



## SKURDALSSJØEN LAKE SURVEY by NOVATEK AS utilizing NORBIT iWBMSc (Compact) system



## About NOVATEK AS



NOVATEK AS is an engineering and surveying firm that was established in Bodø, Norway in 1994.

Their surveying expertise includes conventional land measurements on land and various types of jobs at sea, where they are much engaged in seabed mapping, port mapping, and dredging.





# Survey Location

NORBIT



Skurdalssjøen lake is located 690 meter over sea level on the border between Norway and Sweden: east of Meråker, Norway and north of Storlien, Sweden.

The lake covers about 3.5 km2 and has an average depth of 5m.



# Survey Overview

Survey operations were conducted onboard NOVATEK owned vessel utilizing a NORBIT iWBMSc integrated sonar system with a Novatel+Sensonor configuration.

The job was done for the local electricity company to determine the volume of water in the lake.

As there is no road leading up to the lake, a helicopter transport of both equipment and personnel had to be utilized. The boat was dropped directly into the water.

Including transport and mobilisation/demobilisation, the crew had 3 days to finish the job.





## Survey System

The survey was conducted utilizing an integrated NORBIT iWBMSc system.

The small size and the tightly integrated Novatel GNSS of the iWBMSc facilitates rapid mobilization on vessels of any size, making it ideal for rapid deployments.

In conjunction with the small size, the wide swath angle (maximum 210°) allows for the flexibility to rapidly get a good overview of a shallow lake before planning lines to make sure one does not hit anything.







## Survey System

During this survey, the iWBMSc was mounted on the starboard side of the vessel. A T-bar pole was used with ropes to ensure steady operation.

The inertial navigation system is tightly integrated with the sonar. The IMU is inside the the sonar head and has a static offset to the sonar reference point.

The system was provided RTK corrections utilizing a base station set up for the purpose. RTK corrections were provided directly to the NORBIT topside unit via USB to serial connection.







#### NORBIT iWBMSc Specifications

TECHNICAL SPECIFICATI	ONS
SWATH COVERAGE	7-210° (SHALLOW WATER IHO SPECIAL ORDER >155°)
RANGE RESOLUTION	<10mm (ACOUSTIC)
NUMBER OF BEAMS	256-512 EA & ED
OPERATING FREQUENCY	400kHz w/80kHz BANDWIDTH (FREQ. AGILITY 200-700kHz) (LOW FREQ MODE AND HIGH FREQ ULTRA RESOLUTION MODE)
DEPTH RANGE	0.2-275m (160m TYPICAL)
PING RATE	UP TO 50Hz, ADAPTIVE
RESOLUTION	0.9° ACROSS, 1.9° ALONG @400kHz. OPTION: ALONG 0.9° 0.5° ACROSS, 0.9° ALONG @700kHz
POSITION ACCURACY	0.02-0.1m (RTK)
HEADING RESOLUTION	0.03° (RTK) LONG BASELINE PP (0.08° SHORT BASELINE)
PITCH/ROLL ACCURACY	0.02° INDEPENDENT ON BASELINE
HEAVE ACCURACY	5cm or 5% (2cm RTK)
WEIGHT	APPROX 8kg (AIR), 5kg (WATER)
INTERFACE	100Mb/s ETHERNET
STANDARD CABLE LENGTH	STD 8m, OPTIONS: 25m, PIGTAIL, CUSTOM UP TO 50m
POWER CONSUMPTION	45W AVERAGE (10-28VDC, 110-240VAC)
OPERATING TEMPERATURE	-4°C to +40°C (TOPSIDE -25°C to +40°C)
STORAGE TEMPERATURE	-20°C to +60°C
ENVIRONMENTAL	TOPSIDE: IP67: DUST TIGHT, PROTECTED AGAINST THE EFFECT OF IMMERSION UP TO 1m/WET-END: 100m





#### Data Acquisition and Software

PDS2000 (3,9,6,1) was used for data acquisition and processing.

NORBIT release 10.0 was used on the sonar.

















#### Results



Clearly visible river scours can be seen in the data.

A time-saver: the job of mapping 3.500.000 m2 with an average depth of 5m took NOVATEK just 3 days to complete.





