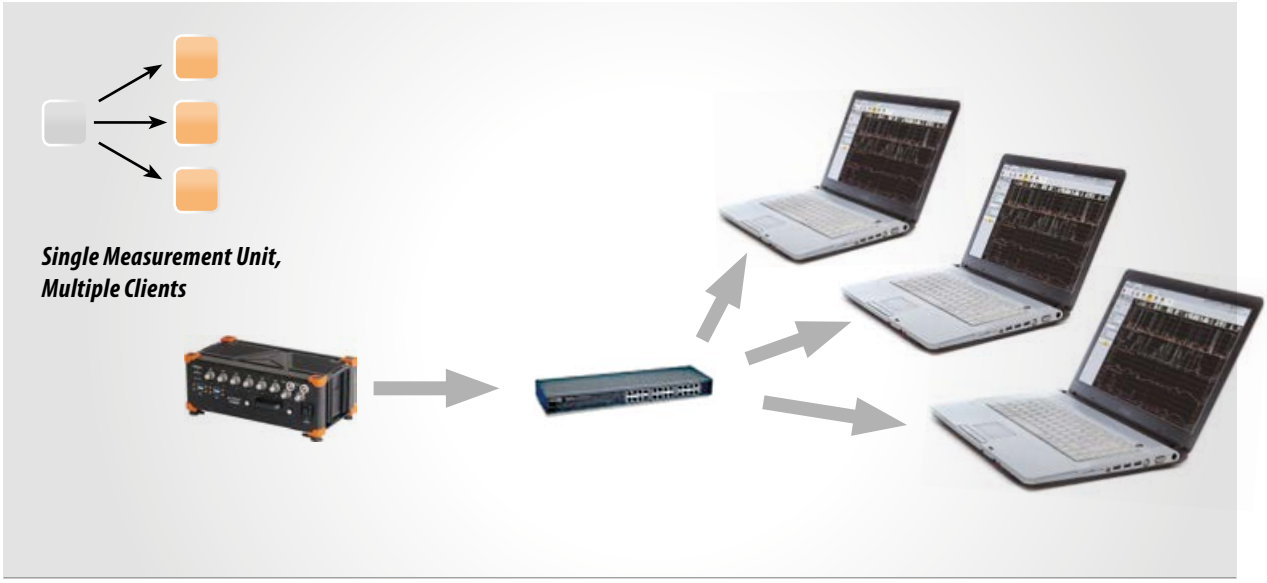
X:1 MODE

Multiple measurement systems and a single client are used in case of distributed measurements or if the acquisistion rates are too high to be managed by a single measurement unit. The measurement systems have to be clock-synchronized either with hardware clock (one unit is the clock master, the others are slaves) or with an external clock source which is either IRIG or GPS.
All measurement systems have to run with the same acquisition rate. In this case only one connection option is possible – the client is always the master. It starts and stops the measurement on all units in the measurement network. At any time the client has access to view mode - but only to one measurement system (one-to-one connection like in single measurement system & single client configuration). Additional view devices are possible, but they can access only a single measurement system.

Multiple Measurement Units, Single Client

1:X MODE

The third network configuration is to have a single measurement system controlled by one master client and additional view clients. The master client is able to change the measurement system setup, storing strategy, start and stop measurements, and many more. The view clients are only allowed to use a few channels from the measurement unit (up to the bandwidth limitation) and view and store the data on their local hard disk.



Single Measurement Unit, Multiple Clients

EXAMPLE SYSTEM

For bigger measurement tasks you can use the DEWESoft®-OPT-NET option to combine several measurement units to one big system of up to 1000 channels and more: simply connect them via GLAN and sync. And if the measurement is done, just disconnect and use each one independently again. The load can be distributed over the individual SBOXes. And since each SBOX has more than enough power, even for most demanding math operations of its 32 channels, all performance problems belong to the past! The SBOX supports also 1 Hz (for precise time sync) or 100 Hz GPS receiver with real time Kinematic option for down to 2 cm position accuracy.

96 channel SIRIUS data acquisition system

Analyse and Publish

Even though the main focus of DEWESoft® is on data acquisition and storage, it also offers powerful analysis features including post processing.
The file preview of DEWESoft® is completely free of charge, so DEWESoft® can be downloaded and used for file preview without any cost or license.

One of the most outstanding feature of DEWESoft® is that data files, even if they are several gigabytes in size, are loaded in a matter of seconds. A special data structure allows fast reloads and zooming. You can select any part of the data in the recorder and zoom in to show all the interesting details.

EXPORT DATA

Since the main focus of DEWESoft® is on data acquisition and storage, it has extensive support for exporting the data to other file formats for post processing. You can choose different export file types, use scripting for direct reporting and export raw, reduced or angle based data.
DEWESoft® offers templates with Flexpro, MS Excel® and Famos. These templates allow you to prepare the reports once and execute them after DEWESoft® data export. In this way you can automate report generation and simplify the measurement process.
Alternatively you can export your measurement screen to **AVI**. This allows to replay the file with every standard video player without the need of installing DEWESoft®.

Supported data formats are:

- *Microsoft Excel®**
- *Flexpro**
- *Text*
- *ASCII*
- *MATLAB®*
- *Diadem®*
- *UNV*
- *FAMOS*
- *NSOFT*
- *Sony®*
- *RPC III*
- *Comtrade®*
- *WAV*
- *Google Earth® KML*
- *BWF*
- *ATI*
- *SDF*
- *WFT*
- *CSV*
- *TDM*
- *TDF*
- *and more ...*

** export only possible if the program is installed on the measurement PC*

REPORTS

When you are reviewing data in the analyze mode, you can make hard copies as easily as clicking the Print button in the top toolbar. Any display can be directly printed to PDF or printer. Even if we have black background as default, DEWESoft® will invert the colors to be printer friendly.
Even the channel setup can be printed for documentation purposes.

REPLAY

To get an impression how the measurement was done, especially when we have video streams in the measured file, DEWESoft® offers file replay capabilities. We can choose a specific portion in the file and replay the data with the same speed as it was stored or with higher/lower speed. For example it is very interesting to view high speed videos in slow-motion.
DEWESoft® does not only show the data, but it can also replay the data through sound card. Any channel can be chosen for replay through speakers.
DEWESoft® can also replay data of any channels through SIRIUS AO8 option.

DEWESoft® X VERSIONS

	EVALUATION	PROFESSIONAL	DSA	ENTERPRISE	AUTOMOTIVE
High speed acquisition cards					
DEWESoft®	FREE	FREE	✓	✓	✓
Low/medium speed acquisition devices					
DEWESoft® DS-NET	✓	✓	✓	✓	✓
CPAD	✓	✓	✓	✓	✓
Signal conditioning					
DEWESoft® instruments	FREE	FREE	✓	✓	✓
Other sources					
CAN/J1939 devices	✓	option	option	✓	✓
GPS receivers	✓	✓	✓	✓	✓
DEWESoft® timing devices	✓	✓	✓	✓	✓
Gyro platform	✓	option	option	option	✓
Kistler wheels	✓	option	option	option	✓
J1587/J1708 devices	✓	option	option	option	✓
Flexray	✓	option	option	option	✓
XCP interface	✓	option	option	option	✓
PCM telemetry	✓	option	option	option	option
ARINC/1553 devices	✓	option	option	option	option
ScramNET	✓	option	option	option	option
XSENS Gyro	✓	option	option	option	option
NMEA weather station	✓	option	option	option	option
Aerospace Chapter 10	✓	option	option	option	option
Modbus protocol support	✓	option	option	option	option
Cameras					
DirectX cameras (webcam)	✓	✓	✓	✓	✓
DS-CAM	✓	✓	✓	✓	✓
GIGE cameras	✓	✓	✓	✓	✓
Basler camera	✓	✓	✓	✓	✓
Photron hi-speed	✓	Option	Option	✓	Option
Micron IR cameras	✓	✓	✓	✓	✓
FLIR thermovision camera	✓	Option	Option	option	Option
NEC thermal camera	✓	Option	Option	✓	Option
Video post synchronization	✓	✓	✓	✓	✓
Other					
Sensor database	✓	✓	✓	✓	✓
TEDS support	✓	✓	✓	✓	✓
Outputs					
Alarm monitoring	✓	✓	✓	✓	✓
Analog replay of data	✓	✓	✓	✓	✓
CAN output	✓	✓	✓	✓	✓
Multichannel function generator	✓	option	option	✓	–
Online/Offline Math					
Formula editor, Filters, Statistics, Reference curve, Latch, Combustion noise, Angle sensor math	✓	✓	✓	✓	✓
Human body vibration	✓	option	✓	✓	option
Order tracking	✓	option	✓	✓	option
Torsional vibration	✓	option	✓	✓	option
Sound level	✓	option	✓	✓	option
Power module	✓	option	option	✓	✓
Combustion analyzer	✓	option	option	option	option
FRF	✓	option	✓	✓	option
SRS	✓	–	✓	✓	option
Sound power	✓	–	FlexPro script	FlexPro script	FlexPro script
Polygon vehicle dynamic test	✓	option	option	option	✓
Psophometer	✓	option	option	option	option
FUSI (functional safety)	✓	option	option	option	✓
Brake test	✓	option	option	option	✓
CAPS / ACC	✓	option	option	option	✓
Energy calculation	✓	option	option	option	✓

Database storing

The Online Data Export (ODE) plugin can export DEWESoft® measurement data during storing directly to a database or to .csv files (that can later be imported into the database), so that the data can be used for statistical analysis or real-time analysiss of production status.

SCOPE

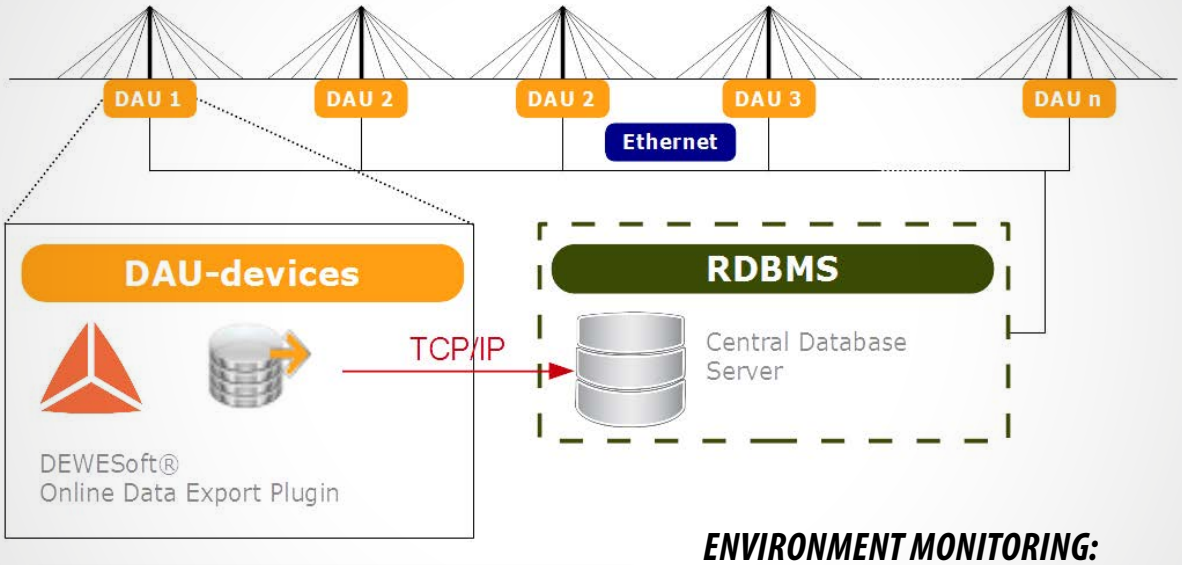
The ODE plugin will store the measurement into the database. The customer may use any visualization or analysis tool that can access the data in the database. DEWESoft® does not offer any visualization or analysis features or programs.

1. PERMANENT DB STORING

REALTIME MONITORING

The ODE plugin is well suited for realtime monitoring over long periods of time: i.e. store slow analogue or statistical data continously into your database to monitor the conditions of the measuring object.

Example: Bridge Monitoring



ENVIRONMENT MONITORING:

- *atmosphere temperature*
- *winds*
- *waves*

STATIC AND DYNAMIC RESPONSE MONITORING:

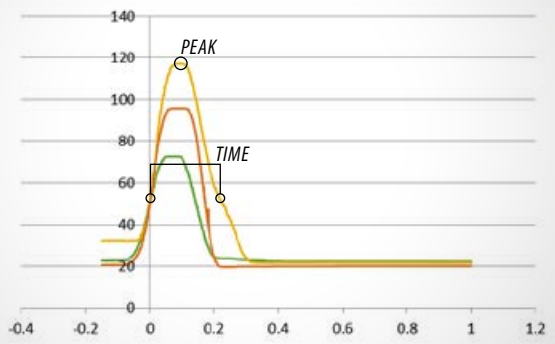
- *structure stresses*
- *structure temperature*
- *structure dynamics*
- *cable tensions*
- *displacements of dampers*

2. CYCLE-BASED DB STORING

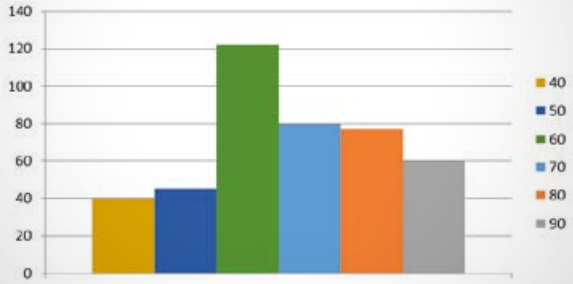
PROCESS MONITORING

The ODE plugin stores the production data continously into the database, so that real-time analysis, statistical analysis and reporting on the measurement data are possible on customer request.

Automation Quality Check



Statistic Analysis



Supported Database Systems

Currently the ODE plugin supports MySQL®
and Microsoft SQL Server® databases.
Other databases (e.g. Oracle®, PostgreSQL®, ..)
can also be supported on customer demand
(please ask our sales departement for a quotation).

TYPICAL APPLICATIONS

- ***Cycle based manufacturing***
  - *Pressing Machine*
  - *Turbine Blade Quality Control*
  - *Injection Modling Quality Control*
- ***Predictive Maintenance***
  - *Machine Durability*
  - *Machine Reliability*

Performance

Storing data into a database is not as fast as storing data into a file (e.g. DEWESoft® datafile or .csv file). The maximum possible amount of data is highly dependant on your database software, database server (hardware) and on your database design.

Example:

- *Hardware: i7-2630QM CPU @ 2.00GHz, Samsung 840 Pro SSD-drive*
- *Software: Windows 7 64-bit, MySQL server 5.6*
- *continously store 100 channels @ 5000Hz*

Applications

DEWESoft® Power Instruments

WIDE-BAND HIGH PRECISION POWER ANALYZER

SIRIUS R8D POWER

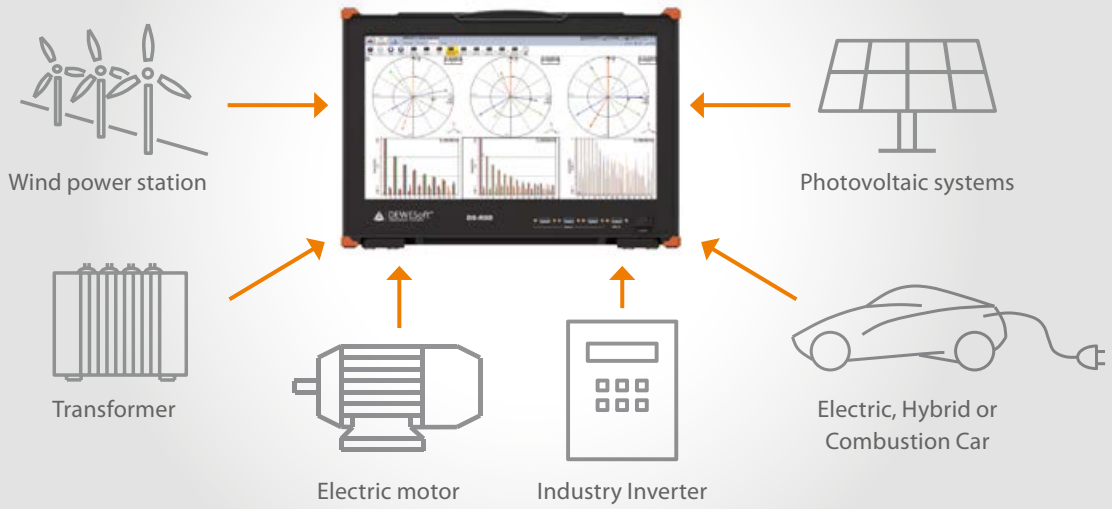
- *Multible 3 phase precision power instrument*
- *Multible 3 phase precision power converter Instrument, 1 MS/s wide-band*
- *Combustion precision power instrument Charge type pressure and angle measurement*
- *Aux. signal inputs, analog, CAN,*

	DEWESoft® DS-R8D PWR	DEWESoft® DS-R2D PWR	DEWESoft® SIRIUS PWR
			
Max. isolated ChnNo.	64	24	8
Sample Rate/Res. - 1	1MS / 16 Bit	1MS / 16 Bit	1MS / 16 Bit
Bandwidth	2MHz	2MHz	2MHz
Sample Rate/Res. - 2	200 kS/s	200 kS/s	200 kS/s
Bandwidth	75 kHz	75 kHz	75 kHz
Base accuracy	0.05%	0.05%	0.05%
Max. Range	1000 Vrms	1000 Vrms	1000 Vrms
Isolation specs	CAT II 1000V	CAT II 1000V	CAT II 1000V
3 PHASE SYSTEMS	4	2	1
FFT	✓	✓	✓
Harmonics	✓	✓	✓
CUSTOMZID CALCULATION	✓	✓	✓
Auxiliary analog Input	✓	limited	–
CAN/Flexray/XCP	✓	✓	✓
Option Combustion Analyzer	✓	–	–
Rotation Analyzis	✓	–	–
Storing raw data	✓	✓	✓

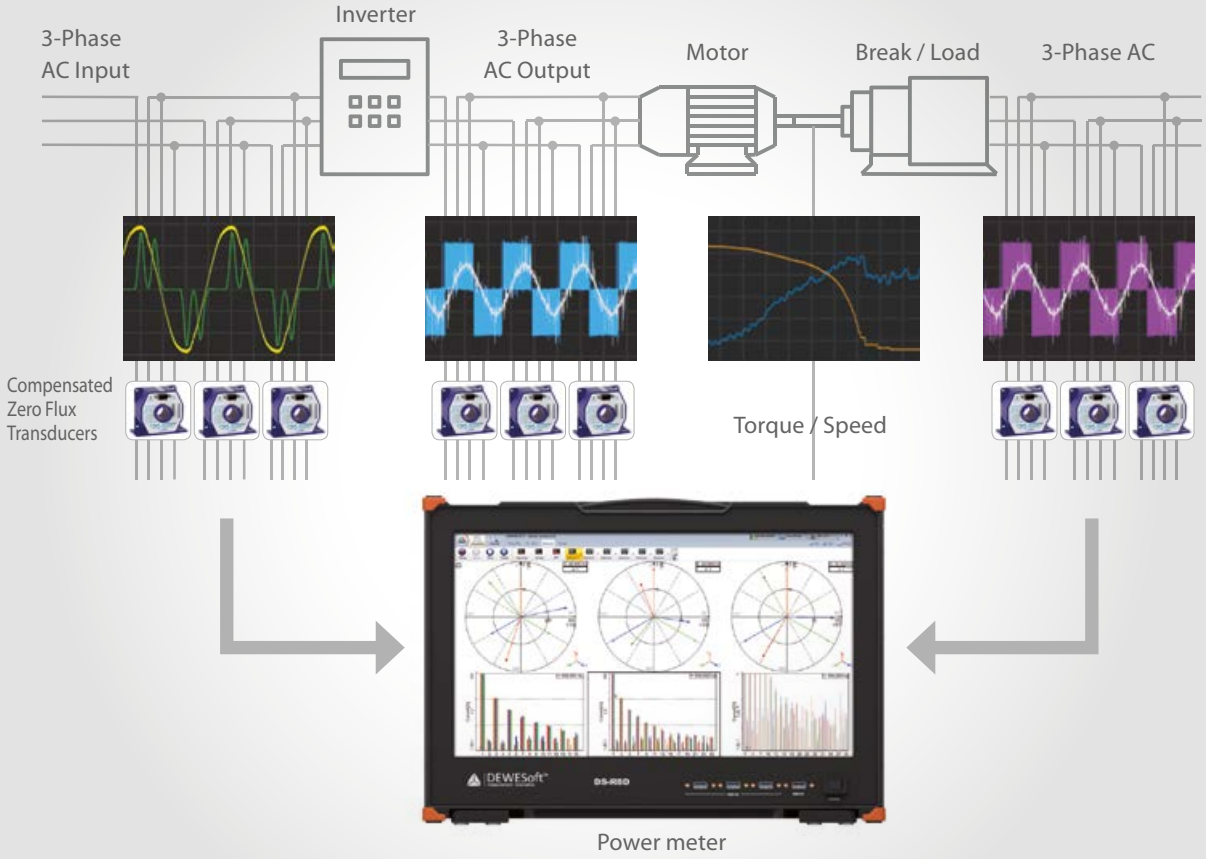
The DEWESoft® Power instruments are well prepared for the today's power measurements applications.
AC, DC and Inverter application as well as any additional analogue and digital channel can be measured.

Even additional requirements like the CAN bus, or the cell voltage and temperature of the battery can be acquired with the powerful DEWESoft® Power software:

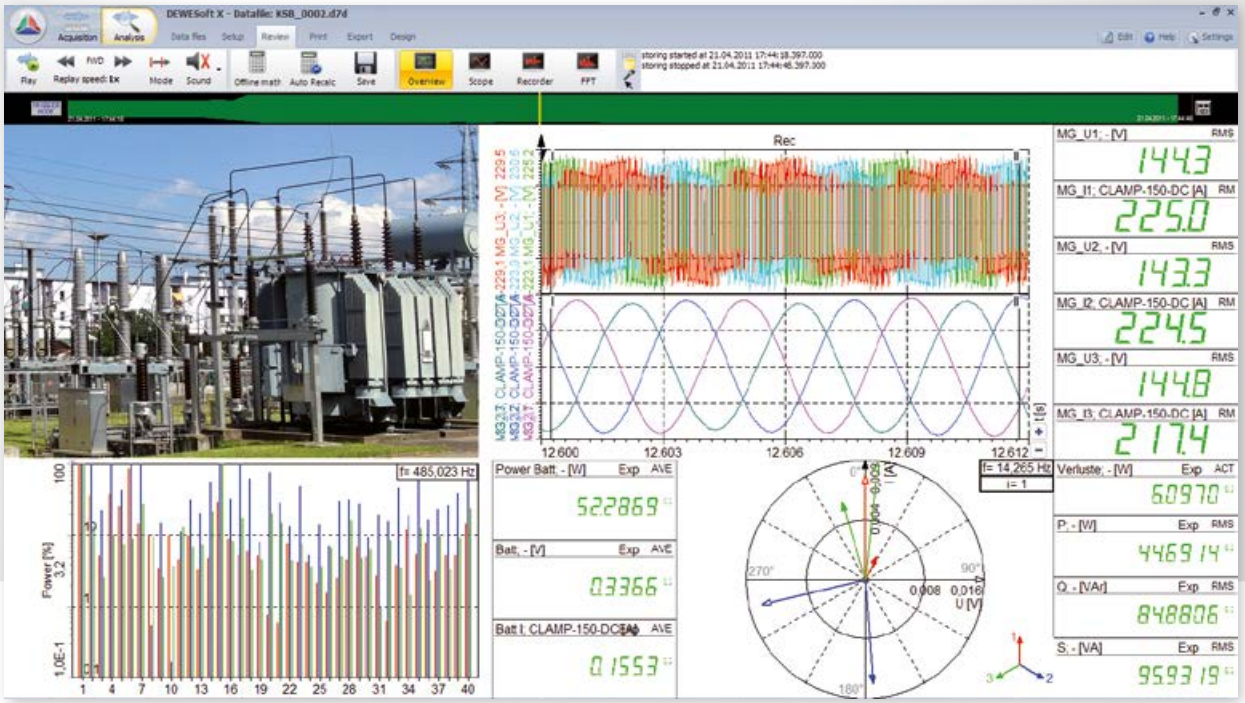
DEWESoft® R8D MULTIPLE POWER INSTRUMENT



TYPICAL ENGINE TEST BED APPLICATION



DEWESoft® Power Software



The POWER option of DEWESoft® is an absolutely high-performance tool for the calculation of power, harmonics and all related parameters. This toolbox is an excellent combination of many features and nearly all applications can be realized by using DEWESoft® hardware.

