INSTRUMENTS

SOFTWARE

APPLICATIONS

DEWESoft X3

- *Easy to use*
- *Free lifetime upgrades and free for analysis and processing*
- *Deep in functionality*
- *Included with every DEWESoft instrument*
- *No hidden costs, licensing model*
- *Built-in sequencer*

Triggered storing
Current
Acceleration
J1939
Open math interface
Frequency
Gige
PCM telemetry
Potentiometer
User input
Temperature
MIL 1553
CAN
Photron
Flir thermovision
Torque
Digital in
Serialcom
Mass flow
DirectX
Function generator
OBDII
Pressure
Sound pressure
CAN FD
Hold off
Storing
Delta amplitude
Kiroad
Ethernet
iNET
Relative time trigger
Data manager
Networked data acquisition
Displacement
Filtered edge trigger
Reduced storing
XCP
Window
Synchronisation
Text file import
Slope
Relative time trigger
Post trigger
Distributed storing
Window and pulsewidth
Instant file loading
Analog output
Post time extension
AK test bed
Pre trigger
Simple edge trigger
Velocity
Open export interface
Siemens S7
FFT trigger
> 500 MB/sec continuous streaming
Multifile
Absolute time trigger
PID control
Pulsewidth
QR code reader
Digital output
Alarms
Modbus
File cleaner
Open visual control interface
Sequencing
Automation
EtherCAT®
DCOM interface
Remote control
Open plugin interface

OPC UA®
Chapter 10
Mass
Stress
Force
Angle
Arinc 429
Signals
Strain
Eye tracking
Weather station
Inertial platforms
TEDS
J1587/J1708
Video
Resistance
GPS
User input
Voltage
CCP

Data analysis

Correlation
Statistics
Sound level meter
IIR filter
Angle sensor math
Reference curves
Counting
Formula
Exact frequency
Modal test
FIR filter
Fusi
Human vibration
Derivative
Integral
Cepstrum
Combustion analyzer
Envelope detection
Order tracking
Latch
Balancing
Polygon
Psophometer
Short time Fourier transform
Classification
Frequency domain filtering
CAPS/ACC
Octave analysis
Torsional vibration
Rosette
Fatigue analysis
Combusion noise
Power analyzer
Tracking filter
Shock response spectrum
Vector constant
FFT analyzer
Octave display
Sine processing
Orbit display
Acoustic weighting filters
XY recorder
Fourier transformation
Visualisation
Matrix constant
Vehicle dynamics
Scope
3D graph
FFT display
Polygon 3D
Overload indicator
Harmonic display
Bar meter
Attitude indicator
Cambpell plot
Rotor balancer
Recorder
Video control
Static image
HDF5
Input control display
FRF geometry
Digital meter
Vector scope
Tabular display
Modal circle
2D graph
Digital indicator
Analog meter

RPCIII
SDF
KML
Famos
BWF
Diadem
Flexpro
Matlab®
Autoexport
TDM
Export
Wave
Vertical recorder
Discrete display
Text/CSV
NSoft
WFT
Universal file format
Sony

DEVICE I/Os

General I/Os

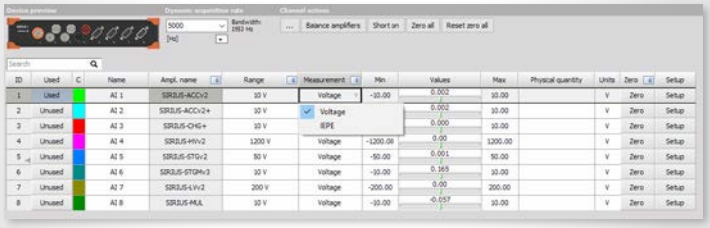
ANALOGUE INPUTS

Voltage, current, temperature, vibration, strain gauges

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 analogue channels with sampling rates from kS/s to MS/s up to 24 bit vertical resolution are supported.

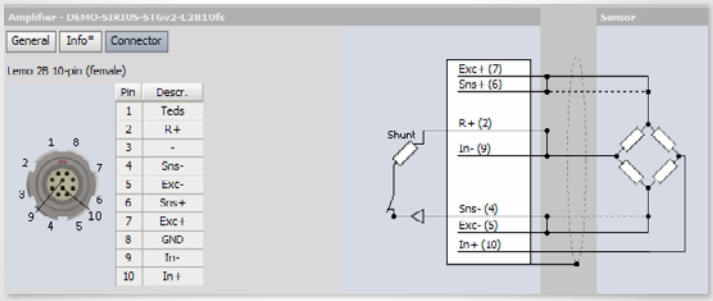
CHANNEL SETUP GRID

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.



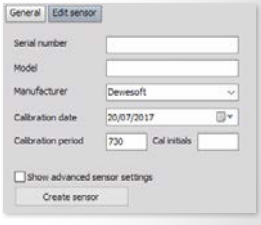
CONNECTOR WIRING DIAGRAMS

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.



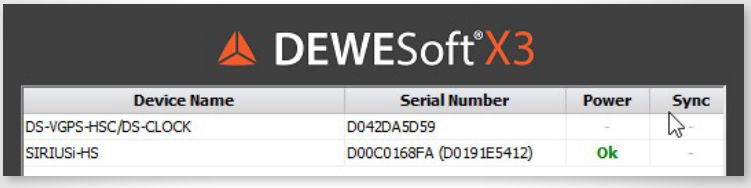
CREATING SMART SENSORS (TEDS)

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

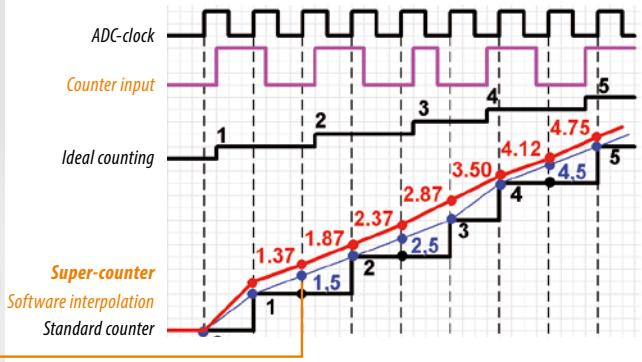
When plugging in the USB connector, the power and synchronization status of the system is checked and displayed. This self-check helps identifying if all cabling is done correctly.



COUNTER INPUTS

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.

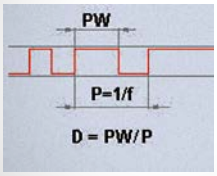
From basic counting to advanced counter modes



DIGITAL INPUTS

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

WAVEFORM TIMING



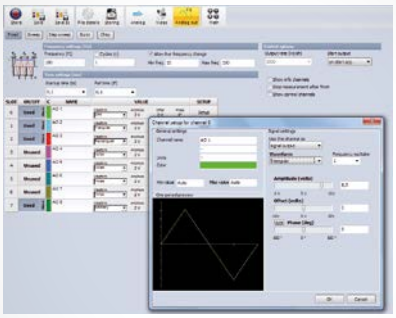
period, pulsewidth and duty cycle

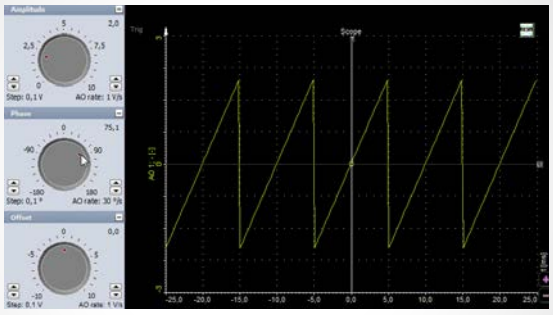
EVENT COUNTING

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

FUNCTION 2: FUNCTION GENERATOR (MODAL/SHAKER CONTROL)

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

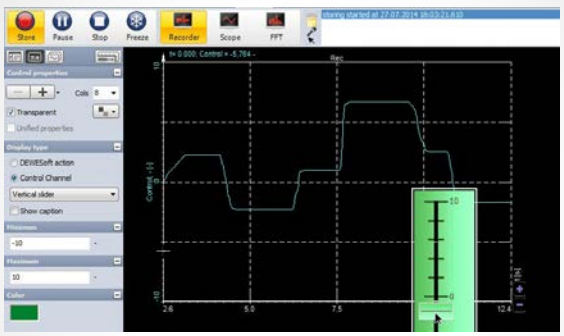


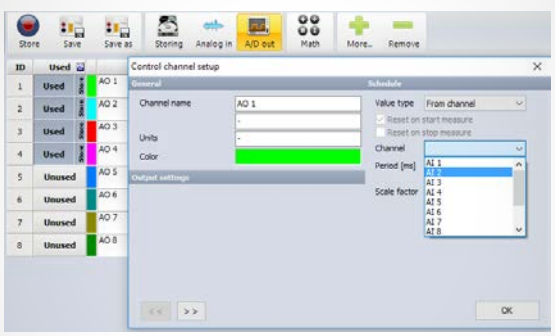


FUNCTION 4: CHANNEL OUTPUT

You can output any DEWESoft channel (even math or CAN channels) to the analogue out BNC connectors. Also manual channel control is possible during LIVE measurement:

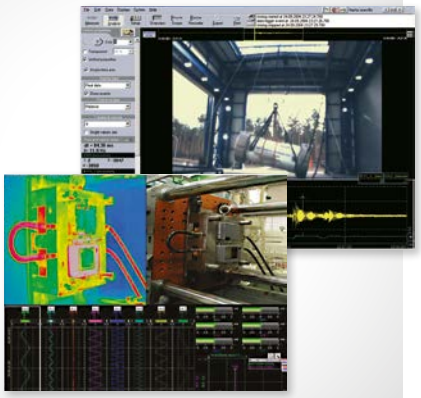
Choose from many different instruments like bar, turn knob, button or text box…





VIDEO INPUT

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



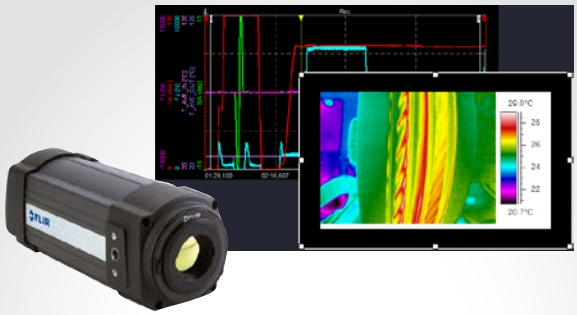
For applications requiring video which is truly synchronized to the dynamic sample rate, there is support for DS-Cameras. A high quality image with automatic shutter speed (selectable) is controlled directly by the A/D card, which generates a pulse to drive the camera. The result is a stunning correlation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

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

GIGE

Plugin supports GigE vision cameras which are directly connected to the Gigabit-LAN port of your system. DEWESoft is clocking the camera to synchronize with other inputs.
Cameras are directly connected to the Gigabit-LAN port of your system. In triggered mode, DEWESoft is clocking the camera.

FLIR THERMOVISION



Plugin adds support for data visualisation, analysis and storage of FLIR Thermovison cameras (models: A300, A310, A315, A320, A325, A615, SC305, SC325, SC645, SC655).

