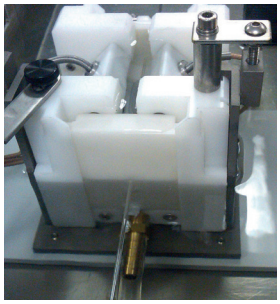
Zumbach

SWISS PRIME MEASURING SINCE 1957

UMAC® – WALLMASTER

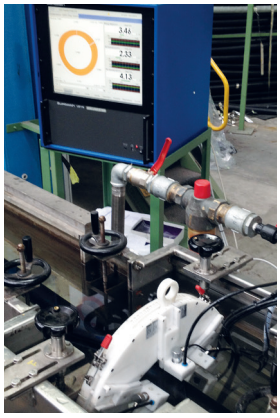
Ultrasonic Measurement & Control Systems for Wall Thickness & Concentricity

UMAC® WALLMASTER SYSTEMS: INCREASE THE EFFICIENCY

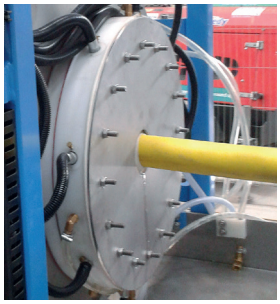


UMAC WALLMASTER systems from ZUMBACH allow in-line measurements, data acquisition and control during the extrusion of a wide range of products, like tubing, pipe, hoses and cables. Cutting edge digital technology (DSP) opens up measuring solutions for each process and product:

- Ultra thin walls
- Smallest and largest diameters
- Multi-layer products
- Cable isolations and jackets



Special products requiring an off-line QC measurement can now be measured in-line and relevant parameters monitored continuously. The diameter can also be measured in a combination with the ultrasonic measurement with certain transducer holder. In addition, UMAC WALLMASTER systems provide for real-time QC data, process monitoring, trending, SPC data, statistical charts etc.



Economic Advantages

- Reduced set-up time
- Raw material savings
- Scrap reduction
- Continuous process monitoring and control
- Fully automated QC, data collection and reporting
- ROI within few months

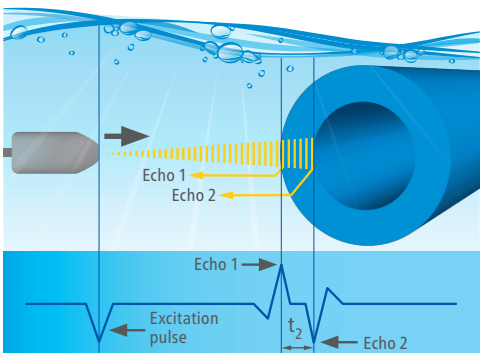
Technical Advantages

- Easy operating
- Digital Signal Processing (DSP)
- Multi-layer measurement (up to 5 layers simultaneously)
- Measurement of thin walls down to 0.05 mm (.003 in.)
- Thick walls up to 99.95 mm (4 in.)
- Product diameters from 0.2 to 400 mm (.008 to 15.75 in.)
- Complete process transparency and control

Ultrasonic Measurement Principle

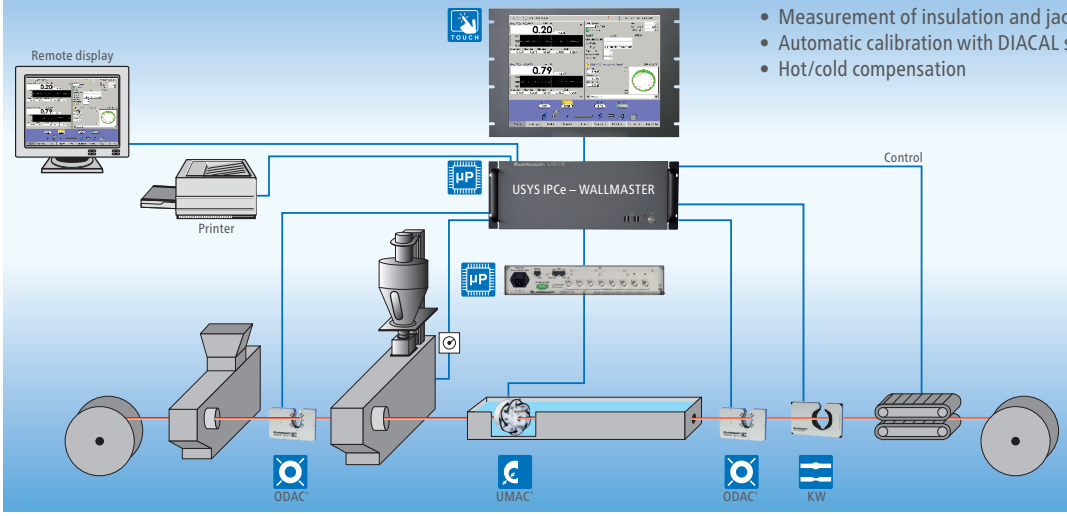
It is based on the time difference (t_2) of the sound echoes from the surface and the inner side of the product. A piezoelectric crystal is excited by a short electrical pulse. The crystal converts electrical energy into mechanical energy, i.e. sound waves. When the sound waves encounter a difference in the propagation medium (for instance when passing from water to a synthetic material), a part of them is reflected back to the crystal (echo).