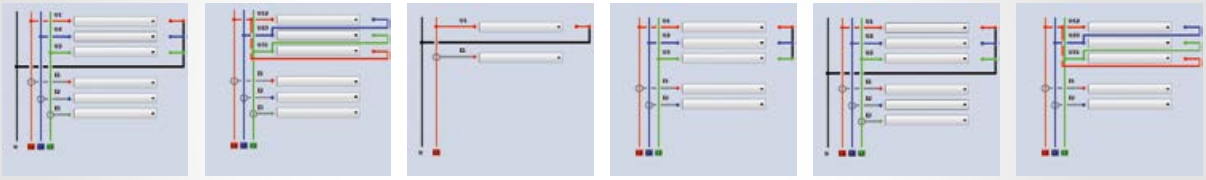
Besides the exact calibration, the frequency calculation is a central feature of this software addon. 50 Hz and 60 Hz are a must – for us also 16.7, 400 and 800 Hz, as well as DC and variable frequencies (driver) are a necessity. Due to the high acquisition rate (up to 1 MS/s) with the SIRIUSi-HS-HV and –HS-LV modules there is no limitation in measurement of PWM drivers and the calculation of active and reactive power, power factor, etc…

The POWER module already comes with prepared screen elements such as vectorscopes and harmonics monitor for perfect online visualization of the data. Furthermore power quality parameters such as harmonics, interharmonics, THD, symmetric components, flicker etc can be calculated.

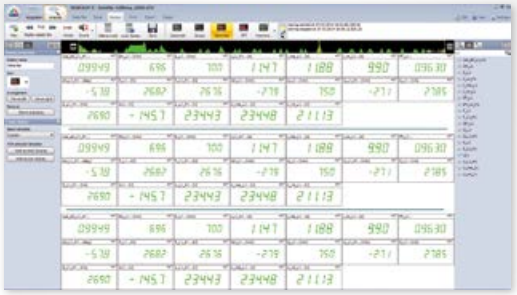
The integration of counter inputs, video and CAN bus offers additional data sources. The mathematical library additionally offers the possibility to calculate parameters such as torque and angular velocity, or even determine the efficiencies online.

WIRING SCHEMATICS

Different wiring schematics allow all possible connections. These are single phase, star connection, delta connection, V connection, Aron connection and a combined star / delta connection. All of course with or without currents.



POWER CALCULATION

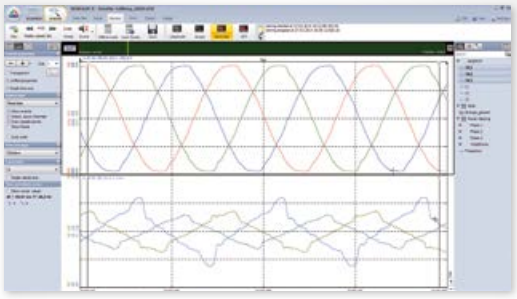


- *P, Q, S, D*
- *Cos φ, power factor*
- *P, Q, cos φ for each harmonic*
- *Symmetrical components (positive, negative and zero sequence components); U, I, P, Q, cos φ; from 10 period values and period values*
- *Period values (½ cycle, cycle, overlapping, 1 ms sliding, ...)*

FREQUENCY CALCULATION

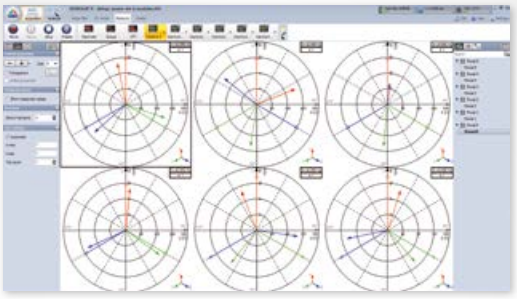
The software PLL guarantees a very accurate frequency calculation (mHz). On one system multiple power systems can be measured and each can have its own frequency. With the use of the different instruments from DEWESoft® the values can be shown in several ways.

SCOPE



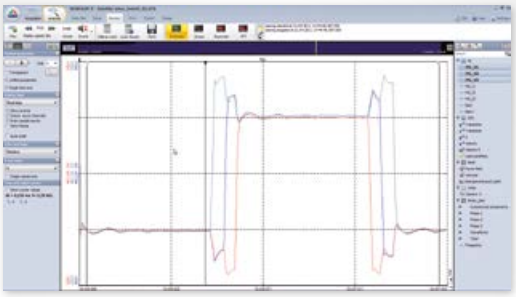
- *Selectable graphs*
- *U1, U2, U3, U12, U23, U31: Line to line and line to earth voltages are supported*
- *Up to 8 graphs in one diagram*
- *Zoom in and out are supported online*
- *Waveforms can be stored*

VECTOR SCOPE



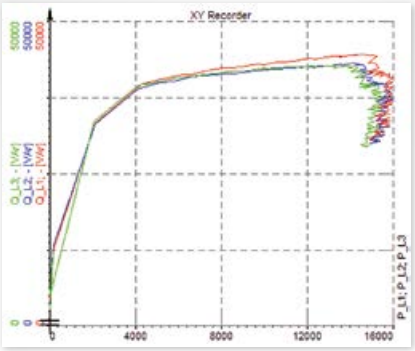
- *Vector scope for 3 phase systems*
- *Each individual harmonic can be shown*
- *More vector scopes can be displayed on one screen*
- *Different power systems can be shown on one screen*
- *With the „transparent" function direct comparisons of phasors are possible*

RECORDER



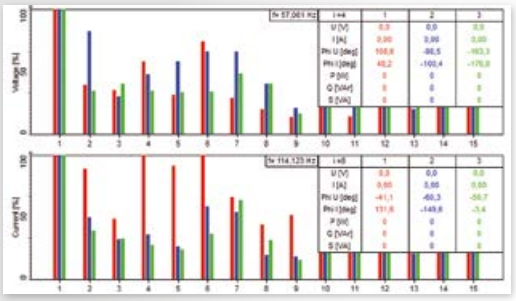
- *Recording of all parameters in individual intervals*
- *Individual screens can be defined*
- *Zoom in and out*
- *Storing fast (full sampling rate) or reduced (e.g. 600 sec.)*
- *Detailed zoom-in to pulse width!*

X/Y RECORDER



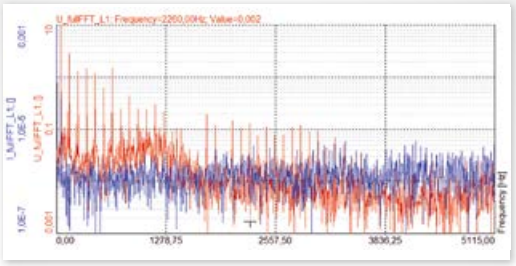
- *Orbitals can be generated online*
- *P over Q as example for this function*

FFT - HARMONICS ANALYSIS



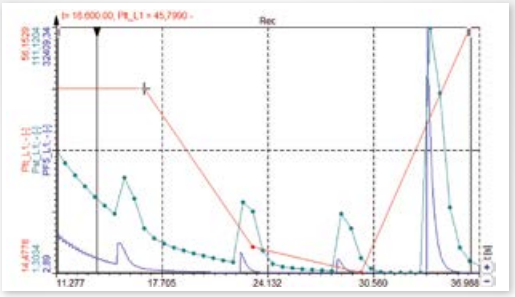
- *U, I, P and Q*
- *Individual setup of the number of harmonics including DC-component (Example: 20 kHz sampling rate = 200 harmonics @ 50 Hz)*
- *Interharmonics, groups or single values*
- *According to EN 61000-4-7*
- *Calculation corrected to the actual real frequency*
- *THD, THD even, THD odd*
- *Trigger on each parameter*
- *Background harmonics substractable*
- *Optionally definable group-mode for harmonics and interharmonics. Selectable number of bins and frequency groups - "200 Hz" according to EN 61000-4-7 (OPT-DB required)*

FULL FFT - FREQUENCY ANALYSIS



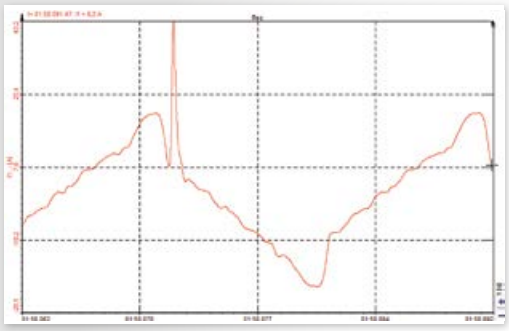
- *In addition to the harmonics FFT a full frequency based FFT is available.*
- *All frequencies can be analyzed with this function*
- *Trigger on FFT patterns*
- *Definable filters (hanning, haming, flat top, rectangle, . . .)*

FLICKER

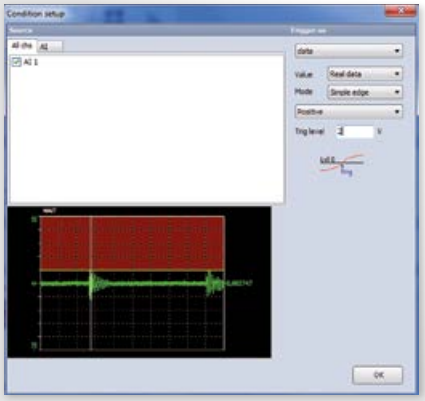


- *According to EN 61000-4-15*
- *PST and PLT with flexible intervals*
- *Individual recalculation intervals*
- *Pinst , du, dumax , duduration*
- *Flicker emission (current flicker)*

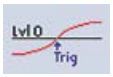
FAULT RECORDER



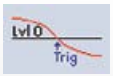
- *Setting a trigger on all parameters of the power module!*
- *U, I, P, Q, S, D, cos φ, power factor, ...*
- *Each harmonic!*
- *Pos-, neg-, zero-sequence systems*
- *Very fast glitch detection (up to MS/s)*
- *Math. channels (rpm, torque, efficiency,. . .)*



Edge-, filtered edge- and window-trigger

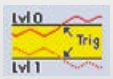


Setting the trigger on rising edge when the threshold has been crossed



Setting the trigger on falling edge when the threshold has been crossed

Setting the trigger when signal enters the range between two definable threshold levels



Setting the trigger when signal leaves the range between two definable threshold levels

Further trigger functions: pulse width, window and pulse width, slope, FFT and time

CALIBRATION/ACCURACY

The high accuracy of the calculation can be reached because of the calibration function in the frequency domain.
With this unique technology amplitude and phase can be corrected for the full frequency range from DC up to 1MS/s.
All internal curves like filter response are corrected inside the software and the sensor database includes correction curves for each clamp, Rogowski coil, transformer or which sensor ever is used.

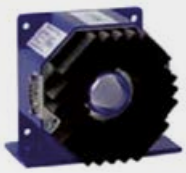
ROTATIONAL AND TORSIONAL VIBRATION MEASUREMENT

Torsional vibration is an oscillation of angular motion (twist) which occurs on rotating parts - such as gear trains, crankshafts or clutches. High torsional forces and vibrations result in material fatigue, abnormal abrasion etc. and can be destructive in the long run. In many cases, torsional vibration is not noticed until the affected part is damaged. Often only vibration noise is the only indication of torsional vibration.

Precision Current Transducers

COMPENSATED ZERO FLUX

TRANSDUCER SPECIFICATIONS

	MCTS 60	MCTS 200	MCTS 400	MCTS 1000
				
Primary Current Range DC, RMS Sinus	60 A	200 A	400 A	1000 A
Overload Ability Short Time (100 ms)	300 Apk	1000 Apk	2000 Apk	4000 Apk
Max. burden resistor (100 % of Ip)	10 ohm	10 ohm	2.5 ohm	2.5 ohm
di/dt (accurately followed)	> 25 A/µs	> 100 A/µs	> 100 A/µs	> 100 A/µs
Temperature influence	< 2.5 ppm/K	< 2 ppm/K	< 1 ppm/K	< 1 ppm/K
Output Ratio	100 mA at 60 A	200 mA at 200 A	200 mA at 400 A	1 A at 1000 A
Bandwidth (0.5 % of Ip)	DC ... 800 kHz	DC ... 500 kHz	DC ... 500 kHz	DC ... 500 kHz
Linearity	< 0.002 %	< 0.001 %	< 0.001 %	< 0.001 %
Offset	< 0.025 %	< 0.008 %	< 0.004 %	< 0.005 %
Frequency Influence	0.04 %/kHz	0.06 %/kHz	0.06 %/kHz	0.06 %/kHz
Angular Accuracy	< 0.025° + 0.06°/kHz	< 0.025° + 0.05°/kHz	< 0.025° + 0.09°/kHz	< 0.025° + 0.09°/kHz
Rated isolation voltage rms, single isolation CAT III, polution deg. 2 IEC 61010-1 standards EN 50178 standards	 2000 V 1000 V	 2000 V 1000 V	 2000 V 1000 V	 300 V 300 V
Test voltage 50/60 Hz, 1 min	5.4 kV	5.4 kV	5.4 kV	3.1 kV
Inner diameter	26 mm	26 mm	26 mm	30 mm

Current Clamps

AC/DC

DS-CLAMP-150-DC

Type	Hall sensor
Range	150 Apk
Bandwidth	DC to 100 kHz
Accuracy	1 % + 2 mA
TEDS	Fully supported

DS-CLAMP-1800-DC

Type	Hall sensor
Range	1800 Apk
Bandwidth	DC to 20 kHz
Accuracy	2.5 % +/-0.5 A
TEDS	Fully supported

DS-FLEX-30/300-17

Type	Rogowski coil
Range	30/300 Arms
Bandwidth	5 Hz to 20 kHz
Accuracy	1%
TEDS	Fully supported

DS-FLEX-300/3K-35

Type	Rogowski coil
Range	300/3k Arms
Bandwidth	5 Hz to 20 kHz
Accuracy	1%
TEDS	Fully supported

Automotive Applications

KEY APPLICATIONS IN AUTOMOTIVE AREA

- *Vehicle dynamics*
- *Ride and handling tests*
- *Brake testing*
- *Advanced driver assistance systems*
- *Pass by Noise*
- *Performance testing*
- *Component testing*
- *Combustion analysis*
- *Structural testing*
- *Order tracking*
- *Torsional and rotational vibration*
- *Crash tests*
- *Power measurements*

DEWESoft® offers

- *the most flexible solutions in hardware and software on the market,*
- *short setup preparation time and additional quick and easy installation, which saves a lot of time and troubles,*
- *synchronised measurement of multiple inputs (analog, digital, CAN, GPS, IMU, FlexRay, XCP, RoadDyn 2000, video & many more),*
- *possibility to capture different software modules (vehicle dynamics, combustion analysis, vibrations,...) in one synchronized data file.*

Automotive Instruments

S-BOX WITH INTEGRATED SIRIUS

- *Multiple combination of inputs (all the SIRIUS modules + additional CAN)*
- *2x 24 bit ADC, 160 dB dynamic*
- *200 kS/s or 1 MS/s sampling rate*
- *High-end computer with the latest i7 generation processor*
- *SSD with up to 960 GB of storage*
- *With optional battery pack for continuous measurement*
- *Additional 12-inch display with High-brightness*

	DEWESoft® S-BOX + SIRIUS	DEWESoft® SIRIUS	DEWESoft® DEWE-43
			
Max. Channels	Up to 1000	8 / slice	8
Sample Rate/Res. – opt 1	200 kS/s / 2x 24 Bit	200 kS/s / 2x 24 Bit	200 kS/s / 16 Bit
Sample Rate/Res. – opt 2	1MS / 16 Bit	1MS / 16 Bit	/
Base accuracy	0.05 %	0.05 %	0.1 %
CAN/FlexRay/CCP/XCP	✓	✓	✓
Option Combustion Analyzer	✓	✓	limited
Camera	✓	–	–
Integrated GPS	✓	–	–
Customized calculation	✓	✓	✓
Analog output	option	option	option
FFT	✓	✓	✓
Harmonics	✓	✓	✓
Integrated GPS	✓	–	–
Option DSA package	✓	✓	✓
Option Power	✓	✓	limited
Storing raw data	✓	✓	✓

DS-IMU

NEXT GENERATION OF NAVIGATION INSTRUMENTS

- *Ruggedized and reliable GPS aided inertial navigation system including AHRS that provides accurate position, velocity, acceleration and orientation under most demanding conditions*
- *Ruggedized Combination of gyroscopes, accelerometers, magnetometers and pressure sensor with a GNSS receiver*
- *Inertial sensors together with GNSS receiver coupled in a sophisticated fusion algorithm to deliver accurate and reliable navigation and orientation*
- *GNSS receiver supports GPS, GLONASS, BeiDou, GALILEO, WAAS, EGNOS, Gagan and Real-time kinematic --> RTK*
- *IP68 & MIL-STD-810G environmental protection*
- *Up to 500 Hz output data rate*
- *Hot start in < 3 s*
- *Connected over USB*
- *Fast and easy installation*

DS-IMU1

DS-IMU1 is a **100 Hz** GPS / MEMS based inertial measurement system for standard vehicle measurement applications.

DS-IMU2

DS-IMU2 is a **500Hz** GPS / MEMS based inertial measurement system for advanced applications which require high position accuracy, high update rate and static heading.

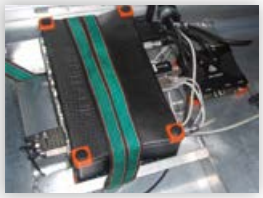
	DS-IMU1	DS-IMU2
Navigation		
Horizontal position accuracy GPS / DGNSS/ OMNISTAR/ RTK	2.0 / 0.6 / - / - m	1.2 / 0.6 / 0.1 / 0.01m
Vertical position accuracy GPS / DGNSS/ OMNISTAR/ RTK	3.0 / 1.0 / - / - m	2.0 / 1.0 / 0.2 / 0.02 m
Velocity accuracy	0.05 m/s	0.007 m/s
Roll & Pitch accuracy (dynamic)	0.2 °	0.15 °
Heading accuracy (dynamic with GNSS)	0.2 °	0.1 °
Slip angle accuracy	0.3°	0.2°
Range	Unlimited	Unlimited
Hot start time	500 ms	500 ms
Output data rate	100 Hz	500 Hz
GNSS		
Supported navigation systems	GPS L1, GLONASS L1, GALILEO E1, COMPASS L1	GPS L1, L2, L5 , GLONASS L1, L2, GALILEO E1, E5, BeiDou B1. B2
Supported SBAS systems	WASS, EGNOS, MSAS, GAGAN, QZSS	WASS, EGNOS, MSAS, GAGAN, QZSS, OMNISTAR HP/XP/G2
Additional features		
PPS output	✓	✓
RTK	–	✓
Static heding (dual antenna)	–	✓
Hardware		
Interface	USB	USB
Operating voltage	5 to 36 V	5 to 36 V
Power consumption	100 mA @ 5 V	220 mA @ 12 V
Operating temperatures	-40 °C to 85 °C	-40 °C to 85 °C
Environmental protection	IP 67, MIL-STD-810G	IP 67, MIL-STD-810G
Dimensions	30x40.6x24 mm	90x127x31 mm
Weight	25 g	304 g
Applications		
General Vehicle Dynamics	✓	✓
Brake Test	✓	✓
Acceleration Test	✓	✓
Lane change	✓	✓
Circle drive	✓	✓
Chassis development	✓	✓
Assistent systems	✓	✓
Comfort testing	✓	✓
Validation	✓	✓
ADAS	–	✓
Pass by Noise	–	✓
FUSI	–	✓
RTK positioning	–	✓

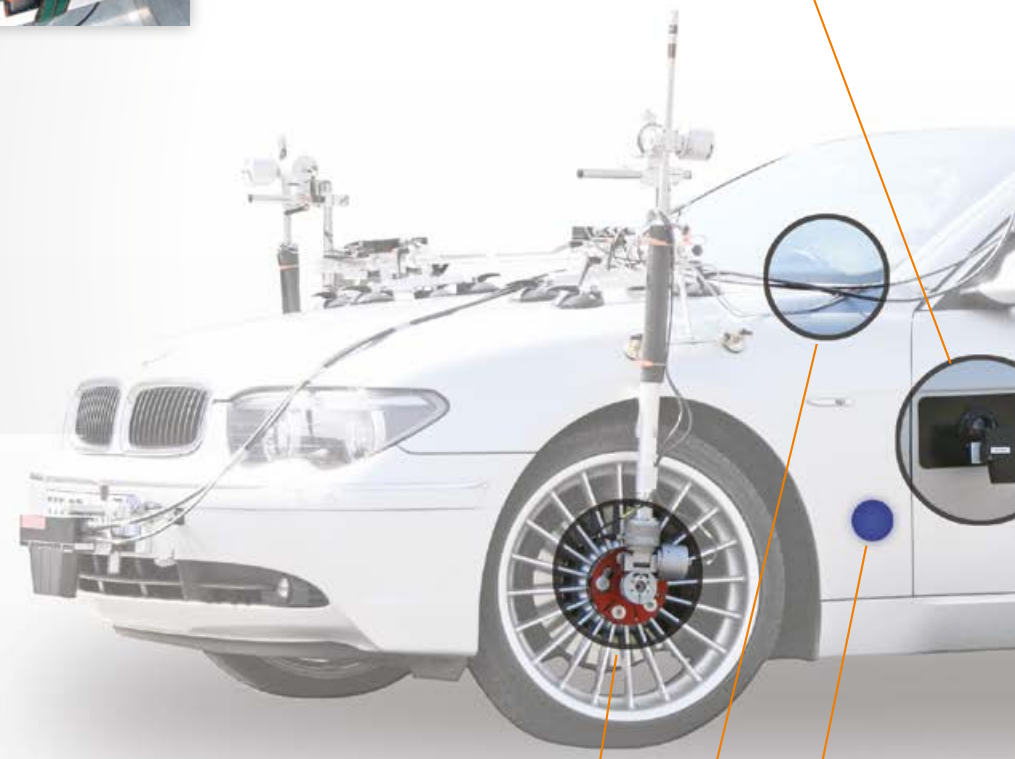
Inertial sensors	Accelerometer	Gyroscope	Magnetometer	Pressure
Range (dynamic)	2g, 4g, 16g	250 °/s, 500 °/s, 2000 °/s	2 G, 4 G, 16 G	10 to 120 kPa
Bias stability	20 ug	3 °/hr	/	100 Pa/yr
Scale factor stability	< 0.05 %	< 0.05 %	< 0.05 %	/

Connection Options

ANALOG INPUTS

The analog inputs are able to acquire data from sensors like pedal force sensors, brake cylinder pressure, temperature of brake discs and others.





