

# HGUIDE n580 INTEGRATED INERTIAL-GNSS NAVIGATION SYSTEM

Mechanical and Electrical Manual



# Table of Contents

3	<a href="#">Product Overview</a>
4	<a href="#">Navigation Performance</a>
4	<a href="#">Available Configurations</a>
5	<a href="#">Connector Cable Description</a>
6	<a href="#">GNSS Antenna Guidelines</a>
6	<a href="#">Real Time Kinematic (RTK)</a>
7	<a href="#">Mechanical Drawing</a>
9	<a href="#">Export Guidance</a>

# Product Overview

The n580 is a small, light-weight, self-contained, all-attitude Inertial/GNSS Navigator which can be used in a wide variety of platforms, applications and industries where continuous navigation information is a critical component.

The n580 contains Honeywell's leading edge HG4930 IMU technology and provides a powerful dual-antenna, dual-frequency, multi-GNSS RTK capability. Honeywell's integration expertise blends the IMU and GNSS data to provide an accurate, robust navigation service to your application with all the functionalities that you need.

The n580 output data includes time stamped position, velocity, angular rate, linear acceleration, roll, pitch and heading data. In dual-antenna mode, the device supports GNSS-based heading measurements.

## Key Honeywell Advantages

- Honeywell proven navigation algorithms for Air, Land, and Sea
- World class inertial sensor development, calibration, and compensation
- Proven reliability, dependability, and ruggedness
- GNSS RTCM3 corrections
- Highest performing Inertial/GNSS navigator of its size, weight, and price
- Flexible configuration. Only purchase the features you need
- Two HGuide Navigation System Interface ports

The n580 is available in either low cost base unit, or higher performance configurations. Multiple options are available to upgrade these units to provide the precise capability your applications require.

n580 TYPICAL KEY CHARACTERISTICS	
GNSS Capability	Multi-frequency, multi-constellation Post-Processed (PPK), RTK, SBAS Single or Dual Antenna capable
GNSS Signals	GPS L1 C/A, L1C, L2C, L2P, L5; GLONASS L1 C/A, L2 C/A, L2P, L3, L5; BeiDou B1, B2; Galileo E1, E5 AltBOC, E5a, E5b; NavIC (IRNSS) L5; SBAS L1, L5 QZSS L1 C/A, L1C, L2C, L5; L-Band upto 5 channels
Supply Voltage	+5VDC to +36VDC (max of 2A)
Power Consumption	< 8 Watts Without Antennas
Weight	430g (0.95 lbs)
Supply Voltage	+5VDC to +36VDC (max of 2A)
Volume / Size	324 cm <sup>3</sup> (19.7 in <sup>3</sup> ), 9cm x 6cm x 6cm
Operating Temperature Range	-40°C to +71°C
Packaging Rating	IP68
Communication Ports	Primary Navigation Interface, 1MBit, RS-422 Secondary Navigation Interface, 1MBit, 5V CMOS RTCM3 Corrections Interface, 115.2KBit, RS-422
Discrete Signals	PPS 5V CMOS Output

## Navigation Performance

n580 NAVIGATION PERFORMANCE					
POSITION ACCURACY		HEADING ACCURACY		PITCH/ROLL ACCURACY	
Horizontal (m, 1 $\sigma$ )	Vertical (m, 1 $\sigma$ )	Static <sup>1</sup> (°, 1 $\sigma$ )	Dynamic (°, 1 $\sigma$ )	Static (°, 1 $\sigma$ )	Dynamic (°, 1 $\sigma$ )
0.01 RTK 0.6 SBAS 1.2 Standalone	0.025 RTK 0.6 SBAS 1.2 Standalone	0.08	0.06	0.1	0.025

n580 RTK DUAL ANTENNA PERFORMANCE - GNSS OUTAGES WITH NO AIDING			
RMS Error (1 $\sigma$ )	3 Second	10 Second	30 Second
Horizontal (meter)	0.09	0.2	1
Vertical (meter)	0.045	0.1	0.5
Heading (degree)	0.06	0.07	0.08

