Sensor System for Production and Quality Control

Sensor System

HST Analyser 1006

Hossbach Sensor Technologie

Analyser

the mobile inspection system
for intermittently aligned products

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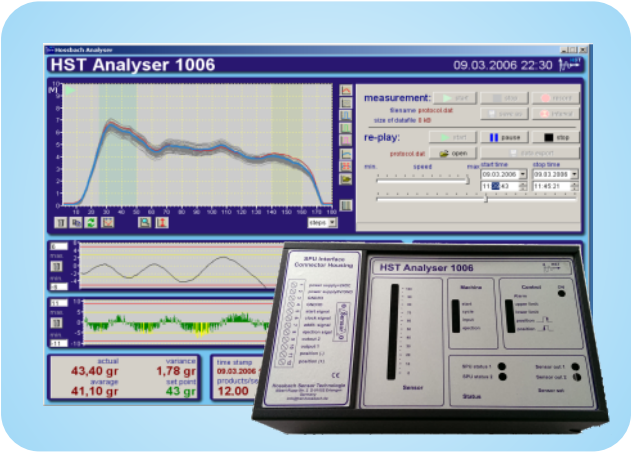
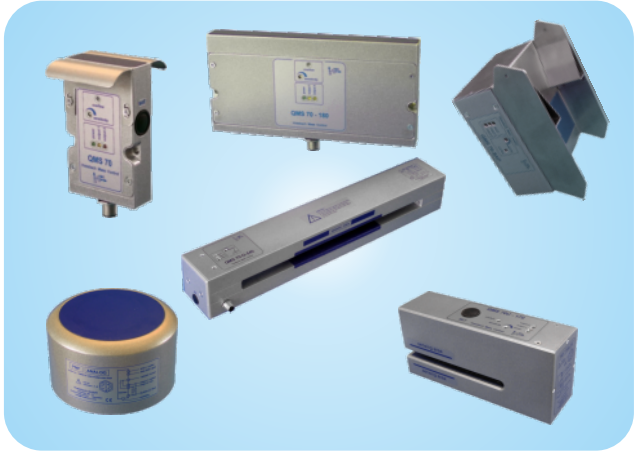
+ Enhancing Quality
+ Saving Money
+ Supporting Engineering
+ Supporting Purchasing
+ Supporting Decisions

=

Being Competitive

HST Analyser 1006





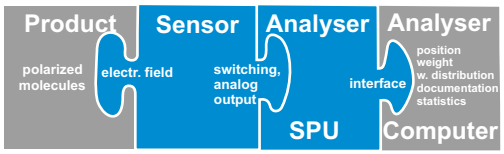
Features :

- mobile, high speed on-line inspection tool
- instantaneous overview over production and quality
- evaluation and visualisation of weight and weight distribution of total products
- evaluation and visualisation of object positions
- evaluation and visualisation of warnings, alarms and position deviations
- covering many inspection application only by changing over to other sensors mounted at different machine locations
- statistical calculations and representations
- comfortable scaling, calibrating, configuring
- drag and drop of weight distribution curves from screen into spreadsheet programs
- powerful protocoling and documentation
- video recorder like play, re-play, record functions

Description :

The HST Analyser inspects and analyses whole products or intermittently aligned materials due to their weight, weight distribution, position etc. The same applies to continuous webs or material flows measured for distinct periods or segments. Each product, web segment or material flow is recorded, based on a pre-set number of sensor measurements. From that a weight distribution profile is generated and weight is evaluated. By comparing a pre-set number of weights important information is derived for quantitative analysis. By monitoring and comparing the weight distribution profiles many information can be derived due to the production process, to the raw material, to the quality, effect of product changes.
A great variety of QMS70 Sensors can be used, each type of sensor covering another inspection application. Whereas the other components of the HST Analyser system can remain the same. The HST Analyser Software Package can be licenced for one or more PCs. The HST Analyser Online Software Package can be used both as on-line inspection software and as off-line analysis software tool. The HST Analyser Offline Software Package is only used as additional off-line software tool.
To reduce the expenditure of time and costs for inspections at different machine line locations additional interface connecting housings can be installed once at different locations to accept the Signal Processing Unit by simple plugging, avoiding reoccurring installations.