- *FLIR thermovision cameras support*

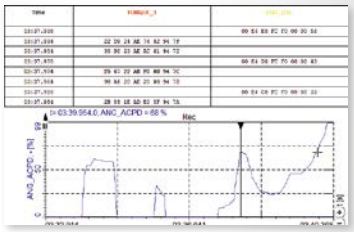
PHOTRON

Adds video support for Photron hi-speed cameras. Allows video data acquisition of megapixel image resolution recording at up to 20,000 fps and up to 2.000.000 fps with limited resolution (depends on camera model). Video is fully synchronized with other data sources. Supports software or external triggering.

- *multiple camera support*
- *fully synchronized*

VEHICLE BUS INTERFACES

CAN, OBDII on CAN, J1939 and J1587 interface support



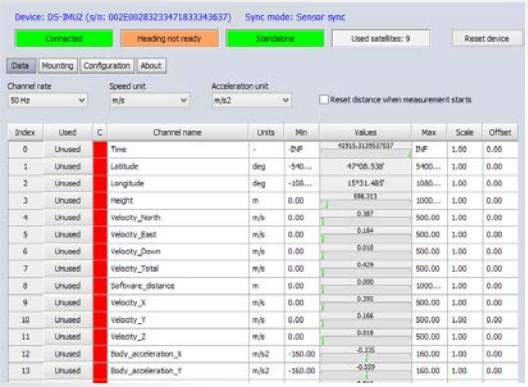
One of the most important vehicle buses today is the CAN (controller area network) bus. DEWESoft® X supports following CAN devices: DEWE-43A, DS-NET, DS-CAN-2 and SIRIUS. Today the CAN bus is present in cars, trucks, boats, tanks, tractors, harvesters and basically anything which has a modern engine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

GPS INTERFACES

Advanced GPS support and capabilites

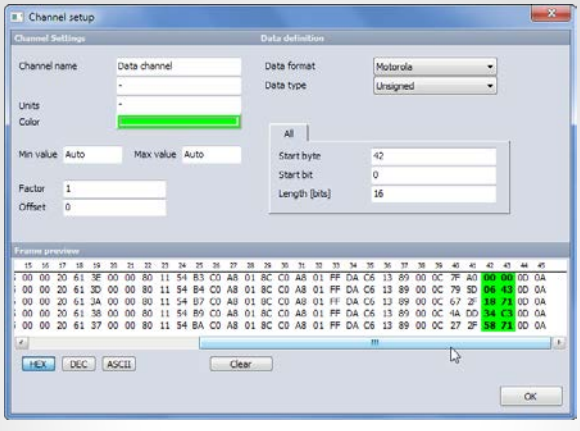
GPS technology is used in three main application areas: to find the position on earth, to determine the velocity of an object and to get precise absolute time information.
DEWESoft® X uses all three areas. For basic positioning, DEWESoft® supports NMEA 0183 GPS interfaces. If you have a GPS receiver which sends the data according to NMEA 0183 specification, it will work in DEWESoft® up to a real-time rate of 500 Hz.

DS-IMU PLUGIN



- *Fast and easy configuration of DS-IMU2, DS-IMU1 and DS-GYRO1 products*
- *Correction of alignment offset and GNSS antenna offset*
- *Additional calculation of position, velocity, acceleration, slip angle for 5 additional reference points*
- *Multiple instances of DS-IMU and DS-GYRO products are supported*

ETHERNET RECEIVER



Ethernet sniffer with simple filtering capabilities and data decoding in order to extract data channels from ethernet streams. Streams can be filtered by various parameters like MAC and IP addres, source and destination port or by manual data filters.
Supports many data encodings: intel, motorola, signed, unsigned, IEEE float:
Linear and non-linear (polynomial) scaling is possible.

- *can receive multiple ethernet streams*
- *different filters capabilities (TCP/IP, UDP, data filter,...)*
- *data decoding with various formats (intel, motorola, float, signed,...)*
- *linear and non-linear scaling*

Automotive I/Os

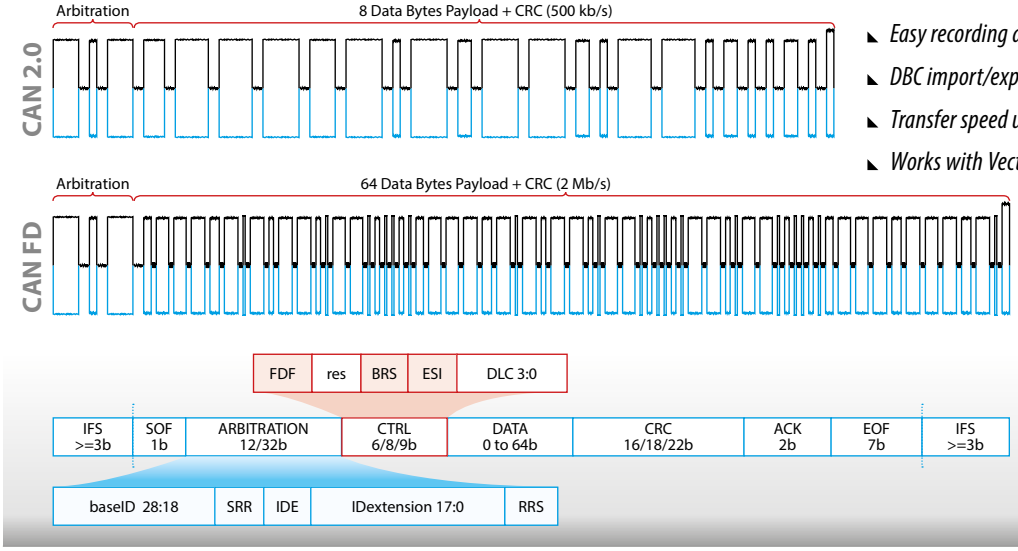
CAN

- *Easy recording and analysis of CAN traffic*
- *CAN standard/extended messages*
- *DBC import/export functionality*
- *J1939 support*
- *Possibility of online/offline decoding (storing just CAN bus traffic)*
- *Option of file replay (.csv transmit) through CAN output*

OBDII

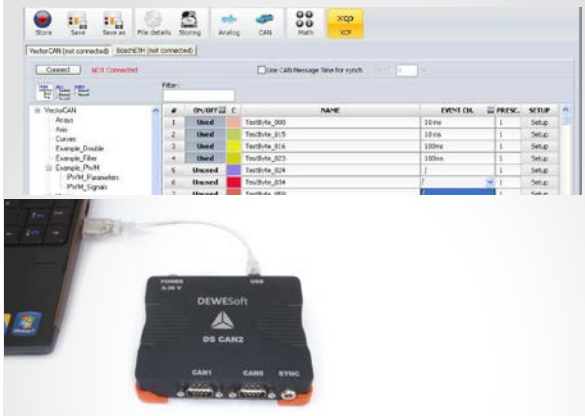
- *Access to the various vehicle subsystems*
- *Low sampling rate*
- *Available as Dewesoft CAN plugin*
- *OBDII on CAN support only (pins 6 and 14 on car connector)*

CAN FD



- *Easy recording and analysis of CAN FD bus*
- *DBC import/export functionality*
- *Transfer speed up to 12 Mbit/s*
- *Works with Vector CAN FD hardware*

XCP/CCP



Plugin enables data acquisition from Electronic Control Units (ECUs) supporting CCP or XCP (over CAN or Ethernet) protocol. No additional HW is needed except CAN/Ethernet port. Also no knowledge about XCP or CCP protocol is required. What is needed is a2l file with parameters definition and unlocking dll file with Key&Seed algorithm if device is key protected. Both should be provided by ECU manufacturer.

- *XCP protocol (over CAN or Ethernet)*
- *CCP protocol*
- *Multiple ECU support*

FLEXRAY PLUGIN

Plugin for FlexRay system bus, with FIBEX library import option, mainly designed for use in automotive industry. All Vector FlexRay cards are supported.

- *decodes FlexRay bus*
- *FIBEX support*
- *works with Vector FlexRay cards*

KiRoad / RoaDyn2000

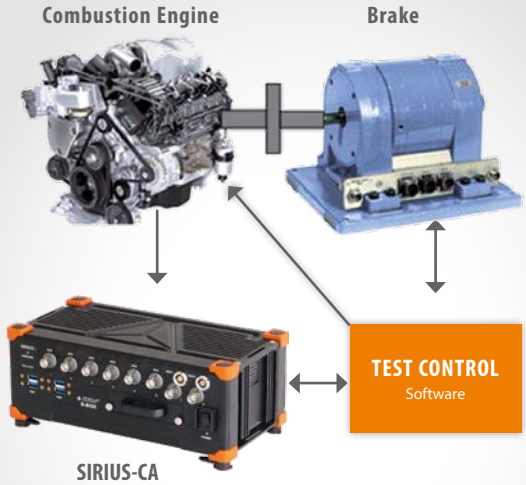
It enables precise measurement of forces and moments, each represented as three vectors in an orthogonal reference system. Device is fully synchronized with other data.

- *sampling rate up to 1250 Hz*
- *HW synchronization*

ETHERCAT TEST RIG INTEGRATION

- *Connection of Ethercat test rig controller together with DEWESoft hardware via single cable -> cost reduction due to less cables and no need of controller analog inputs*
- *Real-time signal processing for load analysis feedback (over EtherCAT) and simultaneous data recording inside DEWESoft SW*

TEST BED PLUGIN



The communication to the test bed server is implemented as a dedicated Plug-In (IndiMaster 670 compatible).

Supported RS232 and TCP/IP connection protocols:

- *AK Protocol*
- *Puma Open AK*
- *D2T AK*
- *Tornado AK*

Aerospace I/Os

AEROSPACE INTERFACES

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

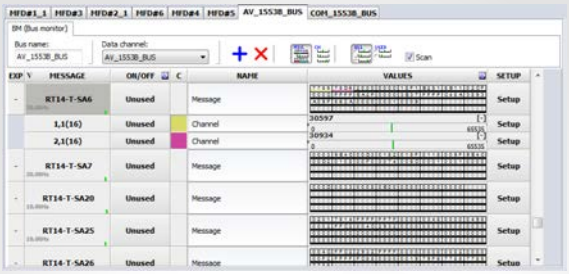
Aircrafts as well as space vehicles such as the US Space shuttle acquire on-board data, digitize them, then send the data to ground stations. They do this via pulse code modulated data stream, also known as PCM. DEWESoft® supports the Ulyssix Tarsus PCM-01 card to decode, visualise and store this PCM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

CHAPTER 10 PLUG-IN

Ethernet sniffer with simple filtering capabilities and data decoding in order to extract data channels from ethernet streams. Streams can be filtered by various parameters like MAC and IP addres, source and destination port or by manual data filters.
Data can be encoded by different formats: intel, motorola, signed, unsigned, IEEE float:
Linear and non-linear (polynomial) scaling is possible.

