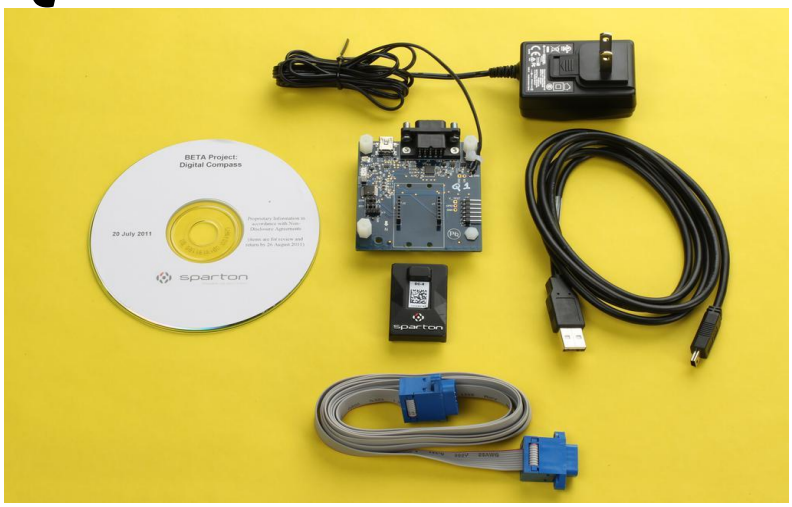
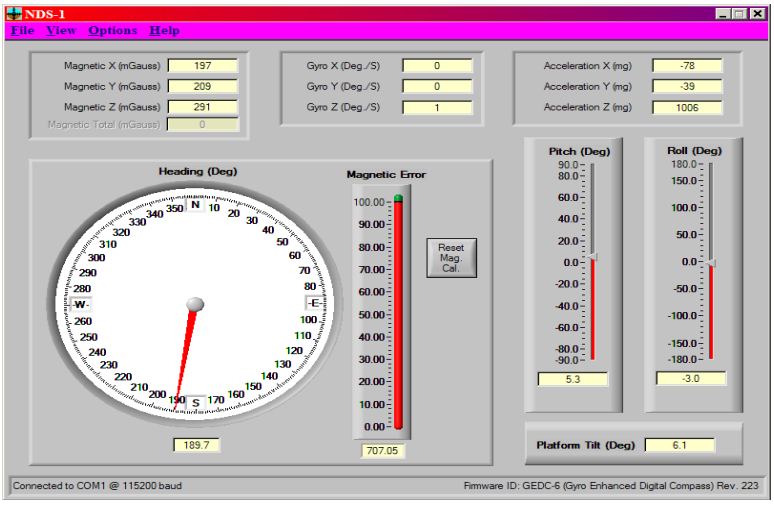
NDS-1 Navigation Development System

QUICK START GUIDE





SPARTON NAVIGATION SENSORS PRODUCT FAMILY:
DC-4 GEDC-6 AHRS-8

Developed By: SPARTON
DATE: 9/18/2012
Issue Number: 2.0
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Navigation Development System (NDS-1) Quick Start Guide

Overview

Welcome to the Sparton Navigation Development System (NDS-1). The NDS-1 provides a simple way to set up and evaluate Sparton's line of navigation sensor modules, including:

- ***DC-4: Navigation Sensor***
- ***GEDC-6: Gyro-Enhanced Navigation Sensor***
- ***AHRS-8 Attitude Heading Reference System***

To run the NDS-1 Navigation Development System, the following is required:

- The NDS-1 Adapter Board printed circuit board assembly with power adapter cord
- A Sparton DC-4, GEDC-6 or AHRS-8 navigation sensor module (purchased separately)
- CD ROM disk containing the NDS-1 Host Application Software and documentation
- A serial or USB cable for connection to a Windows based PC

The NDS-1 Adapter Board and the DC-4/GEDC-6/AHRS-8 navigation sensors are static sensitive devices. Please use proper Electrostatic Discharge (ESD) protection procedures when handling.

The NDS-1 Adapter Board is shown in Figure 1 with the navigation sensor module installed.

