

The Acoustic Emission Company

vallen  
systeme

# Vallen AMSY-6

The Acoustic Emission System





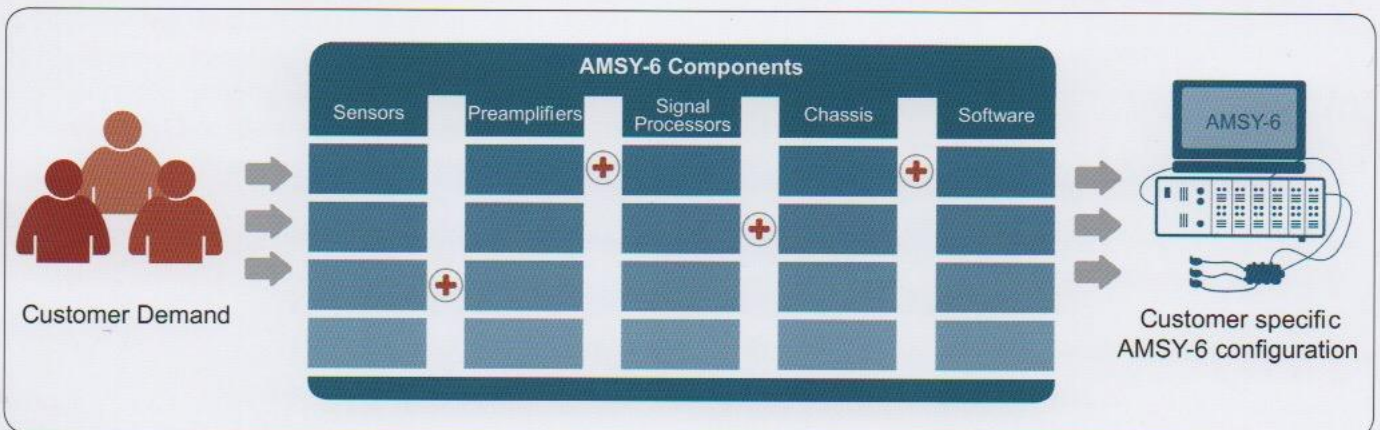
## Acoustic Emission (AE)

Technical systems, such as pressure vessels, piping systems and petrochemical reactors, are exposed to heavy stresses and require regular inspections. For those responsible for the safety of such structures Acoustic Emission (AE) testing can be of great value. AE testing detects beginning damage in stressed components, thus contributing to safe operation and avoiding costly downtimes. AE testing also offers large benefits for material, geological, medical and botanical research, detection and location of partial discharges

in large transformers, leak and corrosion inspection of storage tanks, etc. It is also increasingly applied for tests and inspections in civil engineering (e.g. bridges) and in the automotive and aerospace industries.

Highly sensitive AE sensors detect stress waves on the surface of a test object. These waves originate from crack growth, for example, and propagate through the test object. The sensors' signals are analyzed, so that damage to the test object can be detected and located.

## AMSY-6 - the modular System for many Applications



The Vallen AMSY-6 system covers the entire AE measurement chain. Using modular components customized and expandable systems are configured, comprising sensors, preamplifiers, signal processors, system chassis, PC interface

and software. Vallen offers all of this from a single source - products developed in Germany, a perfect match, in a very wide range of models and with extensive functionality.

### AMSY-6 Highlights

#### ► Connectivity / USB2.0

The USB2.0 interface guarantees user-friendly PC interface. The full bandwidth of USB2.0 bus can be used for data transfer in a multi chassis setup providing unmatched data rates.

#### ► Reliability and efficiency

AE tests are often safety relevant. Certified AE service providers around the world trust the reliability and efficiency of Vallen's measurement equipment for decades.

#### ► Versatility

Well structured software with the most flexible and user-definable processing and visualization capabilities make AMSY-6 the preferred choice for reaching the highest achievements and recognition of research work in various disciplines.

#### ► User-friendliness

Easy-to-use: Efficient dialogs, available in seven languages, extensive online help, premium quality results – all this helps to save time and costs.

#### ► Service quality

Shortest response time, competent technical support, express repair service and minimum downtimes enable you to get the most out of your AE system.

#### ► Investment protection

Very long lifetime, 2 years warranty, product continuity, and software compatibility generate continuing return on investment.