COUNTER INPUTS

Counter inputs can be used for measurement of brake pedal switch, speed and distance from external velocity sensor, speed of four wheels, steering wheel position and others.

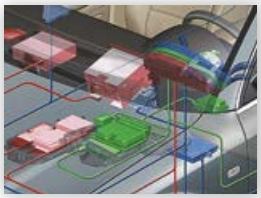
High quality counter inputs are able to perform basic counting, encoder measurement and frequency measurement in the famous “super-counter” mode, which dramatically increases the accuracy of counting.

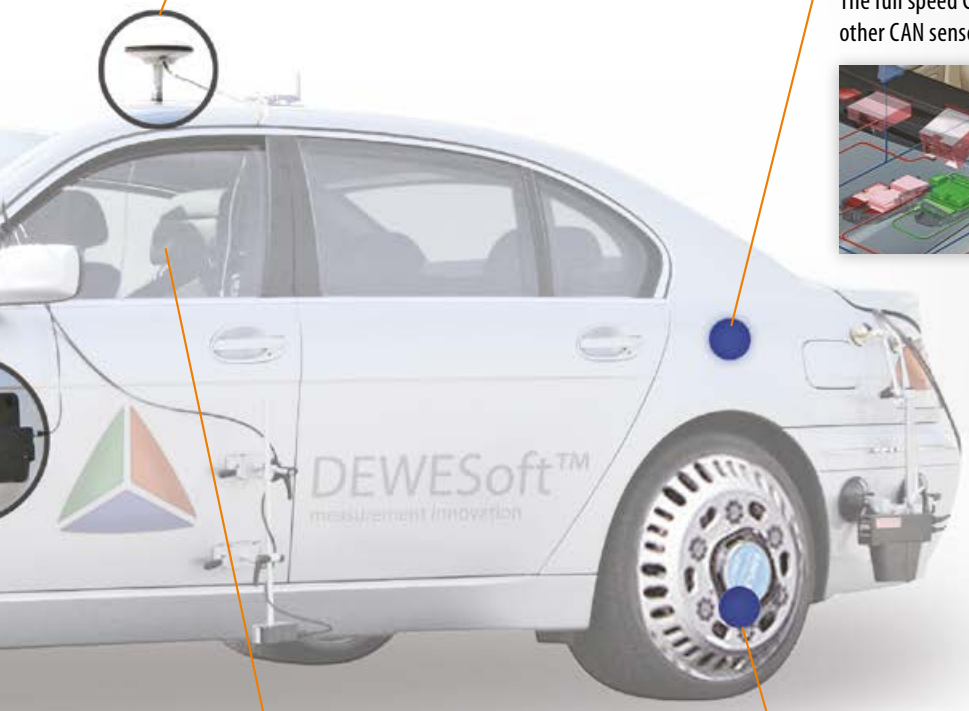
GPS DATA, DS-IMU2, ADMA

IMU built in S-BOX-IMU, provides velocity, position, orientation information which is used for brake test calculations.

CAN, OBD II, J1939, CCP, XCP, FlexRay, GMLAN

The full speed CAN interface connects to vehicle CAN or other CAN sensors; CAN output feature included.





VIDEO

Different video devices can be added and acquired synchronously with other sources.

RoaDyn measuring wheels

Ethernet based acquisition of Kistler RoadDyn 2000 with hardware synchronisation for getting the wheel force and torque in all 3 dimensions.

Vehicle Dynamics

INTRODUCTION

The Vehicle Dynamics Test System is covering all kinds of R&D tests (handling, lane change, lane departure, tire, brake and ABS tests -> covering also regenerative braking and hybrid). Such a flexible system brings us in another dimension of testing, where one system with several software options is capable of doing multiple different tests.

Online checks for validation, visualized online results including post-processing and reporting make the DEWESoft® Vehicle Dynamics system a complete all-in-one solution.

The Vehicle Dynamics system is based on a combination of GPS with IMU which is very simple and easy to set up. This system is a guarantee to have a signal where only GPS reception is not enough.

Brake testing is a wide and flexible field of different requirements for which our multifunctional solution guarantees a safe investment. The same equipment is also capable of tire tests, acceleration tests, odo calibration, fuel consumption, handling tests etc...

MAIN FEATURES

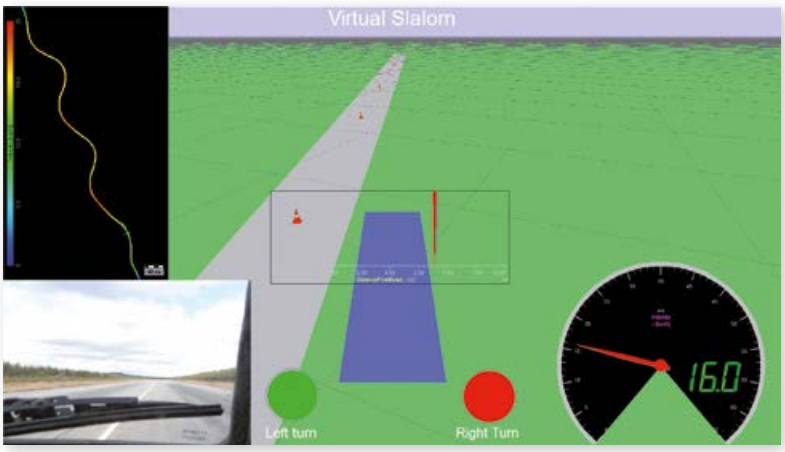
- *Quick and easy installation*
- *Online data transfer between multiple systems*
- *Measurement results available online*
- *Scalable systems for multiplepurpose usage*
- *Multiple data sources (analog, digital, CAN, GPS, IMU, FlexRay, XCP, CCP, RoadDyn 2000, video & many more),*
- *Realtime Math channels,*
- *Synchronisation between all data sources,*
- *Possibility to capture different software modules (vehicle dynamics, combustion analysis, vibrations,...) in one synchronized data file.*
- *Export to many different file formats.*

Handling Testing

One of the vehicle dynamics segments is handling, where inertial parameters such as Roll, Pitch and Yaw combined with GPS information, which comes out of DS-IMU2, are key factors for designers.

Additional data sources such as CAN, CCP, XCP, Video, OBDII , digital and a wide range of analog sensors (potentiometers, accelerometers, strain, voltage, temperature, etc.) all synchronized together with the latest PPS-Sync technology over comes issues with correlating the parameters in post analysis and therefore saves a lot of time by processing the data.

With the polygon plugin you can visualize and calculate distances between different objects on a track, or drive on a virtual map without using any cones.



Vehicle Dynamics

BASIC BRAKE TESTING

GPS information
Position information versus velocity.

Recorder
Speed graph over time

CAN-Bus Data/OBD II
Synchronous data from CAN-bus line:
- Wheel speed,
- ABS status,
- Steering wheel angle,
- …

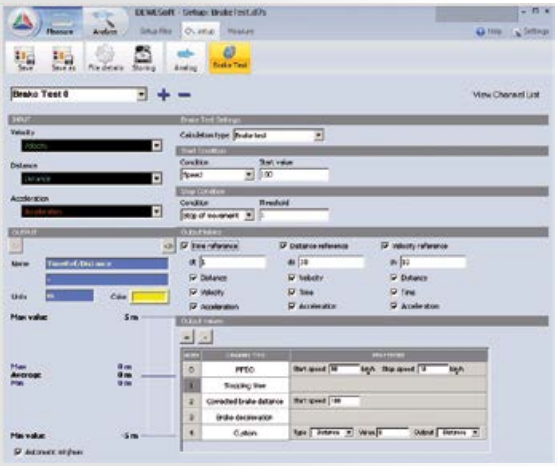
Analog input
Pedal force

Video Information
Synchronized video information

IMU Information
Synchronous inertial data:
- Pitch,
- Roll,
- Slip angle

Polygon/Math
Virtual track for calculation of distance & additional Math further calculated channels

VEHICLE DYNAMIC CALCULATION



The setup of the vehicle dynamic calculation is done in the brake test setup page shown in this screenshot. Start and stop condition are set and also the required channels can be configured.

For each output channel you can choose a name and the proper unit. You can also configure the color and set a minimum and a maximum value used as a preset for its graphical display in DEWESoft®.

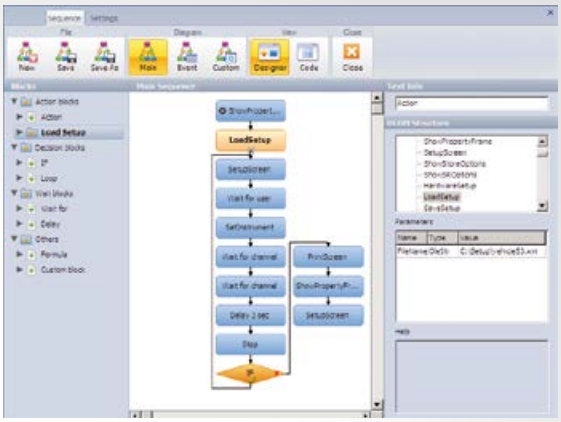
The additional parameters which are calculated are:

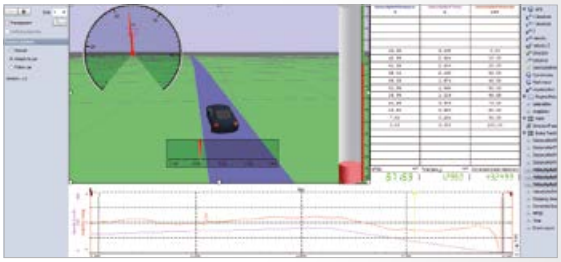
- *Start speed when pushing brake pedal*
- *Stopping time*
- *Corrected braking distance, calculated as $Sc=Sm*Vd^2/Va^2$*
- *Mean fully developed deceleration MFDD (calculation see ECE R13-H)*
- *Brake deceleration over complete measurement*
- *Derivation of acceleration, used to check the passenger comfort*

BRAKE TEST SEQUENCE

The sequencer is a tool to predefine process steps in a sequential format. The interface can be graphically programmed or in a code oriented view. The sequence is stored in a file format. Therefore it's possible to manage these sequences centrally to guarantee a standardized and defined measurement procedure.

Within the sequencer you can access all relevant DEWESoft® features. In addition you can apply actions, calculate formulas and make decisions, wait for interaction or a preset delay and define your customized sequences. So it's possible to define different sequences and fit them together in a single sequence, where the sub sequences are done sequentially. The sequences can be controlled by the user or by an event caused by a certain channel. For a specific test which consists of different steps and loops it's possible to configure such a test sequence. As shown in this simple example for brake testing.





EXCEL REPORT

Testing procedure can be completed with the usage of excel report macro, where you can prepare templates and operate with data from multiple files. With this tool it is possible to make comparision between different files and also build a report which can fit to the standards.

Online Visualization

CAN-Bus Data/OBD II

Synchronous data from CAN-bus

- CAN DBC export and import
- J1939 decoding

Analog Channels

Strain, temperature, acceleration, force, torque, etc ...

Video

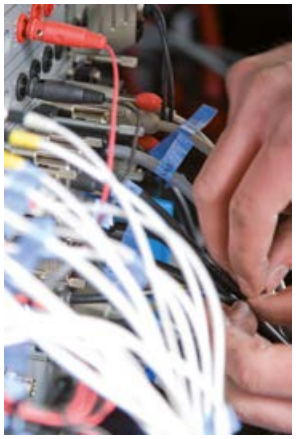
Synchronized video information (normal and hi-speed cameras)

Wheel Force Measurement

Telemetric recipient for all wheel forces

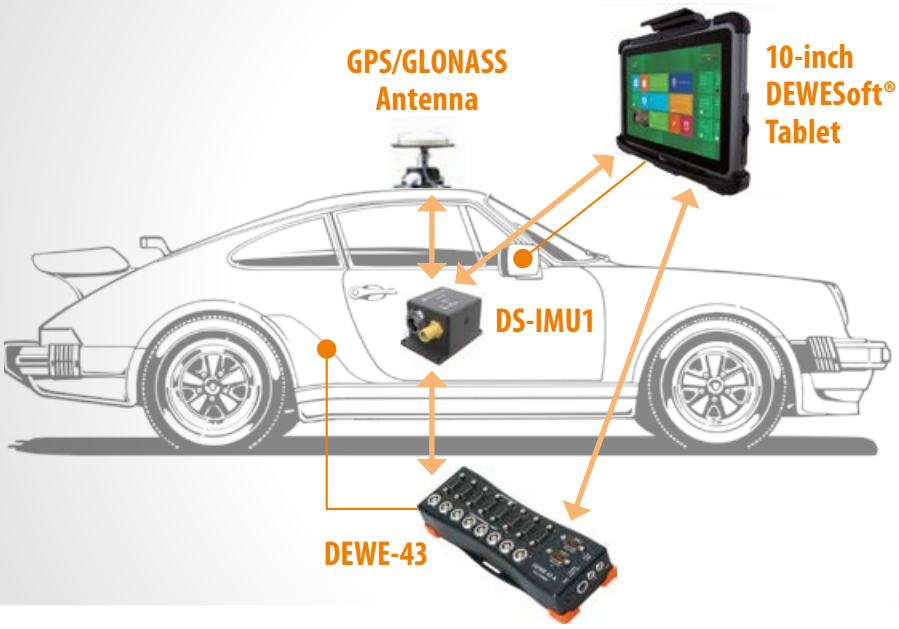
GPS Information

3D visualization and analysis with Polygon Plugin for position data



System configuration

BASIC VEHICLE DYNAMICS SYSTEM



Possible R&D applications

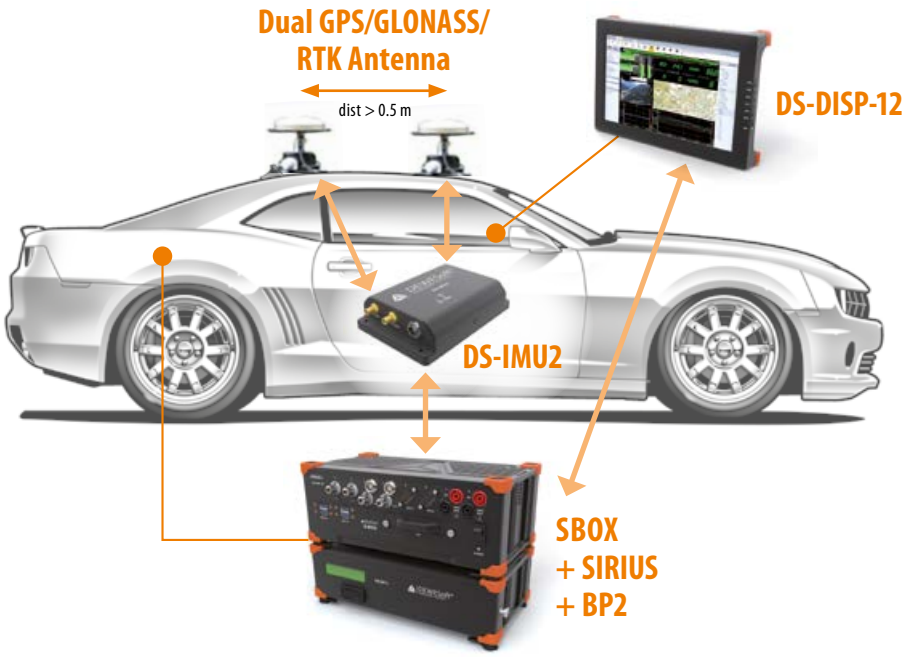
- *Handling test,*
- *Brake/Acceleration test,*
- *Lane change,*
- *Circle drive,*
- *Tire testing,*
- *Performance testing,...*

Key features of the system

- *100 Hz update rate*
- *Distance measurement accuracy < 10 cm*
- *Additional inertial sensors (roll, pitch, angular velocity,..)*

All DEWESoft® Automotive systems focus attention on

- *Quick and easy installation*
- *Measurement results available online*
- *Scaleable systems for multiplepurpose usage*
- *Multiple data sources (analog, digital, CAN, GPS, IMU, FlexRay, XCP, CCP, RoadDyn 2000, video & many more),*
- *Synchronisation between all data sources,*
- *Possibility to capture different software modules (vehicle dynamics, combustion analysis, vibrations,...) in one synchronized data file.*
- *Export to many different file formats.*



Additional R&D applications

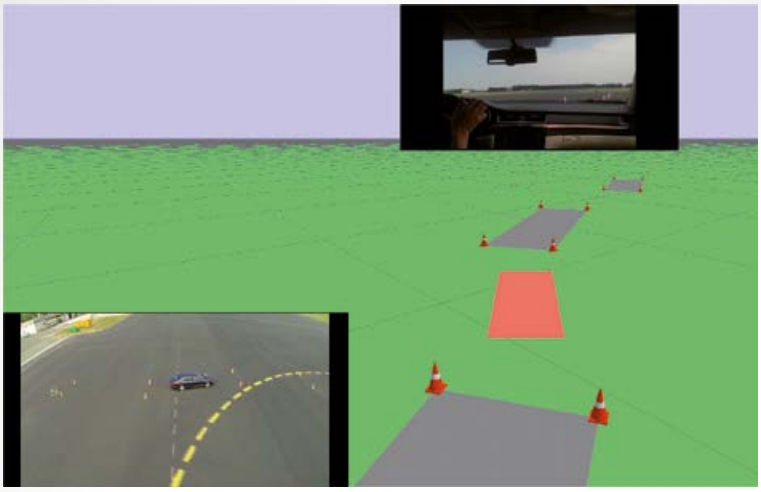
- *Advanced driver assistance systems (ADAS) tests*
- *Pass by noise*
- *FUSI*

Key features of the system

- *500 Hz update rate*
- *High absolute position accuracy using RTK ±2 cm*
- *Dual antenna for 0,1° heading accuracy*

Automotive Polygon Plugin

APPLICATIONS

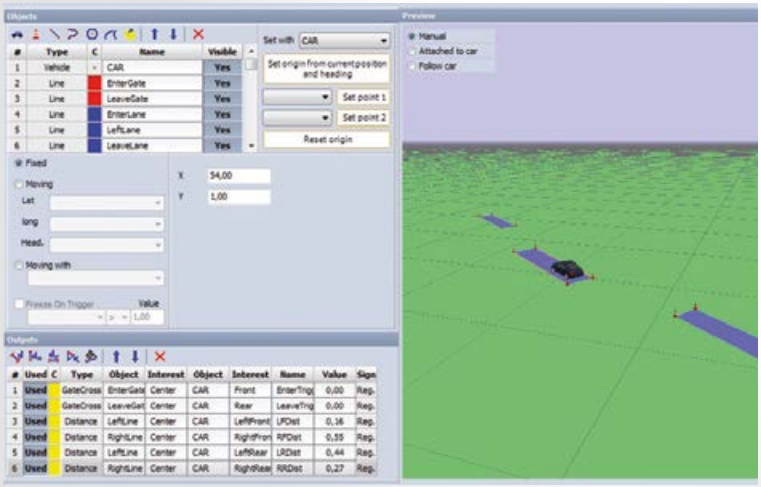


- *All kinds of vehicle dynamics testing*
- *Brake test*
- *Pass-by noise test*
- *ISO lane change*
- *LANE departure warning (LDW) test*
- *CAPS (active passive safety)*
- *Functional safety*
- *Hybrid car testing*
- *Tyre testing*

FEATURES

- *Easy definition of test polygons for all kinds of vehicle dynamic and other moving vehicle involved tests*
- *Supports multiple vehicles and other moving or fixed objects*
- *Easy test polygon definition*
- *3D visualization with easily adaptable viewing angle*
- *Free definable outputs like distances, angles, gate crosses*

EASY SETUP



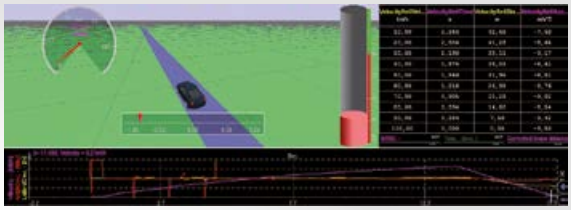
You can easily add moving or fixed, visible or hidden, simple or complex objects. There are six types of objects available:

- *Vehicle*
- *Simple object*
- *Line*
- *Route*
- *Circle*
- *Travel radius*

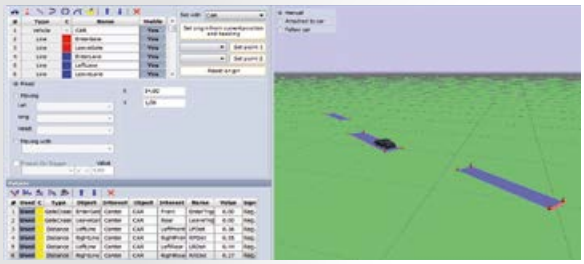
Each type has its specific properties, behavior, calculation options…

