

Acoustic Doppler Current Profilers

An Acoustic Doppler Current Profiler is referred to by the acronym ADCP, however, the name ADCP is a trademark of RD Instruments. Other manufacturers, therefore, use different trademark names. Acoustic Doppler Current Profiler instruments are used to measure the speed of water across an entire water column and also at equal intervals over the water column.

Generally the instrument is mounted vertically - facing upwards or downwards. However, the technology makes it possible for manufacturers to cater to different applications. For instance, the instrument can also be mounted horizontally, to measure the current profile from one side to the other side of a waterway. A number of instruments are particularly suitable for vessel (hull) mount. When interfaced to surface positioning systems you can take constant current profiles from the water column when sailing.

The various applications require the manufacturer to develop techniques to adhere to specific circumstances which the instrument has to measure. For instance, for vessel mount systems, the instrument should be capable of tracking the bottom profile (bottom track). Instruments equipped with surface tracking devices are able to accurately measure the currents in surface layers even when the water level changes due for example, to tide. The technology also has resulted in further development of algorithms which allow computing wave spectrum data from Current Profiler data.

Due to the typical applications and hence their specifications, a direct comparison is difficult to make between the available current profilers. In general, all instruments are able to measure small scale current at various distances up to 800m from the instrument. Obviously the systems which operate at low frequencies provide the biggest range while high frequency systems yield more precise data.

Incorporating additional sensors such as Turbidity, Oxygen, etc. makes the instrument very valuable for applications where environmental data at the instrument location is to be collected as well.

It is up to you to find out which system suits your application requirements best.

Hydro INTERNATIONAL is much indebted to all the manufacturers who contributed to our Product Survey and answered the many questions about their systems. ■

| | |
|--|---|
| Manufacturer | Anderaa |
| Name of Product | RDGP 600 |
| Year of initial development | 2003 |
| General specifications | |
| L/W/H (cm) | 16.0X58.0 |
| Housing material | Titan/POM/Osnisil |
| Weight in air (kg) | 19.0 |
| Weight in water (kg) | 12.0 |
| Operating temperature (°C) | -5...40 |
| Operating power voltage (V) | 7...14 |
| Max operating depth (m) | 300 |
| Max battery lifetime (days) | 10 year |
| Typical deployment period | 60 days with internal battery, 2 year with external |
| Default Cell Size (m) | 2 |
| Max battery lifetime (days) with: 10 minute profile interval, 1 cm/sec standard deviation, default cell size | 30 (use of 35 Ah internal battery) |
| True Bottom Tracking Capability (Speed of boat and Range to Bottom) | N |
| Doppler Current Profiler | |
| Center working frequency (kHz) | 606,7 |
| Typical Profiling range (m) | 100 |
| Number of beams | 4 |
| Transducer slant angle (deg) | 25 |
| Maximum Number of cells per beam | 100 |
| Minimum blanking distance (m) | 1 |
| Ping rate | 100 (600) |
| Minimum vertical resolution (m) | 0.1 |
| Minimum/Maximum cell size (m) | 1 (10) |
| Cell overlap (%) | 0 (90) |
| Velocity range (cm/sec) | 0 (500) |
| Horizontal velocity accuracy (cm/sec) | 0.5 |
| Vertical velocity accuracy (cm/sec) | 1.0 |
| Surface reference capability? (yes/no) | Y |
| Surface current measurement? (yes/no) | Y |
| Measurement and compensation for speed-of-sound? (yes/no) | Y |
| Processing model used e.g. ARMA parametric model | ARMA |
| Raw data in real dimensions? (yes/no) | N |
| Single ping rejection of outliers | N |
| Lost data at far boundary | N |
| Single Ping Horizontal velocity precision for default cell size (cm/sec) | 4 |
| Single Ping Vertical velocity precision for default cell size (cm/sec) | 2 |
| Standard Sensors | |
| Temperature yes/no | Y |
| Temp range (°C) | -3...37 (selectable) |
| Temp accuracy (°C) | ±0.05 |
| Tilt sensor yes/no | Y |
| Tilt range (deg) | ±45 |
| Tilt accuracy (deg) | ±1.5 |
| Compass type | Magnetic field |
| Heading accuracy (deg) | ±4 |
| Deployment method | |
| Moving vessel (yes/no) | N |
| Bottom mount (yes/no) | Y |
| In-line string mooring (yes/no) | Y |
| Data Buoy (yes/no) | Y |
| Marine structures (yes/no) | Y |
| Auxilliary Sensors | |
| Temperature sensor? (yes/no) | Y |
| Pressure sensor? (yes/no) | Y |
| Conductivity sensor? (yes/no) | Y |
| Oxygen sensor? (yes/no) | Y |
| Turbidity sensor? (yes/no) | Y |
| Tide measurement capability? (yes/no) | Y |
| Wave measurement capability? (yes/no) | Y |
| Other sensors | □ |
| Other specifications | |
| Real-time interfacing (eg RS232, RS422, RS485) | RS485, RS 422, PDC4 |
| External power range (V) | 7...14 |
| Max cable length and baudrate | 1400, 38k |
| External battery container for extended deployment period | Y |
| Type and Number of memory slots | MMC,CF; 2 slots |
| Name of data acquisition software | Window CE touch screen |
| Name of data processing software | RDGP Studio |
| Application | |
| What is the typical application for your system (max 30 words) | Operational oceanography, harbours, water quality assessment, scientific long term observations, fish farming |