#### ► Remote control

Easily control the AMSY-6 from any place via Internet - perfect for long term online monitoring.



## AE Sensors

With more than 30 AE sensor models, Vallen offers a wide range covering many acoustic emission testing applications. The highly sensitive piezo sensors are available in all relevant frequency ranges and sizes. All sensors are optimized for greatest sensitivity and are subject to strict quality controls. Some of the most commonly used sensor models are:

- **VS150-M:** 150 kHz resonant, multi-purpose sensor
- **VS150-RIC:** 150 kHz resonant, with integrated pre-amplifier, for pressure/ integrity test
- **VS375-RIC:** 375 kHz resonant, with integrated pre-amplifier, for crack detection in noisy environments
- **VS30-SIC:** 25-80 kHz, low frequency, with integrated preamplifier, for tank bottom testing

Most sensors with integrated preamplifiers are equipped with a calibration-pulse-through feature. This shortens time for checking sensor coupling, cables and preamplifier function. To simplify mounting, sensor holders with heavy duty magnets are offered.



VS700-D is a small and light sensor that can be easily coupled to a paper specimen by means of shown magnet



VS150-L with full metal case designed for composite testing



VS75-V with ceramic shoe is often used for partial discharge detection

## AE Preamplifiers

Vallen offers a number of extremely robust preamplifiers perfectly suited for use with the AMSY-6 system. Bandwidth and performance can be selected to match the test requirements. Their consequent design with 50Ω impedance matching and their low noise input stage make them unique on the market. To ensure reliable operation even under difficult operating conditions, only selected components and materials are used.

### AEP5, AEP5H

Multipurpose preamplifiers for the frequency range from 2.5 - 2400 kHz (AEP5H: 20 - 2400 kHz), are suitable for most applications. Each comes with a rugged case and a calibration bypass for the sensor coupling and wave velocity test.

### AEP3N

The AEP3N amplification can be selected in the range from 34 to 49 dB via software. Exchangeable frequency filter modules allow the use without steep downstream frequency filters. AEP3N provides two inputs, one with the common single-ended BNC connector and the other with a differential BNO connector.



AEP5 preamplifier



VS30-SIC-46dB combines AE sensor and preamplifier for tank bottom testing.



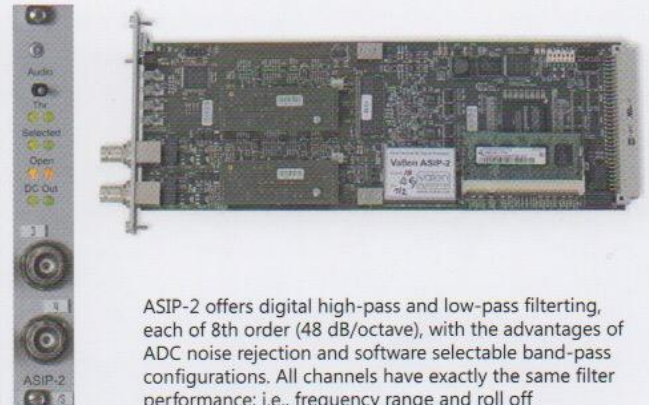
AEP3N preamplifier



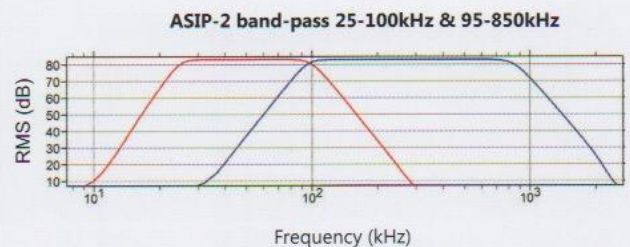
## AE Signal Processors

The dual channel AE signal processor ASIP-2 is the result of more than 20 years experience in developing digital AE systems. ASIP-2 results in a very portable AE system even at large channel counts. Advantages of the ASIP-2 include:

- **High resolution:** 40 MHz sampling rate at 18 bit dynamic range
- **High sensitivity:** Lowest possible system noise due to filtering the ADC data stream digitally
- **More waveforms:** Up to 1 GB/channel
- **Field hardened:** Rugged front panel BNC-connectors for quick and easy cable connection
- **Real time indicators:** Front panel LEDs indicating hit-detection, preamplifier-cable-interruption, audio and calibration-selection, and amplitude saturation
- **Advanced filter concept:** allows for narrow band triggering of wideband transient recording; 500 digital band-pass filters and notch filter for frequency gating are available