Wall thickness = Sound velocity of material • t_2 • 0.5



Measurement of Insulations or Jackets on Cables

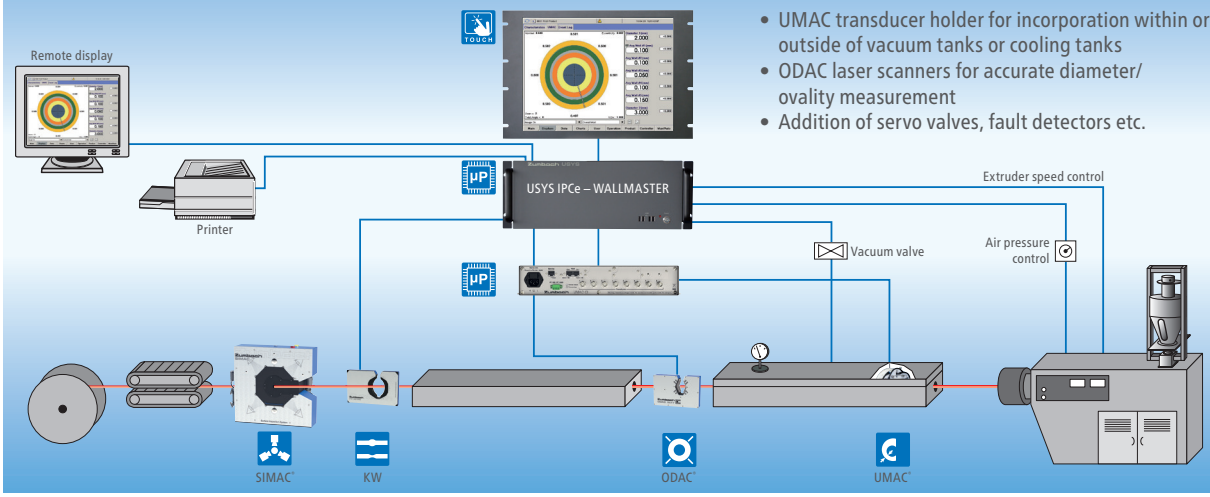
In the cable sheath extrusion, the WALLMASTER system offers many solutions thanks to its flexibility and ease of use. Parameters such as wall thickness, concentricity, diameter and ovality can be measured and controlled.



- Measurement of insulation and jackets
- Automatic calibration with DIACAL system
- Hot/cold compensation

Wall Thickness and Diameter Control on Tubing and Hoses

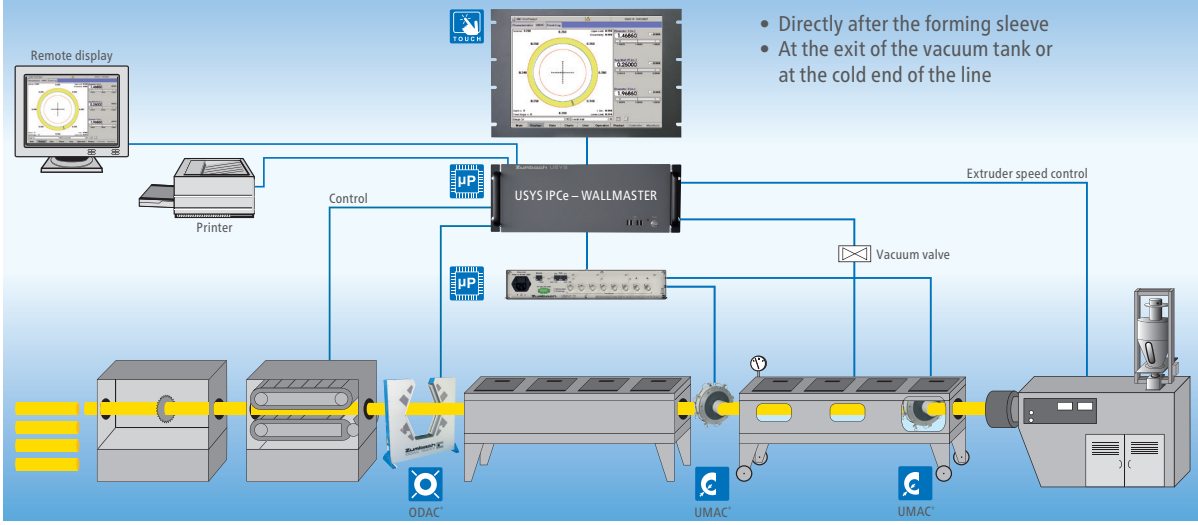
Measurement of wall thickness, concentricity, outer/inner diameter, and ovality. The integration of existing gravimetric dosing systems for the calibration of the wall thickness measurement is also possible.



