



C-PINS METROLOGY

Subsea Precise Inertial Navigation System for Metrologies

C-PINS Metrology is a metrology survey tool that significantly reduces the time taken for jumper or spool measurements with the same precision as conventional metrology methods.

C-PINS Metrology combines all position, heading, pitch, roll and route survey bathymetry tools into a single package.

C-PINS has applications in:

Jumper Metrologies
Spoolpiece Metrologies
Pipeline Out-of-Straightness Surveys
Structure Installations

Pipeline and Umbilical Installation
Bathymetry Surveys
Route Surveys



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Zupt delivers operationally aware inertial technologies to improve the productivity associated with high cost operations for oil and gas exploration and field development. These capabilities are offered and supported worldwide.

C-PINS METROLOGY

Subsea Precise Inertial Navigation System for Metrologies

C-PINS Metrology is a precise metrology survey tool that significantly reduces the time taken for jumper or spool measurements. This fully proven system has completed multiple jobs in West Africa, Gulf of Mexico, Bahamas, Central America, and the North Sea.

During multiple comparisons with conventional acoustic techniques, C-PINS has delivered complete metrology surveys in approximately 6 hours with the same precision as conventional metrology methods.

A single dive is needed to collect all of the required deliverables, including the hub to hub horizontal range, depth difference between hubs, hub attitude (heading, pitch, roll), Alpha/Beta angles between hubs (for horizontal connectors), hub step heights, and bathymetric profile of the jumper route.

A single channel is needed on the ROV for integration. The surface software for C-PINS Metrology is a single application SSTT where all data acquisition, data logging and initial QC data processing is completed. At any point in time as this data is being collected, the accuracy of the solution can be identified in millimeters or fractions of a degree.

Real-Time Attitude and Loop QC Data

Hub	Distance	DDepth	Northing	Easting	Depth	Head+	Pitch	Roll
1	0.000	0.000	0.000	0.000	0.000	0.065	0.247	0.356
Std Dev	0.000	0.000	0.000	0.000	0.000	0.031	0.103	0.122
2	0.000	0.000	0.000	0.000	0.000	0.065	0.430	0.000

Loop	Ena	Tie N	Tie E	Tie D	E@S N	E@S E	E@S D
1	x	-0.041	0.078	-0.278	0.000	0.000	0.000
2	x	-0.172	0.213	-0.327	-0.012	0.026	-0.080
3	x	-0.022	-0.032	-0.164	-0.070	0.100	-0.172
4	x	-0.070	-0.023	-0.132	-0.039	0.033	-0.173
5	x	0.048	0.094	-0.178	-0.049	0.006	-0.151
6	x	0.019	0.075	-0.137	0.002	0.046	-0.166

CAPABILITIES:

C-PINS can be configured to integrate any or all of the following aiding sensors. The only integrated sensor used for metrology is a digiquartz pressure transducer.

- Navigation grade Inertial Measurement Unit (IMU)
- Precise pressure (depth) transducer
- Doppler Velocity Log (DVL) beam data
- Long Baseline lines of position (LoP)
- Ultra Short Baseline acoustic positioning (USBL)
- GPS range and time data (1PPS to UTC)
- Speed of sound - real time sound velocity profile (SVP)
- Seawater Temperature (PRT)

OPTIONS:

- Various IMUs depending on overall error budget
- Various water depth packaging
- Configurations for towfish, AUV as well as ROV

SPECIFICATIONS:

Two subsea housing configurations for metrology surveys

4,000m rated system

- 26cm dia by 46.5cm long
- Weight in air 45kg
- Weight in water 20kg

1,500m rated system

- 25cm dia by 34cm long
- Weight in air 52kg
- Weight in water 38kg

Accurate and precise metrologies
completed in as little as 6 hours.

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