EXTENDED 3D VISUALIZATION AND ANALYSIS

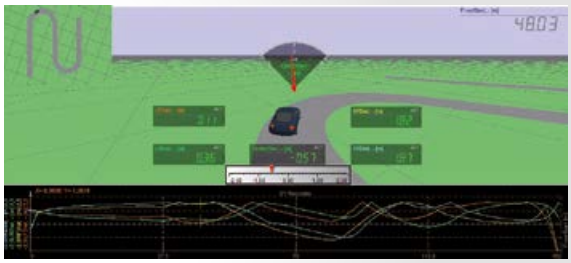
3D ONLINE VISUALIZATION



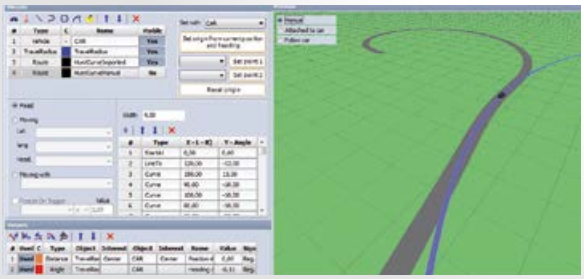
BRAKE TEST



ISO LANE CHANGE MEASUREMENT



LANE DEPARTURE MEASUREMENT



FUSI SETUP ONLINE SCREEN

FUSI SETUP SCREEN

BASIC DEWESoft® FUNCTIONS

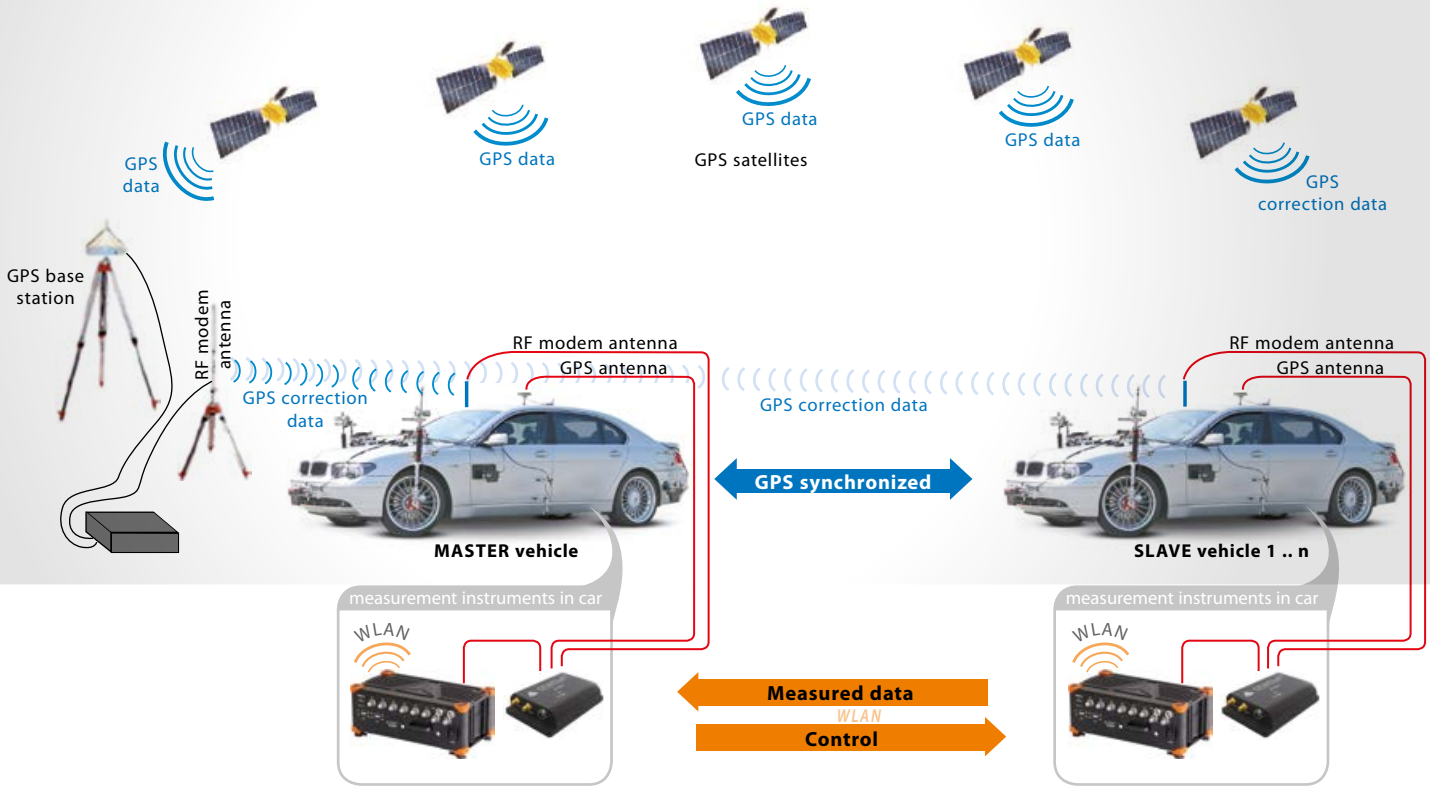
- *Analog setup screen with TEDS*
- *CAN setup (DBC import/export + custom channels, time correction)*
- *ADMA Plug-in*
- *Video, visualisation*
- *Export, sequencer*

OPTIONAL FUNCTIONS IN DEWESoft® X

- *Noise and vibration testing including SOUND LEVEL MEASUREMENT*
- *Torsional and rotating anaylsis including BALANCING*
- *FFT and transfer functions*
- *CAN analysis and recording, FlexRay support*
- *GPS – RTK (real time kinematic) and relative online calculation between several objects (cars)*
- *CAPS (active passive safety testing) automated online analysis*
- *Synchronized video camera support up to 100 000 frames per second*
- *Thermo camera support*
- *ALL SYNCHRONIZED (including IRIG and GPS absolute time UTC)*
- *XCP, OBD II*

ADAS Test System

TECHNOLOGIES THAT PROVIDE A DRIVER WITH ESSENTIAL INFORMATION, AUTOMATE DIFFICULT OR REPETITIVE TASKS, AND LEAD TO AN OVERALL INCREASE IN VEHICLE SAFETY FOR EVERYONE.



SYSTEM OVERVIEW

The latest GPS based position measurement technology is used to provide a highly accurate, easy-to-use ADAS test system. This is possible due to the RTK (Real Time Kinematic with 2 cm accuracy) option for GPS sensors. An immoveable GPS base station sends the correction data over a simple RF modem to all DS-IMU2 in wide area to achieve this accuracy.

Data from two or more vehicles provides very accurate position and distance information relative to each other and/or a fixed object, which is the basis for an ADAS test system. In addition DS-IMU2 provides accurate measurement of all vehicle dynamics, including side-slip angle.

All data is transfered to master system to obtain a measurement result during the test run. This is the standard functionality of DEWESoft®-OPT-NET and the Polygon mathematic module.

A robust WLAN solution is used to keep the communication between the systems for up to a distance of 1 km. There is theoretically no limit in the number of vehicles within this measurement– only the WLAN bandwidth limitation.

All other data sources from any vehicle like analog, counter, video, CAN, CCP/XCP, FlexRay and so on are synchronized together due to the GPS-PPS synch technology.

In addition to the features of the ADAS-Basic test system with IMU and GPS-RTK, the ADAS-Professional system includes the GeneSys IMU fiber optic gyro for applications where a GPS signal is not available for a longer period, such as in tunnels. This combination provides accurate measurement of all vehicle dynamics, including side-slip angle.

KEY FEATURES

- *Ruggedized and reliable miniature GPS aided inertial navigation system and AHRS with High dynamic (500 Hz)*
- *Combination of gyroscopes, accelerometers, magnetometers and a pressure sensor with a dual antenna RTK GNSS receiver*
- *Highest precision and easy to use (fully integrated in DEWESoft® X)*
- *Any SIRIUS module configuration*
- *Expandable with DEWE-43, SIRIUS or DS-CAN2*
- *Many additional synchronized data sources like, Video, CAN, Flex Ray, XCP, OBDII...*

THE FOLLOWING ADAS ARE JUST A FEW TESTING POSSIBILITIES THAT CAN BE DONE WITH THE LATEST TECHNOLOGY OF DEWESoft®:

COLLISION AVOIDANCE TESTING

Real-time updates about relative distances, velocity, acceleration, detection of unavoidable obstructions around of a moving vehicle and ability to store all the other information of target vehicles which are need for collision avoidance testing.

BLIND-SPOT DETECTION TESTING

In automotive sense of the term, blind spots are areas outside of a vehicle that the driver is unable to see.
To test and validate such system it's possible to use DS-IMU2, which provides up to 2 cm accurate position and real-time tracking.

ADAPTIVE CRUISE CONTROL TESTING

ACC is a system that is capable of automatically adjusting the speed of a vehicle to match the speed of the car or truck in front of it. If the lead vehicle slows down, adaptive cruise control can automatically match it. When traffic picks back up, these automatic systems are also capable of acceleration. It is critical to test such systems with different drive maneuvers, where systems developed by DEWESoft® are reliable, easy to use and time saving, because of quickly prepared setups.

ADDITIONAL APPLICATIONS

- *All vehicle dynamics tests,*
- *Lane departure warning,*
- *Forward collision warning,*
- *Lane change warning,*
- *Pre-crash,*
- *Intersection assistance,*
- *Rear collision warning*
- *Driver drowsiness detection testing, . . .*

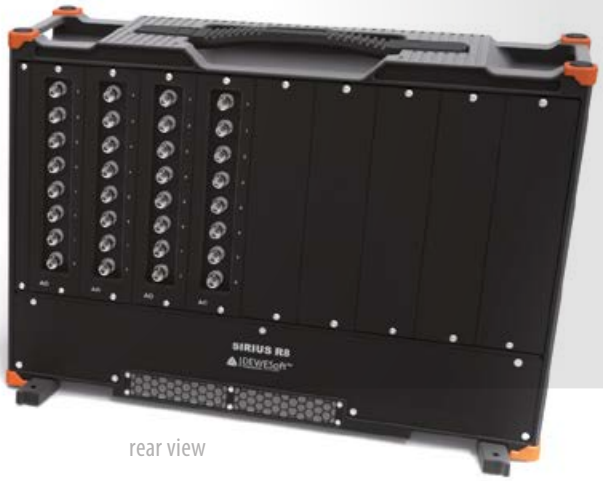
Road Load Data

INSTRUMENTS

DS-R8 WITH ANALOG OUT

- *Multiple combination of up to 128 inputs (all the SIRIUS modules)*
- *Up to 64 analog outputs*
- *Up to 1 MS/s sampling rate*
- *Up to 8 CAN inputs*
- *High-end computer with the latest i7 generation processor*
- *SSD with up to 960 GB of storage*

front view



rear view

	DEWESoft® R8 - RLD	DEWESoft® SIRIUS - RLD
		
Max. isolated ChnNo.	64	8 / slice
Sample Rate/Res. – opt 1	1MS / 16 Bit	1MS / 16 Bit
Bandwidth – opt 1	2MHz	2MHz
Sample Rate/Res. – opt 2	200 kS/s / 2x 24 Bit	200 kS/s / 2x 24 Bit
Bandwidth – opt 2	75 kHz	75 kHz
Base accuracy	0.05%	0.05%
Customized calculation	✓	✓
Analog output	Up to 64 ch	Up to 8 ch
CAN/Flexray/XCP	✓	✓
Camera	✓	✓
Integrated GPS	✓	–
Option Combustion Analyzer	✓	✓
Option DSA package	✓	✓
Option Power	✓	✓
Storing raw data	✓	✓

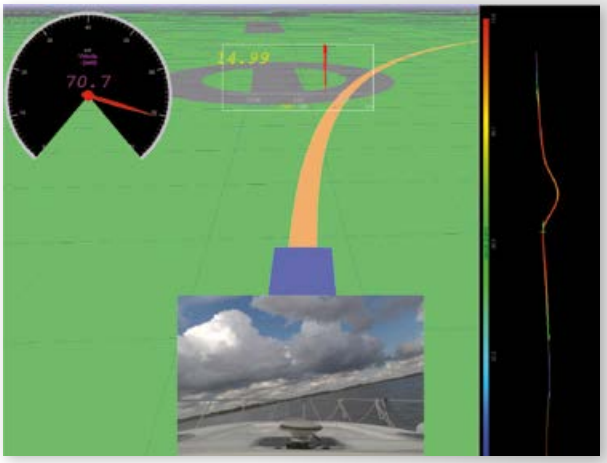
The Road Load Data system provided by DEWESoft® is capable of recording the data during real test drives or at test rigs either for a whole vehicle or certain component. Afterwards this data can be replayed with the same system on a test bed to simulate all the forces and vibrations in the laboratory boundaries.

Such systems are also used in material research, process and parts approval, where it's important to optimize mechanical components to a real-life environment.

KEY FEATURES

- *Connection of any sensor,*
- *Scalable from 8 to 1000 channels*
- *Input protection and optical ±1000 V ISOLATION*
- *Simultaneous sampling*
- *Anti aliasing filters*
- *Programmable analog outputs*
- *TEDS functionality*
- *Quick and easy installation*
- *Highest precision and easy to use (fully integrated in DEWESoft® X)*
- *Measurement results available online*
- *Many additional sychronized data sources like analog, digital, CAN, GPS, IMU, FlexRay, XCP, CCP, RoadDyn 2000, video & many more*
- *Possibility to capture different software modules (vehicle dynamics, combustion analysis, vibrations,...) in one synchronized data file.*
- *Export to many different file formats*

Related Applications on the sea



Vehicle Dynamics system provided by DEWESoft® is due to it's flexibility, quick and easy installation capable of testing also on the sea side.

Additionally because the systems are scaleable and therefore suiting for multiplepurpose usage, it's possible to measure different components of the ship. From engine with Combustion analysis, to electrical engines and batteries with Power module and in the end also vibrations all synchronized together.

APPLICATIONS ON THE SEA

- *Handling testing (different slaloms),*
- *Pass by Noise,*
- *Avoiding obstacles,*
- *Component testing,*
- *Performance testing,...*

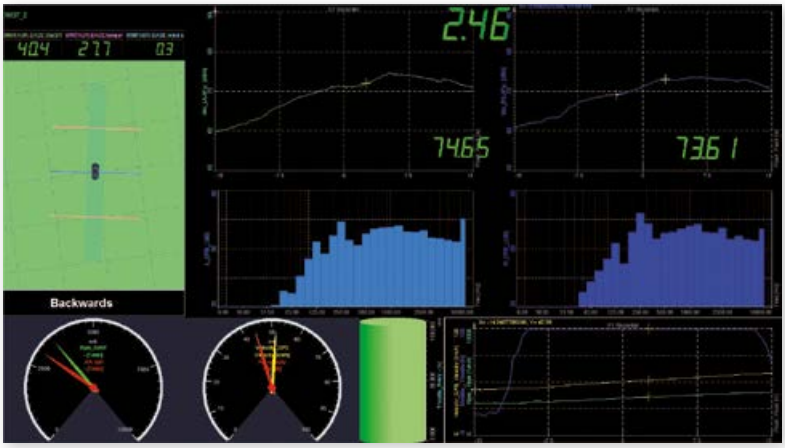
Related Applications in the air

Due to ruggedness, high environmental protection and flexibility of the Advanced Vehicle Dynamics System it's possible to test an airplane, where all the components are under difficult conditions high G forces and huge temperature differences. It's crucial to get precise and accurate data while performing such a maneuvers especially orientation parameters such as Roll, Pitch, Heading and Angular Velocity, which are the key values for designers of the plane.

APPLICATIONS IN THE AIR

- *High G maneuver testing,*
- *Component testing,*
- *Performance testing,..*

Pass by noise



ADDITIONAL APPLICATIONS WHICH CAN BE DONE WITH PASS BY NOISE SYSTEM

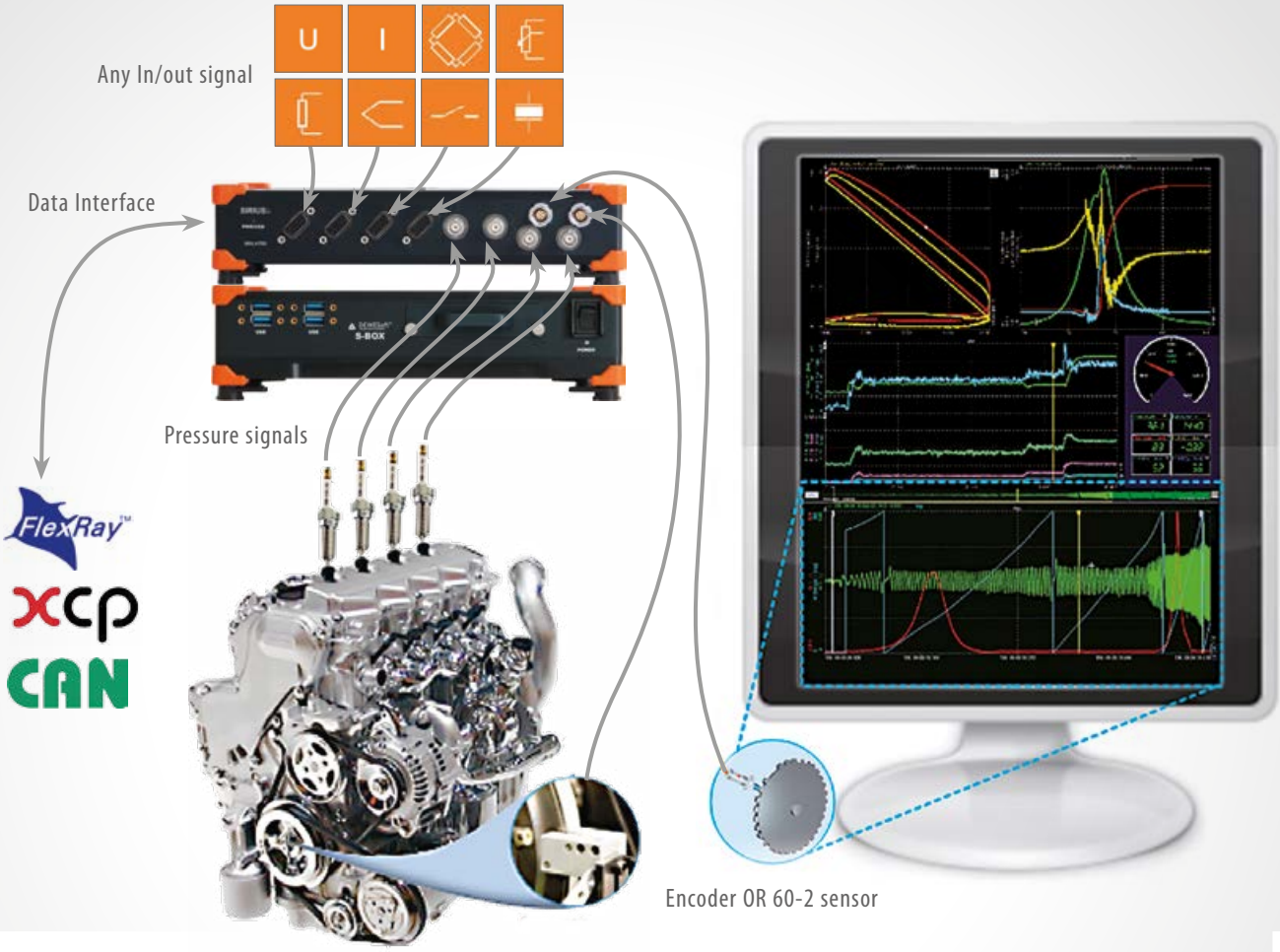
- *Tire acoustic,*
- *Engine and gearbox acoustic,*
- *Tyre to road sound emission,*
- *Intake and Exhaust noise*
- *Sound pressure level emitted by stationary roadvehicles,...*

The DEWESoft® Pass by Noise system is a **flexible Research & Development measurement package**. In addition to hardware it contains powerful software for online check and validation of results.

Guiding the driver through a measurement is done with the help of DEWESoft® Sequencer module, which can be easily modified.

PPS-Sync technology and DEWESoft® NET software option allows the communication between different computers in Master/Slave mode. Online process and visualization of the data is done on the Master computer.

SIRIUS Combustion Analyzer



SIRIUSi Combustion Analyser systems from DEWESoft® are used for engine research, development and optimization. Also for component development and testing – such as ignition systems, exhaust systems and valve control gear. The system consists of our top of the notch isolated **SIRIUSi** hardware and the well-known DEWESoft® X software package for measurement and analysis.

It supports angle and time-based measurement and uses highly sophisticated algorithms for online or offline mathematics and statistics – calculating heat release and other thermodynamic parameters.

The combustion analyser can be fully integrated within a test bed and also supports data from other sources:
e.g. Video, CAN, Ethernet, …

If the powerful integrated post processing features of DEWESoft® are not enough, you can even export the data to several different file formats.
In addition to combustion analysis, the system can be expanded to handle other measurement applications such as hybrid testing on the power train, noise and vibration measurement together with **synchronized** video or GPS data.

MAIN FEATURES

- *8 analogue inputs with sensor supply for any sensor and signal type*
  - *Charge, IEPE, Voltage, Temperature…*
- *Two versions in speed and resolution:*
  - *16 bit, 1 MS/s for high speed engines*
  - *24 bit, 200 kS/s for low rpm diesel engines*
- *Direct connection of any rpm sensor: InCar (e.g. 60-2), Encoder, CDM+Trg*
- *1 isolated High speed CAN bus interface*
- *Expandable to higher channel count*
- *Interface to Test bed and INCA*
- *Simultaneous online analysis of*
  - *Torsional and rotational vibration*
  - *Order tracking*
  - *Electrical Power*
  - *Combustion noise*
  - *Sound power*
  - *and much more…*

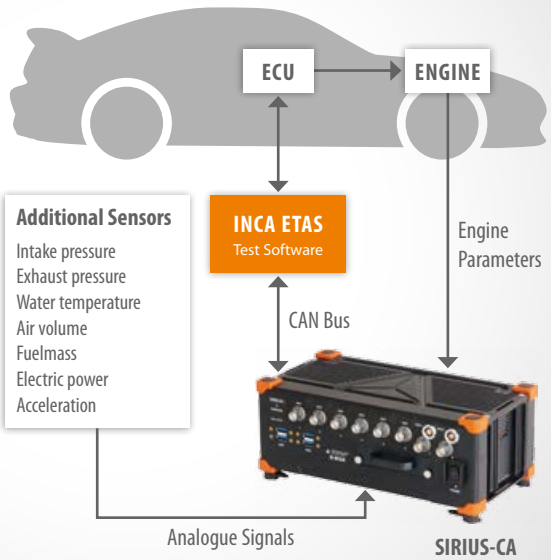
HARDWARE

SIRIUSi-HS-CA	• A/D converter: 16bit, 1 MS/s • SNR: 89 dB @ 100 kHz BW • 0.1° resolution @ 6000 rpm and 8 channels
SIRIUSi-CA	• A/D converter: 2 x 24 bit dual core, 200 kS/s • SNR: 150 dB @ 100 kS/s • 0.1° resolution @ 1650 rpm • 0.2° resolution @ 3300 rpm
Common features	• 4 CHG modules supporting: · Charge signals up to 100 000 pC · Voltage (up to 10 V), DC and AC coupling (0.1 Hz) · IEPE with 4, 8 or 12 mA and full TEDS support • 4 LV modules supporting: · Voltage (up to 100 V), DC and AC coupling (1 Hz) · Programmable sensor supply up to 30 V/100 mA · Full MSI support for any sensor signal • 2 synchronized super-counters (LEMO 7 pin) • 1 CAN bus 2.0b isolated • DS-TACHO with adjustable trigger level (max 100 V) • All I/O fully galvanically isolated 1 kV • USB2 interface, 6-36V supply, 2 sync connectors • Optional channel expansion, battery packs… • BASE STATION (embedded PC) with 6x USB, HDMI, VGA, GigE, WLAN, GPS opt. • CPU: Intel i7-3612QE 8 Core with 4 GB RAM • Storage: 240 GB removable SSD • Including DEWESoft® X Professional Edition and • Windows 7 Ultimate version (Multilanguage support) • 9-36 V DC supply

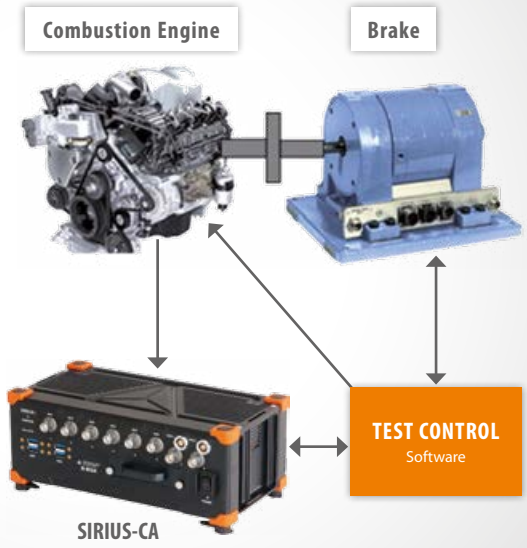
SOFTWARE

CA-BASE	• Online mathematics, statistics, standard derivation • Fast online displays: pressure, pV diagram, … • Time domain sampling, especially for cold start tests • Includes on-line fast combustion "scope", configurable as pressure-volume diagram (pressure vs crank angle) • Includes basic statistic, offline display, data storing, data export to ASCII (also Excel) and export to FlexPro and Concerto (AVL)
CA-OPT1	Extended mathematics, including online calculation of • Heat release • Standard deviation • IMEP, PMEP, NMEP • Thermodynamics • Knock detection
CA-OPT2	Torsional vibration and rotational vibration analysis software (software only!) • Torsional vibration and static torsion measurement • Differential revolution and slippage measurement • Angle resolution up to 0.00075° at 10000 rpm • Supports all incremental position encoders • Rotational vibration analysis: requires only 1 encoder • Torsional vibration analysis: requires 2 encoders
CA-OPT3	Combustion noise analysis (software only!) Online dB noise calculation based on the CA noise special filtering