- *capability to record and playback IRIG-106 Chapter 10 files*
- *capability to receive and send Chapter 10 UDP Ethernet packets*
- *complete, all-in-one processing and recording package*

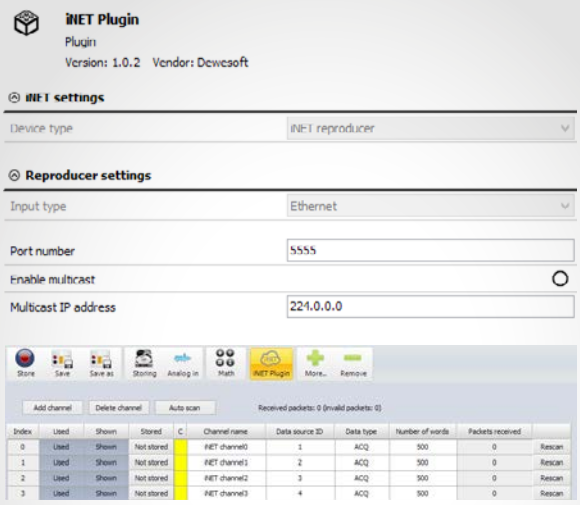
ARINC429 - MIL1553



Handles multiple ARINC 429 and MIL-STD-1553 data-buses. It can capture, filter, display and record data bus traffic. It includes extensive possibilities to convert binary data to user recognizable format. In addition to read and store bus data it can also transmit data to the bus. It provides easy to use transmit schedule designer for ARINC 429 and frame designer for MIL 1553 bus controller functionality.

- *AltaDT and Ballard HW support*
- *Chapter10 input support*
- *RX and TX support (ARINC 429)*
- *BM (bus monitor) and BC (bus controller) support (MIL 1553)*

iNET PLUGIN



iNET plugin captures iNET compliant data using iNET network packet protocol. More specifically, the plugin complies with the TTC NPD data packet protocol version 3 which evolves towards compatibility with the iNET standard for network packet protocols. The NPD message protocol is an application-layer protocol that operates on top of the standard IPv4 over Ethernet network protocol and UDP transport protocol. Each NPD packet contains a 20-byte NPD Packet Header followed by one or more NPD Data Segments containing the actual data (such as ACQ carrying PCM analogue acquisition data). The iNET plugin can operate by capturing the iNET data from a local UDP port or by joining the specified multicast address and capturing a multicast iNET data stream.

- *capture and store iNET compliant data*
- *autodect incoming iNET streams and data types*
- *capture data from local UDP port or by joining multicast session*
- *capture iNET data from multiple NICs- capture and store iNET compliant data*

PCM PLUG-IN

PCM plug-in includes the bit sync, frame sync, decommutation, PCM encoder and simulator for PCM data sources. These sources can be from hardware icluding the DEWESoft PCM-FS2, Ulyssix cards or Chapter 10 plug-in. It can decode several thousand channels from those interfaces, supports embedded streams and FFIs. The data are again perfectly synchronized with the use of IRIG to the analogue data and video streams.

- *Bit sync, Frame sync, Decommutator, PCM Encoder and Simulator*
- *DEWESoft PCM-FS2, Ullysix cards and Chapter 10 support*
- *Embedded streams, FFIs support*
- *Digital recording with full analysis playback*
- *perfectly synchronized with the use of IRIG*

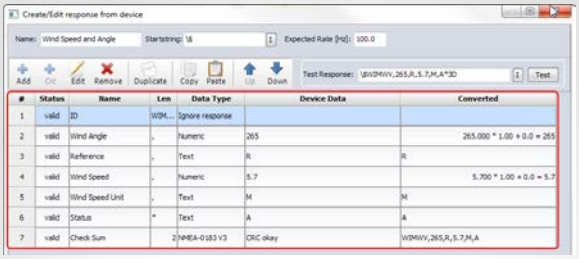
Industrial I/Os

S7 PLUGIN

S7 plugin communicates with Siemens PLC devices via Siemens S7 protocol over Ethernet. Direct communication between plugin and PLC devices, therefore no Siemens licenses are required. Read & write* supported. All S7 data types supported (Bool, Byte, Char, Word, Int, DWord, DInt, Real, Date, Time Of Day, Date_Time, String). Plugin is capable of communicating with multiple PLC devices simultaneously.

- *communicate with Siemens S7 PLC devices*
- *read & write* supported*
- *all S7 data types supported*
- *simultaneous communication with multiple PLC devices*

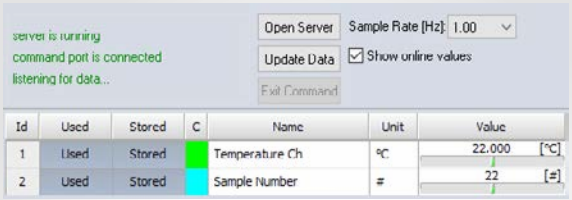
SERIALCOM



A generic plugin for Serial Communication (RS232 and compatible). It can receive serial data and extract text or numeric data from the byte stream. You can also send data to the serial device (e.g. on start of storing or every X seconds, ...).

- *Generic protcol definition (ASCII or Byte protocols)*
- *Read and write text from serial devices*
- *RS232 and compatible devices supported*
- *Check sum calculation possible (Check-sum, XOR, CRC)*
- *Automatic mode or polling*

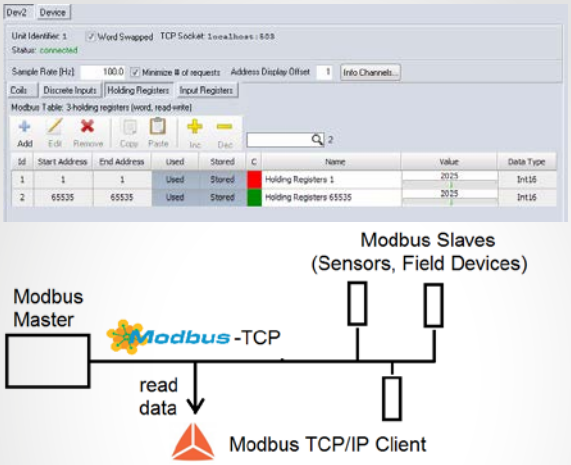
TCP/IP BINARY CLIENT



The DEWESoft® TCP/IP Binary Client plugin can receive data from external applications (e.g. LabView, ...) via TCP/IP and add this data to DEWESoft® channels. The external application must send the data in the protocol specified in the documentation: i.e. the software-team of the external application must do some programming to make their application talk to this plugin.

- *allows external programs to add data to DEWESoft®*
- *proprietary TCP/IP protocol*

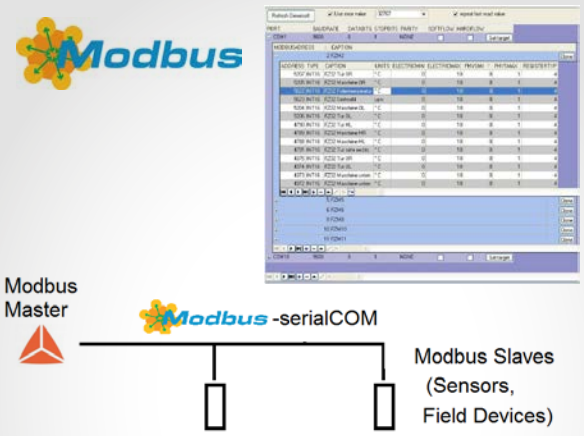
MODBUS TCP/IP CLIENT



The DEWESoft® Modbus TCP/IP plugin can read Modbus channels over TCP/IP. It supports Boolean, Int16, Int32 and Float32 (including Word-Swap) datatypes. Note: writing to the Modbus device is currently not supported.

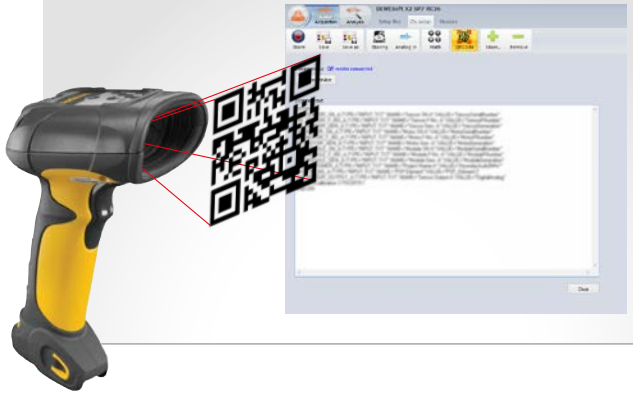
- *Read Coils and Registers*
- *Modbus TCP/IP*
- *Word-swap support*

MODBUS RTU



Read data from measurement devices over Modbus RTU protocol (multiple serial COM ports are possible), ASCII protocol is not supported.

QR CODE PLUGIN



QRCode plugin serves for scanning the barcodes and storing their content into the Dewesoft data header. The plugin supports both 1-D as well as 2-D barcodes, such as QR code and Data Matrix. Both handheld scanner and camera modes are supported.

- *scan linear barcodes, QR codes and Data matrices*
- *store barcode content into the Dewesoft data header*
- *both handheld scanner and camera modes supported*

Sensor I/Os

NMEA WEATHER STATION

This plugin supports one NMEA compatible Weather Station Device (e.g. Vaisala WXT520) via RS232 interface. Currently MWV and XDR messages are supported. The device must be configured to send the data automatically.

- *NMEA Weather Station support*
- *RS232*
- *MWV, XDR sentences*

MARCATOR

Enables data acquisition from MAHR digital callipers and dial indicators. Supports wire (USB) and wireless devices.

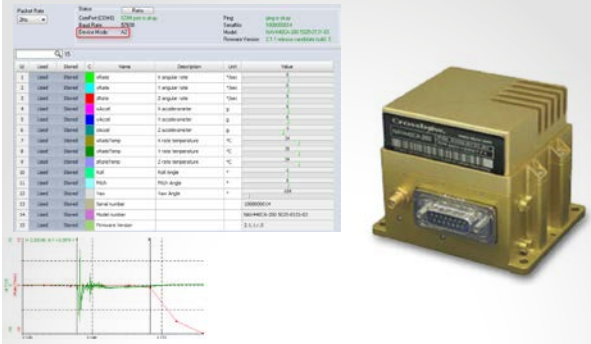
- *adjustable update rate*
- *multiple device support*

ADMA

The Adma device is a high speed/high performance gyro platform used in automotive industry to measure absolute position, velocities, accelerations, angles (yaw, pitch, roll) and angular velocities. The interface allows full control, initialisation and setup of the platform. The data is perfectly synchronized to all other data sources.

- *SW or HW synchronization*

CROSSBOW 440



The DEWESoft® plugin for CrossBow 440 Series Inertial System can read angular rates, accelerometer and temperature data from the CrossBow device at user definable sample rates.

- *angular rates*
- *accelerometer*
- *temperature*

MICROSTRAIN 3DM-GX3

DEWESoft® plugin for the Single Byte Command API of Microstrain® 3DM-GX3® Miniature Attitude Heading Reference System. Pitch, Roll, Yaw are calculated. Note: the newer MIP protocol is NOT supported by this plugin: use the Microstrain-MIP plugin instead!

