

# WCH-4

:: **METHODOLOGIES** ::

Ultrasonic Cross-Hole Testing

## Modular wireless instrument for cross-hole surveys on foundation poles



WCH-4 introduces a new concept of instrument for cross-hole tests on foundation poles. More than an instrument meant in classic sense, WCH-4 is a modulare system for cross-hole surveys on foundation poles. The core are motorized reels electronically controlled on which are mounted high-power borehole probes to cross-hole investigations on foundation poles, diaphragms, and all those infrastructural cement or concrete works that could be verified by cross-hole tests, that is the descent in prepared tubes at the moment of the casting and subsequently filled by water. Each reel of WCH-4 system integrates a motorized probe with cable 60mt, and all the electronics control which supervises automatic management of the probes during the descent/ascent of the probes (cross-hole) and saving data.

Thanks to Rugged tablet, and the almost complete absence of physical cabling, settings, measurement management, besides the display and the interpretation of acquired data, are agile and immediate. In the direct analysis mode each wave emitted by the internal generator is fully displayed and moreover it's possible to modify parameters of display to make even easier reading velocity through crossing and the possible presence of tested defective material. Through the use of 2-3-4- motorized reel with automatic and simultaneous movement, it's possible to obtain an exponential savings of the time used for survey, because with one only descent/ascent of probes inside the pole to be investigated (which has to be instrumented with 2-3-4- tubes) it's possible to obtain correspondance sections. Acquired data in every single impluse, are displayed in real time on the large monitor of the tablet, allowing the immediate viewing of possible imperfection in the investigated structure. Executive procedure of cross-hole with 2-3-4 channels is managed with fully automated modes. The only proceeding required to the user is the placement of encoder to read the position of the motorized probes on the prepared tubes to the survey and the early alignment of the probes on the head of the pole.

Ended this operation, it's enough to push the key to start data acquisition which is automatically managed by the system. It's possible to verify data as they are acquired so that it's possible to check the in real time the performance test. It's also possible to immediately print the test report with its data of the just run investigation directly on the

construction site. The cross-hole method of analysis on foundation poles of buildings and infrastructural works allows to perform an high resolution accurate and qualitative verification of the investigated material, usually a foundation pole. One ultrasonic wave, is sent from a transmitter to a receiver, which are automatically guided from the instrument along the complete lenght of the pole inside the survey poles entirely "drowned" during casting. The velocity of the sonic wave and its energy are strongly influenced by the quality of the cement. So, it's possible to verify its features and provide a 2D or 3D tomographic representation, called diagraphy. In CROSS-HOLE tests on concrete pole (CLS), in order to obtain a right measurement of delay of the crossing wave and an optimal reception of the signal, it's necessary to manage the constant advancing of the probes, which it's feasible thanks to the medium velocity indicators and measurement of depth ones displayed with a graphic on the manual encoder which, in case of overcoming of medium parameteres, indicates the actions to do to return back them.

Reference standards: ASTM D6760-08

**- STRENGHTS -**

- Easy to use system by a single operator
- Easy to carry in a unique case equipped by trolley
- Intuitive to use software and step-by-step guide

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## SPECIFICATIONS

### Acquisition:

- Time bases: 100ns, 200ns, 500ns, 1 $\mu$ s, 2 $\mu$ s, 5 $\mu$ s, 10 $\mu$ s, 20 $\mu$ s
- Sample resolution: 12 bit
- Samples per event: 2048
- Amplification factors: x1, x2, x4, x5, x8, x10, x16, x32
- Bandwidth: 50 MHz
- Ultrasonic filters: central frequency 50 kHz

### Probes:

- Borehole: frequency of resonance 52 kHz, diameter 35 mm
- Excitation peak voltage: 500V (normal), 2000V (high)
- Minimum pass of measurement: 10 mm

### General:

- Wireless technology: Wi-Fi – 2.4 GHz – 802.11b
- Wireless synchronization: band 5 GHz, 8 selectable channels

*The continuous improvement of this product by engineering could create differences with the one specified. MAE reserves the right to make any changes to products without make public communication. All cited brand are registered by relative producers. Pictures of management devices are purely indicative, they can be changed according to the needs keeping indicated functional characteristics.*



[mae-srl.it/go/WCH-4](http://mae-srl.it/go/WCH-4)

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## RELATED PRODUCTS



### [DGWIN](#)

Interpretazione dati prove soniche su pali di fondazione, metodologia di indagine Cross-hole



### [KEXPWCH4](#)

Espansione 1 canale WCH-4



### [SF52](#)

Sonda per ultrasuoni in foro (cross-hole)



### [SF63](#)

Sonda per ultrasuoni in foro (cross-hole)



### [WINSONIC](#)

Software reportistica indagini a mezzo ultrasuoni a contatto