IN CAR USE



TEST BED APPLICATIONS



DEWESoft® Dynamic Signal Analyser

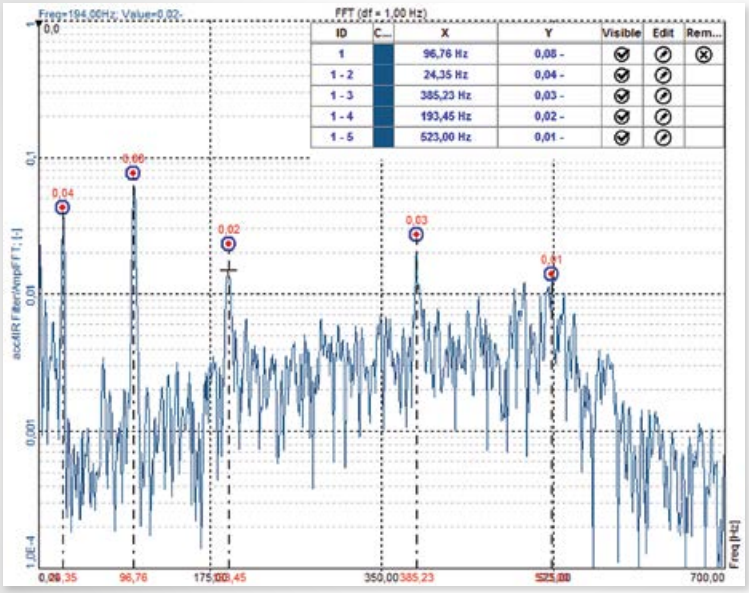
THE „5 IN ONE INSTRUMENT“

- *FFT analyser*
- *Rotating machinery analysis*
- *Fast Data recorder*
- *From 4 up to more than 1000 channels*
- *Customized inputs, analog, counter, CAN BUS*

	DEWESoft® DS-R8D- D S A	DEWESoft® DS-R2D - D S A	DEWESoft® SIRIUS -D S A	DEWESoft® SIRIUS -MINI - D S A
				
INPUT CHANNELS				
Max. isolated ChnNo.	64	16	8	4
Bandwidth	75 kHz	75 kHz	75 kHz	75 kHz
Sample Rate	200 kS/s	200 kS/s	200 kS/s	200 kS/s
Base accuracy	0.05%	0.05%	0.05%	0.05%
Analog input	IEPE or Voltage	IEPE or Voltage	IEPE or Voltage	IEPE or Voltage
Dynamic (2x24 Bit)	160 dB	160 dB	160 dB	160 dB
Counter inputs	16	4	2	1
INSTRUMENT - FUNCTIONS				
FFT Analyzer	✓	✓	✓	✓
Order Analyzer	✓	✓	✓	✓
CPB Analyzer	✓	✓	✓	✓
Envelope Analyzer	✓	✓	✓	✓
Time domain analyzer	✓	✓	✓	✓
Modal Analyzer	✓	✓	✓	✓
Rotation Analyzer	✓	✓	✓	✓
Analog output function generator	–	–	Option	Option
Analog output data replay	–	–	Option	Option
ADDITIONAL - FUNCTIONS				
CAN/Flexray/XCP	✓	✓	✓	✓
Additional Channels	Option	Option	Option	Option

DEWESoft® DSA Instruments

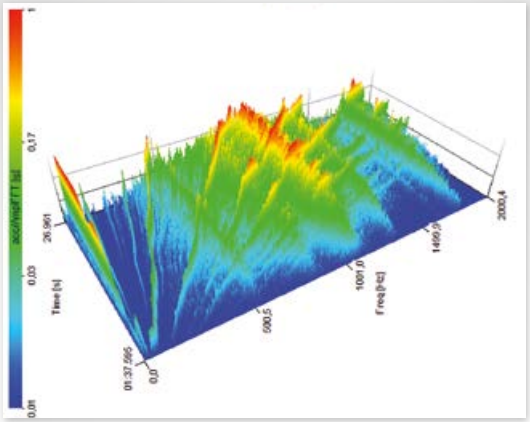
DEWESoft® FFT ANALYZER



Real-time, multi-channel FFT spectrum analysis, for vibration diagnostics, or narrow-band analysis of acoustic signals

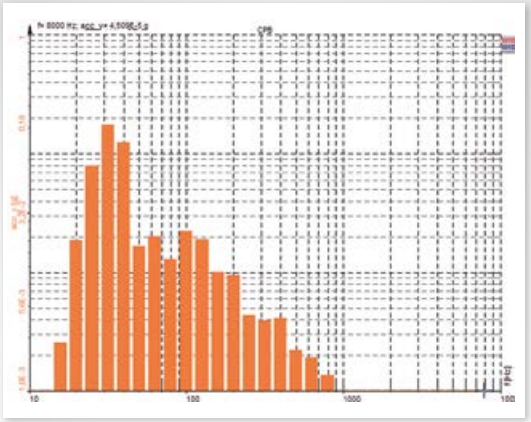
- *Auto spectrum and cross-spectrum*
- *Waterfall spectrum*
- *Resonance and damping estimation*
- *Harmonic and side-bands detection*
- *Pure tone detection*
- *Zoom FFT*
- *Cepstrum analysis*
- *Short time FFT*
- *Envelope (Bearing fault analysis)*

DEWESoft® WATERFALL FFT - ANALYZER



The FFT waterfall shows e.g. a vibration spectrum of an engine runup versus time, it's like plotting multiple FFTs over the recording time.Critical frequencies can easily be identified by various displaying possibilities, such as lin / log / 2D / 3D

CPB ANALYZER



Real-time, standardized digital filter-based analysis using 1/1, 1/3, 1/12 and 1/24 octaves for analyzing noise, determining sound power levels and machine vibration monitoring

- *Sound level meter - octave spectrum*
  - *complies with IEC61672*
  - *Leq logging - sound levels vs. time*
- *Sound intensity - pure tone location while measuring*
- *Machine vibration level monitoring - including pass/fail tolerance check*
- *complies with IEC61260 & IEC 60804*

DEWESoft® DSA Instruments

MODAL ANALYSIS: EMA(EXPERIMENTAL MODAL ANALYSIS)

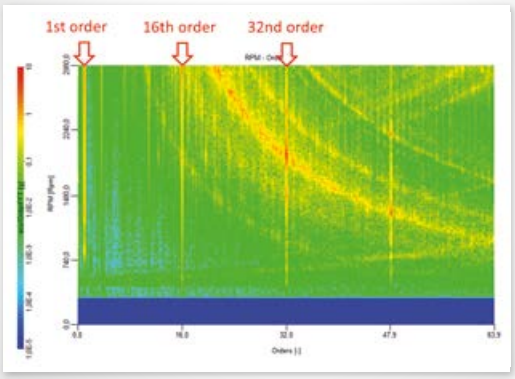
- *SISO, MISO, MIMO configurations*
- *NMA, normal mode analysis*
- *Spectral ODS*
- *Geometry editor with UNV import*
- *Mode indicator function MIF*
- *Circle fit analyze tool*
- *Function generator*
- *FRF from stored timed data*
- *Triggered, free-run measure mode*
- *Roving hammer excitation support*
- *Unv-file export for modal packages (ME-Scope, ...)*
- *Up to 1000 channels linked via OPT-NET*

ROTATING MACHINERY ANALYSIS

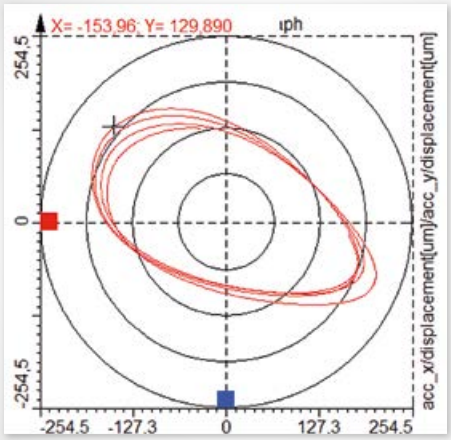
Based on vibration and angle signals DEWESoft® offers a wide range of rotating machine analysis tools like:

- *Order Tracking Order analysis Order extraction*
- *Torsional and rotational Analysis, angle velocity and acceleration*
- *Orbit analysis*
- *ODS (Operating Deflection Shape)*
- *Balancing*

ORDER TRACKING EXAMPLE



ORBIT GRAPH EXAMPLE



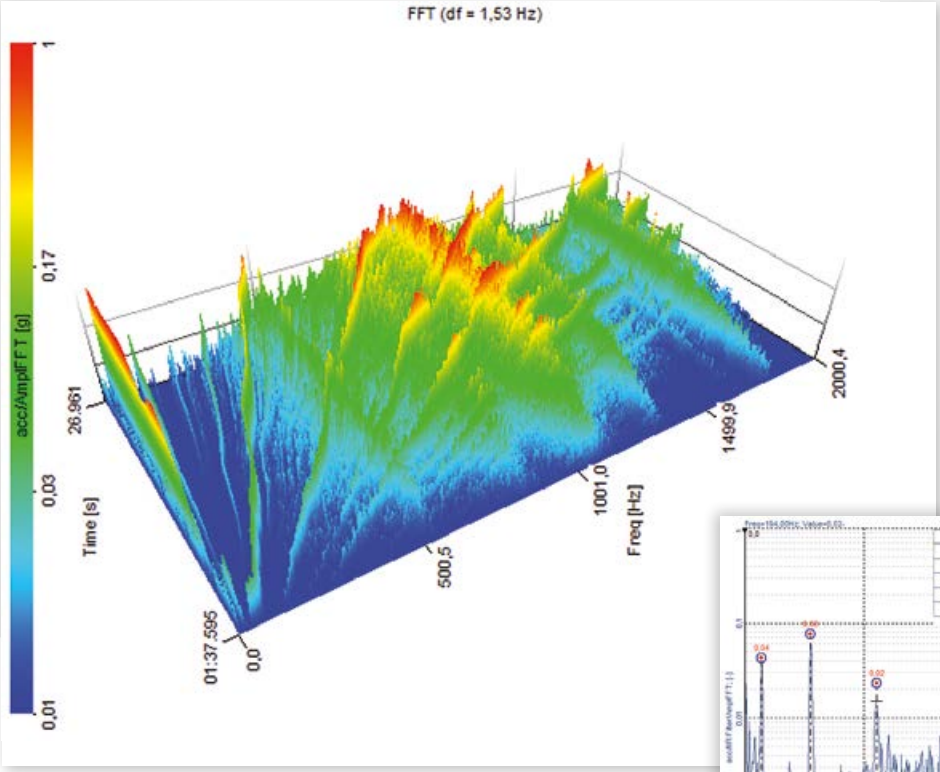
DEWESoft® DSA Sensors

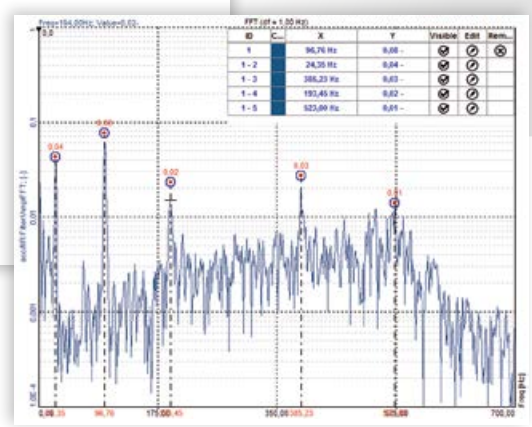
VIBRATION SENSORS

	I1A-50G-1	I3A-50G-1	I1TI-50G-1	C1T-5000G-1
				
Number of axis	single	triaxial	single	single
Sensitivity	100 mV/g	100 mV/g	100 mV/g	50 pC/g
Range	50g	50g	50g	5000g
Type	IEPE	IEPE	IEPE	charge
Frequency range	+/- 5 %: 0.3 to 5000 Hz	+/- 10 %: 2 to 5000 Hz	+/- 10 %: 0.3 to 10 000 Hz	+/- 8 %: up to 5000 Hz
TEDS	yes	yes	no	no
Features	miniature size	case isolated, triaxial	case isolated, industrial	high temperature
Dimensions	10,2 x 10,2 x 10,4 mm	15,5 x 15 x 15 mm	17,5 x 42,2 mm	12,7 x 24,4 mm
Weight	4,3 g	10 g	44 g	25 g
Temperature range	-51…+82 °C	-51…+82 °C	-51…+121 °C	-51…191 °C (up to 260 °C on request)

	I3T-500G-1	I3T-50G-1	IH-500N-1
			
Number of axis	triaxial	triaxial	single
Sensitivity	10 mV/g	100 mV/g	50 mV/lbf (=11,24 mV/N)
Range	500g	50g	100 lbf (=444,82 N)
Type	IEPE	IEPE	IEPE
Frequency range	Axis 1 & 2: 1.5 to 5,000 Hz (+15/-5%) Axis 3: 1.5 to 10,000 Hz (+15/-5%)	+15/-10%: 0.3 to 10,000 Hz	75 kHz resonance frequency
TEDS	no	no	yes
Features	lightweight; triaxial	low noise; triaxial	modal hammer with TEDS
Dimensions	12,4 x 9,1 x 9,1 mm	21 x 12 x 11 mm	221 x 71 mm
Weight	4 g	5,6 g	100 g (head)
Temperature range	-51…+121 °C (up to 160°C on request)	-51…+82 °C	-40…65 °C

FFT Analysis





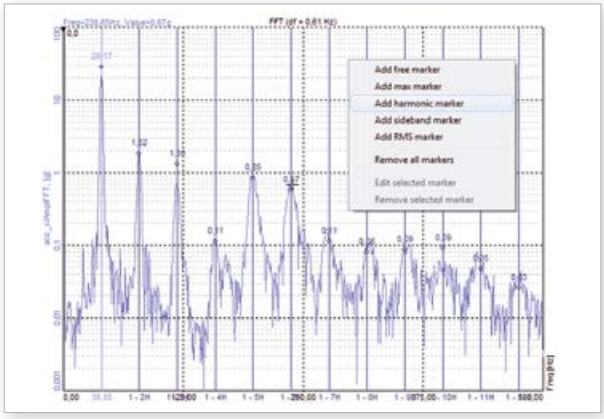
DEWESoft® offers various ways for sophisticated FFT analysis. With the release of DEWESoft® X2 a bunch of new useful features have been added.

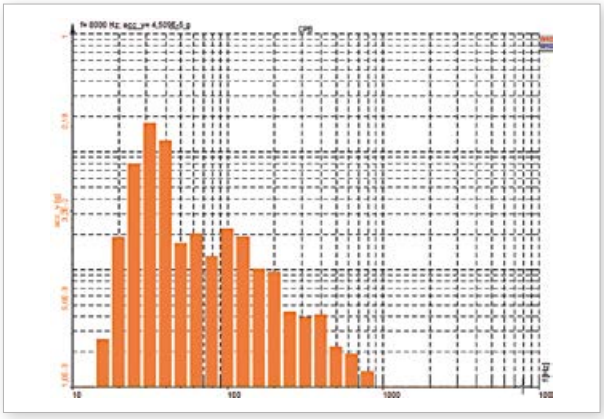
No matter if you need to see the seven highest peaks of the spectrum, or want to use the harmonic cursors to quickly identify all harmonics related to the fundamental – all just with one mouse click.

For acoustic applications the widely used octave plot can be utilized. The STFT is the instrument of choice when it comes to transient signals, such as shock and impact.

MAIN FEATURES

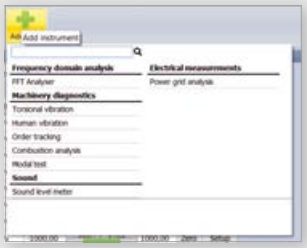
- *FFT*
- *Powerful markers (max, free, sideband, harmonic)*
- *STFT*
- *CPB plot*
- *Auto-generated displays*
- *FFT waterfall plot*
- *Peak hold, Overall, RMS, amplitude weighting, …*

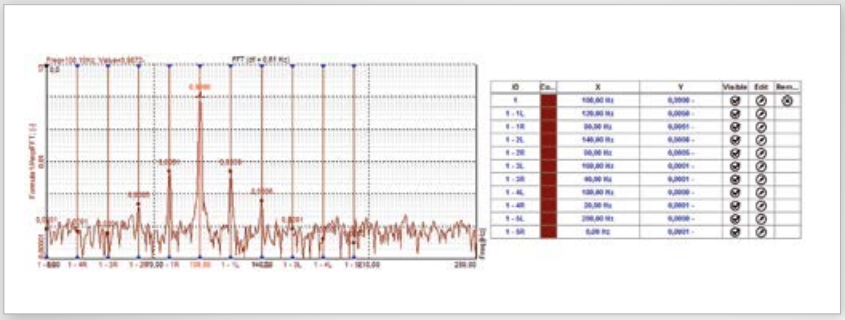


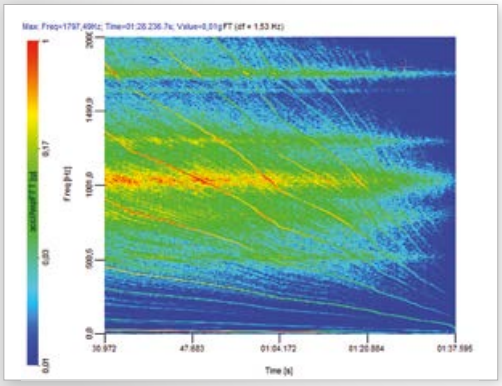


OVERVIEW

DEWESoft® X2 simplifies the way to set up instruments. Now you can add an FFT analyser just like any other module to your setup, and the according screen in measure mode is automatically generated. The added markers (free, max, harmonic, sideband) can of course also be displayed in a table as shown below.



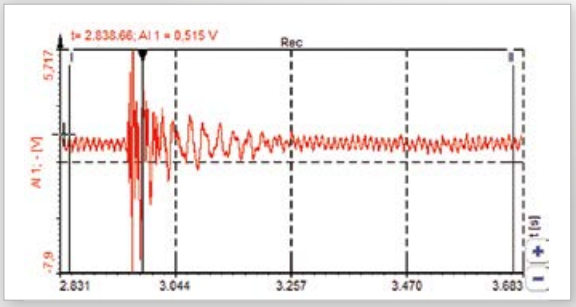




The FFT instruments and mathematics have all the different well-known options, e.g. windowing, overlap, averaging, amplitude weighting, peak hold, overall spectrum, … All these settings can also be done offline on the datafile, after the measurement was recorded.

The FFT waterfall shows e.g. a vibration spectrum of an engine runup versus time, it's like plotting multiple FFTs over the recording time. Critical frequencies can easily be identified by various displaying possibilities, such as lin / log / 2D / 3D.

High frequency bursts are almost impossible to accurately analyse by standard FFT, because the calculation takes too long (during calculation the signal is quickly changing). For this reason DEWESoft® mathematics offers the STFT – short term Fourier transform –, which can have smaller blocks but still the same resolution as standard FFT. Therefore it's much faster.



SUITABLE INSTRUMENTS

R2D

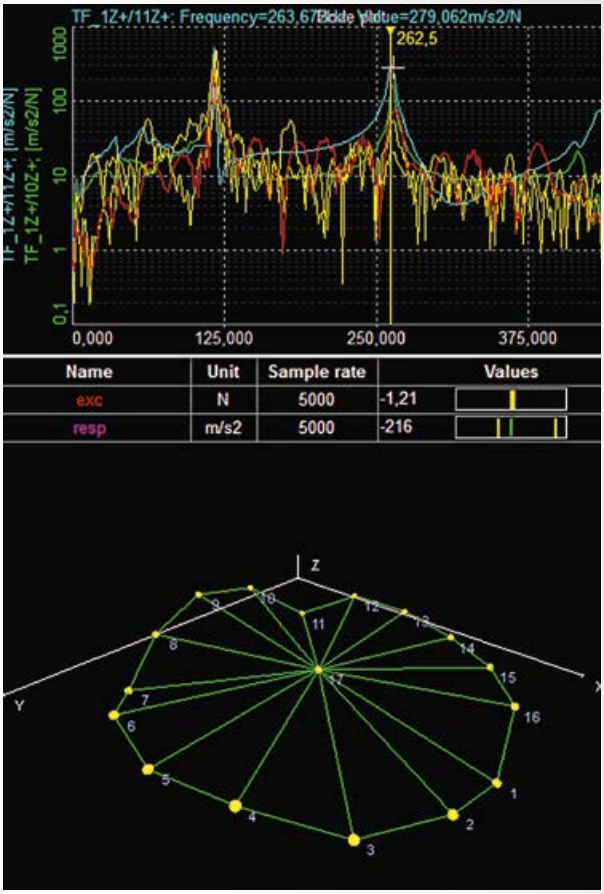
or

SIRIUS

or

SIRIUSm

Modal-Structure Analysis



Modal analysis is needed in every modern construction. The measurement of system parameters, called modal parameters, is essential to predict the behavior of a structure.

These modal parameters are needed also for mathematical models. Parameters like resonant frequencies, structural damping, and mode shapes are experimentally measured and calculated.

DEWESoft® provides a hard- and software solution which is customized to your application. Starting from 8 channels used for maintenance, service and troubleshooting, up to 1000 channels used for complex structures.

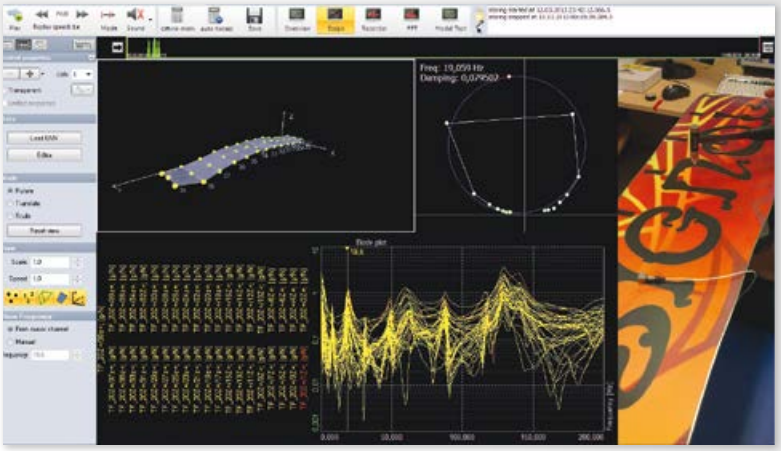
The easy-to-use software is suitable for professional and occasional users.

