

CCNS

COMPUTER CONTROLLED NAVIGATION SYSTEM

CCNS4 - 4th generation

The CCNS4 system is a guidance, positioning and sensor management system for aerial survey missions. The basic system consists of a Central Computer Unit (CCU), one Command and Display Unit (5 inch TFT), a state-of-art GPS receiver with antenna, necessary cabling and a shock-absorbing mounting plate.

The system is universally usable and can operate and integrate all common digital and analog aerial camera systems. Together with *IGIplan*, it provides a complete and comprehensive solution for mission planning, aircraft guidance and sensor management.

The CCNS4 controls the camera and other sensors, including crab/drift setting(s), forward overlap, V/H computation and provides data for data annotation on film; the coordinates may be WGS 84 or the country's X/Y - coordinates.

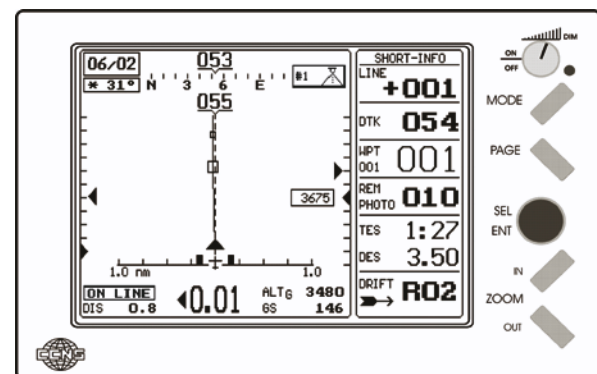


CCNS4 CCU with GPS antenna and 5 inch CDU

Fully Automated Flight Control System

The CCNS4 has the benefit of a fully automated flight control system for aerial surveying and reconnaissance. A pilot's Control & Display Unit (primary) and an operator's Control & Display Unit (secondary) - both 5 inch TFT - are available. All operations are activated easily via one control dial and five buttons. The EFIS type display, which is operated like an aircraft instrument, is divided into guidance and system/sensor management information (right side of the TFT). The pilot merely has to "follow the line". CCNS4 features outputs with selectable sensitivity for HSI and CDI instruments.

The Display - Built like a Cockpit Instrument



The example above is an illustration of data taken from an actual photo mission. From top to bottom, it shows the following pieces of guidance information:

Current Heading:	053 deg
Current (true Track):	055 deg
Drift (bottom):	R02 deg
Camera Symbol:	CAM#1 to be fired
Planned Altitude:	3675 feet
Actual Altitude:	3480 feet
Ground Speed:	146 knots
Off-Track Dist. (XTD):	0.01 NM
Off-Track Correction:	to the left
ON LINE:	aircraft is on line, i.e. the camera(s) is activated
Dist. to next WPT:	0.8 nm



CCNS4™ - Computer Controlled Navigation System

The CCNS4 requires position and velocity information from a GPS receiver and optional directional information from the aircraft's directional gyro (DG).

The CCNS4 can be operated by a variety of external GPS receivers that already may be installed in the aircraft by using the receiver specific data format or the NMEA 0183 data format.

The integrated GPS receiver (DGPS) operates according to the RTCM-104 format and can receive real-time differential corrections from WAAS and EGNOS satellites. Directional gyro information is used by a Kalman filter process for stable position information and drift/crab calculation. Corrections for local variations and aircraft deviations can be used.

Perfect Combination CCNS4 & AEROcontrol

AEROcontrol is IGI's GPS/IMU system for the precise determination of position and attitude of an airborne sensor. All operations and the management of the AEROcontrol system is controlled by the CCNS4. All raw data of the IMU are stored on the AEROcontrol system. The software uses a forward/backward Kalman filter algorithm to achieve optimal results.



Picture showing IMU-11e, AEROcontrol SMU (Sensor Management Unit), CCNS4 CCU with GPS antenna and 5 inch CDU

Over 300 Systems in Operation - Worldwide

The CCNS4 is able to control up to two sensor systems. The actual flight data - including the aircraft's position in WGS 84 coordinate or local grid system - are computed and can be provided for data annotation on film. Waypoint/photo data, flight information and GPS positions are stored and transferred to the CCNS4 Mission Card for post processing, analysis and plotting of the flight index or the complete mission. The system has the advantage of no mechanical (moving) parts, no hard or floppy disk to crash or wear out from dust, humidity, acceleration or vibration. More than 300 installations - worldwide - show that the CCNS4 is a very reliable system. Using the CCNS4, no specialized photo pilot or photo navigator is required.