- UMAC transducer holder for incorporation within or outside of vacuum tanks or cooling tanks
- ODAC laser scanners for accurate diameter/ ovality measurement
- Addition of servo valves, fault detectors etc.

Wall Thickness Measurement and Control During the Extrusion of Pipe up to ø 400 mm (15.75 in.)

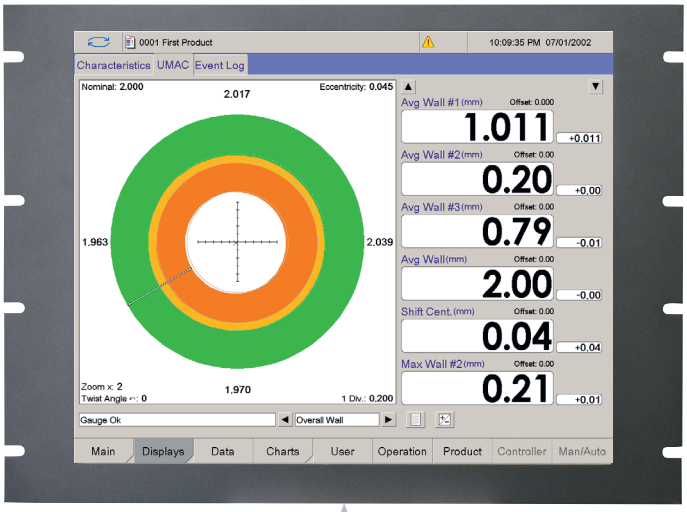
Transducer holders are available for measurement at the hot end or the cold end of the line. Optionally, also with integrated diameter measurement. At the hot end, the highest savings are possible:



- Directly after the forming sleeve
- At the exit of the vacuum tank or at the cold end of the line

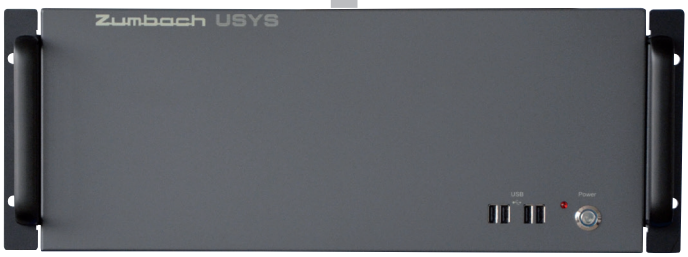
Display

Rack mountable touch screen for convenient installation into existing 19" rack (8 HU*) or extruder panel.
As an alternative, a desktop touch screen or screen with keyboard and mouse are available.



Multi Sensor Data Acquisition and Process Control Systems

The USYS IPC hardware provides a modular alternative to the other processor and display units of the USYS family. It offers the flexibility to mount the processor in a convenient location while mounting the flat panel touch screen at an optimum location for the operator.



USYS IPC 1e WALLMASTER

- Inputs: Up to 3 ODAC or MSD, detector, Start/Stop, Pause
- Up to 4 extension ports (digital & analogue inputs & outputs, relays, ODAC, MSD, etc.
- 4 HU* box design

USYS IPC 2e WALLMASTER

- Inputs: Up to 6 ODAC or MSD, detector, Start/Stop, Pause
- Up to 7 extension ports (digital & analogue inputs & outputs, relays, ODAC, MSD, etc.
- 4 RS-422 ports as standard, extendable to 8
- 19" rack 4 HU*

* HU = Height Unit; 1 HU = 44.45 mm (1.75 in.)
► For detailed specifications of the individual components, please ask for specific data sheets.