## Available Configurations

n580 VARIANTS									
Hardware PN <sup>2,4</sup>	CONSTELLATIONS				ANTENNAS <sup>3</sup>		POSITIONING SERVICES		
	GPS	GLO	Gal	BD	1 Ant	2 Ant	SBAS	PPK	RTK
n580-1111-A131	x				x		x		
n580-1723-A257	x	x	x	x		x	x	x	x
n580-1323-A253	x	x				x	x	x	x
n580-1721-A137	x	x	x	x	x		x		
n580-1321-A133	x	x			x		x		
n580-1421-A135	x			x	x		x		
n580-1432-A225	x			x		x	x	x	
n580-1722-A227	x	x	x	x		x	x	x	
n580-1322-A223	x	x				x	x	x	
n580-1422-A125	x			x	x		x	x	

<sup>1</sup> In dual antenna mode to 2m baseline; longer baselines improve performance

<sup>2</sup> ECCN 7A994

<sup>3</sup> Antennas not supplied by Honeywell

<sup>4</sup> For Honeywell PN, replace "n580" with "68910580." For example, "n580-A257" becomes "68910580-A257"

# Connector Cable Description

CONNECTOR	PORT	INTERFACE TYPE	FUNCTION
IO1	COM1	5 VDC CMOS ASYNCH 1 Mbps	Secondary Navigation Interface
IO1	COM2 TX	RS422 ASYNCH 115.2 Kbps	GNSS Post Processing Output
IO1	COM2 RX	RS422 ASYNCH 115.2 Kbps	RTCM3 Corrections to Unit
IO1	COM3	RS422 ASYNCH 1 Mbps	Primary Navigation Interface
RF1	Main	Male SMA	GNSS Antenna Interface
RF2	Aux	Male SMA	GNSS Antenna Interface

Each asynchronous data byte is transmitted with 1 start bit (low), 1 stop bit, 8 data bits and no parity.

Honeywell will make available an IO1 interface cable with the following:

- a) COM1 Bi-Directional USB
- b) COM2 USB Bi-Directional USB
- c) RCA AH56 AC Adapter - 120 V AC, 230 V AC Input Voltage, 2500 mA. Recommend use the +12 VDC Setting. Adapters included for interface to female power plug pigtail.
- d) Female power plug pigtail with a 2.1 mm diameter x 5.5 mm length female connector (“10” DC Female Power Plug Pigtail for CCTV Security Systems”)

IO1 CONNECTOR CABLE FISHER CONNECTOR – SS104A086-140			
FISHER PIN #	SIGNAL NAME	INPUT/OUTPUT	WIRE COLOR
1	Reserved	No Connection	Black
2	COM3_RX-	Receive from Customer	Blue STP 1
3	COM2_RX-	Receive from Customer	Orange STP 2
4	COM2_TX-	Transmit to Customer	Brown STP 4
5	DATA_RDY	CMOS Output	Red
6	COM3_TX-	Transmit to Customer	Green STP 3
7	COM3_TX+	Transmit to Customer	White/Green STP 3
8	COM3_RX+	Receive from Customer	White STP 1
9	PPS	CMOS Output	Clear
10	Reserved	No Connection	White 24 AWG
11	COM2_RX+	Receive from Customer	White STP 2
12	COM2_TX+	Transmit to Customer	White STP 4
13	COM1_RX	Receive from Customer	Pink STP 5
14	COM1_TX	Transmit to Customer	Gray STP 6
15	GND	Current Return/Signal Ground	Black 24 AWG
16	VDD	Power from Customer	Red 24 AWG
	Not Use	No Connection	Green 24, Green STP 5, Yellow STP 6