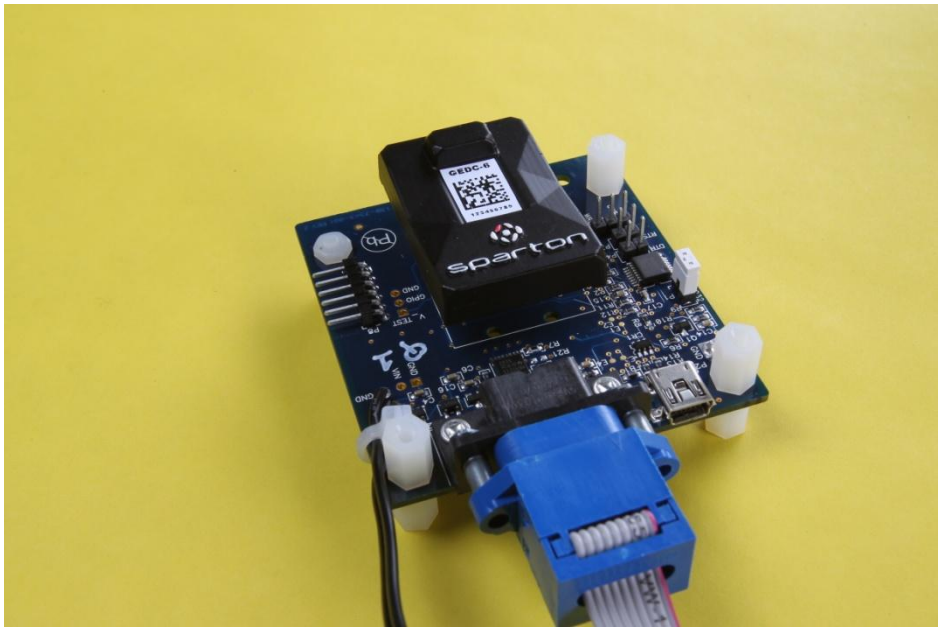


FIGURE 1 NDS-1 ADAPTER BOARD

What's in the Box?

- NDS-1 Adapter Board with power adapter (DC-4/GEDC-6/AHRS-8 purchased separately)
- Non-magnetic Serial Cable
- USB Cable
- NDS-1 Host Application Software
- CD containing application software and documentation

FIGURE 2 NDS-1 HARDWARE

NDS-1 System Set Up

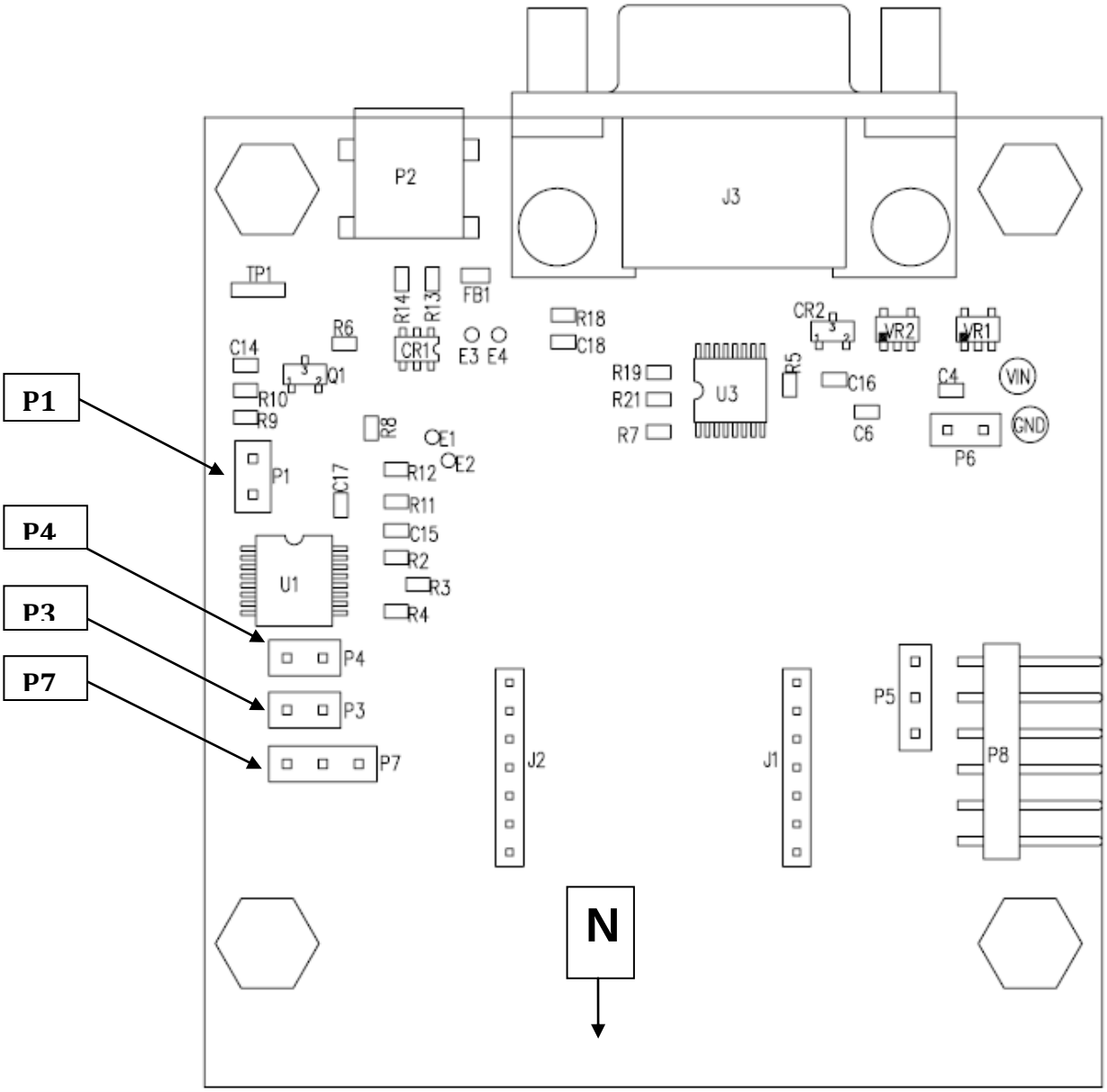
Please follow these instructions to get the NDS-1 system up and running:

1) Insert the NDS-1 Host Application CD-ROM disc into the PC (Note: PC Windows XP/Vista/7 only, no MAC or Linux Support).
2) From 'My Computer' or Windows Explorer select and run setup.exe.
3) Follow the on-screen setup instructions.
4) The newly installed program can be found in the Windows 'Start' menu after installation. Typically: "Start/All Programs/Navigation Development System/NDS-1".