Building Blocks :

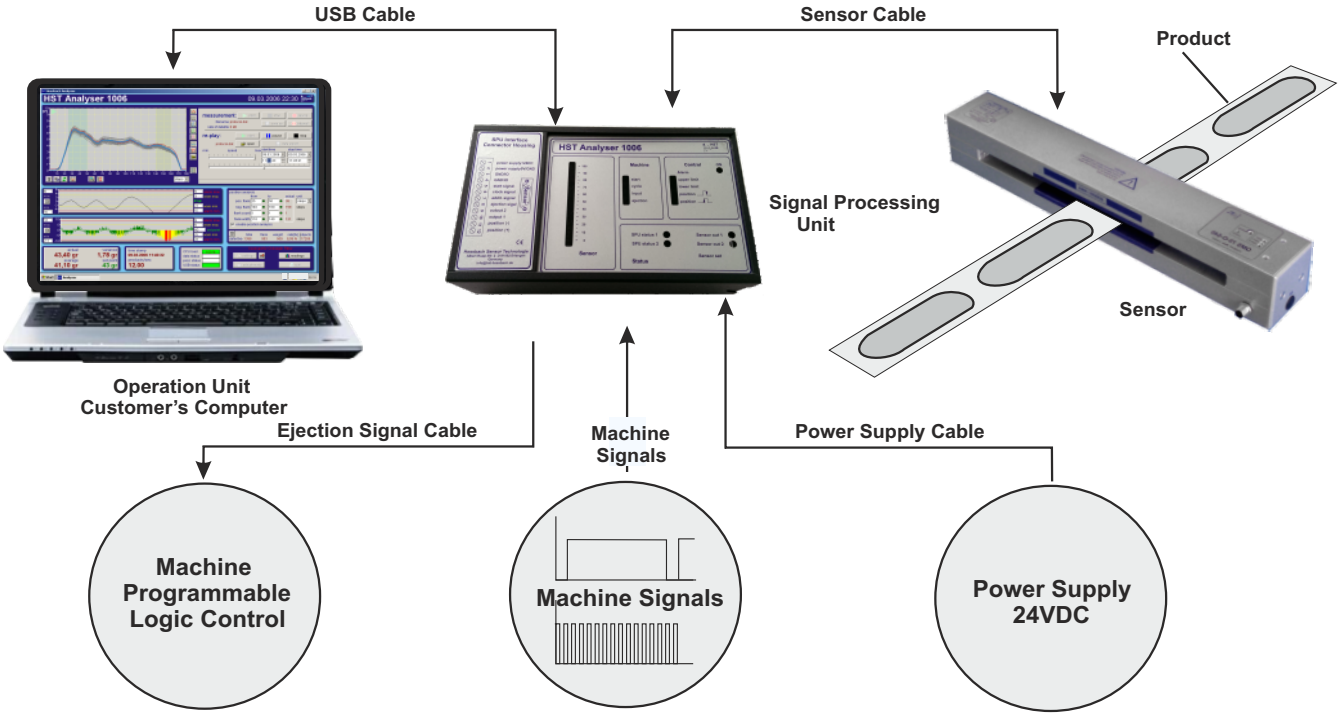


Hossbach equipment

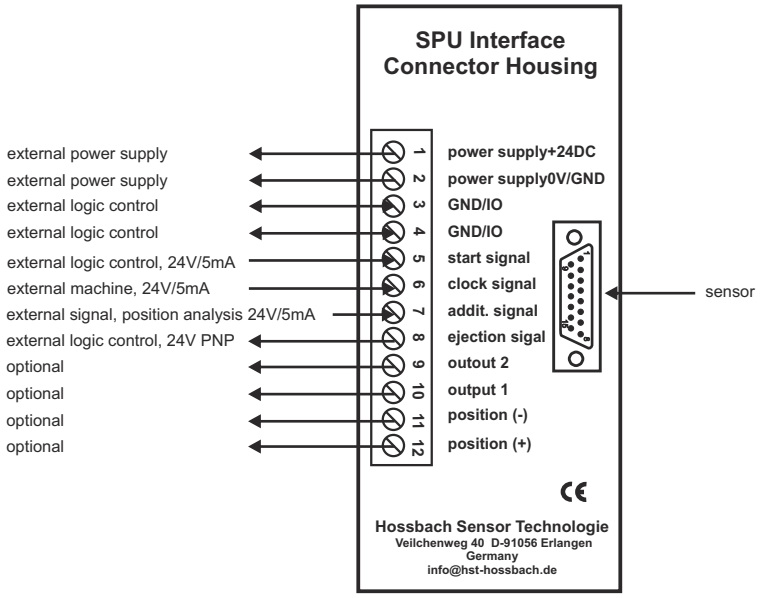
machine line device

System Oberview

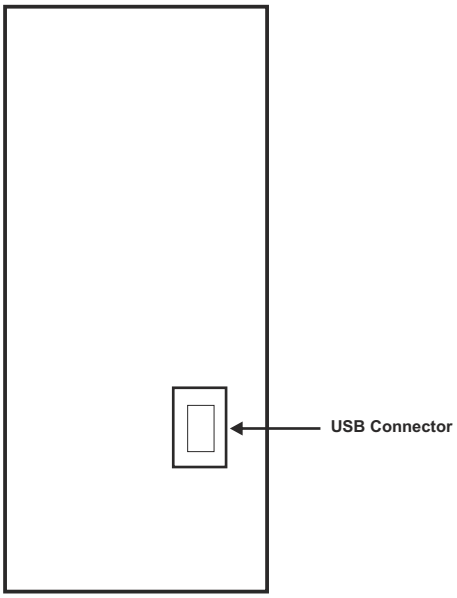
Interconnections :



