Cross-Hole Analyzer CHAMP-XV

For Crosshole and Single Hole Sonic Logging

The Cross-Hole Analyzer determines the quality and consistency of the concrete of drilled shafts, slurry walls, bored piles, cast-in-situ piles and other types of concrete foundations. It may be used for crosshole sonic logging (CSL) of drilled shafts or single hole sonic logging (SSL) of smaller augered cast-in-place piles.

The tablet-like CHAMP-XV continues the tradition of light but rugged Cross-Hole Analyzers. Still small enough to be portable, the CHAMP-XV features a larger color LCD touch screen that is highly visible in all lighting conditions. Enhancements over previous models include a seamless top surface, replaceable battery, USB ports and Windows 7 operating system. Data entry has been optimized.

The CHAMP-XV performs essential real time analysis (waterfall diagram) on site. USB ports now make it simpler to transfer data to a computer for review and additional analysis with CHA-W and for report preparation.

Shafts that will be tested with a Cross-Hole Analyzer are built with steel (preferred for CSL) or PVC (required for SSL) tubes that span their length. A transmitter in one tube sends a high frequency signal that travels through the concrete and is detected by a receiver in another tube (or in the same tube for SSL). As these sensors are raised and/or lowered along the length of the foundation, the CHAMP-XV displays and records the strength of the received signal, as well as the time from signal emission to signal arrival at the receiver, versus depth. In CSL, scanning various tube combinations for the entire shaft allows evaluation of concrete quality and defect location along the length and by quadrant. Only one tube is used in SSL. The optional Motorized Probe Deployment System relieves the operator from pulling the cables manually, making testing more comfortable.

Shaft cross section with four tubes, six paths are tested.

Shaft schematics showing one tube (SSL test, right) or one pair of tubes (CSL test, left), with signal being sent from transmitter (T) to receiver (R).

The CHAMP-XV meets or exceeds the requirements of ASTM D6760 and several other crosshole sonic logging codes and standards. Visit www.pile.com/cha for a listing.
### CHAMP-XV Specifications

#### Physical
- Size: 320 X 250 X 68 mm    Weight: 5 kg
- Screen: 26.4 cm VGA sunlight readable touch screen display
- Operating temperature range: 0 to 40°C.
- Power: Internal replaceable 12V battery for four hours of continuous data collection

#### Electronic
- Computer with 60 GB SSD internal drive and 4 external USB ports
- Analog to digital converter resolution: 12 bits
- Sampling rate: 500 kHz, 1 MHz and 2 MHz, user selectable
  (equivalent measuring accuracy 2μs, 1μs and 0.5μs)
- Scan rate: 32 scans/s (pull rate allows up to approx. 1.5 m/s)
- User adjustable gain, trigger and transmission power level
- User selectable record size: 250, 500, and 1,000 points

#### Other
- Operates in English or SI units
- Windows® 7 operating system
- User manual included
- One year warranty and lifetime technical support
- Dual high resolution encoders independently track the depth and direction of probe movements. Probes may be at different levels during pulling. Data may be taken in upward or downward direction. Encoders are placed directly on tubes, on a tripod or are part of optional motorized probe deployment system.

### Probes Specifications

#### Physical
- Diameter: 25 mm    Length: 215 mm
- Element: Ceramic
- Enclosure: Oil Filled Nickel Plated Brass
  - Shells pressure tested to 300m water depth
- Optional centralizers and bottom extension weights for deeper shafts.
- Probe Cable: 60 m, 100 m or 150 m, heavy duty polyurethane jacket

#### Electronic
- Transmitter frequency (nominal): 45 kHz
- Receiver tuned to 45 KHz nominal
- Transmitter voltage: 200, 400, 600 or 800 Volts (user selectable), powered by 12 V source in the CHAMP-XV, for safety.
- Maximum probe separation: 3 m

### Motorized Probe Deployment System

#### Main Unit
- Size: Two 380mm x 480mm x 405mm spools    Weight: 11.3Kg each
- Includes 60 m cable, detachable from spool
- Includes depth encoder for each probe, attached to frame

#### Motor Control Unit
- Size: 240mm x 160mm x 90mm
- Weight: 1.6 Kg
- Powered by either external battery (8 hours duration), 12VDC car battery, or 100 – 240 VAC with 12VDC converter
- Fast charger to recharge the external battery in 4 hours
- Variable probe pull rate: 0.150 to 0.915 m/sec (low, medium, high speed selection) Resettable circuit breaker motor protection
- Operating temperature range: 0° to 40°C
- Storage temperature range: -10° to 65°C

#### Other
- Includes pulley for placement at the tube
- Includes roller guide for routing cable through re-enforcement rebar cage or over casing