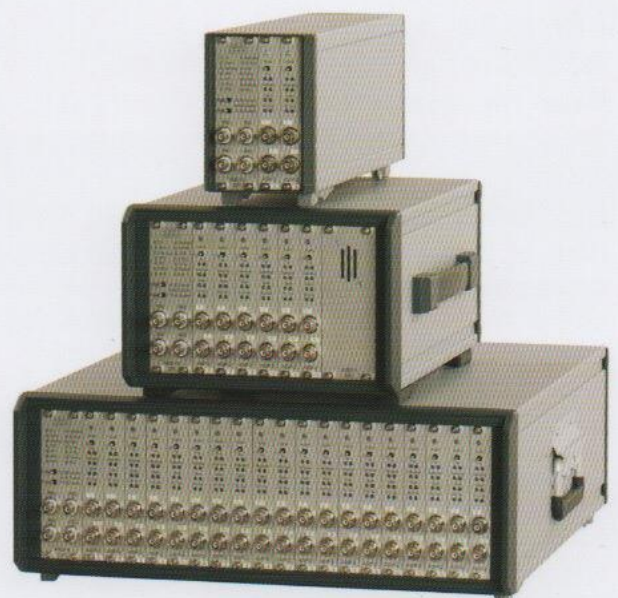
ASIP-2 offers digital high-pass and low-pass filtering, each of 8th order (48 dB/octave), with the advantages of ADC noise rejection and software selectable band-pass configurations. All channels have exactly the same filter performance; i.e., frequency range and roll off



## Chassis Types

The rugged AMSY-6 chassis are designed for field testing. There is room for up to 4, 12, 38 or 42 channels, respectively, in four compact models. The AE system is controlled by an external PC that can easily be disconnected, e.g. for offline analysis in the hotel room. Desktop PCs, laptops, or industrial PCs can be used. The chassis feature:

- **Connectivity:** High speed USB2.0 interface for easy connection with any PC
- **Investment protection:** compatible with ASIP-2
- **Correlation with AE:** Up to 8 parametric inputs for measuring, e.g. pressure, strain, displacement, etc.
- **For any material:** Test pulse generator is programmable up to 450V to overcome strong wave attenuation
- **Audio warning:** An audio unit that makes incoming AE signals audible
- **Real time indicators:** LEDs for displaying the most important system status information
- **Finger tip fast response:** Switches for manually disabling data recording
- **Ease of stack ability:** Up to eight chassis can be connected into one large system with up to 254 channels



AMSY-6 chassis MB2, MB6 and MB19 housing 4, 12, 38 AE channels respectively.



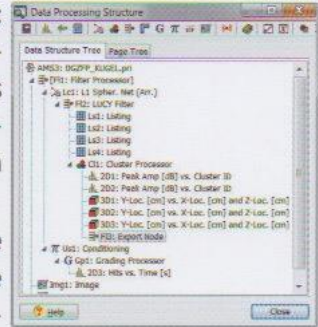
## AMSY-6 Software

Vallen offers reliable state-of-the-art software solutions, easy to learn, easy to use, and for optimum profitability.

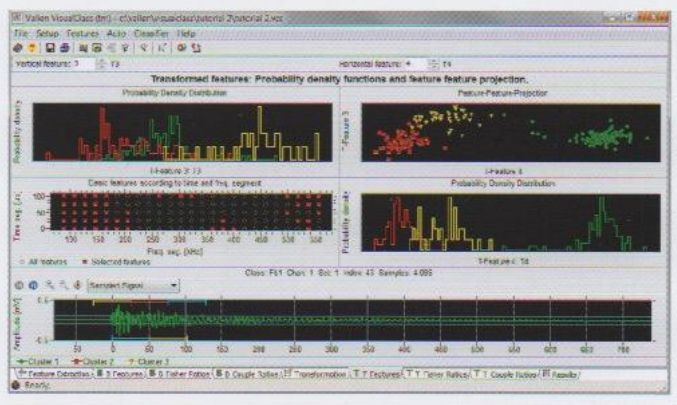
### Flexible and user friendly data analysis

In order to match the requirements of different AE tests, the AMSY-6 software offers full flexibility and transparency at all times. Obtain analysis results faster and more precise than ever before – online as well as offline.