- *Read acceleration, angular rate, magnetometer and orientation matrix.*
- *Pitch, Roll, Yaw are calculated.*
- *Sample rate up to 1 kHz.*

MICROSTRAIN MIP

This plugin supports the Microstrain® MIP protocol. It was developed with a 3DM-GX4-45™ sensor. 3DM-GX4-45™ is a high-performance, miniature Inertial Navigation System (INS) that combines micro inertial sensors and a high-sensitivity embedded (GPS) receiver. The plugin supports most of the IMU, GPS and EF (Extended Kalman Filter) data-packets and some initialisation commands.
The plugin should also work with other MIP sensors (i.e. 3DM-GX4-35™, 3DM-GX4-25™).
Note: there is also another plugin "DEWESOFT-PLUGIN-MICROSTRAIN" which supports the older byte-based protocol.

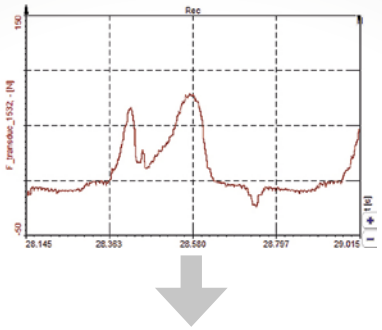
- *support for Microstrain® sensors that use the MIP protocol*
- *support for IMU, GPS and EF data packets- support for IMU, GPS and EF data packets*

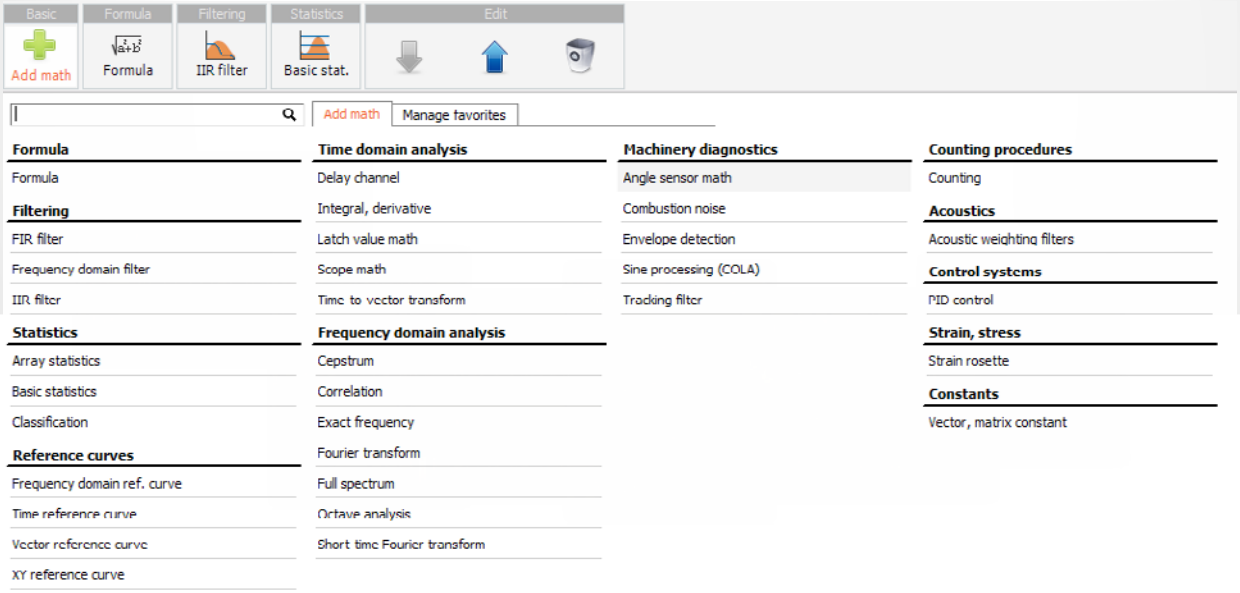
GRS-1

Plugin for Topcon GRS-1 devices (portable W-LAN GPS with RTK option). The plugin supports TCP/IP and UPD. RTK allows for submeter accuracy (i.e. in combination with the ADMA plugin).

- *portable GPS/RTK*
- *WiFi (TCP/IP, UDP)*

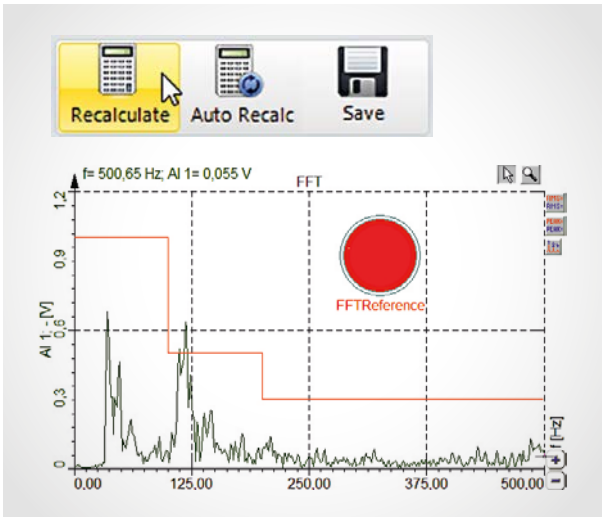
DATA PROCESSING



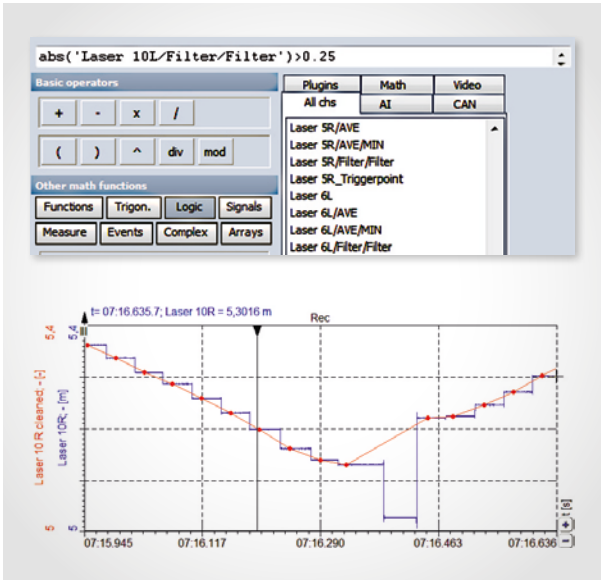


Over the past years we have covered lots of application areas with expert modules, so that the user is only a click away from the total solution. But also the standard mathematic is very powerful, and sometimes underestimated.

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!



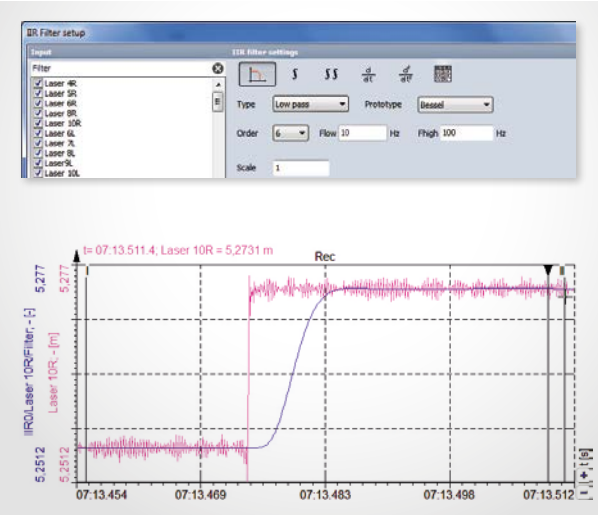
Imagine you have a big data file of a long-term battery test. With the formula mathematics you can define logical conditions (e.g. if current > 10A AND temperature > 70°C) to quickly find the positions you are interested in. By the way, it's also possible to exclude faulty data points, such as spikes,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

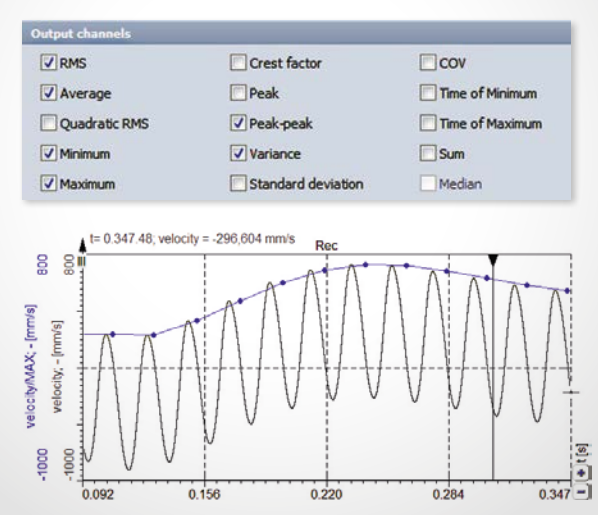


Furthermore, often used functions like delta time measurement between two signal edges, counting how often conditions appear, or holding the signal value on a condition and many more are already prepared. Use the complex section to split a signal into real and imaginary part, while the array section 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.

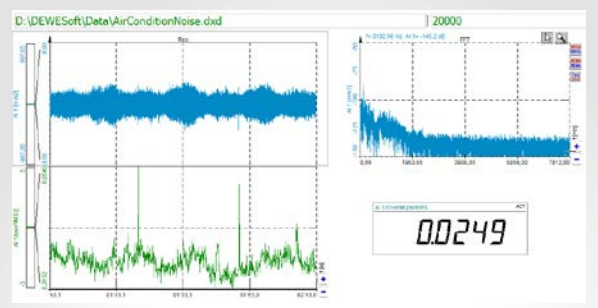




MATH FEATURES

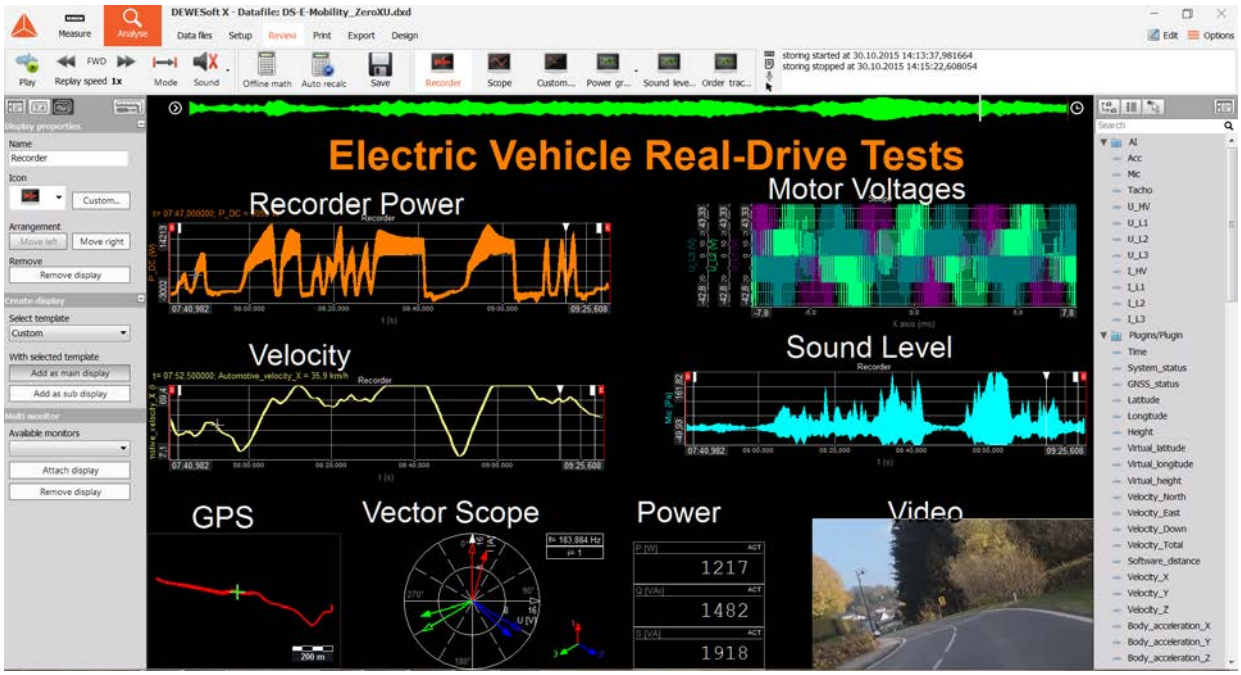
- *Filtering (FIR, IIR, FFT filter, integration, derivation, …)*
- *Logical conditions*
- *Basic Statistics (RMS, AVG; Min, MAX, …)*
- *Advanced Statistics (Std deviation, variance, classification, counting …)*
- *Reference curve (time, XY and frequency domain)*
- *Converting time-based to angle-based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