# GNSS Antenna Guidelines

HONEYWELL TESTED ANTENNAS	BANDS	SIZE	USE CASES	PERFORMANCE	
				SBAS/DGPS/STANDALONE	RTK
Maxtena (M1227HCT-A2-SMA)	L1/L2	3 cm radius 5.1 cm tall	Open Air UAV	No Effect	3 cm
Tallysman (TW7972)	Tri	4.3 cm radius 2.2 cm tall	Open Air	No Effect	2 cm
AeroAntenna AT1675-382W-TNCF-000-RG- 39-NM-R	Tri	7.3 cm radius 9.5 cm tall	Urban Canyons GPS Outages	No Effect	1 cm

Honeywell tests Antennas mounted at least 1 Meter apart with the RF2 (aux) antenna forward of the RF1 (main) antenna relative to the X Axis Case Frame with auto-estimation algorithms that further refine the antenna lever arm estimate. Mounting antennas < 1 meter will result in unspecified attitude performance degradation.

The HGuide default settings require that the antennas be mounted in line with 10 degrees of the X Axis Case frame. Customer may optionally define new locations for the antennas via the software interface. The HGuide will estimate lever arms and with default settings, this estimate will supersede the entered lever arms. Antenna cable lengths should be identical within typical manufacturing tolerances. All antennas must be at least L1/L2 capable.

The following website provides technical information on a wide variety of antennas:  
[www.ngs.noaa.gov/ANTCAL/#](http://www.ngs.noaa.gov/ANTCAL/#)

## Real Time Kinematic (RTK)

The use of RTK requires that RTCM3 connections be made available on Com2 RX. Most RTCM3 broadcast sites can be found at [www.rtcn-ntrip.org/home](http://www.rtcn-ntrip.org/home)

Use of RTCM3 broadcast sites requires the NTRIP client software. Open source clients can be found at [www.geodetic.gov.hk](http://www.geodetic.gov.hk)

# Mechanical Drawing

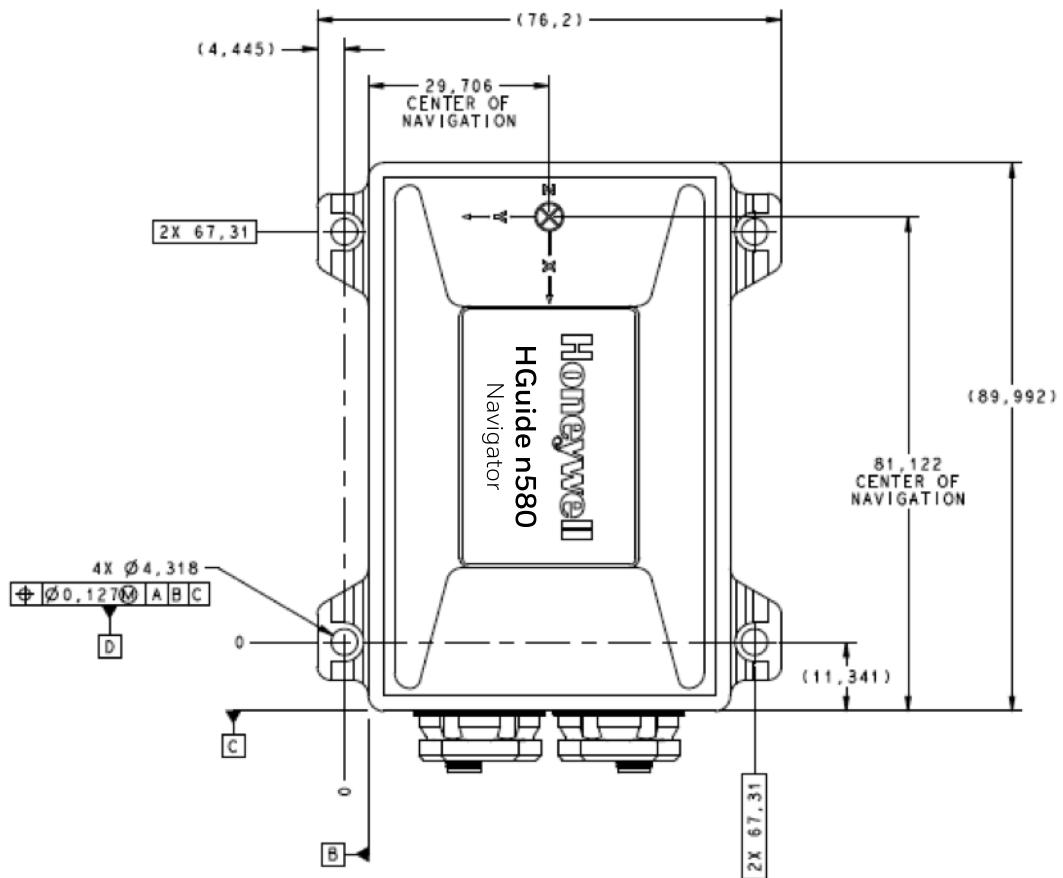
A STP file is available from Honeywell on request. The referenced Center of Navigation Point is coincident with “Case Frame” origin identified in a separate software interface manual. All dimensions are in millimeters.