N/A Not Applicable
□ No information received

| Link Quest | Link Quest | Link Quest | Link Quest | Link Quest |
|---|---|---|---|---|
| FlowQuest 75 Acoustic Current Profiler | FlowQuest 150 Acoustic Current Profiler | FlowQuest 300 Acoustic Current Profiler | FlowQuest 600 Acoustic Current Profiler | FlowQuest 1000 Acoustic Current Profiler |
| 2006 | 2006 | 2005 | 2006 | 2006 |
| 43/58/58 | 24/40/40 | 37/20/20 | 37/20/20 | 37/20/20 |
| Anodized Aluminium | Anodized Aluminium | Plastics and Anodized Aluminium | Plastics and Anodized Aluminium | Plastics and Anodized Aluminium |
| 40 | 23 | 16 | 16 | 16 |
| 26 | 14 | 7 | 7 | 7 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12...26 | 12...26 | 12...26 | 12...26 | 12...26 |
| 6000 | 6000 | 6000 | 6000 | 6000 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 to 24 months | 2 to 24 months | 2 to 24 months | 2 to 24 months | 2 to 24 months |
| 8m | 4m | 2m | 1m | 0.5m |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | Y | Y | Y | Y |
| 75 | 150 | 300 | 600 | 1000 |
| 900 | 500 | 230 | 100 | 40 |
| 4 | 4 | 4 | 4 | 4 |
| 22 | 22 | 22 | 22 | 22 |
| 170 | 170 | 170 | 170 | 170 |
| 3.8m | 2.8m | 1.4m | 0.7m | 0.4m |
| 1Hz | 2Hz | 2Hz | 2Hz | 5Hz |
| 4m | 2m | 1m | 0.5m | 0.25m |
| 4m / 32m | 2m / 16m | 1m / 8m | 0.5m / 4m | 0.25m / 2m |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| +/- 1000 cm/second | +/- 1000cm/second | +/- 1000cm/second | +/- 1000cm/second | +/- 1000cm/second |
| 1% +/- 5mm/s | 1% +/- 5mm/s | 0.5% +/- 5mm/s | 0.25% +/- 2.5mm/s | 0.25% +/- 2.5mm/s |
| 1% +/- 5mm/s | 1% +/- 5mm/s | 0.5% +/- 5mm/s | 0.25% +/- 2.5mm/s | 0.25% +/- 2.5mm/s |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Y | Y | Y | Y | Y |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Y | Y | Y | Y | Y |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Y | Y | Y | Y | Y |
| -5...45 | -5...45 | -5...45 | -5...45 | -5...45 |
| 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| Y | Y | Y | Y | Y |
| +/- 15 | +/- 15 | +/- 15 | +/- 15 | +/- 15 |
| 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| Fluxgate | Fluxgate | Fluxgate | Fluxgate | Fluxgate |
| 2 | 2 | 2 | 2 | 2 |
| Y | Y | Y | Y | Y |
| Y | Y | Y | Y | Y |
| Y | Y | Y | Y | Y |
| Y | Y | Y | Y | Y |
| Y | Y | Y | Y | Y |
| Y | Y | Y | Y | Y |
| Y | Y | Y | Y | Y |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Y | Y | Y | Y | Y |
| 22...26 V | 22...26 V | 22...26 V | 22...26 V | 22...26 V |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Y | Y | Y | Y | Y |
| Compact flash card | Compact flash card | Compact flash card | Compact flash card | Compact flash card |
| FlowQuest Studio | FlowQuest Studio | FlowQuest Studio | FlowQuest Studio | FlowQuest Studio |
| FlowQuest Studio | FlowQuest Studio | FlowQuest Studio | FlowQuest Studio | FlowQuest Studio |
| Current measurement in ultra deep ocean | Current measurement in deep ocean | Measure currents and flows in oceans, harbors, lakes and rivers | Measure currents and flows in oceans, harbors, lakes and rivers. Directional wave and discharge measurement | Measure currents and flows in oceans, harbors, lakes and rivers. Directional wave and discharge measurement |



