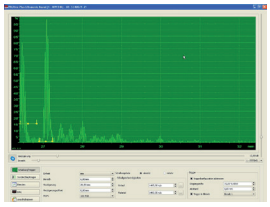
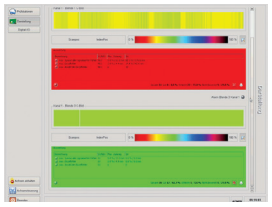
PROLINE

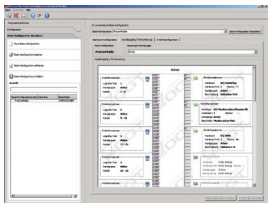
ULTRASONICS VOGT

Inspection Software PROLINE PLUS

for PROLINE Ultrasonic Inspection Systems







The inspection software for cost-conscious ultrasonic inspection of components for the

- Aerospace industry
- Automotive industry
- Power supply industry
- Ceramic industry
- Steel industry
- and many more

www.vogt-ultrasonics.de

PROLINE

Inspection Software PROLINE PLUS

for PROLINE Ultrasonic Inspection Systems

The PROline^{PLUS} software is an user-related software for imaging and evaluation of ultrasonic inspection data of the PROline device family (please refer to the brochure "multichannel ultrasonic inspection systems of the PROline device family") as well as the PROline^{USB} ultrasonic device (ultrasonic electronics, please refer to data sheet "PROline^{USB}").

The PROline^{PLUS} software package is sub-divided into the following sectors:

- Device driver
- Instrument software
- Inspection plan administration
- System configuration
- Inspection data imaging
- Inspection data evaluation

Device driver

The device-driver of the ultrasonic hardware is the basic requirement for all applications. In combination with further software modules, the device driver forms the basic framework for the application software PROline^{PLUS}. The customer has access to the ultrasonic raw data and can process this data with his own software.

Instrument software

The software is utilised to display the ultrasonic signals as well as to adjust the ultrasonic parameters *(refer to picture 1)*. Amongst others,the following belong to the parameters per ultrasonic channel:

- Sound path
- Speed of sound
- Gain and DAC
- Frequency
- Gates (hard- and software gates)
- Input and output for gates and hardware ports
- Sampling rate
- and much more

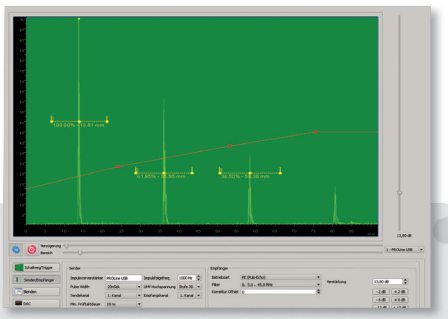
Inspection plan administration

The inspection plan administration is the central location for defining all relevant inspection parameters *(refer to picture 2)* An inspection inspection plan can be defined amonst others by the following adjustment possiblities:

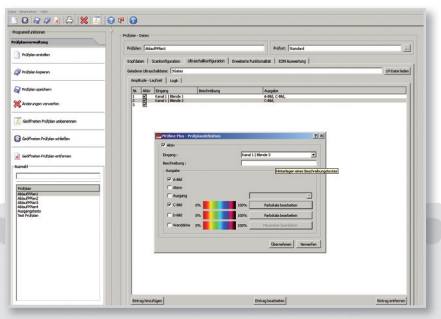
- Determination of the data storage location for the image display of the inspection data.
- Determination of index and scan resolution, inspection area, etc.
- Definition of the evaluation of the inspection data. Inspection data can be evaluated immediately after inspection (online) as well as later on by means of the recorded data (offline evaluation).
- Determination of the ultrasonic files for the inspection plans
- Determination of simple up to complex inspection procedures

Among other possibilities the software is structured in such a way that among others the following inspection data processes are possible:

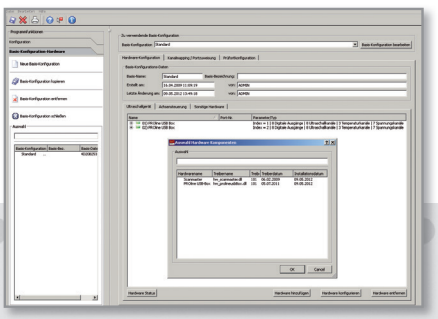
- Data evaluation according to gates and display of OK and not OK results on the screen as well as subsequent activation of switching outputs for sorting or marking of components.
- Display and recording of line and area scans of the inspection data, triggered by an external motion control and the related encoder signals.



Instrument software (picture 1)



Inspection plan definition (picture 2)



System configuration (picture 3)

System configuration

In the basic configuration, external hardware components (motors, controls etc.) are linked parallel to single from each other independently working base stations.
The channels which are used by the hardware can be allocated to internally used logical channels, i.e. for each existing inspection station it can be specified which logical channels are relevant for it *(refer to picture 3)*.

Inspection data imaging

The display of test data is flexibly adaptable to the application. In general the following variations are available:

- A-scan (ultrasonic HF view)
- Line scan
- Area scan
- Amplitude and time of flight evaluation
- "Combi display" (combined display of several gates, inspection channels or/and input ports)
- "Combi display" (combined display of several gates, inspection channels or/and input ports in just one image).