PSOPHOMETER



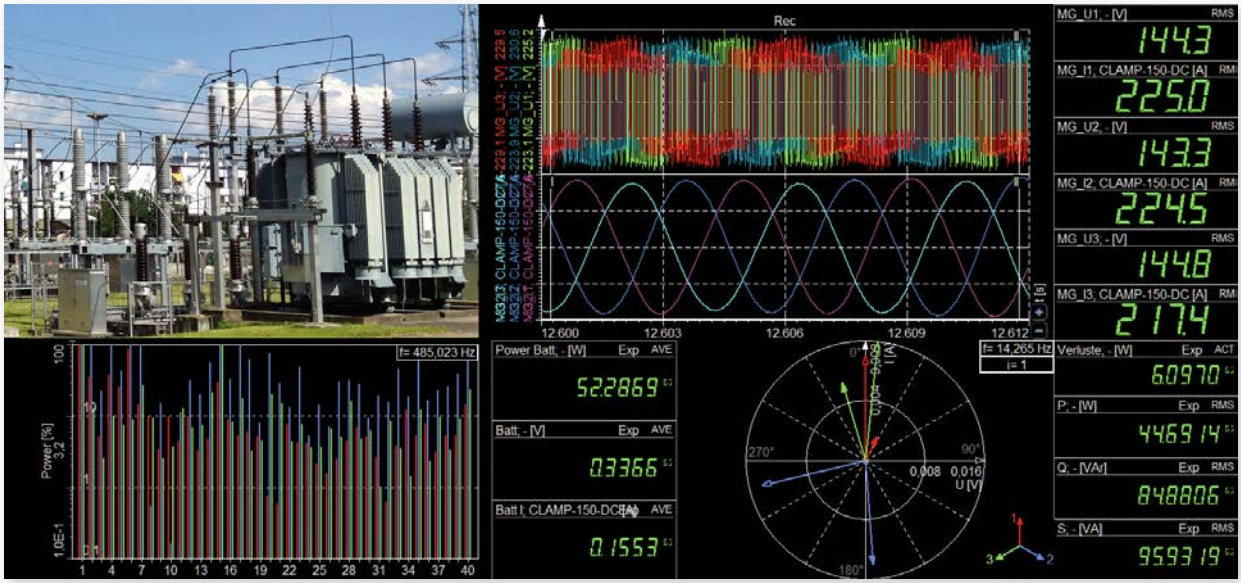
Psophometer is used for testing telecommunication equipment. It shows us audible effects of disturbing voltages of various frequencies. Psophometer uses weighting network in frequency domain.

Power Analysis

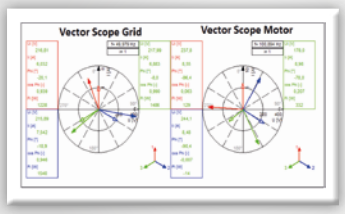


The POWER option of DEWESoft® is an absolutely high-performance tool for the calculation of power, harmonics and all related parameters. This toolbox is an excellent combination of many features and nearly all applications can be realized by using DEWESoft® hardware.

The unique system architecture of the DEWESoft® Power Analyser makes it possible to fulfill a couple of tasks within just one device. The DEWESoft® Power Analyser combines the functionality of a Power Analyser, a Combustion Analyser, a Data logger, a Scope, a Vector Scope, a Transient Recorder and an FFT – Harmonics Analyser. Acquiring different signals (analog, digital, counter, CAN, video etc.) simultaneously from different sources with different sampling rates and storing them in one file allows comprehensive, not yet experienced analysis for all types of applications.

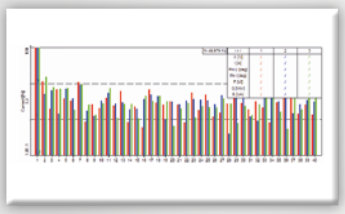


POWER ANALYSIS



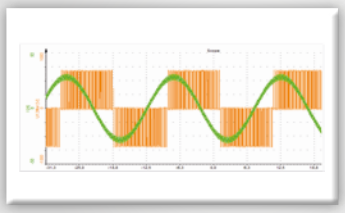
- *More than 300 calculated parameters*
- *Power analysis for 1-12 phase AC systems Star-Delta Calculation of RMS values and Waveform*
- *Voltage, Currents (rms, rm, ave) and Frequency*
- *Active, Reactive & Apparend Power (P, Q, S, PF, cos phi, . . .)*
- *Distortion and Distortion Factors (D, DH, QH, K, THD I, THD U)*
- *Period Values with overlap for detailed fault analysis*

POWER QUALITY ANALYSIS



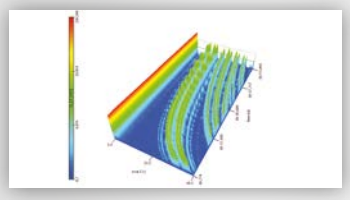
- *Class A Power quality Analyser according to IEC 61000-4-30*
- *Harmonic Analysis up to 150 kHz according to IEC61000-4-7*
- *Flicker and Rapid Voltage Changes according to IEC61000-4-15*
- *Flicker emission according to IEC64000-21*
- *Unbalance and Symmetrical components (zero-, positive-, negative sequence)*

RAW DATA STORING



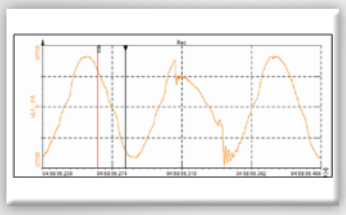
- *Raw Data Storing with up to 1 MS/s*
- *Osciloscope View*
- *Vector Scope View*

FFT ANALYSIS



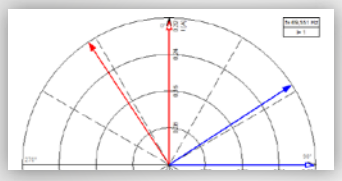
- *Harmonic FFT*
- *Full FFT*
- *3D Waterfall FFT*

TRANSIENT RECORDING



- *Triggering on analogue, math or power channels*
  e.g. trigger on voltage unbalance, frequency deviation, voltage dips . . .

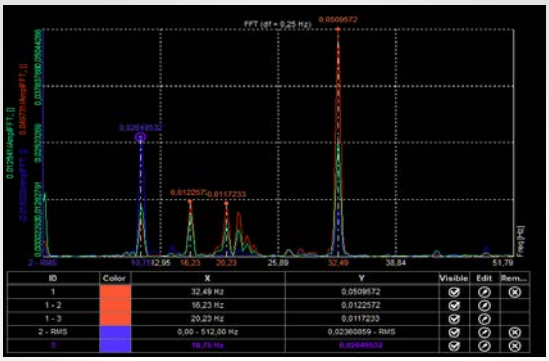
SPECIAL ANALYSIS



- *DQ Transformation*
- *Efficiency Mapping*
- *Power Quality Reports according to FGW-TR3*

NVH Analysis

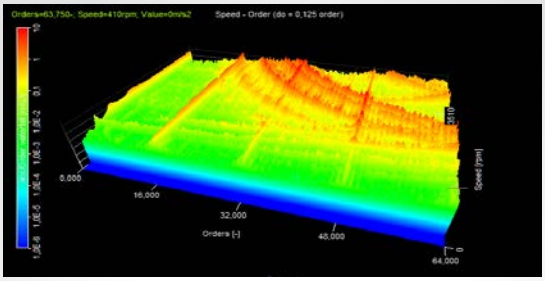
FFT ANALYSER



FFT analyser provides all main functions for spectral analysis with advanced averaging, selectable resolution (64000 lines) or direct specification of the bandwidth (0.01 Hz). Multiple channels can be displayes in one FFT instrument for easier comparison.

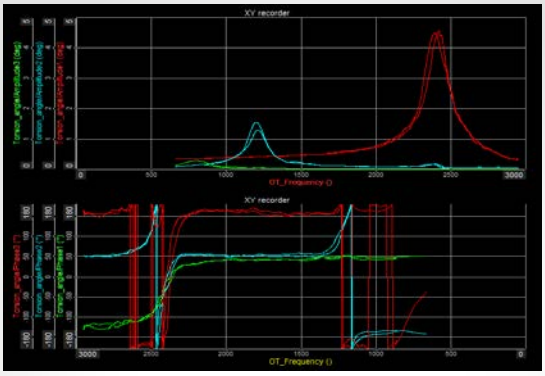
- *Multiple cursors and markers*
- *Envelope*
- *Auto and cross correlation*
- *Cepstrum*
- *Short time FFT*

ORDER TRACKING



Order tracking module is the main function for measurement with varying speeds. Any input can be used: microphone, accelerometer and even the output of the torsional vibration module. It cleary separates the engine related harmonics from other frequencies like structural resonances. The high precision digital counters of the DEWESoft instrument provide accurate and repeatable measurements. Results are represented on 3D color spectogram and 2D graph for selected order and phase extraction over RPM

TORSIONAL VIBRATION

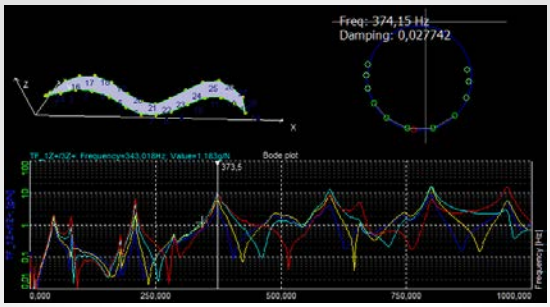


With the high precision digital counters of the DEWESoft instruments, based on a 102.4 MHz time base, rotational and torsional vibration angles and velocities (with two encoders) can also be exactly determined at high RPM speeds. Constant angle offset, uncentered mounting and sensor errors can be compensated, gearbox ratios are supported and aditional filters can be applied.