High-Tech Measured Value Processors for Ultrasonic Wall Thickness Measurement

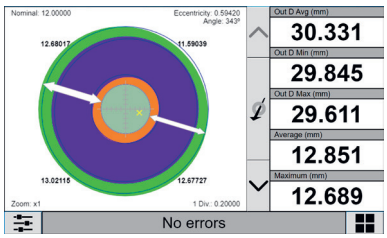
Industrial processor with DSP (Digital Signal Processor) technology for connection to a higher level system (PC, PLC or USYS, resp. WALLMASTER systems).
For display and process control, the UMAC CI provides serial RS, Profinet IO, Ethernet TCP/IP, EtherNet/IP or OPC UA interfaces.

UMAC CI

For single and multi-layer cables and tubes

- Multi-layer measurement (up to 5 layers)
- Wall thickness down to 0.05 mm (.002 in.)

Webserver



NEW!
Now with integrated communication interface.

► For further specifications, please ask for the new UMAC CI prospectus.

Accessories / Peripherals

19" cases / cabinets, keyboard, mouse, printers, remote displays, vacuum and pressure control valves.

UMAC® TRANSDUCER HOLDER

UMAC A8 / A11 / A21 / A28

Open, compact and available in two versions:
– K version: for standard water trough installation (height adjustment from the top)
– V version: for vacuum tank installation (height adjustment from the bottom)

Model	Meas. points	Diameter range mm	inch
UMAC A8-4K/8K	4 or 8	0.2 ... 8	.008 ... .31
UMAC A11-4K/8K	4 or 8	0.2 ... 11	.008 ... .43
UMAC A21-4K/8K	4 or 8	0.2 ... 21	.008 ... .83
UMAC A28-4K/8K	4 or 8	3.5 ... 28	.138 ... 1.10

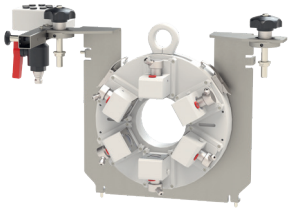
UMAC RZ35 / RZ65

Ring-shaped measuring chamber with two pairs of sliding guides, opening up automatically; each diameter requires 1 set of guides. Simple adjustments to suit the new product diameter in just a few seconds. All transducers are symmetrically positioned with a central adjustment.

Model	Meas. points	Diameter range mm	inch
UMAC RZ35-4K	4	0 ...35	0 ... 1.38
UMAC RZ35-6K	6	0 ...35	0 ... 1.38
UMAC RZ65-4K	4	0 ...65	0 ... 2.56
UMAC RZ65-6K	6	0 ...65	0 ... 2.56

UMAC Z50 / Z100 / Z180

Two quick hand adjustments to suit the new product diameter take just a few seconds. All transducers are symmetrically positioned with a central adjustment and a large measuring range.



Model	Meas. points	Diameter range mm	inch
UMAC Z50-4K	4	5 ... 50	.19 ... 1.97
UMAC Z50-6K	6	5 ... 50	.19 ... 1.97
UMAC Z100-4K	4	10 ...100	.39 ... 3.94
UMAC Z100-6K	6	10 ...100	.39 ... 3.94
UMAC Z180-6K	6	25 ...180	.98 ... 7.08

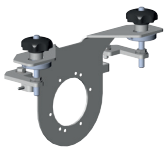
UMAC R

Fixed transducer holder for 4, 6 or 8 measuring points. Ring shaped transducer mounting fixture custom configured for installation into existing vacuum tank. This UMAC® R version is installed inside the vacuum tank on to the bulk head separating the first and second vacuum chamber.

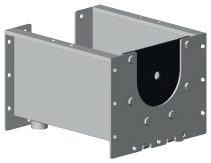
Model	Meas. points	Diameter range mm	inch
UMAC R110-8K	4...8	20 ... 110	.80 ... 4.30
UMAC R180-8K	4...8	20 ... 180	.80 ... 7.09
UMAC R250-8K	4...8	20 ... 250	.80 ... 9.84
UMAC R350-8K	4...8	30 ... 350	1.18 ... 13.78
UMAC R400-8K	4...8	30 ... 400	1.18 ... 15.75

► Transducer holders for other diameter ranges upon request.

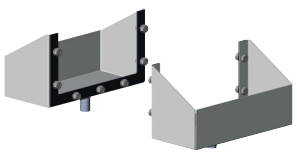
Accessories for UMAC transducer holders



RZ/Z holder mounting frame
Holding platform for direct mounting into existing cooling trough or water basin of the F versions.