Product Survey

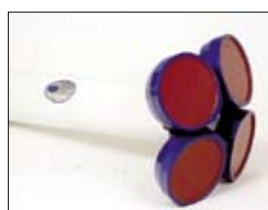
| Manufacturer | Nortek | Nortek | Nortek |
|--|---|--|--|
| Name of Product | Aquadopp Profiler | AWAC | Continental |
| Year of initial development | 2001 | 2003 | 2003 |
| General specifications | | | |
| L/W/H (cm) | L=55cm, D=7.5cm | H=19cm, D=19 cm | 22cm, D=19cm |
| Housing material | POM and epoxy | POM | POM |
| Weight in air (kg) | 2.4 - 3.7kg | <input type="checkbox"/> | 18.4kg |
| Weight in water (kg) | Neutrally buoyant | <input type="checkbox"/> | 13 kg |
| Operating temperature (°C) | -5...+35 | -4...+ 40 | -5...35 |
| Operating power voltage (V) | 9...16 VDC | 9...16 VDC | 12...18 VDC |
| Max operating depth (m) | 300m* | 500 m* | 500m |
| Max battery lifetime (days) | 300 days** | <input type="checkbox"/> | 150 days* |
| Typical deployment period | Three months | Three months | Three months |
| Default Cell Size (m) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Max battery lifetime (days) with: 10 minute profile interval, 1 cm/sec standard deviation, default cell size | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| True Bottom Tracking Capability (Speed of boat and Range to Bottom) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Doppler Current Profiler | | | |
| Center working frequency (kHz) | 2, 1, 0.6, and 0.4 MHz | 1 MHz or 600 kHz | 190 and 470 kHz |
| Typical Profiling range (m) | 5, 25, 40, and 80 m | 25 or 50 meters | 250 and 100 m |
| Number of beams | 3 | 4 | 3 |
| Transducer slant angle (deg) | 25 | 25 | 25 |
| Maximum Number of cells per beam | 128 | 128 | 128 |
| Minimum blanking distance (m) | 5, 20, 30, 100cm | <input type="checkbox"/> | 2m and 1m |
| Ping rate | 27 Hz max. | <input type="checkbox"/> | 2 Hz |
| Minimum vertical resolution (m) | 10, 30, 50, 100cm | <input type="checkbox"/> | 2m and 1m |
| Minimum/Maximum cell size (m) | 0.1/2m, 0.3/4m, 0.5/8m, 1/8m | <input type="checkbox"/> | 2/20m and 1/10m |
| Cell overlap (%) | Varies | Varies | Varies |
| Velocity range (cm/sec) | 0 - 10 m/s | 0 - 10 m/s | 0 - 10 m/s |
| Horizontal velocity accuracy (cm/sec) | Better than 1 cm/s | Better than 1 cm/s | Better than 1 cm/s |
| Vertical velocity accuracy (cm/sec) | Better than 1 cm/s | Better than 1 cm/s | Better than 1 cm/s |
| Surface reference capability? (yes/no) | N | N | N |
| Surface current measurement? (yes/no) | N | N | N |
| Measurement and compensation for speed-of-sound? (yes/no) | Y | Y | Y |
| Processing model used e.g. ARMA parametric model | N/A | N/A | N/A |
| Raw data in real dimensions? (yes/no) | Y | Y | Y |