BALANCING

To cancel out the vibrations caused by the first order (unbalance), DEWESoft offers the balancing module. It is very easy to setup, just specify angle sensor and vibration sensor. It acts as a sequence: first record the initial run, than add a trial mass at the appropriate angle. Steps can be repeated if required. Depending on the rotating part, single plane and dual plane balancing is supported. All results and the raw data are stored in the datafile.

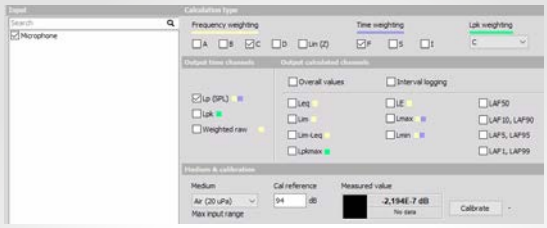
MODAL TEST AND ODS



DEWESoft provides an efficient solution, time for setup and measurement is short. The structure can be imported or drawn in the geometry editor, where the points are defined. For measurement move the modal hammer or the response accelerometers, whatever you prefer. In analyse mode click on the resonant frequencies and check the animated shape.

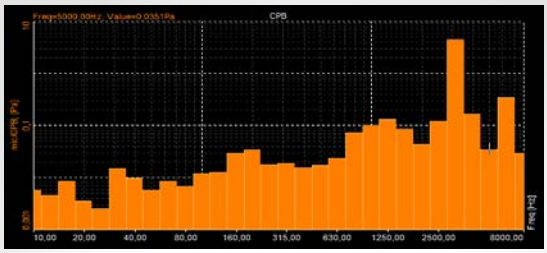
- *Frequency response function (FRF)*
- *Coherence*
- *Mode indicator function (MIF)*
- *Double hit detection*
- *Reject hits or points*
- *Averaging of hits*
- *Excitation and response spectra, windowing*
- *SISO, MISO and SIMO, response group aligment*
- *Circle fit method for extracting modal parameters (frequency and damping ratio)*
- *Spectral ODS measurement is useful wherever it's not possible to measure the excitation source and the structure is excited by the machine in it's operational state.*

SOUND LEVEL METER



DEWESoft provides real time sound level calculations accoring to the international standards IEC61672, IEC60651, IEC60804. Any combination of frequency and time weighting can be calculated. The statistical values are calculated over the whole range or with the custom specific entered block size.

OCTAVE ANALYSIS (CPB)



The constant percentage band filters work in real-time (true octave) and provide 1/1, 1/3, 1/6, 1/12, 1/24 band octave spectrum. With the array statistic matehmatics it's easy to extract min/max/avg values over the whole spectrum or a specific frequency range.

SOUND POWER

Plugin supports the sound power measurements according to ISO 3741, ISO 3744 and ISO 3745. The microphone positions are calculated by the software, depending on the size of the sound source and configuration (hemisphere, paralelepiped, ...). If there are less microphones available than requested by the standard, you can build groups and change the postion between the measurement. The user is guided step-by-ste, next to the background measurement (K1, K2) there is also a repeatability check and the visualization by third-octave band analysis for the report.

Vehicle Analysis

COMBUSTION ANALYSIS

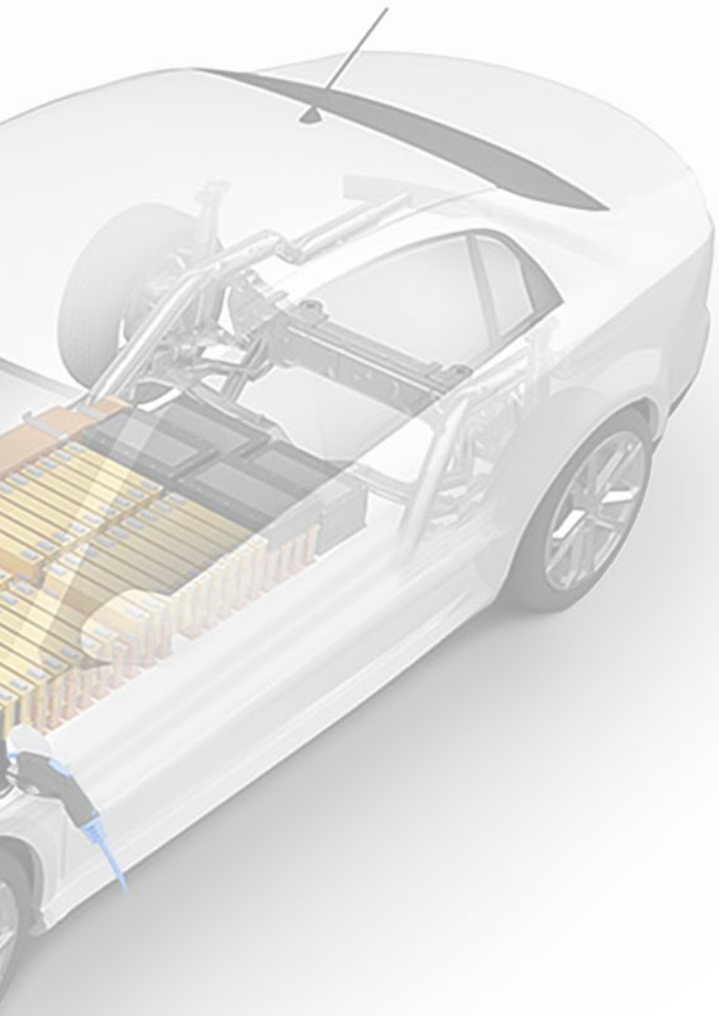
- *Charge analogue inputs*
- *Online mathematics, statistics, standard derivation*
- *Fast online displays: pressure, p-V diagram, CA scope,. . .*
- *Time domain sampling (cold start tests)*
- *iFile, Excel, FlexPro, txt,. . . export*
- *Standard deviation, IMEP, PMEP, NMEP, Thermodynamics*
- *Knock detection*
- *Combustion noise analysis (online dB noise calculation)*
- *Testbed communication*
- *ECU communication*

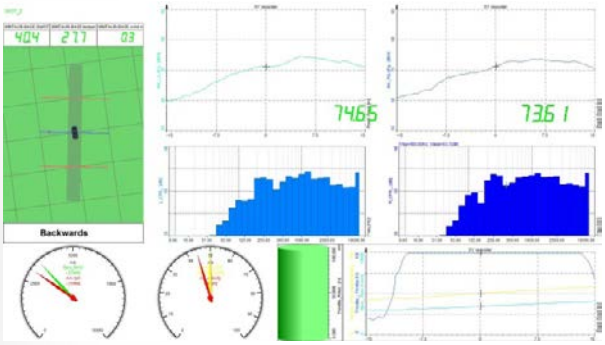
ADVANCED DRIVER ASSISTANCE VALIDATION SYSTEM

- *Ruggedized and reliable GPS IMU with high dynamics of up to 500 Hz and < 2 cm position accuracy*
- *Easy to use software with additional Polygon option for real-time car to car distance and time to collision calculations*
- *Many additional synchronized data sources like Video, CAN, CAN FD, FlexRay, XCP/CCP, OBDII,. . .*
- *Build in analysis and math for:*
  - *Lane departure & Lane assist*
  - *Collision avoidance, Blind spot detection and AEB*
  - *Adaptive cruise control*
  - *Any kind of additional R&D maneuvers*

E-MOBILITY

- *Motor, Inverter, Battery testing*
- *AC & DC Power Analysis*
- *Energy & Efficiency*
- *Static & Dynamic testing*
- *Testbed & Real-Drive Testing*
- *Summer & Winter testing*



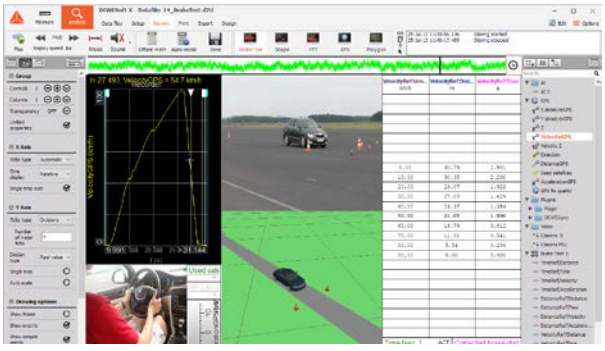


PASS BY NOISE

- *Automated workflow and online results*
- *Single person system operation*
- *Direct IEPE microphone inputs, weather station, IR temperature, RPM, Throttle position inputs*
- *Build in analysis and math for:*
  - *ISO 362*
  - *UNECE R51.03, R41 & R117*

VEHICLE DYNAMICS

- *Automated workflow and driver guidance by VTS – Vehicle Test Suite*
- *Vehicle, maneuver and sensor data base with automatic coordinate system assignment and filtering*
- *Built in analysis and math for:*
  - *ECE 13H Sine with dwell*
  - *ISO 7401 Step steer & Frequency sweep*
  - *ISO 13674-1 Sinus Steer*
  - *and many more*



BRAKE TEST

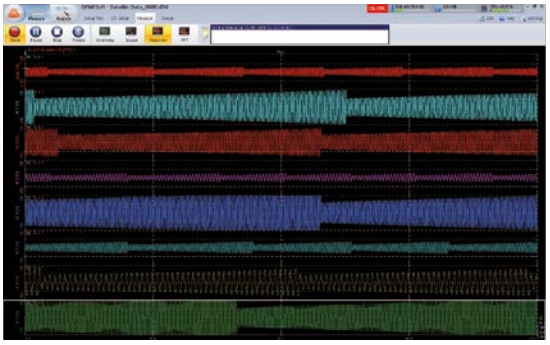
- *Automated workflow with DEWESoft sequencer & report generation*
- *Direct pedal force, travel & temperature sensor, pressure inputs via analogue or CAN*
- *Live results*
- *Build in analysis and math for:*
  - *Standard tests (ECE13H, FMVSS 135, ...)*
  - *ABS testing*
  - *R&D tests*
  - *Braking comfort testings*
  - *Possibility to add additional standards or manoeuvres*

VISUALIZATION

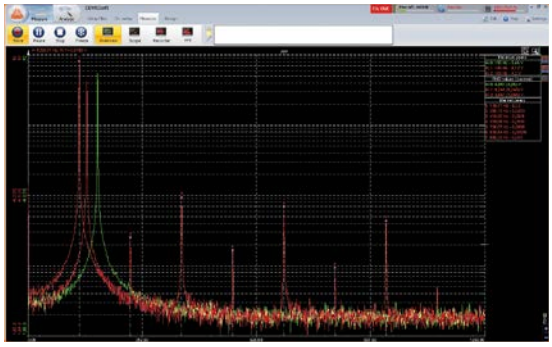
FREELY CONFIGURE YOUR INSTRUMENT SCREEN:

Digital and Analogue Meter

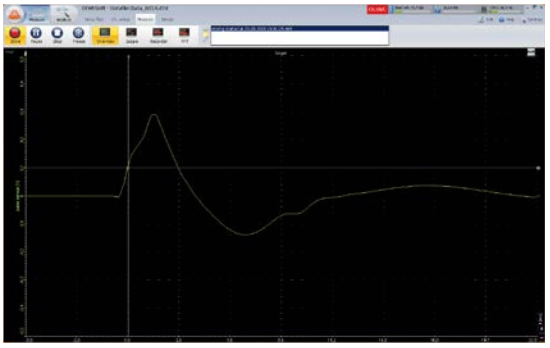
Recorder



FFT Analyser



Scope Mode/Trigger



CHOOSE FROM A WIDE VARIETY OF INSTRUMENTS:

- Digital meter
- Analog meter
- Horizontal / Vertical bar graph
- XY recorder
- Indicator lamp
- Overload indicator
- Recorder and Vertical recorder
- Scope
- FFT
- Orbit graph
- Octave plot
- Vector scope and harmonic FFT
- P-V diagram and combustion scope
- 2D graph
- Campbell plot
- 3D graph
- Tabular values display
- Video
- Input control display
- Static image
- Note
- Line
- Rotor balancer
- FRF geometry editor
- Polygon 3D
- Altitude indicator
- Modal circle

CAN-Bus Data/OBD II

Synchronous data from CAN-bus

- CAN DBC export and import
- J1939 decoding

Analogue Channels

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

Video

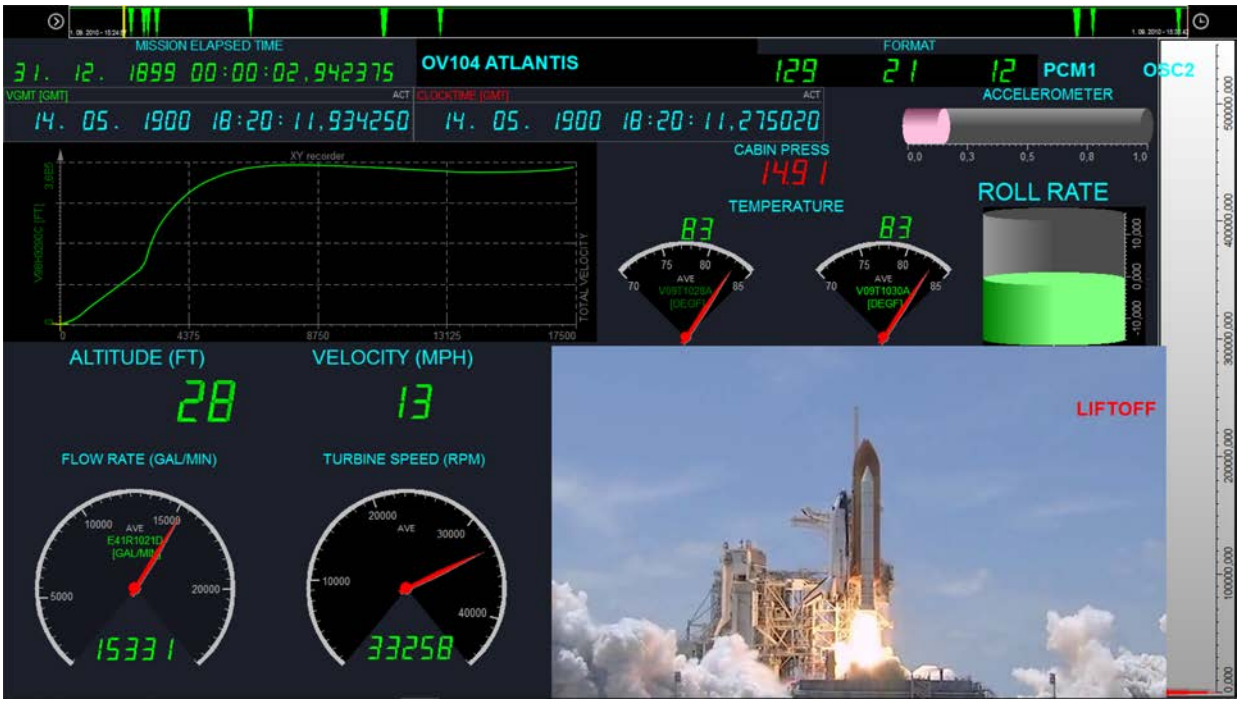
Synchronized video information (normal and hi-speed cameras)

Wheel Force Measurement

Telemetric recipient for all wheel forces

GPS Information

3D visualisation and analysis with Polygon Plugin for position data



STORING

Distributed Acquisition

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

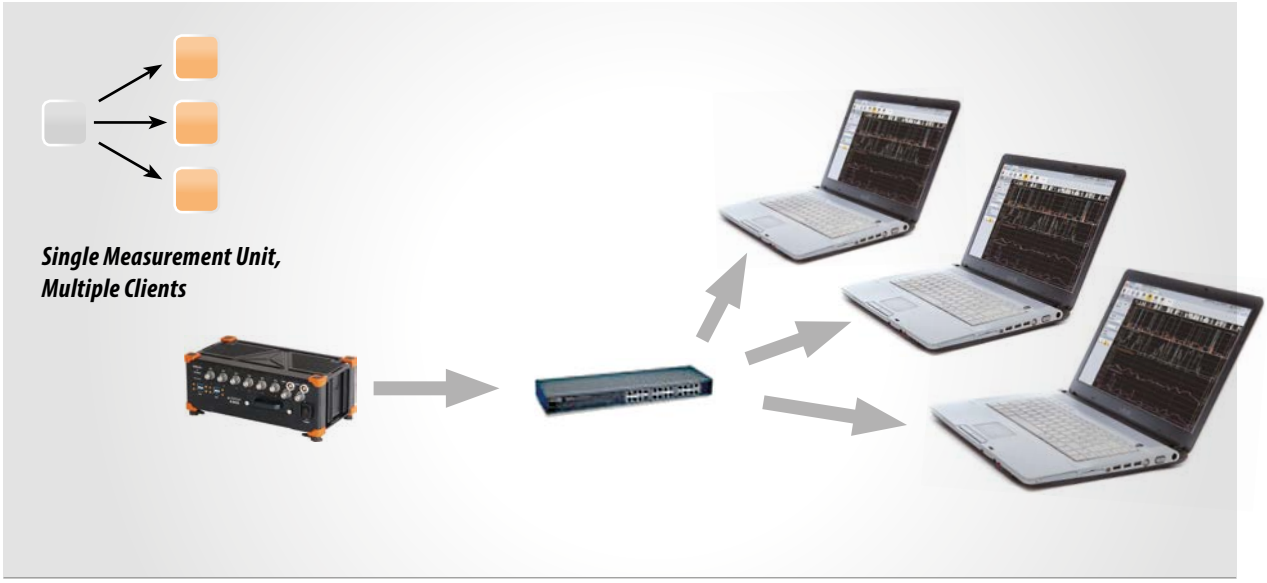
X:1 MODE

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 **R**eal **T**ime **K**inematic option for < 2 cm position accuracy.

96 channel SIRIUS data acquisition system

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 500 MB/second sustained stream rates. Even with such high rates, DEWESoft® prepares the data to be reloaded in a matter of seconds.

STREAMING

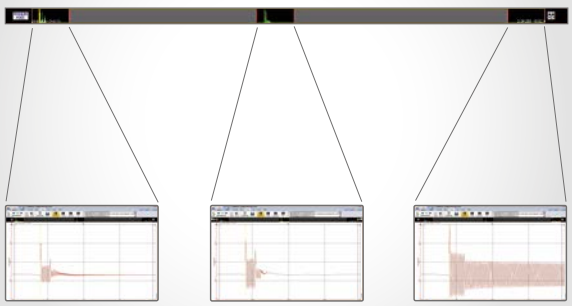
With a very specific data file structure we can write the channel setup, display setup, all the events, fast analogue data and slow asynchronous data from different sources in a single file. For long term measurement DEWESoft® offers to roll-over the file automatically when certain file size is reached 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 s. 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.

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

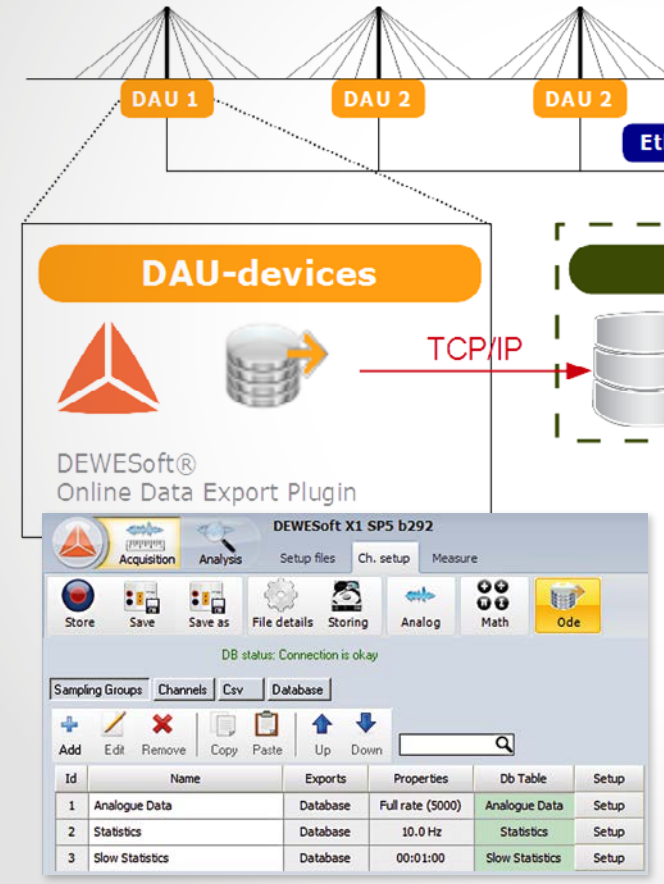
The ODE plugin will store the measurement into the database. The customer may use any visualisation or analysis tool that can access the data in the database. DEWESoft® does not offer any visualisation or analysis features or programs.

1. permanent DB storing

1. PERMANENT DB STORING REALTIME MONITORING

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

Example: Bridge Monitoring



ENVIRONMENT MONITORING:

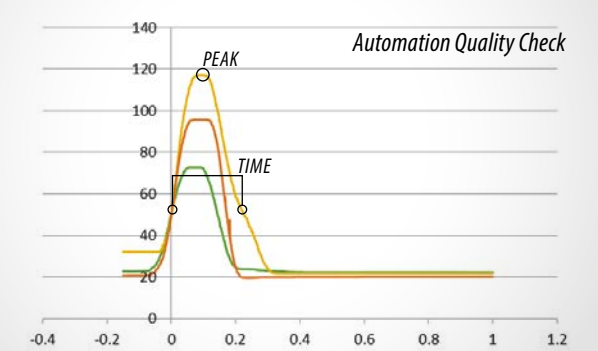
- *atmosphere temperature*
- *winds*
- *waves*

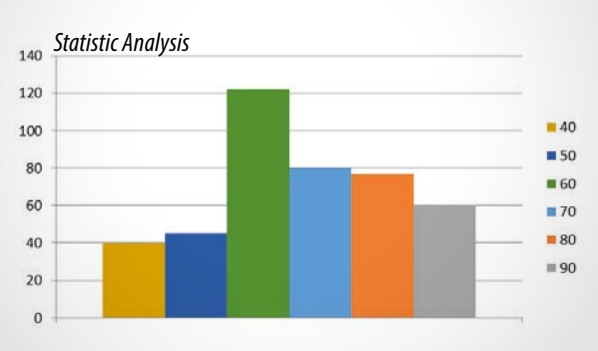
STRUCTURAL HEALTH MONITORING:

- *structure stresses*
- *structure temperature*
- *structure dynamics*
- *static and dynamic response monitoring*
- *cable tensions*
- *displacements of dampers*

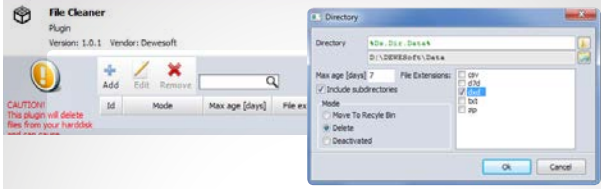
2. CYCLE-BASED DB STORING PROCESS MONITORING

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.





