A3000 Acquisition Specification

**General**
- Operational time between charge: 100 days @ 2 ms
- Maximum deployment depth: 3000 meters
- Operating temperature range: -10 to +55 °C

**Data acquisition** *
- Number of channels: 4
- ADC resolution: 24 bit
- Sample interval: 0.5, 1, 2 and 4 ms
- Pre-amplifier gain, adjustable: 0 to 36 dB in steps of 6 dB
- Gain Relative uncertainty: 0.5 %
- Recording bandwidth (-3dB): DC – 0.413 x f\_\text{DATA}
  Anti-aliasing filter: Sinc+FIR, Linear phase
- High pass filter: Programmable 0.1 – 10 Hz, or disabled
- High pass filter roll off: 6 dB/octave
- Maximum input signal:
  - ± 2500 mV @ 0 dB
  - ± 625 mV @ 12 dB
  - ± 156 mV @ 24 dB
  - ± 39 mV @ 36 dB
- Equivalent Input Noise ***
  - 0.95 µVrms @ 0 dB ****
  - 0.31 µVrms @ 12 dB
  - 0.21 µVrms @ 24 dB
  - 0.20 µVrms @ 36 dB
- Dynamic Range @ 0dB gain: 125 dB Geophone, 120 dB Hydrophone
- Total harmonic distortion (THD):
  - < 100 dB Geophone @ 0 dB gain
  - < 119 dB Hydrophone @ 0 dB gain
- Crossfeed: >120 dB
- Common-mode rejection ratio (CMRR): > 90 dB (Geophone)
  > 88 dB (Hydrophone)

**Self-test, diagnostic, and calibration**
- Impedance test: Yes
- Geophone impulse test: Yes
- Internal noise (preamp input terminated): Yes
- Internal gain accuracy: Yes
- Internal total harmonic distortion (THD): Yes
- Channel separation (Crossfeed): Yes
- Common-mode rejection ratio (CMRR): Yes
- Automatic gain and offset calibration: Yes
- Clock stability: Yes

**Transponder (Optional)**
- Type (integrated design): Sonardyne / Kongsberg 26kHz

**Geophone**
- Type: ION SM-6 Omnidirectional
- Number of Geophones: 3
- Configuration: Orthogonal
- Resonance frequency: 14 Hz
- Sensitivity: 28.8 V/m/s
- Damping: 0.7
- Sensitivity after damping: 15.6 V/m/s

**Hydrophone**
- Frequency response (-3dB): 3 Hz - 30 kHz
- Sensitivity:
  - -201 dB re: 1µPa (8.9V/bar)
- Equivalent Input self noise (1-1000Hz):
  - 78 dB re: 1µPa (0.09uBar)
- Spectral:
  - 54 dB re: 1µPa/Hz @ 10 Hz
  - 42 dB re: 1µPa/Hz @ 100 Hz
  - 42 dB re: 1µPa/Hz @ 1000 H

**Tilt Sensor**
- Type: 3-axis MEMS inclinometer
- Range X and Y (Roll and Pitch): ± 90 °
- Relative uncertainty: ± 1 °

**Internal Power supply and Charger**
- Charger operating voltage range: 36 – 72 VDC
- Charger insulation voltage, input/output: 1500 VDC
- Recharge time to 80% SOC: 16 h
- Charging temperature range: +4°C – +40°C

**Battery and Battery Management System**
- Chemistry: Li-Ion
- BMS: Fuel gauging, diagnostic and protection
- Certification: UN38.3

**Precision clock**
- Clock type: Microsemi CSAC (Optional: OCXO)
- Time drift correction:
  - inApril’s proprietary solution
- Typical error (corrected, post-acquisition):
  - < ± 1.0 ms after 100 days (CSAC)
  - < ± 1.0 ms after 70 days (OCXO)

**Data capture memory**
- Type: Embedded managed NAND flash
- Storage capacity total: 128 GByte

**Communication link; data capture and diagnostic**
- Ethernet over copper: 100 base-TX

**Mechanical specification**
- Position of normal use: ±180°
- Weight: 21 kg (9.5kg in seawater)
- Dimensions: 330mm(L) x 289mm(W) x 115/143mm(H)

**Notes**
- @ 2ms sampling interval, 25°C, 31.25 Hz, internal test, unless otherwise noted
- ** Recording bandwidth = 0.413 x f\_\text{DATA}
  \text{Sampling frequency} = \text{Sample Interval} (Hz)
- *** for geophone channel, and hydrophone channel above 10 Hz
- **** 1.2 µVrms @ 0 dB for frequency above low cut