| Single ping rejection of outliers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lost data at far boundary | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Single Ping Horizontal velocity precision for default cell size (cm/sec) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Single Ping Vertical velocity precision for default cell size (cm/sec) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Standard Sensors | | | |
| Temperature yes/no | Y | Y | Y |
| Temp range (°C) | -4...+30 | -4...+40 | -4...+30 |
| Temp accuracy (°C) | 0.1 | 0.1 | 0.1 |
| Tilt sensor yes/no | Yes | Yes | Yes |
| Tilt range (deg) | 0 - 40 | 0 - 40 | 0 - 40 |
| Tilt accuracy (deg) | 0.2 | 0.2 | 0.2 |
| Compass type | Fluxgate | Fluxgate | Fluxgate |
| Heading accuracy (deg) | 2 | 2 | 2 |
| Deployment method | | | |
| Moving vessel (yes/no) | N | Y | N |
| Bottom mount (yes/no) | Y | Y | Y |
| In-line string mooring (yes/no) | Y | Y | Y |
| Data Buoy (yes/no) | Y | Y | Y |
| Marine structures (yes/no) | Y | Y | Y |
| Auxiliary Sensors | | | |
| Temperature sensor? (yes/no) | Y | Y | Y |
| Pressure sensor? (yes/no) | Y | Y | Y |
| Conductivity sensor? (yes/no) | Y | Y | Y |
| Oxygen sensor? (yes/no) | Y | Y | Y |
| Turbidity sensor? (yes/no) | Y | Y | Y |
| Tide measurement capability? (yes/no) | Y | Y | Y |
| Wave measurement capability? (yes/no) | Y | Y | Y |
| Other sensors | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other specifications | | | |
| Real-time interfacing (eg RS232, RS422, RS485) | Y | Y | Y |
| External power range (V) | 9 - 48 VDC, 220/110 VAC | 9 - 48 VDC, 220/110 VAC | 9 - 48 VDC, 220/110 VAC |
| Max cable length and baudrate | 4km at 9,600 baud | 4km at 9,600 baud | 4km at 9,600 baud |
| External battery container for extended deployment period | Y | Y | Y |
| Type and Number of memory slots | Proprietary memory | Proprietary memory | Proprietary memory |
| Name of data acquisition software | AquaPro | AWAC | Continental |
| Name of data processing software | Surge | Storm | Surge |
| Application | | | |
| What is the typical application for your system (max 30 words) | Coastal and near-shore current profile measurements, often in combination with wave measurements (PUV). Physical dimensions and weight make it an ideal tool for such applications. | Scientific studies of highly accurate wave and current profiles combined, transient wave measurements, online monitoring of waves and currents in harbours, vessel-mounted applications. | Continental shelf current profile measurements. The Continental bridges the gap between near-shore and long range profilers. |
| | * The 2 MHz sensor also comes in a 6,000m version ** Assuming 10 minutes between measurements | * For wave measurements the maximum operating depth is 60 meters | |