MAIN FEATURES

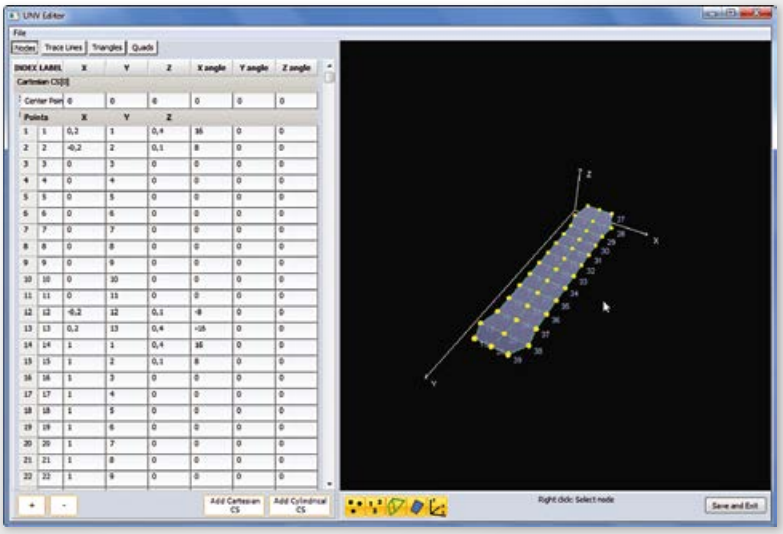
- *SISO, MISO, MIMO configurations*
- *NMA, normal mode analysis*
- *Spectral ODS*
- *Geometry editor*
- *Mode indicator function MIF*
- *Circle fit analyze tool*
- *Function generator*
- *FRF from stored timed data*
- *Triggered, free-run measure mode*
- *Roving hammer excitation support*
- *Unv-file export for modal packages (ME-Scope, ...)*
- *Up to 1000 channels linked via OPT-NET*

OVERVIEW

To measure an FRF of a structure basically two channels are needed. One channel is used to measure the excitation force, which could be an impact hammer or a shaker. This excitation force excites the structure, and at least one acceleration sensor measures the response of the structure. Out of that the transfer characteristic (FRF) and the modal parameters are calculated.



To determine the structure, you have to measure several points to get the whole system identified. This could be done either with one response or up to hundred or thousand channels depending on the complexity of the structure.



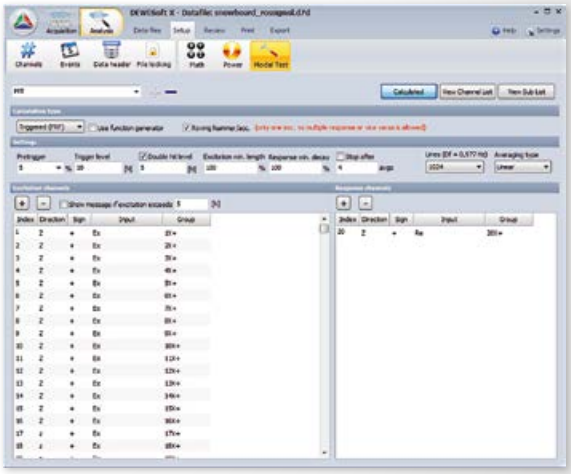
CHANNEL SETUP

In the channel setup the excitation-, and the response channels are defined. Most DEWESoft® devices support the state of the art TEDS interface which gives the maximum comfort especially at high channel count.

The FRF setup provides all parameters needed for the measurement

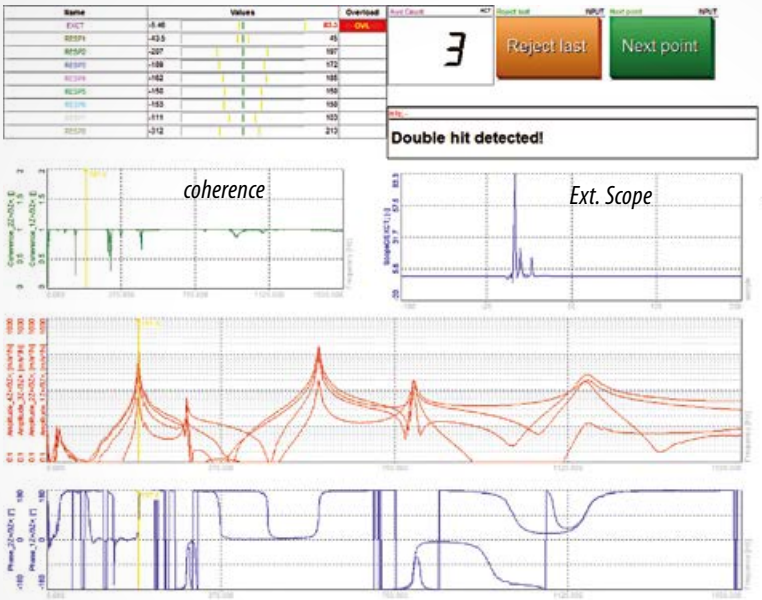
- *Free run, triggered mode*
- *Average*
- *Excitation window length*
- *Response decay*
- *Trigger levels*
- *Overlap*

Also the channel definition according to the structure is done in the FRF setup. A structure could be imported from any other software with .unv file format or created with the included geometry editor.



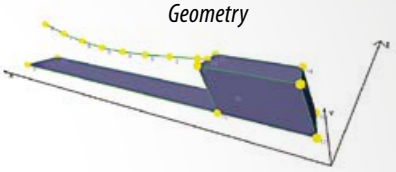
MEASUREMENT

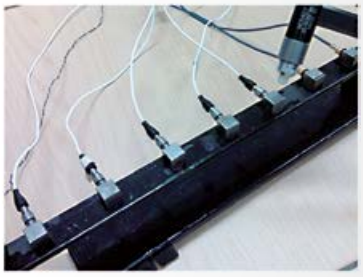
Analog overload indication



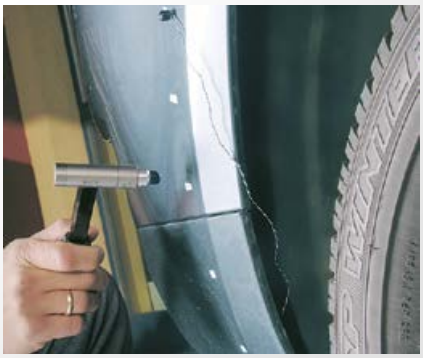
The prepared measurement screen will give you all the control possibilities for either running or triggered FRF.

Geometry





The tool bar provides all important and necessary functions which are needed during the measurement. At Single Input Single Output (SISO) measurement either the excitation or the response could be moved, because sometimes it is easier to move the excitation than the response. DEWESoft® supports both types of this measurement.



ANALYSIS

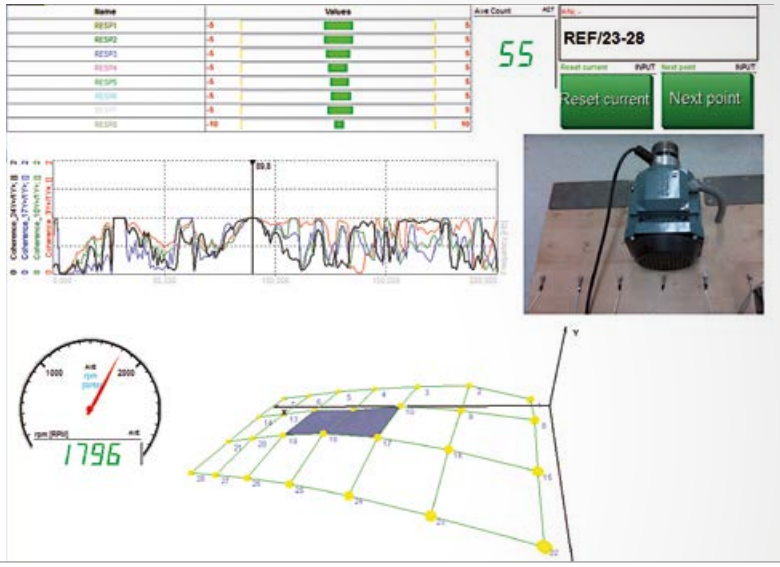
In the analyze screen the FRF spectra are shown together with the geometry.

The included analyze tools like

- *animation of the geometry,*
- *circle fit,*
- *MIF*

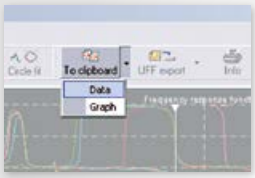
are provided to determine the results immediately.

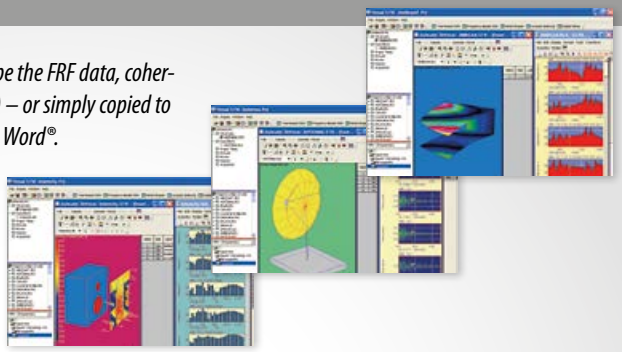
In case of an error the spectrum could be re-measured immediately. This saves time and money. Display options could be set according to the needs. Phase, Coherence, Re-, Imag, are only a few possibilities which could be set.



FRF EXPORT

For further investigation and analysis in modal packages like ME-Scope the FRF data, coherence and excitation can be exported to the UFF (Universal File Format) – or simply copied to clipboard – and used in standard applications like Microsoft Excel® or Word®.





FUNCTION GENERATOR

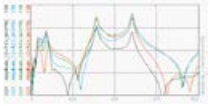
For a running FRF the structure is excited with a shaker. Here either one shaker or multiple shakers for big structures are used. The shaker(s) have to be controlled mainly in amplitude, phase, waveform and frequency. DEWESoft® offers an integrated function generator of up to 16 channels which is fully software controlled. Various time patterns like

- *Fixed*
- *Sweep*
- *Step sweep*
- *Burst*
- *Chirp*

are configurable for any application.

FRF

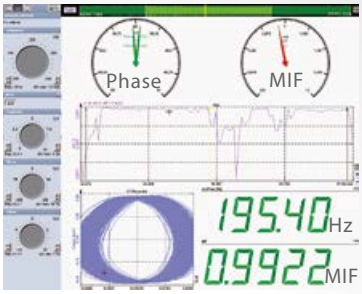
Frequency resolution like FFT



Exact resonant frequencies must be calculated out of mathematical models. Circle fit, SDOF System (ME-SCOPE)

NMT (NORMAL MODE TESTING)

Whats the difference to FRF?



Resonant frequency will be searched manually by changing the excitation frequency of the DEWE-FGEN.

If Excitation and response have a phase shift of 90deg this is called Normal Mode and indicates the resonant frequency.

With this method no additional mathematic is needed, because the frequency set at FGEN indicated the resonant frequency.

Technical Data: Function Generator

- *Smooth change for shaker control*
- *24 bit D/A up to ±10 V*
- *Watchdog*
- *Frequency resolution 1 mHz with 10 ppm*
- *Phase adjustment 0.05°*
- *Sine, square, triangle, ramp, noise, ...*
- *Up to 1 MHz D/A rate SNR>80dB, THD<0,05%*
- *Arbitrary output/file replay*
- *Fix frequency, lin/log SWEEP, CHIRP, BURST Mode or STEP sine*

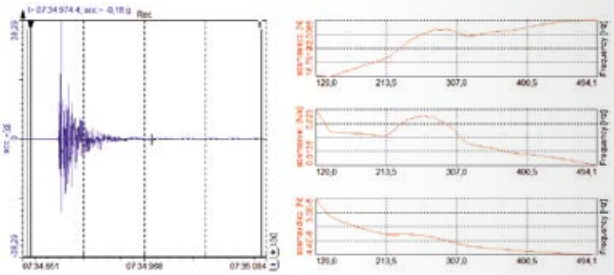
Requirements (Hardware and Software)

- *ICP®-Inputs*
- *DEWESoft® SIRIUS*
- *DEWESoft® option FG*
- *DEWESoft® option FRF*
- *DEWESoft® option SRS*

SHOCK RESPONSE SPECTRUM (SRS)

The shock response spectrum shows the maximum responses of a series of uniformly damped single-degree-of-freedom (SDOF) systems caused by a shock waveform applied on the structure. After setting damping, resolution (1/12, 1/24, 1/48, 1/96/octave) and primary section, the spectra are calculated out of the time domain signals.

After the time domain signals are recorded, the data is analysed by the DEWESoft® SRS plugin. The easy-to-use user interface offers a convenient straight forward procedure for fast results.



Torsional and Rotational Analysis

Rotating machines and engines are sources of rotational and torsional vibration. Rotational vibration is a result of the change in shaft speed during one revolution and torsional vibration is due to angular twist in the shaft or drive train which may cause fatigue.

So you will observe: vibration, force, strain, voltage, current, power, CAN data and rotational- and torsional vibration with only one instrument at the same time.

That's unique!

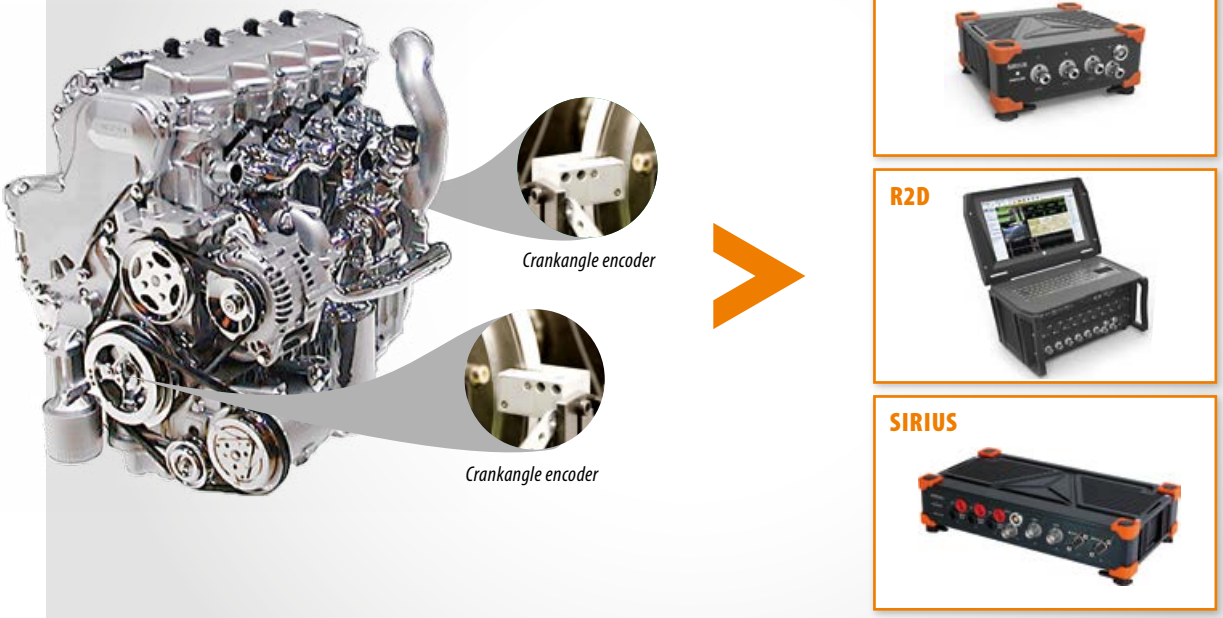
MAIN FEATURES

- *Time domain measurement*
- *Angle based view*
- *In addition to other functions (analog, CAN, GPS, video, ...)*
- *Configurable display*
- *Direct sensor connection*
- *102 MHz counter time base*

APPLICATIONS

- *Power train*
- *Paper mill*
- *Combustion engine*
- *Belt drive*
- *Engine test bench*
- *Examination of rotating field*

SYSTEM OVERVIEW



SETUP

For rotational vibration measurement one rpm sensor is used to determine the rpm deviation and for torsional vibration there is one at each end of the power train. DEWESoft® hardware supports a wide range of different sensors e.g. encoder, pickup, RIE-360/720 and many others. These are connected directly to a counter input of the system. Each counter input provides a power supply, 3 differential inputs with selectable trigger level compatible with all sensor outputs.

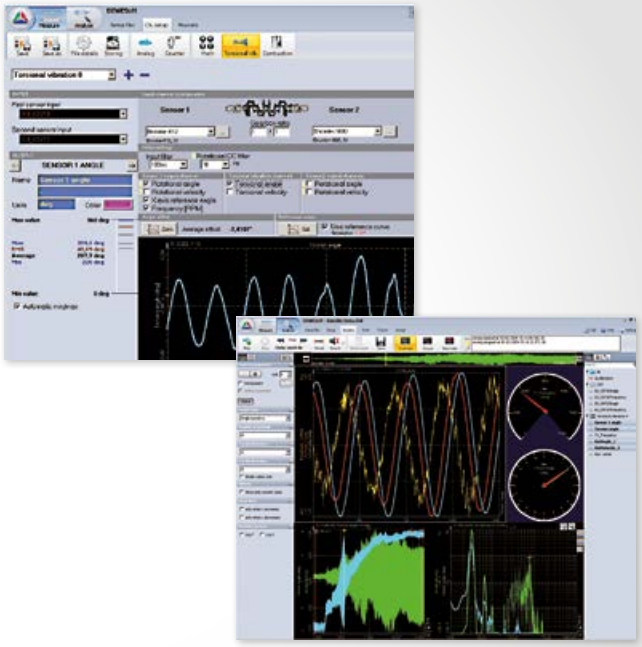
The automatic display generation makes it easy to setup the measurement within minutes. Digital input filters, a sensor database and a reference curve eliminates sensor errors. Various output channels are immediately provided for further investigation:

- *Reference angle [deg]*
- *RPM [rpm]*
- *Rotational angle [deg]*
- *Rotational velocity [deg/s]*
- *Rotational acceleration [w/s]*
- *Torsion angle [deg]*
- *Torsion velocity*

The picture on the right shows a typical analysis screen. Data is shown either in

- *time domain or*
- *angle domain*

together with all other measured channels. By selecting the order analysis module you will get order based results.



Balancing

Rotating machines and engines produce vibration from many sources, including rotational and torsional vibration. Also unbalanced rotating parts are sources for vibration. Unbalanced masses are distributed by the rotor causing vibration. To balance a system, we have to measure and correct the masses so that the rotor is returned to a balanced condition.

DEWESoft® provides an easy-to-use and straight-forward tool for single and dual plane balancing. This add-on is included as an option in every DEWESoft® instrument. One or two acceleration sensors and a tacho probe are needed.

MAIN FEATURES

- *User interface which guides through all steps*
- *Order tracking based balancing method*
- *Single or dual plane*
- *Multiple balancing for two directions saves time (X, Y)*
- *2D graph for plane view*
- *RPM channel with color indicator (rpm range)*
- *Alarm output if velocity exceeds predefined value*
- *Displays tacho probe time signal to set trigger*
- *Vector polar plots of 1st order of all runs (initial, trail, ...)*
- *Weight splitting*
- *Acceleration, velocity, displacement in recorder*
- *Time domain measurement*

GENERAL

During construction or assembly of a machine or even through abrasion, a rotor could become unbalanced. This condition causes vibration, noise and fatigue of the material.

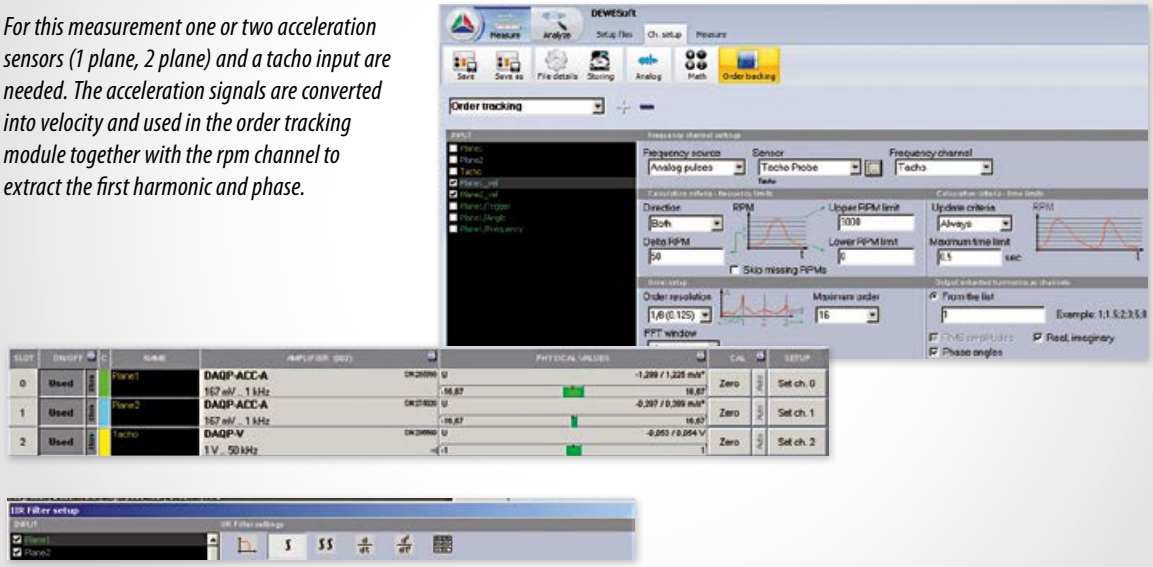
DEWESoft® provides an in-field-balancing method, which enables balancing of the machine. This saves time and money because balancing can be done in situ and the rotor is balanced in its operating condition, which includes the whole structure of the machine.

Balancing includes in general five steps:

1. Measuring the imbalance
2. Add a trial mass
3. Add the correction mass (balancing)
4. Measuring the balanced system
5. Repeat steps 2 to 4 if needed

Balancing is done either for one plane or two planes. One plane is used for small rotors, and two planes is used for long rotors.

For this measurement one or two acceleration sensors (1 plane, 2 plane) and a tacho input are needed. The acceleration signals are converted into velocity and used in the order tracking module together with the rpm channel to extract the first harmonic and phase.



The automatic display generation and the visual component in DEWESoft® provides step by step guidance through the whole balancing procedure.

MULTIPLE TEMPLATES LINKED TOGETHER

If a triaxial sensor is used, the balancing can be done on x and y direction of the plane(s) at the same time. Depending where you get the best result (x or y direction) you choose the correction mass. This saves time and guarantees a high quality of balancing.