- **Analysis transparency:** The sequence of processing steps, such as filtering, location, clustering, etc., is shown in form of a structure tree
- **Structural freedom:** The structure tree can be easily built up and rearranged by drag & drop
- **User written software integration:** The Embedded Code Processor integrates user code, e.g. to obtain specific results during routine testing by non AE experts, or specific alarm criteria, etc.
- **Flexible result presentation:** Any combination of results can be displayed in graphs or listings
- **High quality reports:** Graphs and listings can be exported with any resolution and font size
- **Data file compatibility:** The latest AMSY-6 software can process all AE files recorded with any Vallen AE System since 1991
- **Nine dialog languages:** Chinese, English, French, German, Italian, Japanese, Romanian, Russian and Spanish are included



Waveform based analysis, such as FFT, wavelet transform, enhanced feature extraction, pattern recognition, provides additional information about e.g. source mechanisms, damage evaluation or wave propagation.

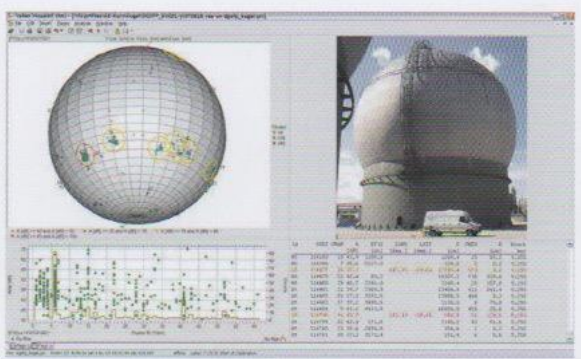
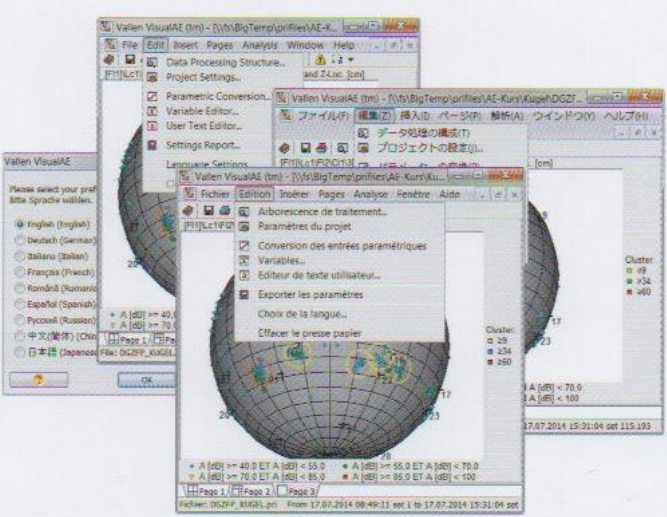


### Optimized for online analysis

AMSY-6 considers highest demands for online data analysis:

- **All data in one file:** Prior to and after changing acquisition parameters
- **Full analysis control:** Change analysis settings during ongoing data recording. Restart analysis at any label or point in time
- **Fast online location:** Even at high data rates from many channels
- **Easy data positioning:** Enter notes to be recorded as labels
- **Alarm notification:** The powerful Alarm Manager monitors PC resources, data flow interruptions, and user defined AE alarm criteria. Alarms or warnings trigger actions, e.g. sound, email sending or digital outputs

AMSY-6 software is a complete package for most convenient and efficient AE testing and represents outstanding stability, performance and user friendliness.





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## Think AE – Think Vallen!

We develop and produce technologically advanced, high quality acoustic emission test equipment based on decades of expertise. For over 20 years our devices and techniques have contributed to a safer world, Vallen stands for competence and continuity in AE and for reliable cooperation with international business partners from industry, testing services and research. We actively support the AE community by contributing to conferences, working towards international standardization (CEN, ASTM, ISO), and developing certified education courses.



**Our vision is to be the World's preferred solution provider for AE test equipment. We realize this vision through outstanding customer service and support, pioneering and implementing technology, and with honest and sincere client partnerships.**

Contact us now for more detailed information or consultation for a quotation optimized for your requirements!

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