Notes

- [1] WINSC,VMDAS
3rd Party:VISEA, NAVIPAC, UHDAS, HYPACK, QUINSY, SEDIVIEW
- [2] WINADCR,VMDAS
3rd Party:VISEA, NAVIPAC, UHDAS, HYPACK, QUINSY, SEDIVIEW
- [3] WINSC,VMDAS, WAVESMON, WINRIVERII
3rd Party:VISEA, NAVIPAC, UHDAS, HYPACK, QUINSY, SEDIVIEW
- [4] WINADCR,VMDAS, WAVESMON, WINRIVERII
3rd Party:VISEA, NAVIPAC, CODAS, HYPACK, QUINSY, SEDIVIEW

N/A Not Applicable
 No information received

| Nortek | RDI Teledyne | RDI Teledyne | RDI Teledyne | RDI Teledyne |
|---|--|---|---|---|
| HR Profiler | WorkHorse Long Ranger 75kHz (WHS150) | WorkHorse Quarter Master 150kHz (WHS150) | WorkHorse Sentinel 300kHz (WHS300) | WorkHorse Sentinel 1200kHz (WHS1200)/600kHz (WHS600) |
| 2007 | 1997 | 2000 | 1995 | 1995 |
| L=55cm, D=7.5cm | 102cm (L), 202cm P-Case(W), 550cm XDCCR(W) | 102cm (L), 202cm P-Case(W), 550cm XDCCR(W) | 41cm(L), 23cm(W) | 41cm(L), 23cm(W) |
| POM and epoxy | Aluminum | Aluminum | 200m Plastic, >500m Aluminum | 200m Plastic, >500m Aluminum |
| 2.4kg | 86kg | 85kg | 13kg (Plastic), 27kg (aluminum) | 13kg (Plastic), 27kg (aluminum) |
| Neutrally buoyant | 55kg | 48kg | 4.5kg (Plastic), 9.5kg (aluminum) | 4.5kg (Plastic), 9.5kg (aluminum) |
| -5...+35 | -5...+45 | -5...+45 | -5...+45 | -5...+45 |
| 9...16 VDC | 20...50VDC | 20...50VDC | 20...50VDC | 20...50VDC |
| 300m | 3000m | 6000m | 6000m | 6000m |
| 2 days 1) | 365 days shelf + 730 days deployed | 365 days shelf + 730 days deployed | 365 days shelf + 730 days deployed | 365 days shelf + 730 days deployed |
| 1-2 days | 30-400 days | 30-400 days | 30-400 days | 30-400 days |
| 0.05 2) | 16m | 8m | 4m | 1m/2m |
| 500 3) | 205 days | 280 days | 130 days | 365/260 days |
| Cannot be used with BT | N | Y | Y | Y |
| 2 MHz | 76.8kHz | 153.6kHz | 307.2kHz | 1,228.8kHz/614.4kHz |
| 1 - 2m | 500-800m | 250-375m | 100-160m | 15-20m/50-70m |
| 3 | 4 | 4 | 4 | 4 |
| 25 | 20 | 20 | 20 | 20 |
| 128 | 128 | 128 | 128 | 128 |
| 0.05m | 7m | 3.5m | 0.8m | 0.1m/0.5m |
| 27Hz | 0.5hz | 1Hz | 2Hz | 10Hz/3Hz |
| 0.01m | 4m | 2m | 1m | 0.1m/0.25m |
| 0.01/0.15m | 4-32m | 2-16m | 1-8m | 0.1-2m/0.25-4m |
| Varies | <25% | <25% | <25% | <25% |
| 0 - 100 | +/-1000 | +/-1000 | +/-1000 | +/-1000 |
| Better than 1cm/s | +/-0.5cm/s | +/-0.5cm/s | +/-0.5cm/s | +/-0.25cm/s |
| Better than 1cm/s | +/-0.18cm/s | +/-0.18cm/s | +/-0.18cm/s | +/-0.09cm/s |
| N | Y | Y | Y | Y |
| N | Y | Y | Y | Y |
| Y | Y | Y | Y | Y |
| N/A | Broad Bandwidth Processing | Broad Bandwidth Processing | Broad Bandwidth Processing | Broad Bandwidth Processing |
| Y | Y | Y | Y | Y |
| N/A | Y (Error Vel, Fish Rejection, Correlation, Signal Level) | Y (Error Vel, Fish Rejection, Correlation, Signal Level) | Y (Error Vel, Fish Rejection, Correlation, Signal Level) | Y (Error Vel, Fish Rejection, Correlation, Signal Level) |