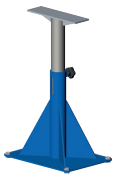
Water basins (F versions)
Additional water basin for the accommodation of the transducer holder (with or without H version).



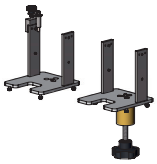
Overflow basins
For mounting on the water basin (F version).

Guiding blocks
These blocks guarantees a proper guiding of the product.
(Available for the A and RZ version).

Transducers of various frequencies (typically: 2.25 / 5 / 10 / 20 MHz).



Floor stands
To accomodate the water basin (F version).



A holder mounting frame K – for open trough installation.

A holder mounting frame V – for vacuum trough installation.

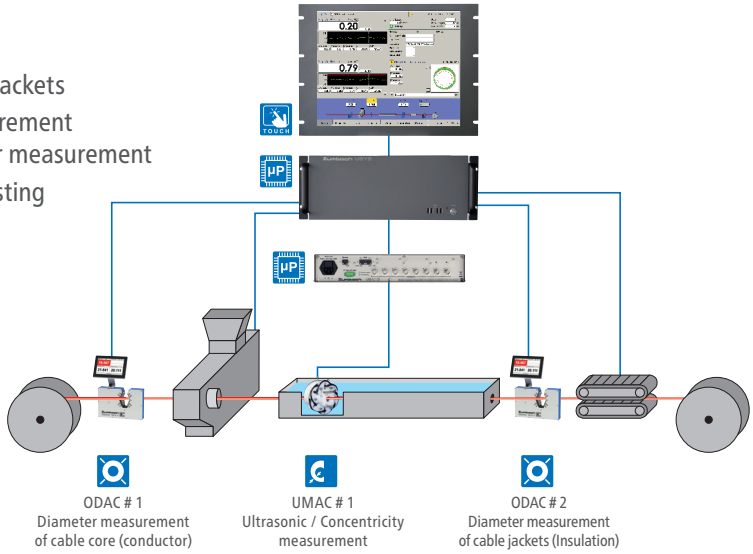
IMPROVE AND SIMPLIFY PROCESSES

DIACAL 8000

For Compensation and Automatic Calibration of the Wall Thickness. DIACAL 8000 is a smart method for the simplified calibration during the extrusion of cable jackets.

Benefits

- Precise wall thickness measurement of cable jackets
- Automatic calibration of the ultrasonic measurement through intelligent processing of the diameter measurement
- Economic solution because it employs the existing and essential diameter measuring instrument
- Optimised material consumption
- Generally improves the process



USYS Web Server

For integration into local and wide area networks (LAN, WAN) the optional USYS Web Server software module allows for work stations configured with a standard Internet browser to access and view the USYS IPC WALLMASTER screens remotely, providing insight information about the process and product being manufactured.

SIGMA-EXPERT and CpK-Pilot

Sigma Expert – this sophisticated, self-tuning control algorithm automatically adapts to process and product conditions to ensure tightest control possible. CpK-Pilot statistically analyses the process capability and adjust the set-point for optimum material savings.

USYS Report Manager / Report Viewer

Historical storage of all printed reports such as trend charts, package summaries and SPC charts locally or on the network (XML format). Reports can be retrieved by the USYS for display. Report Viewer installed on the PC provides access to the reports from previous production runs for viewing and printing (ISO 9000 traceability).

USYS Data Log

For quick and easy data logging to a PC or network file server to a text delimited (CSV) file. USYS Data Log is a Windows™ based software for convenient configuration of the data to be provided by the USYS processor.

Zumbach OPC Server Software

The "Zumbach OPC Server" application connects to several measuring devices and systems via the Zumbach host protocol and acts as a gateway so that these devices and systems are accessible via OPC UA or alternatively via legacy OPC DA (OPC classic). Measured values can then be read, parameters can be written and product recipes can be set and activated. The application works with Microsoft Windows™ and can be installed on a Microsoft Windows™ computer, on a Zumbach system with Microsoft Windows™ (RAYEX®, SIMAC®, PROFILEMASTER®, STEELMASTER) or purchased as pre-installed software on a dedicated nanoPC solution offered by Zumbach.

Other products and measurement technologies

Further sensors for the measurement of other parameters such as diameter with laser technology, capacitance as well as lump and neckdown detectors (fault signal), surface inspection systems, conductor preheaters and temperature measurement, spark testers, scanners based on x-ray technology, lengths and speed measuring systems etc. complete the product range from ZUMBACH.

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• Technical specifications are subject to change without notice

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