MULTIPLE TEMPLATES LINKED TOGETHER

Trigger probe

Acceleration sensor

Acceleration sensor

R2D

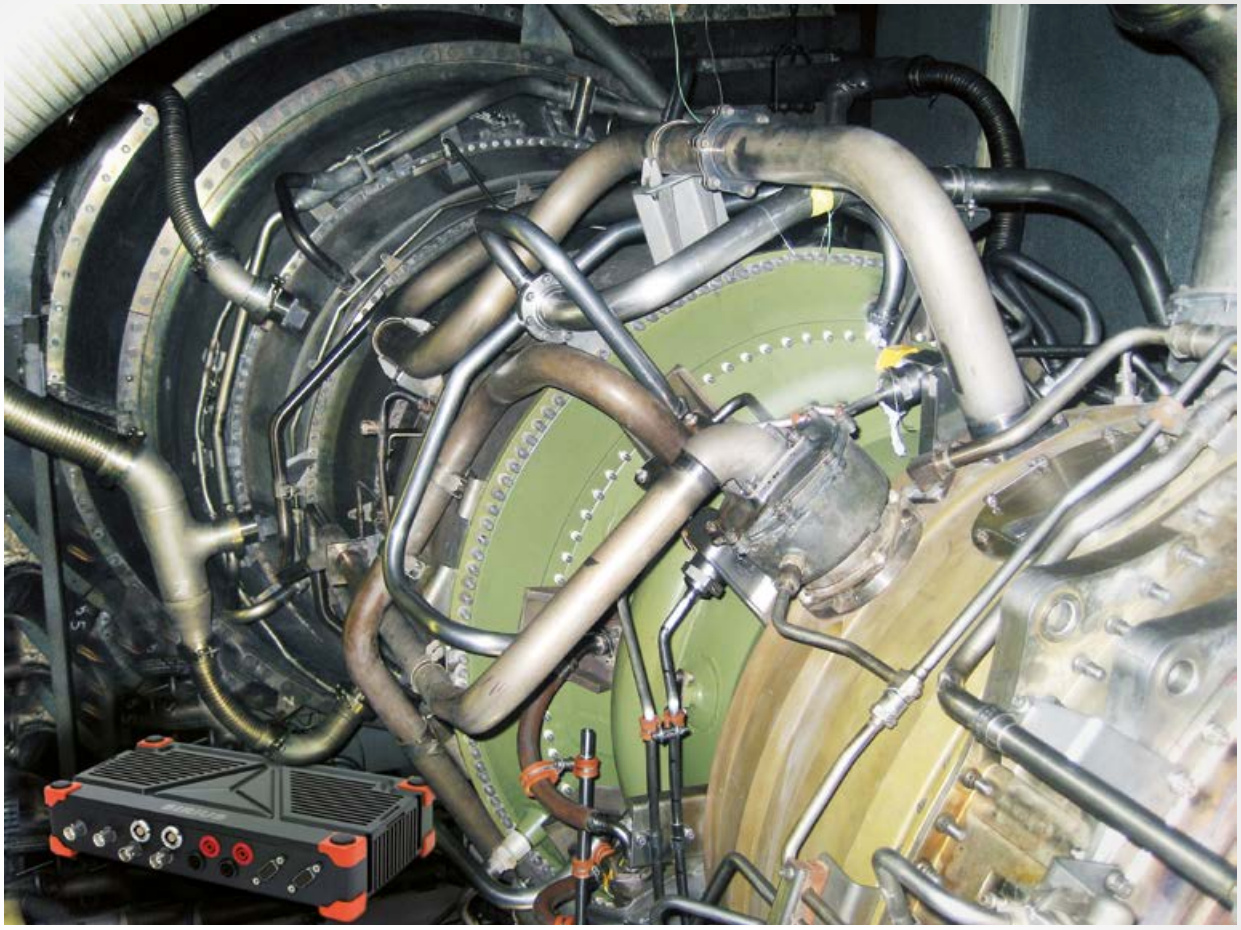
or

SIRIUS

or

SIRIUSm

Order Tracking



Rotating machines under operational conditions require additional analysis such as order tracking. Compared to normal FFT the spectrum is based to orders instead of frequency (time). The orders describe the fundamental or a multiple of the actual rotation speed [Hz]. With this method you can separate frequency components which are related to engine speed and that are related to structure.

DEWESoft® provides a powerful and very easy-to-use order tracking module for fast and efficient results. The data and the rpm information is recorded simultaneously in time domain and re-sampled in the order tracking module. Therefore we can show narrow band FFT, waterfall spectra, and still keep all other convenient functions in time domain.

MAIN FEATURES

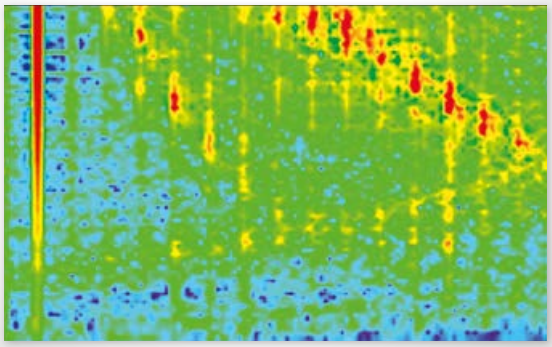
- *Dedicated re-sampling method for sharp order separation*
- *Measurement in time domain to keep all benefits*
- *2D, 3D waterfall in order or frequency domain*
- *Amplitude, phase extraction*
- *Recalculation in post processing*
- *Phase synchronous rpm input with 9.8 ns resolution*
- *Easy to setup*

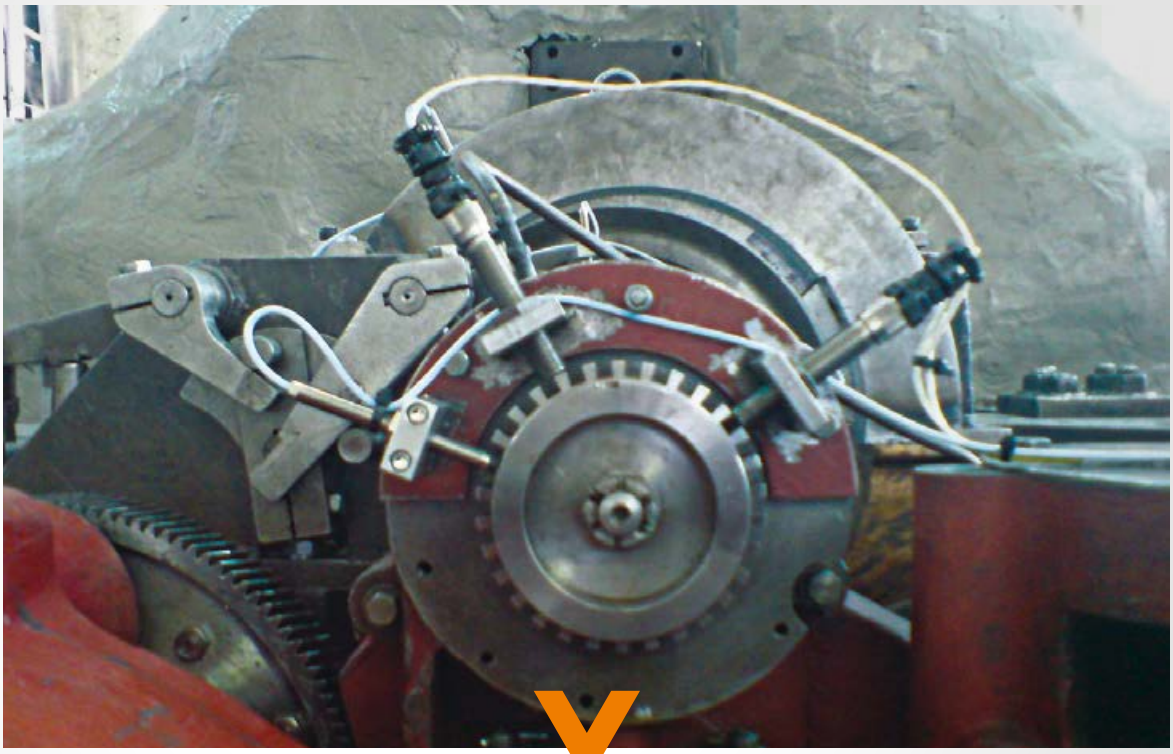
OVERVIEW

Order tracking requires two signals, the vibration signal and the rpm information. The measurement is done in time domain, and all the order related channels are calculated out of these time signals.

A fast state of the art re-sampling method produces the results online. Run-ups, coast-down or both are possible online.

Time based data recording enables recalculation even in post processing. Narrow band FFT, CPB spectrum and order tracking information could be shown at the same test run, saving time.





R2D

or

SIRIUS

or

SIRIUSm

CHANNEL SETUP

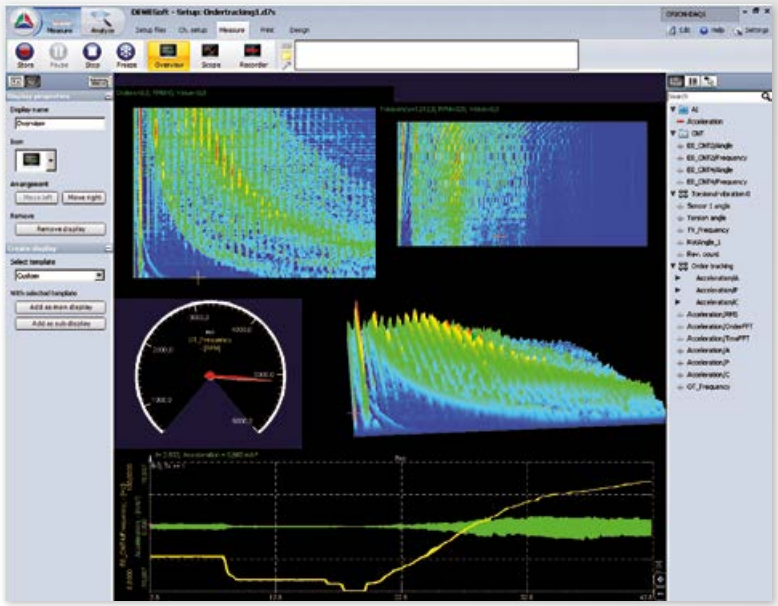
Simply specify the channels to analyze, define the rpm channel and set the parameters for your run. This will only take a few minutes and you are ready for the test.

Immediately after configuration, you will get the calculated results which can be shown in dedicated instruments for analysis and reporting:

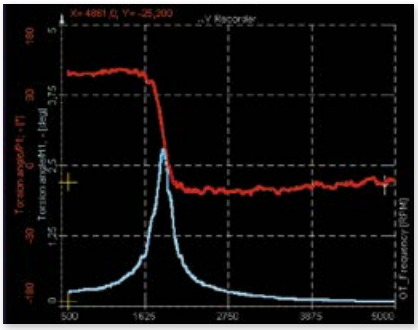
- *Amplitude*
- *Phase*
- *RE- Imag- Part*
- *Order resolution up to 1/64 order*
- *Upper- lower- rpm limits*
- *Extract specific orders for further investigation*

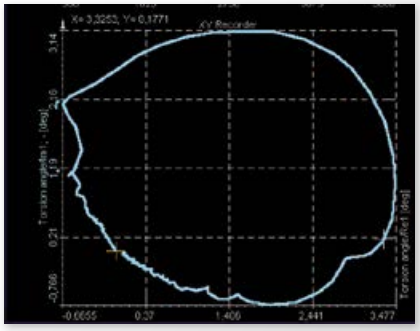
ANALYSIS

In the easy-to-use analyze screens data could be shown and analyzed in many different ways. So you could draw orders or narrow band FFT in 2D and 3D waterfall diagrams. Either displayed with time history or rpm. Specific orders or phase information could be recorded over time, rpm or any other physical value. All analysis screens could be arranged in a convenient way.



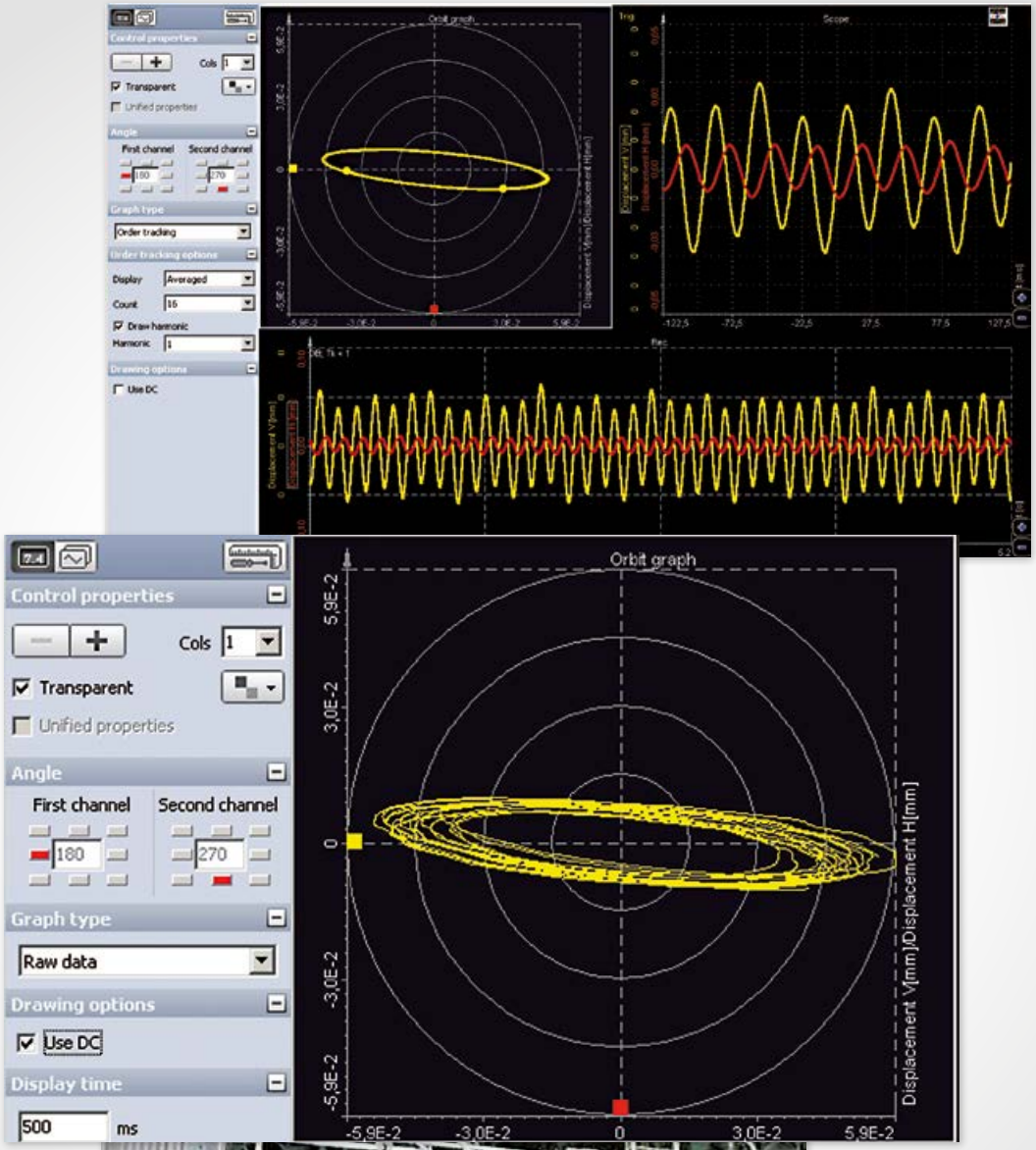
Amplitude or phase is shown over rpm, RE- IM- Part displayed in XY diagram to observe resonant frequencies.

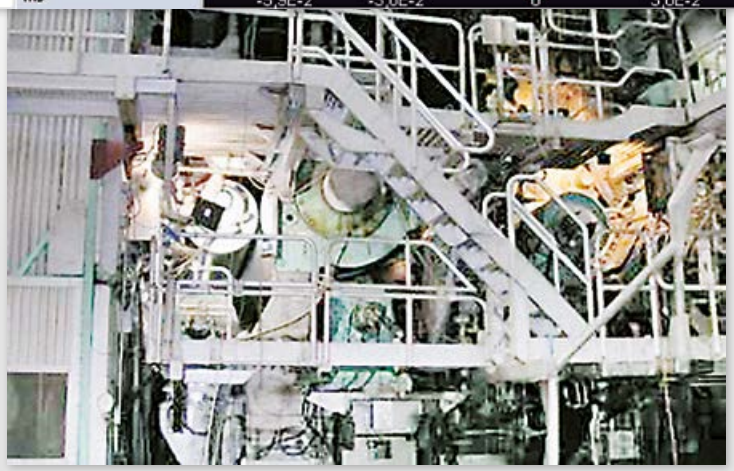




ORBIT VIEW TOGETHER WITH ORBIT TRACKING

In addition, the order tracking module is also used to show an orbit plot which is used to observe bearings or movements of rotating machines. The order tracking module extracts specific harmonics in the orbit view and also averages them.





Example: Paper Mill

Industrial Acoustics

Frequency analysis is a big issue in acoustics. Octave and fractional octave bands are used for this in most cases. The Sound Level plugin (included in the DSA package) provides an extensive choice of tools for frequency analysis, where all weighting functions for time and frequency weighting are implemented.

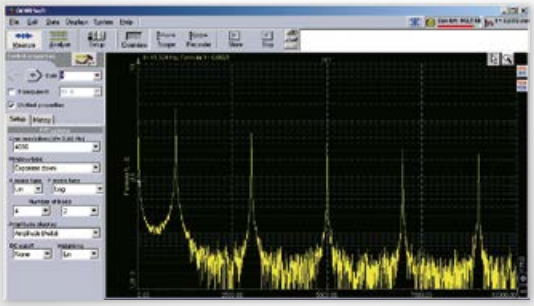
For complex acoustic analysis, advanced measurement tools are available in addition to the standard analysis tools.

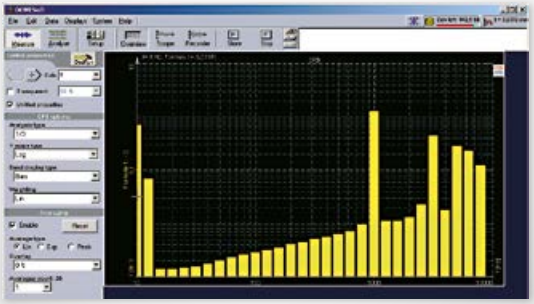
MAIN FEATURES

- *Real time narrow band FFT*
- *1/1, 1/3, 1/12, 1/24 band octave spectrum*
- *A-, B-, C-, D-weighting (frequency weighting)*
- *Fast-, slow-, impulse-weighting (time weighting)*
- *Leq-calculation*
- *Sound level meter*

POST-PROCESSING FEATURES

- *FFT, octave analysis and weighting*
- *Sound level meter*
- *Sound power measurement*

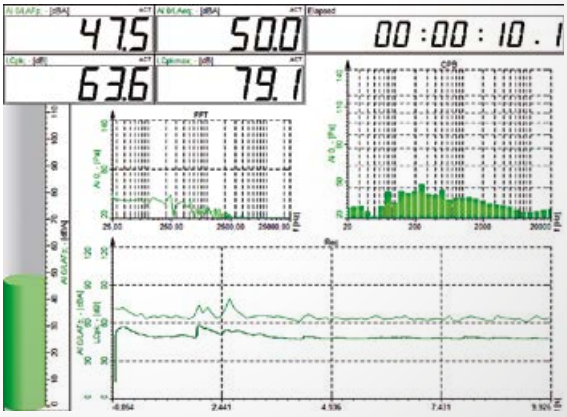




SOUND LEVEL METER

DEWESoft® calculates several parameters online:

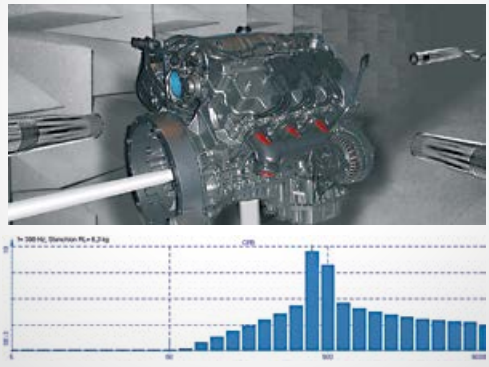
FUNCTION	DESCRIPTION
Lp (8PL)	Time (F, 8, I) and frequency weighting (A, B, C, ...) sound level [dB]
Lpk	Current maximum sound level [dB]
Weighted raw	Frequency weighted (A, B, C, ...) sound level [dB]
Log	Equivalent sound level [dB]
Lim	Pulse weighted equivalent sound level [dB]
Lpkmax	Absolute maximal sound level [dB]
Lo	Sound exposure [dB]
Lmax, Lmin	Maximum and minimum Lp sound level
LAF50, LAF10, ...	Classes for 0, 1, 5, 10, 50, 90, 95 and 90 dB



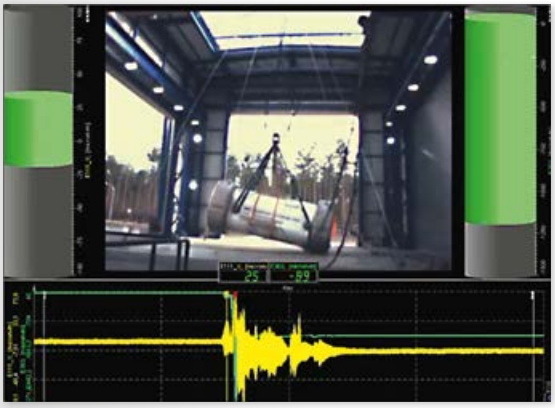
SOUND POWER MEASUREMENT

Sound power measurements are important for noise measurements and qualification of noise emission from machines and products (CE mark). They can be done with two measurement procedures, measuring the sound pressure or the sound intensity. Both are supported with the Sound Level plugin (included in the DSA package). Following corrections will also be done:

- Barometric pressure and temperature (K0)
- Background noise (K1)
- Surrounding correction (K2)
- Measurement area (Ls)



Transient Recorder



*DEWESoft® brings a new faster version of the well-known and reliable SIRIUS hardware. The new version is called SIRIUS*i*-HS (high speed) and has the following highlights:*

- *1 MS/s/ch sampling rate*
- *16 bit resolution*
- *Measurement modules (bandwidth 300 kHz):*
  - *HS-ACC (ACC+): Voltage (+super-counters)*
  - *HS-LV: Low voltage measurement*
  - *HS-HV: High voltage measurement*

SOPHISTICATED TRIGGER FUNCTIONS & ALARMS

The versatile trigger condition setup of DEWESoft® leaves nothing to be desired. The flexible trigger conditions can be used to start/stop the acquisition or to control a digital alarm channel: i.e. You could use this to to stop the engine in case of certain alarm conditions.

When using the data-trigger conditions you can choose to trigger on

- *The real data*
- *Average*
- *RMS (root mean square)*
- *Minimum*
- *Maximum*

It is possible to define a trigger within the Fourier spectrum using a FFT trigger for a certain range of frequency - so you can trigger from frequency and magnitude. Even relative or absolute time as a trigger source can be set to trigger an action. You can always press the manual TRIG button to force an acquisition at any time.

