AANDERAA

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# Doppler Current Profiler Sensor – DCPS 5400/5400R/5402/5402R/5403/5403R

*The Doppler Current Profiler Sensor (DCPS) is a medium range, 600kHz current profiler smart sensor. It features innovative development of the acoustic profiling ability to collect high quality current information also on moving and tilting platforms. Available as 300m depth rated (5400/5400R), 4500m (5402/5402R), 6000m (5403/5403R), it is intended for commercial as well as research use. It comes with the integrated temperature sensor 4080 that can be calibrated on request.*

*The DCPS 5400/5402/5403 can be connected to a SeaGuardII or SmartGuard using the CANbus based AiCaP protocol. It can also be connected to a PC or third party systems through the RS-232 interface using the AADI Real Time Collector or SmartSensor Terminal protocol. This makes the DCPS the ideal cost effective solution for obtaining current profiles in systems already containing a Datalogger.*

*The 5400R/5402R/5403R has the RS-422 interface for use on longer cables.*

## Key features

- *Built-in solid state 3-axis tilt compensated compass*
- *Heading and tilt compensation for each ping*
- *Insensitive to fouling*
- *Low maintenance needs*
- *Direct readout of engineering data*
- *Output interval from 30 seconds to 2 hours*
- *RS-232/RS-422 output for integration to most third party Dataloggers*
- *Configurable output for easy integration*
- *Cell size selectable from 0,5 to 5 meters*
- *Up to 150 individual cells divided into three columns*

## Applications

- Oceanographic research
- Marine Transport
- Offshore / Oil & Gas
- Aquaculture / fisheries
- Environmental management
- Infrastructure design / Survey companies
- Integration into third party systems; data buoy, ocean observatory

## Exceptional compensation in moving applications

Measurements are compensated for instrument movement;

- Each ping is compensated for the corresponding tilt and heading, taking into account mooring or buoy motions
- The Doppler current profiler sensor calculates the correct vertical distance to a specific cell for each beam.

## Optimal flexibility

- Easy to use
- Configuration flexibility
- Upward or downward looking
- User selectable broadband or narrowband modes matching different applications
- Address different applications scenarios using a single instrument; up to three profiling configurations simultaneously; each profiling column can be set up with individual cell size and cell overlap
- Surface current feature; measure in the top centimeters layer*
- Surface referred columns; the column keeps a fixed distance to the surface to follow water level changes*
- Direct readout of engineering data
- Configurable output format

*) Surface referred columns and surface cell require pressure data from an external pressure sensor. This functionality is only available when the DCPS is used together with an Aanderaa Datalogger, SmartGuard or SeaGuardII in combination with a pressure sensor.

## Increased deployment time

- Low power consumption
- Reduced power consumption with broadband technology

## Smart Data quality control

- Increased quality control
- Automatic flagging of bad data; status report for each cell
- User selectable advanced autobeam algorithm; automatic selection of the best 3-beam combination to remove faulty cells in case of an object passing in front of one beam

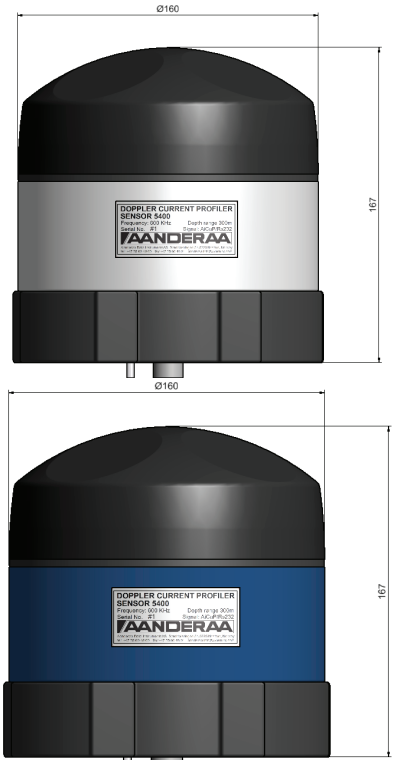
## Sensor communication protocols

The AADI Real-time collector PC software can be used together with all DCPS versions. It simplifies the sensor configuration process and saves sensor data to files on a PC. The AADI Real-Time communication protocol is a XML-based protocol which also includes numerous metadata for all the data parameters from the sensor.

The Smart Sensor Terminal protocol is a simpler protocol which gives smaller message sizes since it includes a limited amount of metadata in the output.