| □ | 6% of range | 6% of range | 6% of range | 6% of range |
| 4) | 3,6cm/s | 3,6cm/s | 3,6cm/s | 3,6cm/s |
| 4) | 1,31cm/s | 1,31cm/s | 1,31cm/s | 1,31cm/s |
| Yes | Y | Y | Y | Y |
| -4...+30 | -5...+45 | -5...+45 | -5...+45 | -5...+45 |
| 0.1 | +/-0.4 | +/-0.4 | +/-0.4 | +/-0.4 |
| Y | Y | Y | Y | Y |
| 0 - 40 | +/-20, +/-45 optional | +/-20, +/-45 optional | +/-20, +/-45 optional | +/-20, +/-45 optional |
| 0.2 | +/-0.5 | +/-0.5 | +/-0.5 | +/-0.5 |
| Fluxgate | Fluxgate | Fluxgate | Fluxgate | Fluxgate |
| 2 | <+/-1.0 with field calibration | <+/-1.0 with field calibration | <+/-1.0 with field calibration | <+/-1.0 with field calibration |
| N | Y | Y | Yes | Y |
| Y | Y | Y | Y | Y |
| N | Y | Y | Y | Y |
| N | Y | Y | Y | Y |
| Y | Y | Y | Y | Y |
| Y | Y | Y | Y | Y |
| Y | Y | Y | Y | Y |
| N | N | N | N | N |
| N | N | N | N | N |
| N | N | N | Y | Y |
| □ | Speed of Sound | Speed of Sound | Speed of Sound | Speed of Sound |
| Y | RS232/RS422/Inductive Modem/ Acoustic Modem | RS232/RS422/Inductive Modem/ Acoustic Modem | RS232/RS422/Inductive Modem/ Acoustic Modem | RS232/RS422/Inductive Modem/ Acoustic Modem |
| 9 - 48 VDC, 220/110 VAC | 20 to 50 | 20 to 50 | 20 to 50 | 20 to 50 |
| 4km at 9,600 baud | 6km, 1200 baud | 6km, 1200 baud | 6km, 1200 baud | 6km, 1200 baud |
| Y | Y | Y | Y | Y |
| Proprietary memory | 2 PCMCIA Slots, 4GBytes Total | 2 PCMCIA Slots, 4GBytes Total | 2 PCMCIA Slots, 4GBytes Total | 2 PCMCIA Slots, 4GBytes Total |
| AquaPro HR | [1] | [1] | [3] | [3] |
| Surge | [2] | [2] | [4] | [4] |
| Studies of detailed boundary layer velocity profiles and measurements of very low flow velocities | Physical & Biological Oceanography, Coastal Engineering, Hydrology, Fisheries, Pipe & Cable Laying, Offshore Oil, Marine Renewables, Observatories, Plume Tracking, Transport & Discharge, Model Calibration | Physical & Biological Oceanography, Coastal Engineering, Hydrology, Fisheries, Ports, Pipe & Cable Laying, Offshore Oil, Marine Renewables, Observatories, Seismic Operations, Plume Tracking, Transport & Discharge, Model Calibration | Physical & Biological Oceanography, Coastal Engineering, Hydrology, Fisheries, Ports, Pipe & Cable Laying, Offshore Oil, Marine Renewables, Observatories, Seismic Operations, Plume Tracking, Transport & Discharge, Model Calibration | Physical & Biological Oceanography, Coastal Engineering, Hydrology, Fisheries, Ports, Pipe & Cable Laying, Offshore Oil, Marine Renewables, Observatories, Seismic Operations, Plume Tracking, Transport & Discharge, Model Calibration |