SPU Interface Connector Housing :



SPU Housing USB Connector :



Features

HST Analyser 1006 a Versatile Analysis Tool

The reason why the HST Analyser 1006 is an amazing tool for a great variety of applications is based on its features and its system concept. The concept implies the software as well as the system components :

- **software package with features that are based on many years of experience**
- **software version for on-line measurements**
- **software version for off-line works, e.g. documentation, product design etc.**
- **the use of many different sensors, each designed for other measurement demands**
- **place to place moveable components**

The measurement concept covers a great variety of applications, products and materials and makes many measurements, checks, detections and tests possible. Products can be existent in many kinds:

- **discrete objects and products...**
- **endless, thin or voluminous materials, webs...**
- **material flow consisting of powder, granulate...**
- **coatings on paper or foils...**
- **covered or packaged object and products...**

Performance of the HST Analyser

Listing up all the advantages in production lines, where the HST Analyser 1006 can be used for as a tremendous inspection tool is not possible. In contrast to other inspections systems, the HST Analyser measures the quantity of the material, object or product just being in the measuring field of the sensor. Although the sensor measures the dielectric behaviour of the items being in the measuring field, the Analyser allows due to its unique features the calibration in weight or weight/sqm.

The HST Analyser gives many direct inspection results like position, weight, weight distribution or - remaining in the weight category - the production continuity concerning weight and weight distribution of whole products over time. Weights are indicated as single weight or average weight, or as weight deviations from a set weight value. Much more information of the production quality can be derived from the weight distribution of whole products or material webs represented by profile curves.

The HST Analyser gives immediate inspection results self-evidently. But it indicates much more. Due to one figure, the variance of weight, calculated by the HST Analyser 1006, the user can see, when the line is running constantly, is drifting, makes changes periodically, spontaneously or is running out of limits. The smaller the variance, the better the production runs. In other words, the machines running at lower variance values are working better than machines working at higher. The HST Analyser is not only a tremendous tool, but also an objective support to find the right decisions concerning e.g. overhauling or purchasing machine equipments.

The HST Analyser gives indirect inspection results in many categories. These indirect results are often very specific concerning on the one hand products, objects or material to be inspected or on the other hand the production line and production process. The inspection may range from raw material control to timing of different production steps. It is put in the hand of the user, to see if the coating, the knives, the vacuum, the infeed, the transport, the thickness, structure, placement of layers, the forming process, the product change or development... is ok or not.

Features

Although he HST Analyser offers many ultra modern analysis features the operation is kept very easy. The features are designed to give needed product data on-line at once during production or to deliver data thanks to its recording, documentation statistics tools off-line for later analysis.

Features

video recorder
The HST Analyser has three operation possibilities, due to a video recorder like panel. Other than the measurement mode, where the product information can only be monitored, the video recorder mode offers to record the just acquired production data or to re-play formerly recorded production data. Which production data should be stored, can be set by parameters. Weight or weight distribution data are two of such recordable data. All product or material measurements are stored with the referring time stamp.

weight distribution chart
External machine signals control the operation of the HST Analyser 1006. The start signal initiates the measurement of the product to be measured. The number of clocks determines the number of measurement signals of the sensor to represent the product as a weight distribution curve (profile) in the multi-functional chart. The beginning of the profile is the beginning of the product, the end of the profile is the end of the product. The profile-curve-points in between represent the weight quantity distribution of the profile in direction of the transport direction. In many applications the sensor measures over the whole width of the product, whereby the profile shows the weight distribution of product slices.

weight panel
The weight panel shows several weight data: The actual, the average, the set weight and the variance.

weight deviation histograms
Two weight histograms show the weight deviation of the last manufactured products or material portions.
The single weight histogram shows the weight deviation from the set weight of each product. Products whose weight exceed or undergo the preset limits are visualised in different colours.
The average weight histogram shows the tendency of the product weight. Each spike represents an average weight preset number of products. Exceeds the average weight preset limits, the referring spikes are shown in other colours.

weight calibration
The sensor of the HST Analyser 1006 system has to be calibrated for the product to be checked. For that purpose several products or material extracted quantities are ejected, that are weighed on external balances. The determined weight is then inserted in the referring input line. From that moment on the HST Analyser is weight calibrated. For the weight calibration procedure, the HST Analyser 1006 outputs a 24V signal to the control unit of the production line, which ejects several products or extracts distinct material quantities.

