

## Mark 4 Plus Doppler String Phantom



The Mark 4 *Plus* Doppler phantom is a very accurate device for testing Doppler ultrasound scanners. It is especially useful for checking sample volume registration, color registration, directional discrimination, and Doppler velocity accuracy.

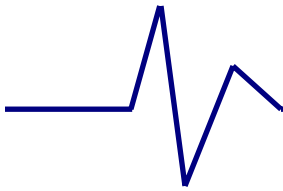
Superior accuracy is provided by using a string target that never changes (unlike suspended scatterers in fluid flow phantoms), and a crystal-controlled stepper motor. The motor speed is adjusted 1000 times per second, allowing realistic reproductions of human blood flow velocity patterns and a wide range of constant velocities.

Included with the Mark 4 *Plus* is an RS-232 remote control interface. This new port can be used to control and monitor all functions of the phantom using automated testing equipment or any computer.

The Mark 4 *Plus* has been designed for ease of use. It can be set up quickly and easily with ordinary tap water, it is simple to use, and almost no maintenance is required. Ultrasound technologists, biomedical technicians, researchers, and manufacturers all rely on the Mark 4 *Plus* for hassle-free, reliable testing.

RS-232 upgrade available  
for existing customers

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## Mark 4 *Plus* Features:

- Flow simulation speeds of 10 to 200 cm/sec, bidirectional flow.
- Waveform simulations:
  - ◊ Sine waves with peak speeds of 100, 150, and 200 cm/sec
  - ◊ Triangle waves with peak speeds of 100, 150, and 200 cm/sec
  - ◊ Stepped ramp wave with stops at 0, 20, 40, 60, 80, and 100 cm/sec
  - ◊ Physiological waveforms including common carotid, femoral, aortic, pediatric umbilical, stenotic common carotid, pediatric renal, pediatric ductus arteriosus, pediatric middle cerebral, and pediatric descending thoracic
- Speed drift crystal locked to 20 parts per million.
- Speed accuracy controlled to  $\pm 1\%$  of stated speed.
- RS-232 remote control interface for automation.
- 'Super Clamp' probe positioner accepts all probes.
- Target angles from 15° to 90°.
- Power supply: 120V, 50W standard.
- Weight: 10 pounds (4.5 kg).
- Dimensions:
  - ◊ Tank: 10" x 12" x 9" (25 x 30 x 23 cm)
  - ◊ Controller: 8" x 9" x 4" (20 x 23 x 10 cm)

## RS-232 Upgrade:

The Mark 4 has provided reliable Quality Assurance for health care providers, manufacturers and researchers for several years. It has now been upgraded to the Mark 4 *Plus* with the addition of a fully functional RS-232 interface port. This new port can be used to control and monitor all functions of the phantom. This is useful for many applications, including final QC testing at manufacturing facilities. A process control computer can run the Mark 4 *Plus* through a battery of tests while downloading the Doppler spectrum from the scanner being tested. Comparison of the measured waveforms and the Doppler target confirms proper operation.

Existing Mark 4's can be upgraded to include the RS-232 interface. Please contact us for more information.