| Manufacturer | RDI Teledyne | SonTek | SonTek |
|--|--|---|--|
| Name of Product | Doppler Volume Sampler (DVS) | ADP | XR |
| Year of initial development | 2006 | 1994 | 1998 |
| General specifications | | | |
| L/W/H (cm) | 70cm(L), 10cm(W) | Frequency-dependant | 15/15/18 |
| Housing material | Fiber Wound/Plastic | Delrin, Aluminum | Delrin |
| Weight in air (kg) | 8kg | Frequency-dependant | 2,5 |
| Weight in water (kg) | 3.5kg | Frequency-dependant | -0,3 |
| Operating temperature (°C) | -5...+40 | -5...45 | -5...45 |
| Operating power voltage (V) | 10.6...28VDC | 12-24 | 12-24 |
| Max operating depth (m) | 6000m | 6000 | 200 |
| Max battery lifetime (days) | 365 days shelf + 730 days deployed | 700+ | 400+ |
| Typical deployment period | 30-400 days | 1-24 months | 1-12 months |
| Default Cell Size (m) | 0.5m | 0.25 - 2 | Frequency dependant |
| Max battery lifetime (days) with: 10 minute profile interval, 1 cm/sec standard deviation, default cell size | 365 days | 200 | 220 |
| True Bottom Tracking Capability (Speed of boat and Range to Bottom) | N | 10m/s; up to 200 m | <input type="checkbox"/> |
| Doppler Current Profiler | | | |
| Center working frequency (kHz) | 2.457.6kHz | 250-3000 | 750-3000 |
| Typical Profiling range (m) | 3-5m | 5-180 | 5-40 |
| Number of beams | 4 | 3 or 4 | 3 |
| Transducer slant angle (deg) | 45 | 25-30 | 25 |
| Maximum Number of cells per beam | 5 | 128 | 10 |
| Minimum blanking distance (m) | 0.02m | 0,25 | 0,25 |
| Ping rate | 50Hz | Variable | 1Hz |
| Minimum vertical resolution (m) | 0.03m | 0,15 | 0,2 |
| Minimum/Maximum cell size (m) | 0.03-5m | 0.15-2 | 0,2 |
| Cell overlap (%) | <25% | 50 | 50 |
| Velocity range (cm/sec) | +/-600 | 1000 | 600 |
| Horizontal velocity accuracy (cm/sec) | +/-0.5cm/s | 0,5 | 0,5 |
| Vertical velocity accuracy (cm/sec) | +/-0.5cm/s | 0,5 | 0,5 |
| Surface reference capability? (yes/no) | N | N | Y |
| Surface current measurement? (yes/no) | N | Y | Y |
| Measurement and compensation for speed-of-sound? (yes/no) | Y | Y | Y |
| Processing model used e.g. ARMA parametric model | Broad Bandwidth Processing | <input type="checkbox"/> | <input type="checkbox"/> |
| Raw data in real dimensions? (yes/no) | Y | Y | Y |
| Single ping rejection of outliers | Y (Error Vel, Fish Rejection, Correlation, Signal Level) | N | N |
| Lost data at far boundary | 30% of range | <5% | <5% |
| Single Ping Horizontal velocity precision for default cell size (cm/sec) | 3,5cm/s | <input type="checkbox"/> | <input type="checkbox"/> |
| Single Ping Vertical velocity precision for default cell size (cm/sec) | 3,5cm/s | <input type="checkbox"/> | <input type="checkbox"/> |
| Standard Sensors | | | |
| Temperature yes/no | Y | Y | Y |
| Temp range (°C) | -5...+35 | -5...45 | -5...45 |
| Temp accuracy (°C) | +/-0.005 | 0,1 | 0,1 |
| Tilt sensor yes/no | Y | Y | Y |
| Tilt range (deg) | -70...+70 | 60 | 60 |
| Tilt accuracy (deg) | +/-1.0 | 1 | 1 |
| Compass type | Fluxgate | Proprietary fluxgate | Proprietary fluxgate |
| Heading accuracy (deg) | <+/-1.0 with field calibration | 2 | 2 |
| Deployment method | | | |
| Moving vessel (yes/no) | N | Y | N |
| Bottom mount (yes/no) | Y | Y | Y |
| In-line string mooring (yes/no) | Y | Y | N |
| Data Buoy (yes/no) | Y | Y | Y |
| Marine structures (yes/no) | Y | Y | Y |
| Auxilliary Sensors | | | |
| Temperature sensor? (yes/no) | Y | Y | Y |
| Pressure sensor? (yes/no) | Y | Y | Y |
| Conductivity sensor? (yes/no) | Y | Y | Y |
| Oxygen sensor? (yes/no) | N | N | N |
| Turbidity sensor? (yes/no) | N | Y | N |
| Tide measurement capability? (yes/no) | N | Y | Y |
| Wave measurement capability? (yes/no) | N | Y | Y |
| Other sensors | None | Frequency-based Pressure | <input type="checkbox"/> |
| Other specifications | | | |
| Real-time interfacing (eg RS232, RS422, RS485) | RS232/Inductive Modem | RS-232/422 | RS-232/422, SDI-12, ModBus, Analog (current or voltage) |
| External power range (V) | 10.6 to 28VDC | 110-240 AC | 110-240 AC |
| Max cable length and baudrate | 6km, 1200 baud | >1000m; 115200 | >1000m; 115200 |
| External battery container for extended deployment period | Y | Y | Y |
| Type and Number of memory slots | 16Mbytes Flash | CF; 1 | On-board 4MB |
| Name of data acquisition software | DVS (PLAN) | Variable, dependant on application | Variable, dependant on application |
| Name of data processing software | WINADCP | ViewADP | ViewArgonaut |
| Application | | | |
| What is the typical application for your system (max 30 words) | Physical & Biological Oceanography, Coastal Engineering, Hydrology, Fisheries, Ports, Offshore Oil, Marine Renewables, Observatories, Plume Tracking, Transport, Model Calibration | Coastal and deep water oceanography, directional waves, port and harbors, underway coastal surveying, river discharge, sediment transport | Coastal water oceanography, waves, port and harbors, fisheries monitoring and assesment, Low-cost applications |