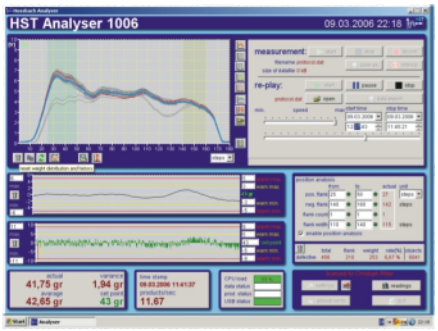
position, timing and synchronisation analysis
The position of objects, whose detection effects a 24V switching signal, can be analysed by the HST Analyser 1006. The beginning, the end and the length of the object can be checked by adjustable tolerance ranges. Although the position analysis is designed primarily for position analysis of objects detected by HST sensors, signals from other sensors like photo cells or machine signals in general can also be checked referring their position or timing or synchronisation.

statistics
Data which characterise the quality of the manufactured products give important information about the production process. Among these data is the total sum of manufactured products and defectives referring weight and position. An important value is the variance, that describes the weight fluctuation of a preset number of products. To visualise the weight fluctuations a Gaussian-like weight fluctuation curve is created, including the weight of all products.

documentation
All measurement (sensor) and evaluated data including time stamps can be recorded and re-played thanks to the video-recorder-like feature. Furthermore selected data can be easily extracted from recorded data files and imported into spreadsheet formula programs like Excel.
For quick documentation weight distribution and position curves can directly be copied from the screen to the spreadsheet formula programs.

Delivery Extent

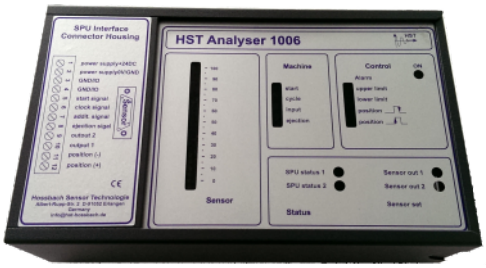
Delivery Extent :



HST-Analyser 1006 Software Package

HST-Analyser 1006 Software Package

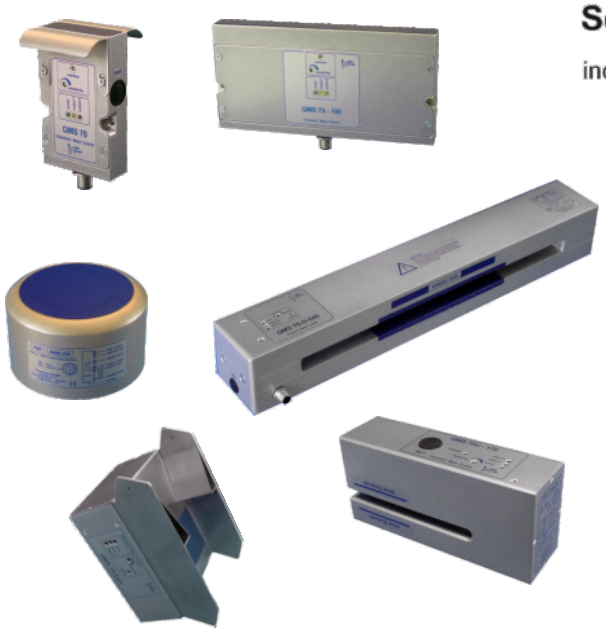
including : - CD containing software package
and operation manual
and Instruction film
and further information