In addition, a link between the display modes and the input and output ports is possible, so that e.g. the following inspection plans can be defined:

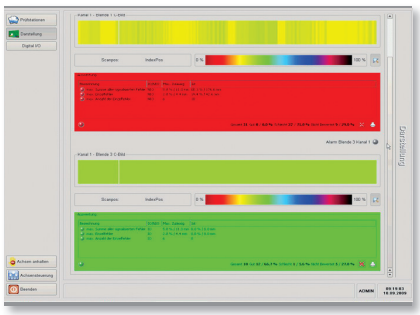
- Input signal (in) = start of inspection
- Exceeding the threshold = output signal (out)
- Optical presentation on the display for good/bad evaluation
- Exceeding the threshold = output signal (out 1) for the subsequent automatic good/bad sorting.

Inspection data evaluation

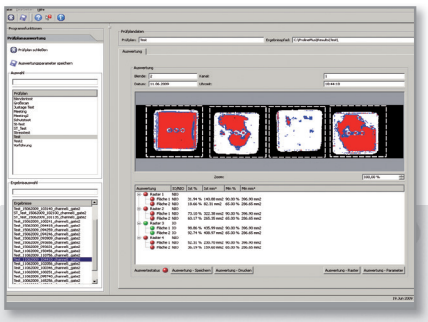
The evaluation of test data is carried out online and/or offline *(refer to picture 4)*. In general, test data can be evaluated manually or automatically.
For this purpose, the PROline^{PLUS} software records the inspection data in a legible and universal data format.

The following examples for the evaluation of test inspection data result from:

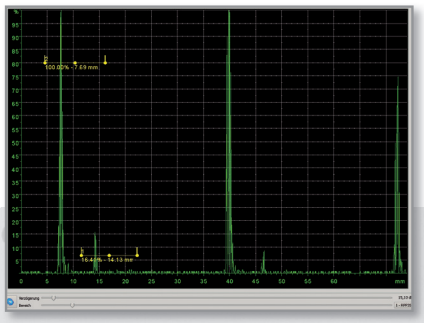
- Visual evaluation of the A-scan with or without optical switching output *(refer to picture 5)*.
- Line scan display with good/bad evaluation acc. to exceeded threshold and evaluation of display size *(refer to picture 6)*.
- Area scan display, colour-coded with or without automatic evaluation *(refer to picture 7)*.
- Line or area scans out of events: one or multiple logical links of events (e.g. exceeding gate threshold) or a link of multiple events are displayed in coloured "combi-display". The links follow the Boolean algebra, following requirements are deposited: AND, OR, NAND, NOR, XOR, EQU.



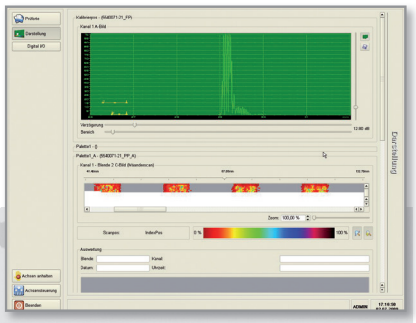
Line scan display with evaluation (picture 6)



Evaluation of test data – raster scan (picture 4)



A-scan, absolut display (picture 5)



Area scan display (picture 7)

Available software modules

- Ultrasonic software for using the PROlineUSB ultrasonic inspection device or the PRO-USG2-ultrasonic device. The ultrasonic software is utilized for the ultrasonic setup, signal display as A-scan as well as system configuration of the inspection device.
- PROlinePLUS line-scan software for imaging of ultrasonic inspection and display of ultrasonic amplitudes or sound path data (TOF) as area scan including inspection plan administration.
- PROlinePLUS evaluation software "line" for the automated evaluation of line scans. Threshold related evaluation of line scans with subsequent output of results within the evaluation criteria "max. sum of all defects, "max. single defects" and "max. number of single defects" displayed as absolute and as percentage numeric value. This evaluation procedure also fulfills the Volkswagen group standard no. 6364.
- PROlinePLUS grid evaluation "rectangle" for the automated evaluation of line- and area scans. The evaluation is carried out threshold related (2 threshold values can be defined) via individually defined evaluation ranges (rectangle, circle, Polygon) within the scan with subsequent output of the corresponding evaluation. Both online or offline evaluation is possible.
- PROlinePLUS input-/output interface software for connecting of gate information of the A-scan display with a visual good- / bad display (traffic light display) or with outputs of supported hardware for optical or acoustic display of the threshold signals (horns, lights, etc.), resp. for sorting of components.
- Ultrasonic channel software for hardware perspective already prepared channels of the PROlineUSB ultrasonic inspection device.
- Ultrasonic software for hardware perspective already existing rotating encoders
- Ultrasonic software for hardware perspective already existing I/Os
- Software for Profibus connection (WIN XP/WIN 7)
- Software for Profinet connection
- Software for axis control via CAN interface for WIN XP/WIN7, 32 Bit
  Precondition for the axis control: PC plug-in card CANopen

The range of software modules is continuously extended.

VOGT Ultrasonics GmbH
Ehlbeek 15
30938 Burgwedel
GERMANY

Tel. +49 (0) 5139-9815-0
Fax +49 (0) 5139-9815-99
info@vogt-ultrasonics.de
www.vogt-ultrasonics.de