FILE CLEANER



The free file-cleaner plugin can be configured to automatically delete old files (i.e. DEWESoft® data files) in specific folders.
USE WITH CARE - deleted files cannot be restored!

- *delete old files from your PC*

AUTO SYNCHRONIZER

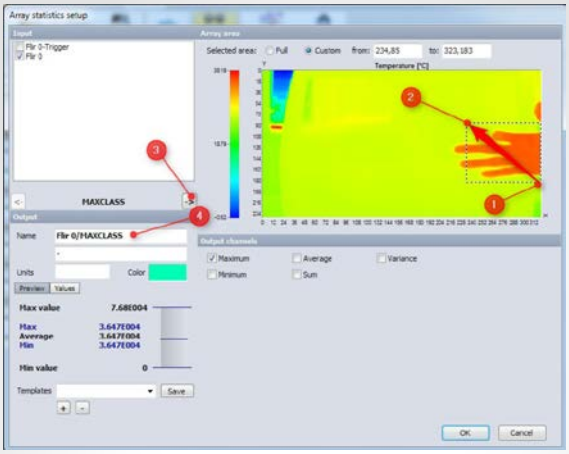
Small tool, which automatically transfers all datafiles from a selected local folder to the USB memory stick, in the moment the stick is connected. It can also remove the original files to free disk space.

DATA MANAGER

It can also shut down the computer after the file is transferred. This plugin is able to copy in background while the multifile storing is still going on. This allows the user to live-copy files on a different computer, and already start the export process by sequencer, which means saving time!

- *copies data files to FTP or local folder*
- *is able to shut down computer after file transfer*
- *copy files during multifile storing!*
  Start exporting already during measurement!

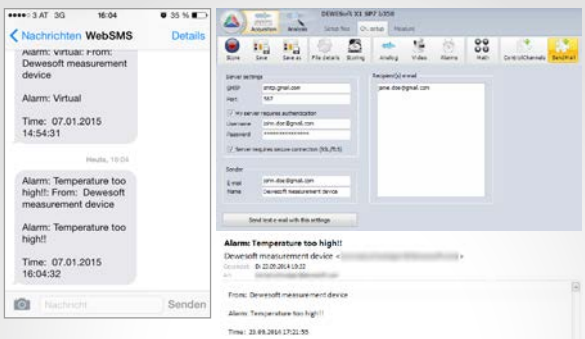
SELECTIVE STORE (FLIR ALARM)



Stores data of array channels only when a custom condition is true. You can easily define simple alarm-conditions and a pre-post trigger time. This will work with any 2D array channels, but is commonly used for FLIR cameras.
A typical use-case is that you want to store a DEWESoft® data-file and only when the FLIR camera detects that a certain region gets too hot, you also want to store the FLIR data to the DEWESoft® datafile, to see what's going on.

- *works with any 2D array channels (e.g. FLIR image)*
- *custom conditions when to store the data*
- *example usecase:*
  store FLIR image data only to the DEWESoft® datafile in certain conditions to reduce the size of the DEWESoft® data-file

SENDMAIL



Whenever the measurement system is unattended in a remote location, there is the need of getting a note about the system status, whenever parameters reach critical limits. This plugin will send an e-mail or SMS (by the use of a e-mail to SMS service) to one or more recipients, if an Alarm appears in DEWESoft. Multiple alarm constraints can be specified (the combinations are endless by using Math), resulting in different text, sent per mail (e.g. "Temperature Sensor 1 too high!").

- *Alarm on e-mail or SMS*
- *Multiple alarms*

IMPORTS / EXPORTS

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*

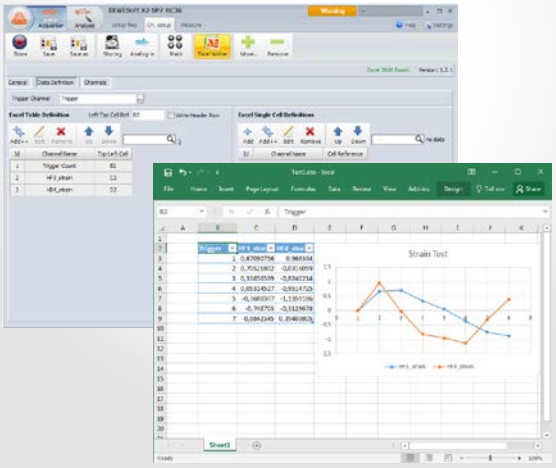
REPORTS

When you are reviewing data in the analyse 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.

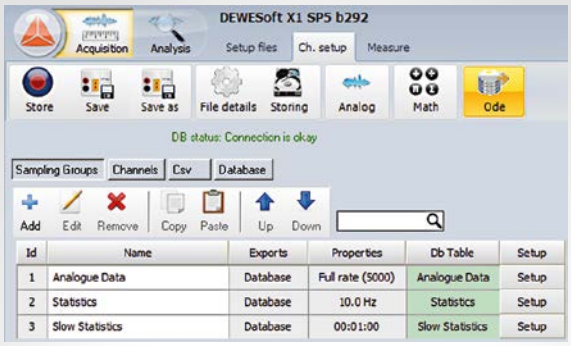
EXCEL WRITER



The Excel® Writer plugin can write numeric and textual DEWESoft® data during maeasurement to Excel®. You can select a trigger channel and define which channels should be written to Excel®. Whenever the trigger fires, the data will be written to Excel® and can be show immediately: e.g. display in a chart or do real-time calculations (check values, use conditional formatting, etc.).
The plugin requires Excel 2007 or higher.

- *write data to Excel® during measurement*
- *supports numeric and textual channels*
- *customer defined trigger channel*
- *Excel® can then use the data for online calculations, charts, etc.*

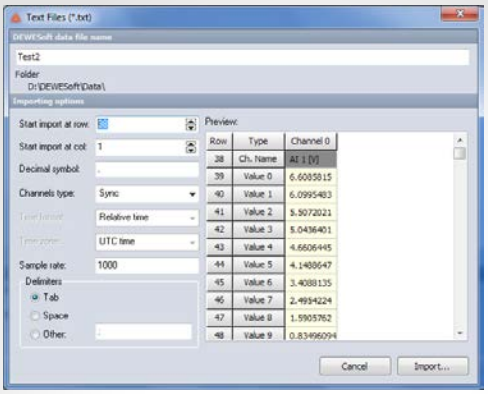
ONLINE DATA EXPORT



The Online Data Export (ODE) plugin can export DEWESoft® measurement data of numerical channels during storing directly to a database (currently MySQL® and Microsoft SQL Server® are supported) or to .csv files (that can later be imported into the database, Excel®, ...).
Note: array channels (like FFT) are not supported.

- *write data during measurment to a database*
- *MySQL® and Microsoft SQL Server® supported*
- *write data during measurment to .csv files*

TEXT IMPORT



Text import plug-in imports data for text files (*.txt). It supports different channel types as well as different time formats.

- *imports text files*
- *supports different sync and async channels*
- *supports different time formats (absolute time, relative time etc.)*

DEWESoft® X VERSIONS

	EVALUATION Free	PROFESSIONAL Free with DS-HW	DSA upgrade	ENTERPRISE upgrade	AUTOMOTIVE upgrade
High speed acquisition cards					
DEWESoft SIRIUS, KRYPTON, DEWE-43, MINITAURs	✓	✓	✓	✓	✓
Low/medium speed acquisition devices					
DEWESoft DS-NET	✓	✓	✓	✓	✓
CPAD	✓	✓	✓	✓	✓
Vehicle buses					
DEWESoft CAN/J1939 devices	✓	✓	✓	✓	✓
Vector CAN/J1939 devices	✓	option	option	✓	✓
J1587/J1708 devices	✓	option	option	option	✓
XCP, CCP	✓	option	option	option	option
Other input sources					
GPS receivers	✓	✓	✓	✓	✓
Timing devices	✓	✓	✓	✓	✓
Gyro platform	✓	option	option	option	✓
Kistler wheels	✓	option	option	option	✓
PCM telemetry	✓	option	option	option	option
ARINC 429, MIL-STD-1553 devices	✓	option	option	option	option
ScramNET	✓	option	option	option	option
User inputs (control channels)	✓	✓	✓	✓	✓
Cameras					
DEWESoft cameras DS-CAM	✓	✓	✓	✓	✓
DirectX compatible cameras	✓	✓	✓	✓	✓
GigE cameras	✓	✓	✓	✓	✓
FLIR thermovision cameras	Option	Option	Option	Option	Option
Photron high speed cameras	✓	Option	Option	✓	Option
Video post synchronisation	✓	✓	✓	✓	✓
Other					
Sensor database	✓	✓	✓	✓	✓
TEDS support	✓	✓	✓	✓	✓
File import (merge)	✓	✓	✓	✓	✓
File export (to all formats)	✓	✓	✓	✓	✓
Outputs					
Alarm monitoring	✓	✓	✓	✓	✓
Analog replay of data	✓	✓	✓	✓	✓
CAN output	✓	✓	✓	✓	✓
Function generator	✓	✓	✓	✓	✓
Online/Offline Math					
Basic Math Formula editor, Filters (IIR, FIR), Cepstrum, Envelope detection, Exact frequency extraction, Integration, Derivation, Octave analysis, Statistics (Basic, Array), Reference curve, Latch, Combustion noise, Angle sensor math, Counting (Histogramming), Harmonic tracking filter, Two-sided Fourier transform	✓	✓	✓	✓	✓
Balancing	✓	option	✓	✓	option
Combustion analyser	✓	option	option	option	option
Fatigue analysis	✓	option	option	option	option
FFT analyser (basic)	✓	✓	✓	✓	✓
FFT analyser (advanced) Advanced cursors, bearing fault	✓	✗	✓	✓	✓
FRF	✓	option	✓	✓	✓
Human body vibration	✓	option	✓	✓	option
Order tracking	✓	option	✓	✓	✓
Power analysis	✓	option	option	✓	✓
Psophometer	✓	option	option	option	option
Sound level	✓	option	✓	✓	✓
Sound power	✓	option	option	option	option
SRS (works only in analysis mode)	✓	option	✓	✓	✓
Torsional vibration	✓	option	✓	✓	✓