Signal Processing Unit

Signal Processing Unit

including : - interface connector housing
- shielded USB cable



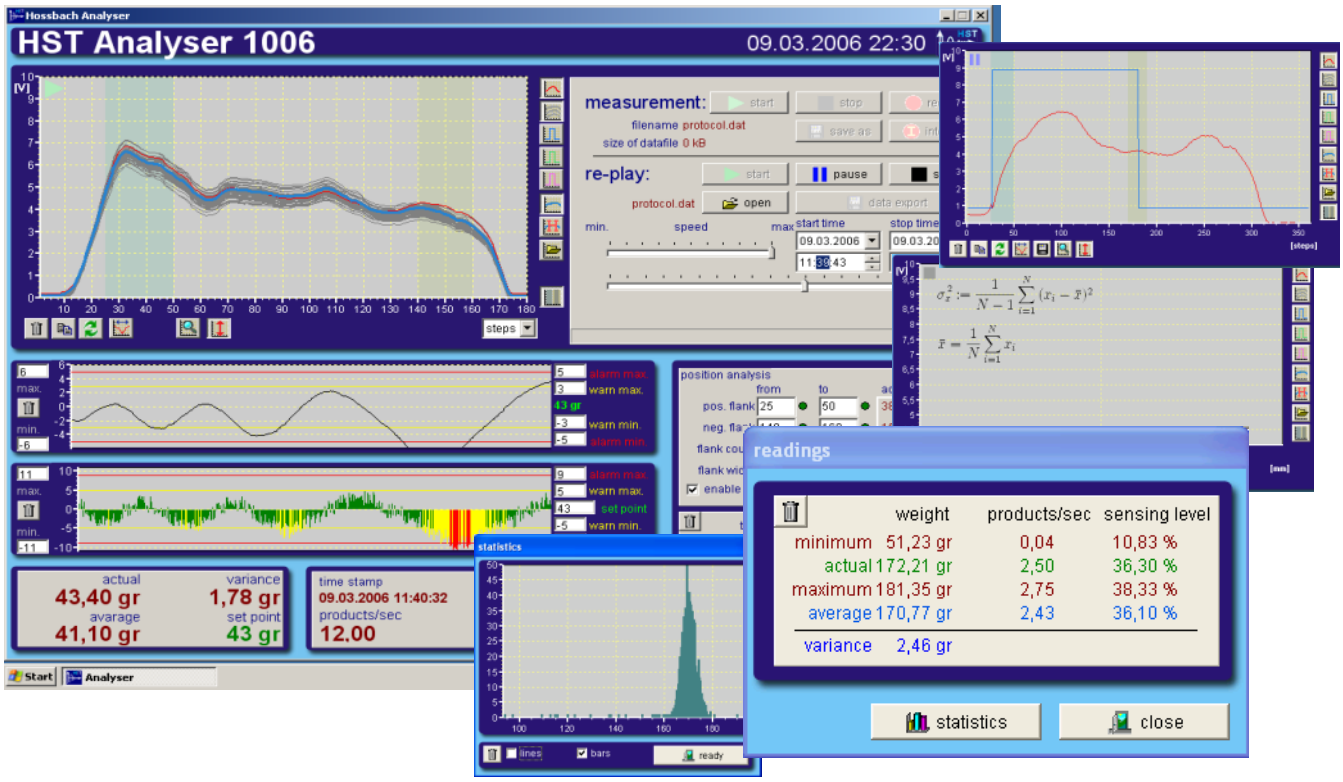
one sensor, version according application