IO1 mates with Fischer Connector SS 104 A086-140.  
 IO2 mates with Fischer Connector SS 104 A086-240.  
 RF1 and RF2 connectors mate with a Male SMA.

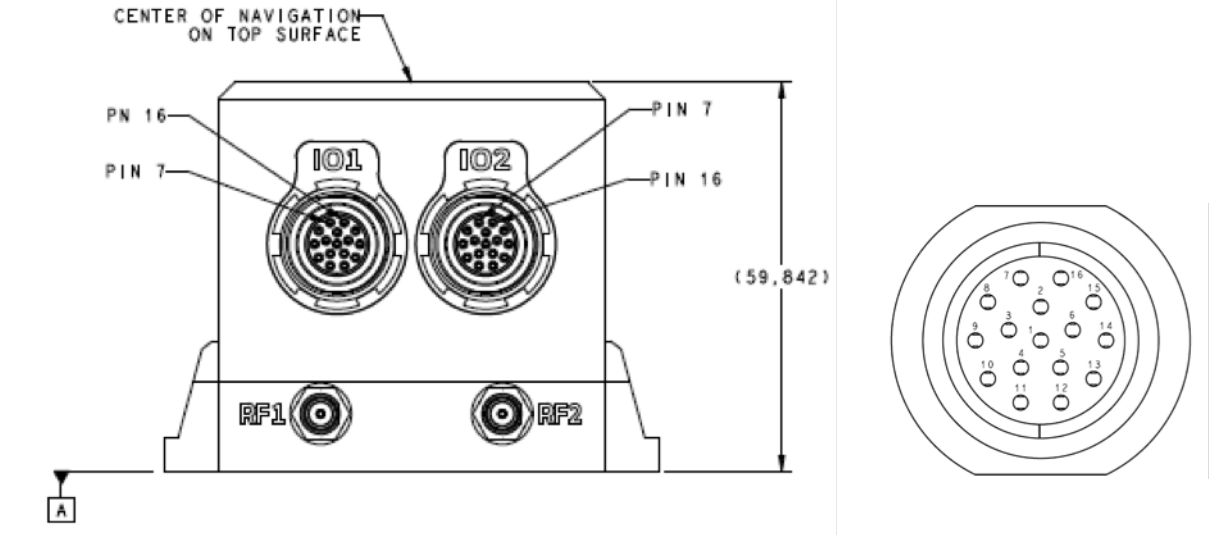
Mount device with four M4 Socket Head Cap Screws with Reduced Diameter 5.5 mm head.  
 Alternatively – a # 0.138-32 UNC Socket Head Cap Screw can be used.

Torque mounting screws to 1 N-m +/- 0.05m (9 +/- 0.5 in-lbs).