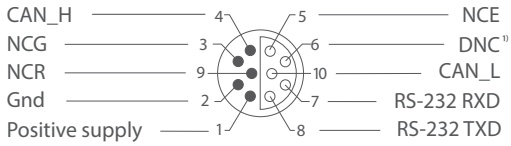
The size of the output message can be reduced in both protocols by only enabling the necessary data parameters. Both protocols use ASCII output which makes it directly readable without any conversion (no binary data).

# Specifications




PIN CONFIGURATION 5400/5402/5403

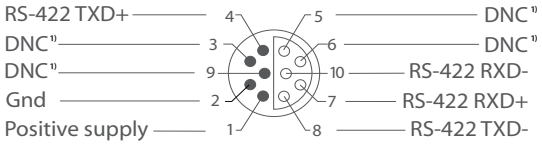
Receptacle, exterior view; pin = ● bushing = ○




DNC[1] = Do Not Connect

PIN CONFIGURATION 5400R/5402R/5403R

Receptacle, exterior view; pin = ● bushing = ○




DNC[1] = Do Not Connect

## Specifications subject to change without prior notice

[1] Typical range with normal backscatter conditions. The measurement range is highly dependent on the scattering conditions. For waters with low amount of scatters, expect a shorter range than for waters with a high amount of scatters
[2] Standard deviation for the horizontal velocity in broadband mode, 3m cell size
[3] Requires pressure data, only available when DCPS connected to SmartGuard or SeaGuardII
[4] Compensation calibrated up to ± 35°
[5] In Broadband mode, 30min. interval, 20x2 pings, 2m cell size, 20 cells

### Velocity profile measurement

| | |
|---|---|
| Acoustic frequency: | 600 kHz |
| Typical profiling range: | Broadband: 30-70m<br>Narrowband 35-80m[1] |
| Cell size: | 0.5m - 5m |
| Cell overlap: | 0-90% |
| Velocity range: | Narrowband: 0-500cm/s (up to 1000cm/s with max tilt ± 5°)<br>Broadband: 0-400cm/s |
| Velocity accuracy: | 0.3cm/s or ±1,5% of reading |
| Velocity resolution: | 0.1cm/s |
| Velocity precision: | <3,3cm[2] |
| Ping rate: | Up to 10Hz (depends on config) |
| Output interval: | from 30s to 2h |
| Cell positioning: | Static (instrument referred)<br>Dynamic (surface referred)[3] |
| Number of columns: | 3 simultaneous columns + Surface cell[3] |
| Max. number of cells: | 150 total, 75 for first column 50 for the second and 25 for the third |
| Blanking zone: | 1m |

### Transducers

| | |
|---|---|
| Number of beams: | 4 |
| Beam angle: | 25° |
| Beam width: | 2.5° |

### Echo intensity

| | |
|---|---|
| Dynamic range: | > 50dB |
| Resolution: | < 0.1dB |
| Precision: | < 0.1dB |

### Tilt and compass

| | |
|---|---|
| Type: | Internal solid state |
| Pitch / roll range: | ± 90°[4] / ± 180°[4] |
| Tilt / Heading accuracy: | ± 1.5° / ± 3.5° |
| Tilt / Heading resolution: | < 0.1° |

### Interfaces:

| | |
|---|---|
| 5400/5402/5403: | AiCaP protocol, RS-232 |
| 5400R/5402R/5403R: | RS-422 |

### Maximum cable length:

| | |
|---|---|
| RS-232: | 15m |
| RS-422: | 1500m |

### Embedded temperature sensor 4080 (calibration on request)

| | |
|---|---|
| Range | -4- +40°C |
| Resolution | 0,001°C |
| Accuracy | ± 0,05°C |
| Response Time (63%): | <5 sec |

### Power

| | |
|---|---|
| Supply voltage: | 6-30 Vdc |
| Current drain example: | 4,2 mA[5] |

### Environmental

| | | |
|---|---|---|
| Depth rating: | SW-300m / IW-4500m / DW-6000m | |
| Operating temperature: | -5 to +40°C | |
| Dimensions: | D: 160mm | H: 167mm |
| Weight: | In Air | In Sea Water |
| SW | 5.1kg | 1.8kg |
| IW/DW | 7.2kg | 4kg |
| Materials: | PET, PUR, Titanium, Stainless steel 316, polyurethane | |

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