Sensor

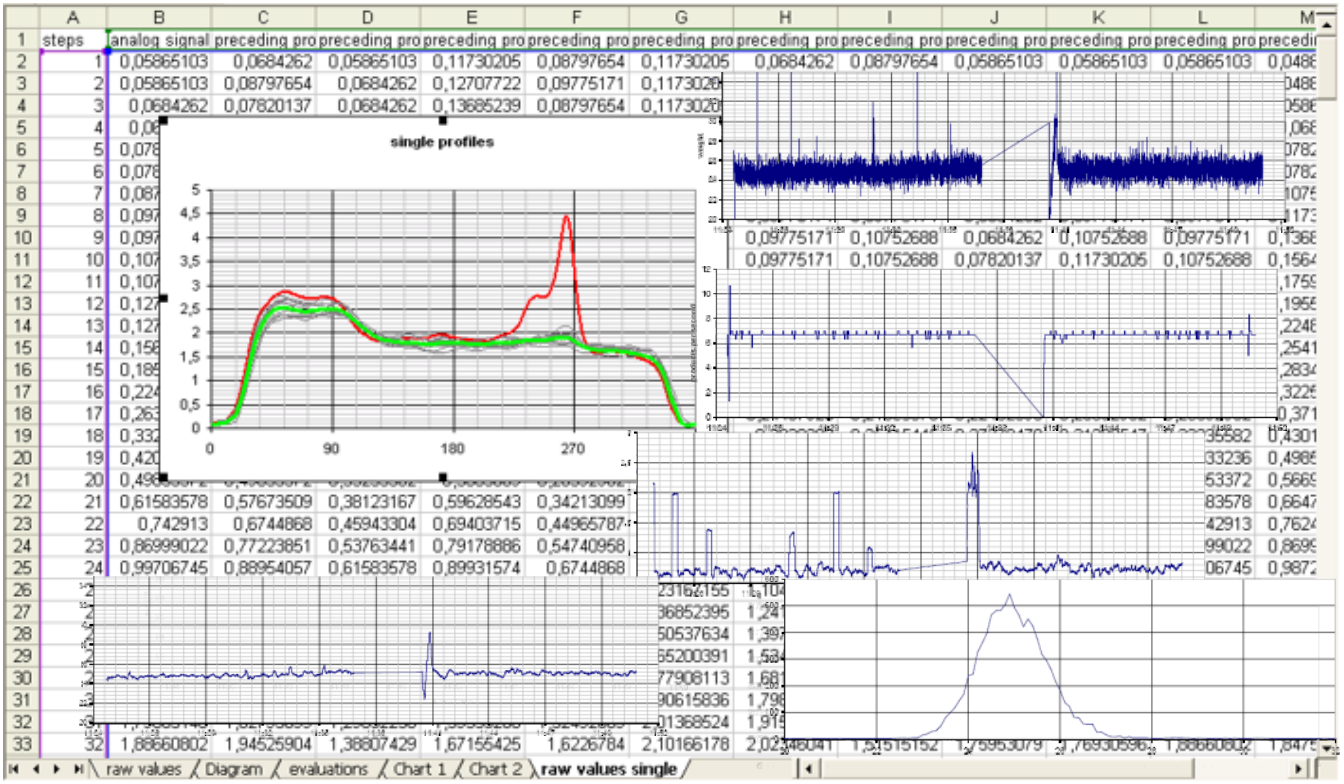
including : sensor cable

HST Analyser 1006

Operation Screen



Charts



Order Data : **- control equipment -**

HST Analyser 1006	order no.
HST Analyser **Signal Processing Unit , SPU** 0...10V analog input as sensor interface switching output PNP USB output as PC interface 1,5m shielded USB cable **Online Software Package** licensed software for on-line measurement data acquisition on-line recording on-line analysis on-line editing, protocoling and documentation off-line measurement data re-play off-line analysis off-editing, protocoling and documentation **Transport Case**	**HST Analyser 1006 Basic**

Order Data : **- complete sensor system -**

HST Analyser 1006	order no.
HST Analyser **Signal Processing Unit , SPU** 0...10V analog input as sensor interface switching output PNP USB output as PC interface 1,5m shielded USB cable **Online Software Package** licensed software for on-line measurement data acquisition on-line recording on-line analysis on-line editing, protocoling and documentation off-line measurement data re-play off-line analysis off-editing, protocoling and documentation **QMS70xxx Sensor** Sensor with 0...10V analog output, incl. 5m sensor cable **Transport Case**	**HST Analyser 1006 - QMS70xxx** *)
*) QMS 70xxx replaced by the order no. of the referring sensor	

Order Data : **- spare parts -**

HST Analyser 1006	order no.
HST Analyser Transport Case	**HST Analyser 1006 - case**
1,5m shielded USB cable	**USB-SH-1-5**

Order Data : **- software packages -**

HST Analyser 1006	order no.
HST Analyser Online Software Package - one user license - software for on-line measurement data acquisition on-line recording on-line analysis on-line editing, protocoling and documentation off-line measurement data re-play off-line analysis off-editing, protocoling and documentation	**HST Analyser 1006 Online - SWP -1**
HST Analyser Online Software Package - five user license - same features as the one user license of the Online Software Package	**HST Analyser 1006 Online - SWP -5**
HST Analyser Offline Software Package - one user license - off-line measurement data re-play off-line analysis off-editing, protocoling and documentation	**HST Analyser 1006 Offline - SWP -1**
HST Analyser Offline Software Package - five user license - same features as the one user license of the Offline Software Package	**HST Analyser 1006 Offline - SWP -5**

Technical Data

Signal Processing Unit :

function :	high speed sensor signal processing and conversion, data transfer to the PC
signal conversion rate :	max. 5 kHz
signal inputs :	start and clock signal, 24V&10mA
signal output :	switching output 24V PNP, for product ejection and weight calibration
sensor interface :	0 ... 10V, +24V, 15-pin SUB-D connector
PC interface :	USB
PLC and power supply interface :	12-pin screw fastening connector
indicators :	status LEDs , sensor signal bar-graph
operation voltage :	+24VDC +- 10%
dimension, HxWxD incl. interface connector housing :	145 x 240 x 68 mm
weight :	2000 gr.
mounting of the interface connector housing :	four 4 mm holes for wall mounting
mounting of the electronic housing :	by plugging into the interface connector housing
operation temperature range :	10...40° C
storage temperature range :	0...50°C
meets or exceeds standard and requirements :	EN 50011:2007 class A EN 61326-1:2006
protection type :	IP 50

CE

Technical Data

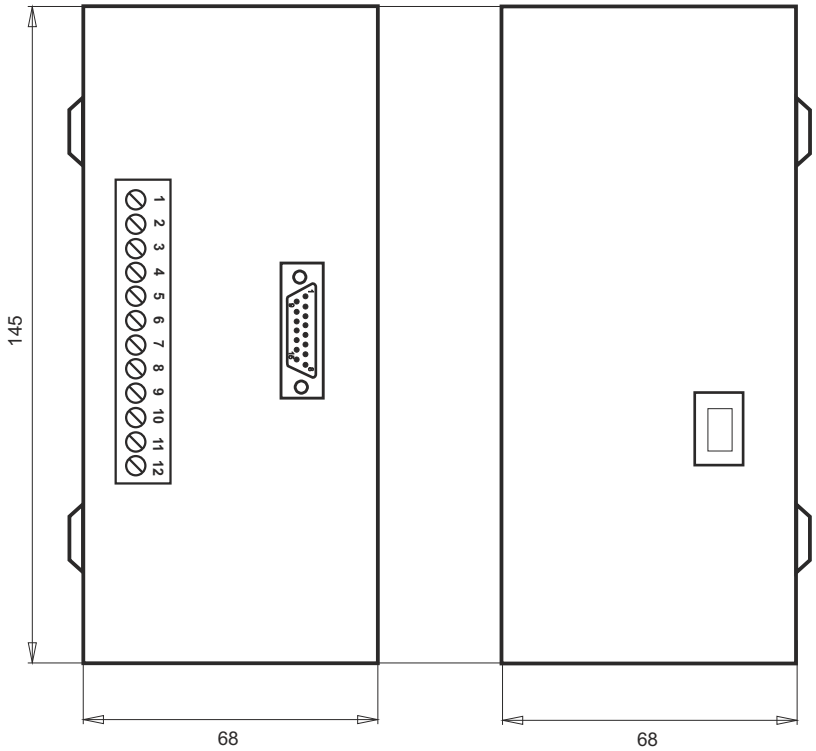
Software Packages :

