µPAP
Compact acoustic positioning

The µPAP 201-C is a system designed for tracking ROV's, tow fish, divers and other subsea objects. The units includes all parts needed for a full system in a compact transducer housing well suited for USV installation.

The µPAP is an integrated SSBL acoustic positioning solution complete with motion sensor and processing unit integrated in one subsea housing. The system is remotely controlled from an external computer vie Ethernet access where the user can control which transponders to be used or send data for acoustic modem transfer to a modem on a subsea vehicle.

The system can also be remotely operated by use of APOS over remote connection. APOS is the standard operator station software for HiPAP and µPAP systems.

Specifications

Product	µPAP
Country of origin	Norway
Manufacturer	Kongsberg Discovery
Housing	Bronze/Stainless Steel

Application

APOS, the operator station for µPAP, provides the full range of functions for acoustic positioning and data communication. µPAP benefits from the Cymbal acoustic protocol and all functions that are available for the HiPAP products are also available for µPAP.

µPAP has full LBL calibration and positioning capabilities and can be used for position box in, calibration and positioning. The system is offering the user a wide range of transponder channels and cNODE transponder models for depths down to 4000 meters.

µPAP has built-in motion sensors for compensating the position for vessels roll and pitch movements. These models have no need for calibration of roll and pitch alignments but need to calibrate for alignment to the vessels' heading sensor and GNSS system. Data output to users are available in established formats.

Technical data

Model	Motion sensor accuracy	System position accuracy
201-C-m30 Part no.:465865	R/P: 0.08° Range ± 180°	0.26°/0.45%, Range: ± 0.02 m
201-C-X Part no.:465078	R/P: 0.2° Range ± 180°	0.32°/0.56%, Range: ± 0.02 m
201-C Part no.:465079	NA	0.25°/0.45%, Range: ± 0.02 m

Technical data - all models

Frequency	20-30 kHz (MF)
Operational coverage (3) **Main coverage**	± 90° ± 80°
Range capability (m) (2)	4000+
Receiver beam	22°
Source level (re 1µPa)	190 dB
Navigation channels	560 Cymbal, 56 FSK, cNODE Compatible
Operation mode	SSBL, LBL, acoustic modem
Transducer connector	UV-RECEPT 19p MALE
Transducer deployment depth	< 100 m
Temp. operating/Storage	0°C to +35°C/-20°C to +70°C
Storage humidity	95 % relative, non-condensing
Vibration	5-100 Hz, 5-13.2 Hz ± 1.5 mm, 13.2-100 Hz 1 g
Power	24 V DC nominal (18-36 V DC) 25W nominal, Max 75W
Connection	Terminals for power RJ45 for Ethernet All interfaces over Ethernet Cable part no 422611
Weight	16 kg

Environmental specifications

Operating temperature range	-25 to +55 °C
Operating humidity	100 % max.
Storage temperature range	-30 to +70 °C
Storage humidity	100 % max.
Enclosure material sensor housing	Polyethylene
Enclosure material bracket	Anodised aluminium
Enclosure protection	IP-66
Compass safe distance	0.3 m

Standards and regulations

Product safety low voltage	IEC 60945/EN 60945
Electromagnetic compatibility immunity / radiation	IEC 60945/EN 60945
Vibration	IEC 60945/EN 60945
Wheelmark	THD (4.41), GPS (4.14), Glonass (4.15), SDME (4.7), DGPS (4.50, SeaNav 320)
MTBF (hours)	45.000

Data output and inputs

Message formats	NMEA 0183, Proprietary, NTP
Outputs SeaNav 320 DGNSS corrections	RTCM 104 v 2.3
Inputs DGNSS corrections	RTCM 104 v 2.3
Message types	DTM, GBS, GGA, GGL, GFA, GNS, GSV, GSA, GST, HDT, RMC, ROT, THS, VBW, VTG, ZDA, ALF, ALR, ALC, ACK BLM/BLS/BLT (SeaNav320)