N/A Not Applicable
 No information received

| SonTek | Son Tek | SonTek |
|---|---|---|
| ADV | PC-ADP | SL |
| 1992 | 2001 | 1997 |
| Frequency-dependant | 10/10/9 (head) | Frequency-dependant |
| Delrin, 316 SS | Delrin | Plastic |
| Frequency-dependant | 2.2 (head) | Frequency-dependant |
| Frequency-dependant | 0.8 (head) | Frequency-dependant |
| -5...45 | -5...45 | -5...45 |
| 12-24 | 12-24 | 7-15 |
| 400 | 500 | 30 |
| 700+ | 200+ | 400+ |
| 1-24 months | 1-6 months | Continuous |
| N/A | 0,016 | Frequency dependant |
| 200 | 200 | 220 |
| N/A | N/A | N/A |
| 5000-16000 | 1500 | 500-3000 |
| N/A | 2-3 | 120 |
| 2 or 3 | 3 | 3 (one is vertical) |
| 15 | 15 | 25 |
| N/A | 100 | 10 |
| N/A | 0,05 | 0,1 |
| Variable | Variable | 1Hz |
| N/A | 0,016 | N/A |
| N/A | 0,016-1 | 0,2 |
| N/A | 50 | 50 |
| 500 | Variable | 600 |
| 0,1 | 0,1 | 0,5 |
| 0,1 | 0,1 | 0,5 |
| N/A | N | N/A |
| Y | Y | Y |
| Y | Y | Y |
| Y | Y | Y |
| Y | Y | Y |
| N/A | N | Y |
| N/A | <5% | N/A |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Y | Y | Y |
| -5...45 | -5...45 | -5...45 |
| 0,1 | 0,1 | 0,1 |
| Y | Y | Y |
| 60 | 60 | 60 |
| I | I | I |
| Proprietary fluxgate | Proprietary fluxgate | Proprietary fluxgate |
| 2 | 2 | 2 |
| N | N | N |
| Y | Y | Y |
| N | N | N |
| N | N | N |
| Y | Y | Y |
| Y | Y | Y |
| Y | Y | Y |
| Y | Y | Y |
| Y | Y | Y |
| N | N | N |
| Y | Y | Y |
| Y | Y | Y |
| Y | Y | Y |
| Frequency-based Pressure | Frequency-based Pressure | <input type="checkbox"/> |
| RS-232/422 | RS-232/422 | RS-232/422, SDI-12, ModBus, Analog (current or voltage) |
| I 110-240 AC | I 110-240 AC | I 110-240 AC |
| >1000m; I 15200 | >1000m; I 15200 | >1000m; I 15200 |
| Y | Y | Y |
| CF; I | CF; I | On-board 4MB |
| Variable, dependant on application | Variable, dependant on application | Variable, dependant on application |
| HorizonADV,ViewHydra | ViewADP | ViewArgonaut |
| Near shore oceanography, surf zone measurements, directional wave measurement, wave and tide studies, turbulence, Reynolds stress | High resolution current profiling, bottom boundary layer/benthic studies, sediment transport, near shore oceanography | Side-looking applications, horizontal applications, open channel flow, Ports & Harbors, discharge monitoring, vessel traffic systems, measurements from bridges or fixed structures |



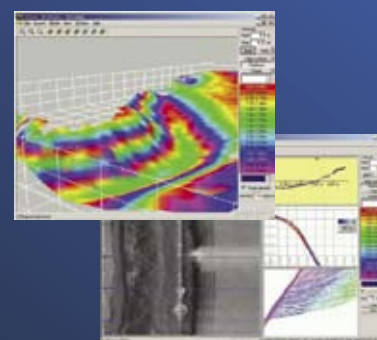
Versatile and Flexible Software for all Your Survey Needs

NaviPac Integrated Navigation



- :: System integration
- :: Comprehensive survey planning
- :: Extensive geodetic support
- :: Versatile device I/O driver support
- :: Data collection & output
- :: Unlimited Helmsman displays
- :: USBL/LBL/INS support
- :: AIS integration

NaviScan Multibeam and Sonar Data Acquisition



- :: Interactive patch test calibration
- :: Sensor data displays
- :: Real-time 2D/3D DTM
- :: Side scan sonar imagery
- :: 3D geo-referenced Snippets support
- :: ROV/AUV support
- :: Pipeline inspection & eventing

EIVA
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