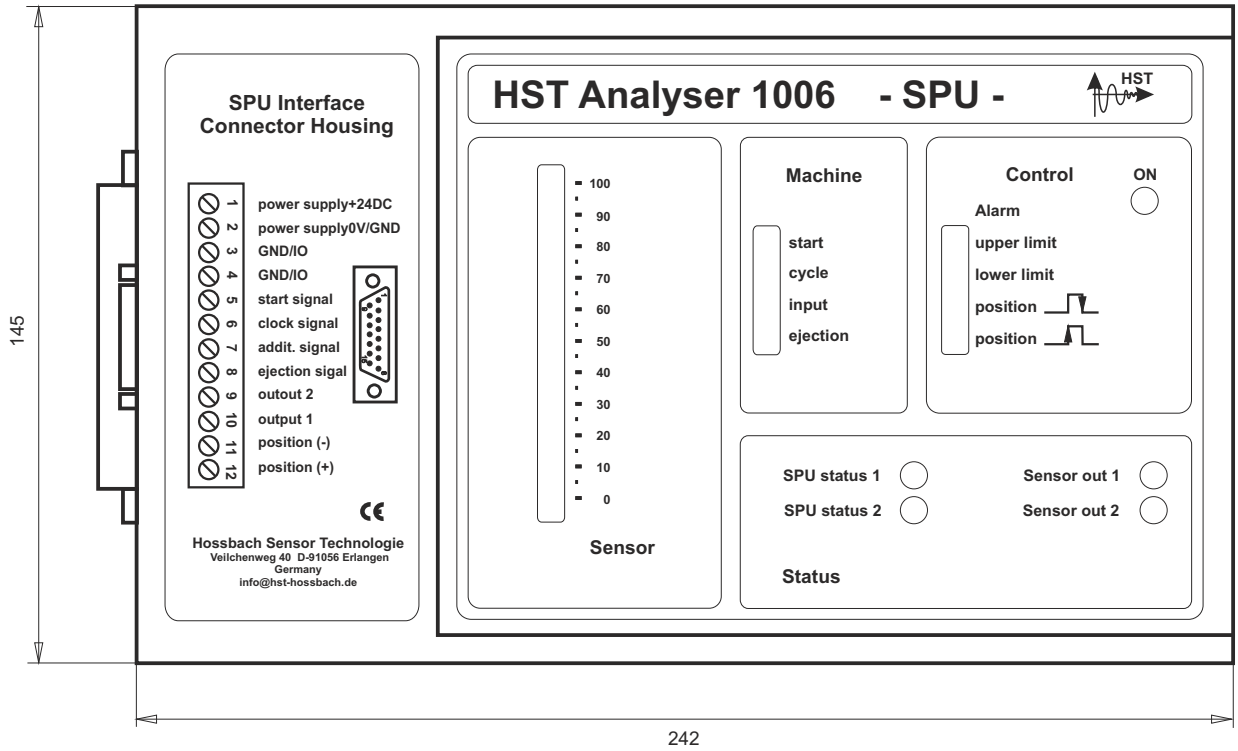
Online Software Package :	1) on-line measurement 2) on-line recording 3) on-line analysis 4) off-line production data re-play 5) off-line analysis 6) off-data editing, protocoling and documentation
Online Software Package :	1) off-line production data re-play 2) off-line analysis 3) off-data editing, protocoling and documentation
delivery extent :	licensed software on CD, incl. operation manual

Demands on Customer PC :

personal computer :	high performance PC
graphic resolution :	optimised for 1074x768 pixel, higher resolution possible
operation system :	Windows XP, Windows Vista, Windows 7, Windows 8
processor frequency :	min. true 2 Ghz
RAM :	min. 512 MByte
needed hard disk space :	program: 20Mbyte ; Data : >= 500MByte
RAM :	min. 512 MByte
interface :	USB
max. conversion rate :	> 1000 measuring values / second