Trigger Types


Simple edge (either rising or falling slope)


Window trigger (two levels; entering or leaving logic)


Pulsewidth trigger (longer or shorter than duration logic)


Window and Pulsewidth (completely selectable as above)


Slope Trigger (rising or falling slope with steepness selection)

ACQUISITION SPECIFICATIONS

ACQUISITION MODES	
Scope/Transient	300kHz bandwidth, 1MS/s, 16 bit ADC per channel, single shot or continuous
Frequency Analyser	Real-time FFT analysis up to 1MHz with simultaneous time domain displays
Signal Averaging	Both time and frequency domain averaging are available to reduce noise and increase resolution

ACQUISITION SPECIFICATIONS	
Transient Memory	Limited by HD size; typical 128 GB
Sweep Length	Limited by HD size; typical 128 GB
Pre-trigger	Limited by internal memory
Post trigger	Limited by HD size; typical 128 GB
Trigger modes	Data/FFT/Time triggers on any channels
Trigger conditions	Simple edge, Window, Pulse width, Slope + any logical combinations
Number of triggers	Unlimited by multi file feature
Bandwidth	300kHz
Filter type	All kinds of software filters

HIGH SPEED STREAMING

Through the entire history of DEWESoft® the performance in storing was one of the most important issues. The PC technology has advanced through the years and we are using all possible resources to get more from the system. We achieve more than 160 MB/second sustained stream rates. Even with such high rates, DEWESoft® can reload large data files in seconds and you can zoom into the data until you see every individual data point.
Even in disastrous events, such as complete power-loss during recording, your data files will not be corrupted. You will lose some of the last samples immediately before the power-loss but you can open the datafile and analyse it without any problem.
Even during recording of the measurement you can freeze the measurement screen and analyse the current data (in the meanwhile storing to the data-file will continue uninterrupted and you will not lose a single data point).

SIRIUSi-HS MODULES








	HS ACC	HS ACC+	HS CHG	HS CHG+	HS STG	HS STG+	HS HV	HS LV
Module Type								
Data Rate (up to)	1 MHz		1 MHz		1 MHz		1 MHz	1 MHz
Vertical Resolution	16 bit		16 bit		16 bit		16 bit	16 bit
Isolation Voltage	1000 V		500 V		1000 V		CAT II 1000 V	1000 V
ANALOGUE								
Input range	±10 V to ±0.2 V		100 000 pC to 1000 pC		500 mV/V to 2 mV/V		±1600 V to ±20 V	±100 V to ±50 mV
IEPE/ICP Sensors	✓		✓		MSI option			MSI option
Sensor (excitation) Supply	4 or 8 mA		4 or 8 or 12 mA, max 25 V		Voltage: 0 to 20 V Current: 0.1 to 60 mA			
TEDS support	IEPE		IEPE		✓			✓
Pt100, Pt1000					✓			MSI option
Thermocouple					MSI option			MSI option
Charge			✓		MSI option			MSI option
Digital								
Counter	0	1	0	1	0	1		
Digital Input Channels	0	3	0	3	0	3		
Digital Output	0	1	0	1	0	1		
CONNECTORS								
BNC	1		1		1		0	Option
DSUB 9	0		0		0		0	1
Banana	0		0		0		1	Option
(Counter) LEMO 7pin	0	1	0	1	0	1	0	0

Aerospace TELEMETRY

INTRODUCTION

DEWESoft® is the next generation of Telemetry Ground Station software for real time telemetry data processing and Mission Control Room Displays with full post mission analysis capabilities. The Telemetry interface is built around the established DEWESoft® user friendly and reliable software to process/display/record critical mission data.
DEWESoft® has based its Telemetry data interface around the IRIG 106 Chapter 10 Ethernet protocol. Along with the real time Ethernet interface DEWESoft® has the ability to read any vendors recorded IRIG 106 Chapter 10 data file. With different hardware solutions any application has a solution to get their data real time into the DEWESoft® platform. Utilizing the Dewe-NET Ethernet option this solution can be scaled from a single portable system to the Launch Control Center at NASA's Kennedy Space Center.

MAIN FEATURES PCM

- *Easy to use interface to setup the hardware and software process the data*
- *Able to bring in Telemetry data from wide variety of sources*
- *IRIG Chapter 10 Processing (Ethernet & .CH10 File) and Record capability*
- *Synchronized PCM, Analog, ARINC 429, GPS, and 1553 data inside of DEWESoft®*
- *Full range of hardware solutions from a USB brick to an entire Ground Station Server.*
- *Integrated drivers for VAR Single Board Receivers and Single Board PCM Processors with Simulator.*
- *PCM Encoder functionality using the DEWESoft® data acquisition hardware*

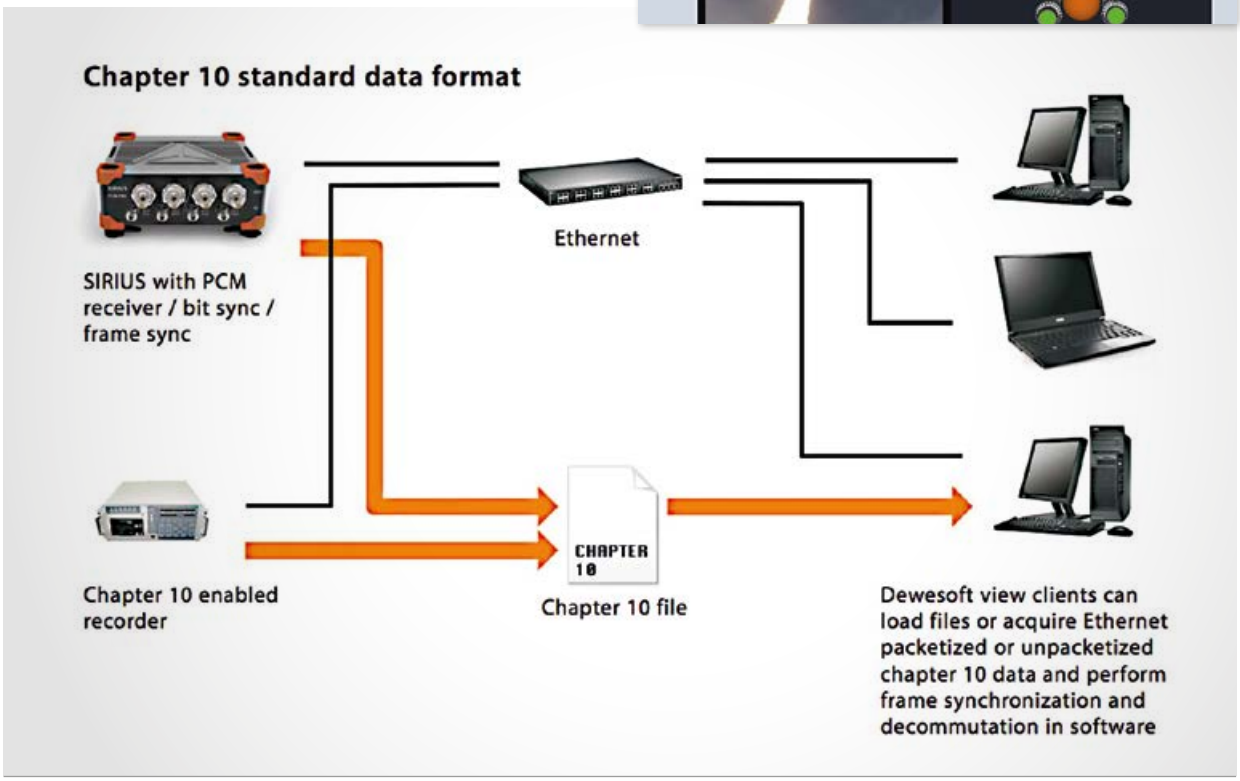
GROUND STATION

The DEWESoft® Ground Station solution is focused on accurate and efficient data processing. Starting with the Ethernet IRIG 106 Chapter 10 interface users can be supplied data from a variety of channels like PCM, Analog, Mil-1553 and Video. This interface gives the users the flexibility to look at a wide variety of data sources on the screen at the same time. With TMATs built into the Chapter 10 structure the software can automatically tell what each data stream is and prepare it for further processing.

DEWESoft® performs real time software based frame synchronization and decommutation on any PCM stream. Capable of extracting multiple embedded PCM streams for decommutation in the software simultaneously. Individual parameters can be defined with easy to interpret setup screens. Once the parameter is defined as a channel all the tools and mathematics of DEWESoft® can be used.

Each sample from a Decom parameter is given an individual time stamp to keep all data within DEWESoft® time correlated. This gives any parameter the ability to have independent math functions performed on the data real time for the user. The DEWESoft® solution gives the user the ability to store their data in a magnitude of ways to meet any mission requirement. One way is to store a DEWESoft® data file (D7D) which can be analyzed by anyone free of charge using DEWESoft® analysis section of the software. DEWESoft® is also able to store the raw frame data in an IRIG 106 Chapter 10 data format. Chapter 10 files are stored in such a form that they can later be replayed by any Chapter 10 recorder.

Utilizing Ethernet connections, data can be transferred between any number of hardware systems. Each client is given the ability to setup, display and record their own data subset in real time. The Ethernet connection allows for data real time data transmission to any number of view client computers. Within a single package, users can process multiple telemetry streams while displaying & recording the decommutated data in visually stunning displays.



VARIETY OF HARDWARE

The DEWESoft® has a wide variety of hardware it can interface with in the Telemetry Market. Using the Chapter 10 interface any Telemetry data recorder can be used to feed data real time over Ethernet or a prerecorded file to DEWESoft®. This gives the user the ability to only have to learn a singular software package for data Analysis.

The DEWESoft® Frame Sync box allows users to bring in up to 40 Mbps Clock & Data signals into a platform independent solution. The Frame Sync box can receive to independent data streams into a single system. The units can then be daisy channel together to allow for higher channel counts.

The USB interface and size of the Frame Sync box allow this product to go out be tossed in a backpack with a standard Windows laptop for a flight line checkout. When combining this product with a portable computer or the DEWESoft® SBOX this solution can provide telemetry data processing in the aircraft and provide the pilot a visual display of the Telemetry data real time. This giving the ultimate flexibility to the engineer to solve their mission requirements.

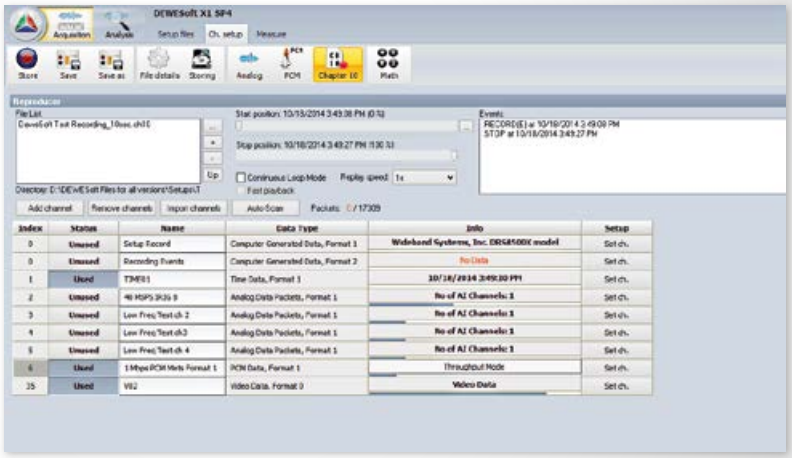
What makes DEWESoft® unique in Market is the ability to combine standard DEWESoft® Data Acquisition solutions with Telemetry data, Aircraft Bus data, Video. This giving the end user the flexibility to only have to invest their time into learning a single easy to use software interface for a variety of solutions.

CHAPTER 10 INTERFACE

With the scalability of DEWESoft® the user can take the entire ground station capability into one computer. DEWESoft® utylized the IRIG-06 Chapter 10 standard file and real time Ethernet format to bring in variety of data types simultaniously.

Interface with Chapter 10 file & Ethernet packets real time consisting of

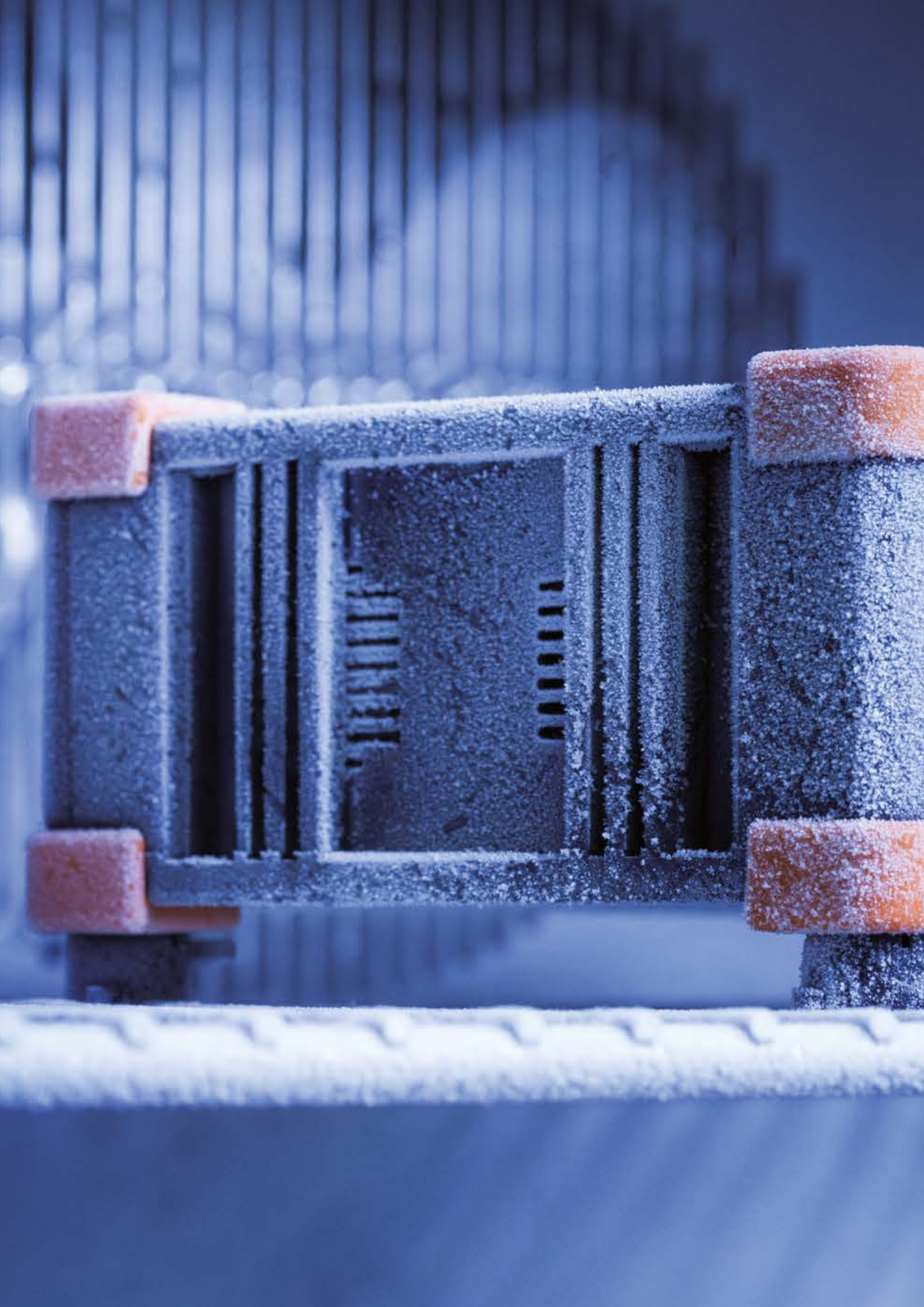
- *PCM Data (unpacked, packed and throughput)*
- *Mil-1553 and ARINC-429 BUS Data*
- *Video (Ch10 Channel and Embedded in PCM stream)*
- *Ethernet & UART Data Channels*
- *Analog Channels*
- *TMATS (setup channel)*
- *Timing (absolute time)*

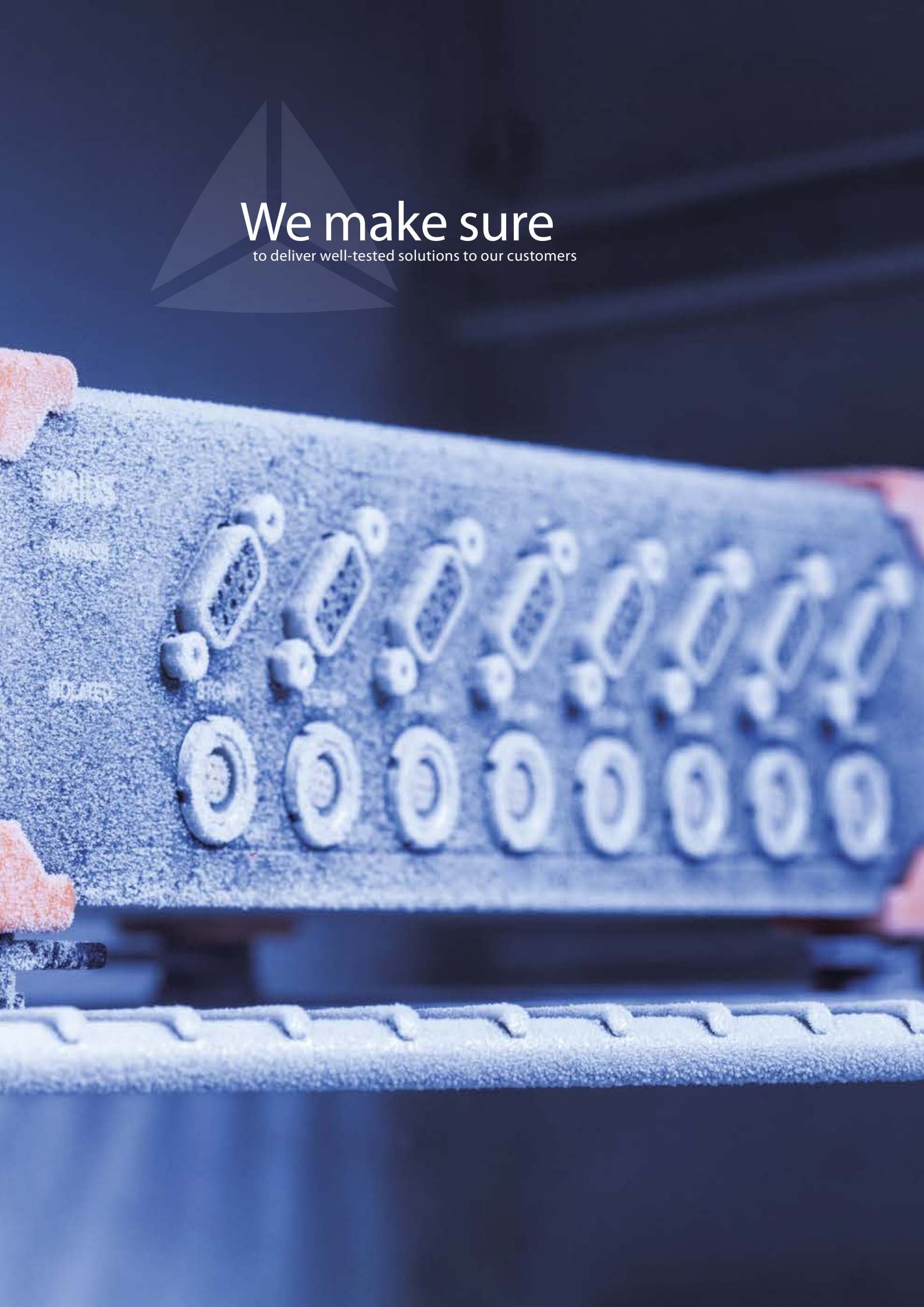


PCM ENCODER

DEWESoft® has the ability to acquire and synchronize a magnitude of different types of signals like analog, GPS, IRIG time, 1553, video, ARINC 429 and many others. Once the data has been acquired by DEWESoft® it can be encoded into a PCM data stream real time. Thus creating the perfect solution for a flexible and scalable PCM Encoder system.

This solution helps the user in a variety of ways from easily creating a PCM stream over trying out new sensor configurations to simulating a vehicle on the launch pad without tying up expensive flight hardware. This capability can also be used to correlate and record the stray analog signals from receiver AGC strengths to the communication links in the ground station.




We make sure
to deliver well-tested solutions to our customers

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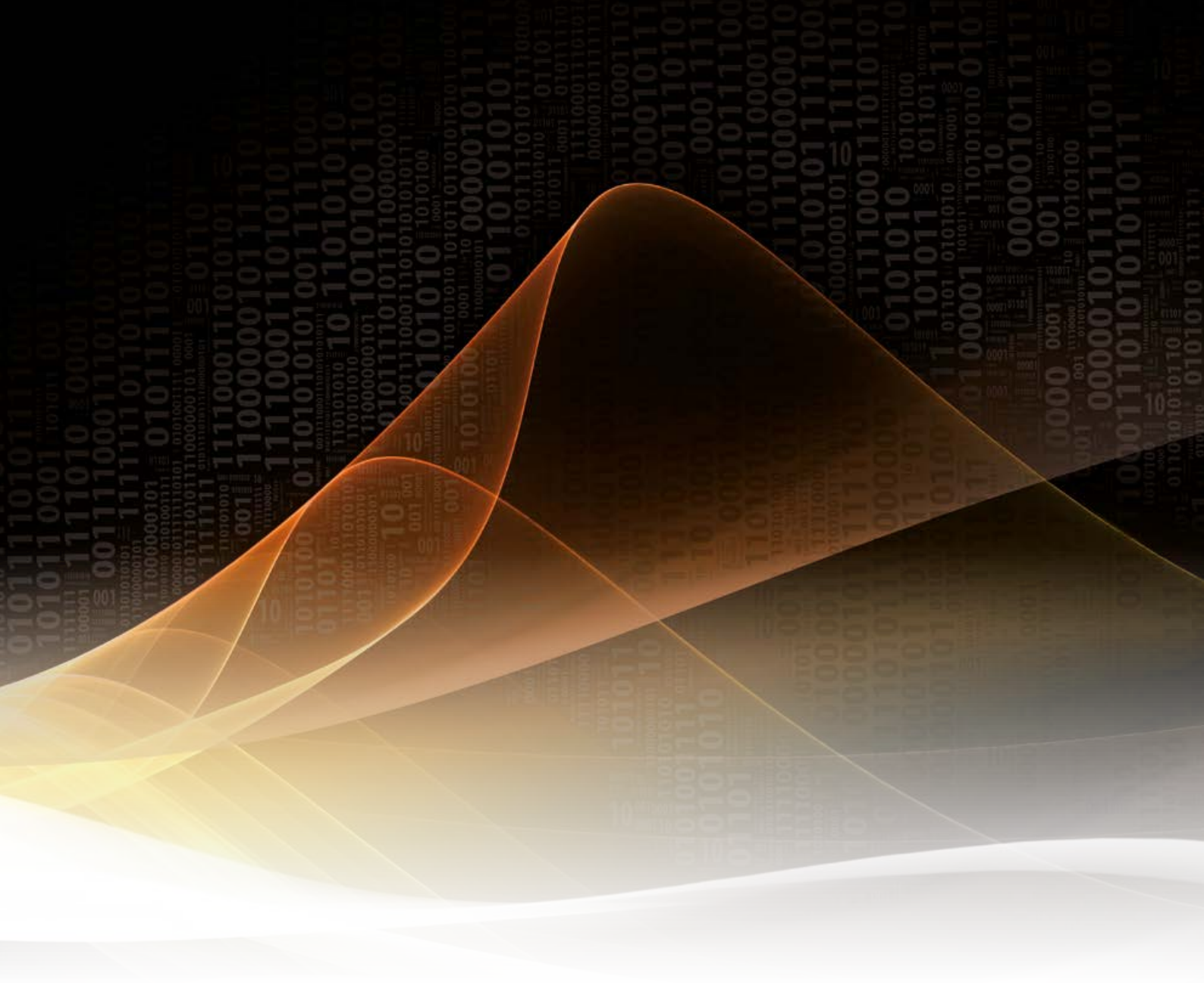

DEWESoft®

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