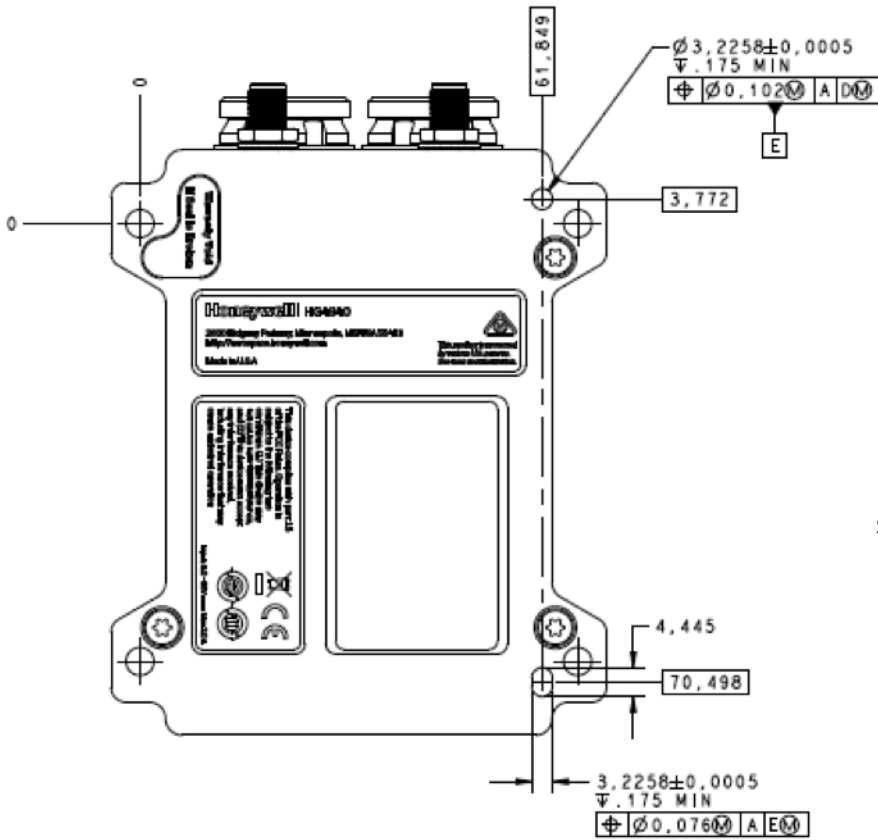
## TOP VIEW



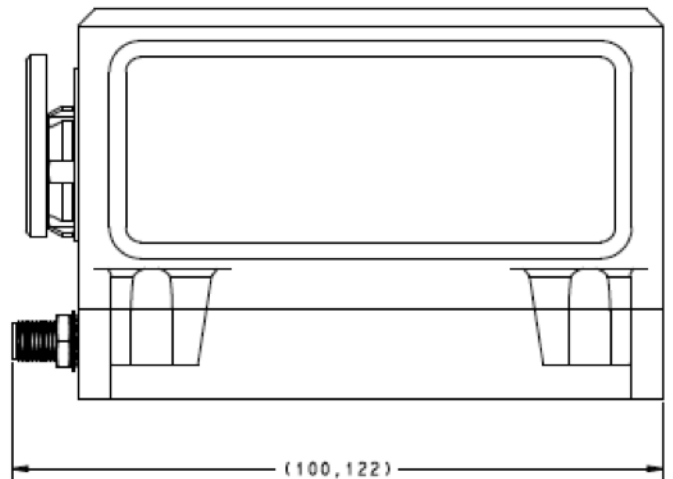
CONNECTOR VIEW



BOTTOM VIEW



SIDE VIEW





# Export Guidance

All technology that leaves the United States is subject to export regulations. This manual contains technology that has an Export Commodity Classification of ECCN 7E994 with associated country chart control code of AT1. This technology generally will not require a license to be exported or re-exported. However, if you plan to export this item to an embargoed or sanctioned country, to a party of concern, or in support of a prohibited end-use, you may be required to obtain a license.

## For more information

[aerospace.honeywell.com/n580](https://aerospace.honeywell.com/n580)

## Honeywell Aerospace

2600 Ridgway Parkway  
Minneapolis MN 55413  
[aerospace.honeywell.com](https://aerospace.honeywell.com)

N61-1914-000-000 | 03/18  
© 2018 Honeywell International Inc.

**Honeywell**