Dimensions


145
1 2 3 4 5 6 7 8 9 10 11 12
68
68


145
SPU Interface
Connector Housing
1 power supply+24DC
2 power supply0V/GND
3 GND/IO
4 GND/IO
5 start signal
6 clock signal
7 addit. signal
8 ejection sigal
9 outout 2
10 output 1
11 position (-)
12 position (+)
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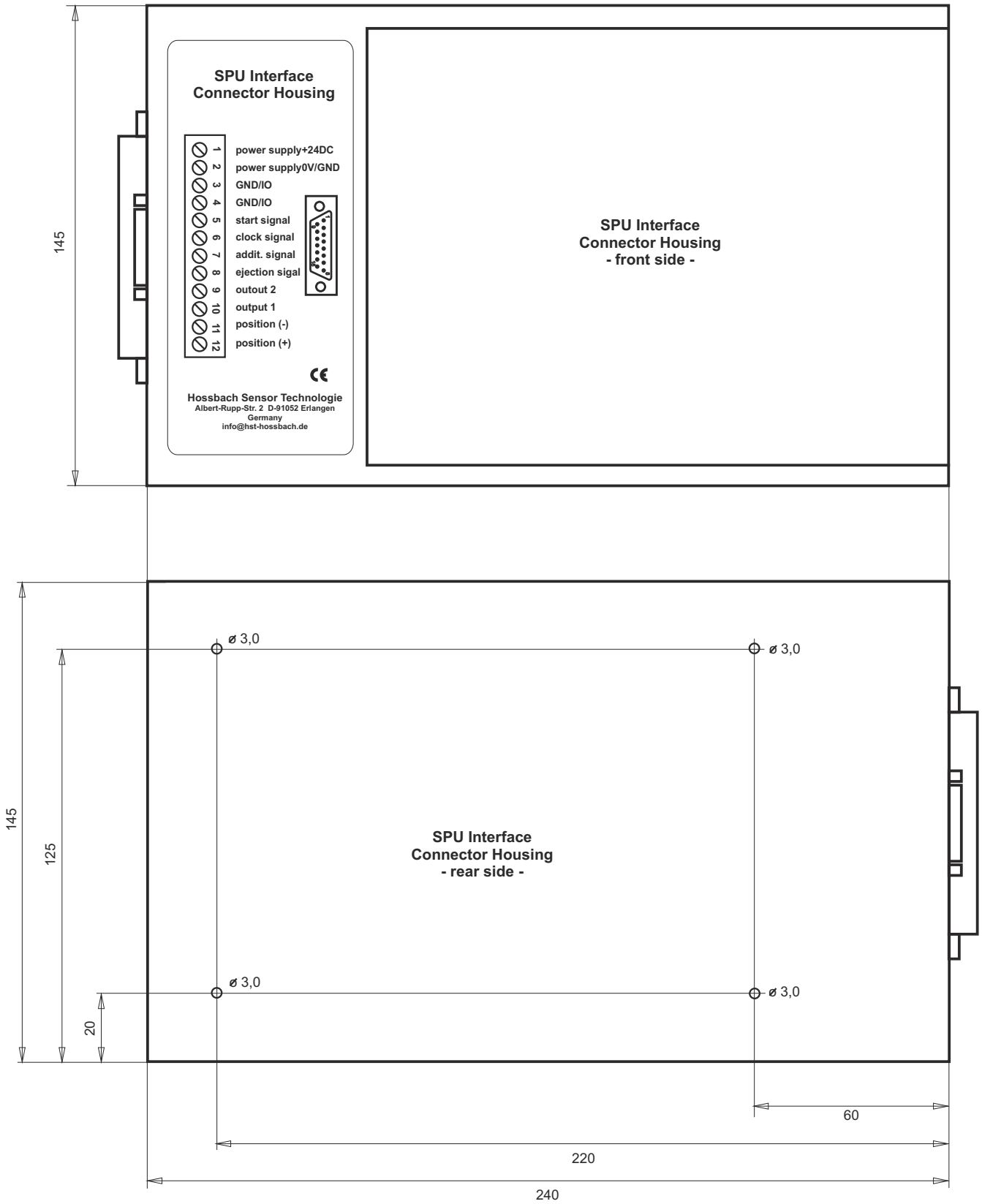
Germany
info@hst-hossbach.de
HST Analyser 1006 - SPU -
HST
100
90
80
70
60
50
40
30
20
10
0
Sensor
Machine
start
cycle
input
ejection
Control
ON
Alarm
upper limit
lower limit
position
position
SPU status 1
SPU status 2
Sensor out 1
Sensor out 2
Status
242

Dimensions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Germany
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SPU Interface
Connector Housing
- front side -
145
SPU Interface
Connector Housing
- rear side -
ø 3,0
ø 3,0
ø 3,0
ø 3,0
145
125
20
60
220
240