Warning: Make sure the navigation sensor is mated correctly to the interface board. Misalignment of the pins can cause serious electrical damage to the navigation sensor. Sparton's warranty does not cover faulty user hardware setup.

5) Install the Sparton navigation sensor module (DC-4, GEDC-6, AHRS-8) into the NDS-1 Adapter Board connector (the connector is keyed) per Figure 1.
6) Connect the NDS-1 Adapter Board to the PC using one of the provided cables. (Note: It is preferential, although not required, to use the serial cable due to its non-magnetic properties).

7) The NDS-1 Adapter Board has several jumper blocks (Figure 1) as noted by Adapter Boards silkscreen as P1, P3, P4, and P7. These connectors are further described in the NDS-1 Navigation Development System Users Guide. Follow the applicable instructions below depending upon whether USB or RS232 cable connectivity is chosen.



PRIMARY SIDE

FIGURE 3 THE NDS-1 ADAPTER BOARD LAYOUT

If you have chosen to connect to a PC via a RS232 port:

- Short pins 1 and 2 of jumper P1 with provided jumper plug
- Leave pins of jumpers P3, P4 and P7 open (factory default)
- lug the attached power adaptor into an AC outlet
- Connect serial cable to DB9 connector J3. (Note: Use the provided non-magnetic serial cable to avoid interference with navigation sensor operations.)

If you have chosen to connect to the PC via a USB port:

- Leave pins of jumper P1 open (factory default)
- Leave pins of jumpers P3, P4 and P7 open (factory default)
- There are two ways to apply power, either plug in the AC adapter or run the system using USB power (+5V). It is permissible to leave the AC adapter unplugged. The AC adapter is designed to provide clean power in electrically noisy environments.
- Connect USB cable to Mini-B USB connector P2 on the NDS-1 Adapter Board.

Note 1: The USB cable has magnetic properties. An in-field calibration of the navigation sensor must be performed to compensate for this.

Note 2: The NDS-1 Adapter Board uses the FTDI USB to serial UART converter chip FT232R. The target PC needs to have a USB driver for the FT232R chip installed. If not resident on the PC, the driver and the applicable instructions can be downloaded from FTDI website: http://www.ftdichip.com/FTDrivers.htm

8) Start the NDS-1 Host Application by double clicking on the NDS-1 icon as found on the 'Start' menu bar.

The software will search for the correct COM port and baud rate (factory default is 115.2K baud, COM1). This may take a few minutes. Alternatively, the Setup Menu can be used to manually set the COM port and baud rate.

Note 3: The NDS-1 GUI is different from that used for the Sparton SP300xD series digital compasses, and is required for use with the DC-4, GEDC-6 and AHRS-8 products. The NDS-1 GUI is labeled as such in the upper left hand corner of the GUI.

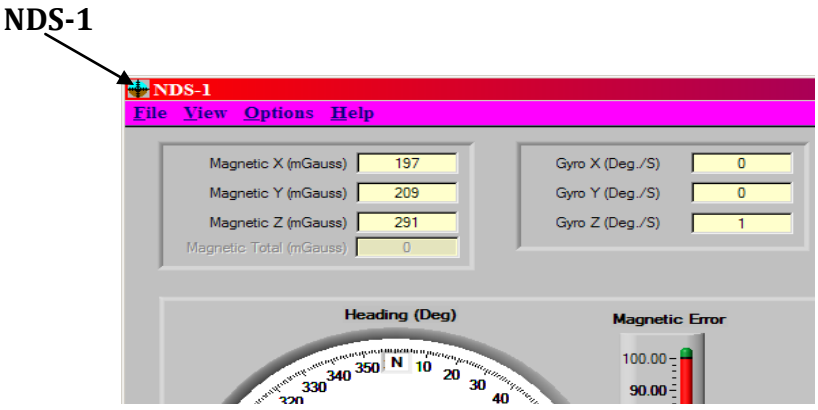


FIGURE 4 THE NDS-1 HOST APPLICATION

Guided Tour of the NDS-1 Host Application

Boot up screen:

When the program is started, a dialog box will be displayed as the system searches for the NDS-1 adapter board and DC-4/GEDC-6/AHRS-8 navigation sensor module. The status is displayed in the lower left hand corner as the system scans available COM ports. Once the system connects, the COM port and baud rate are displayed. Cancelling auto-search will bring up the dialog box for manual settings.

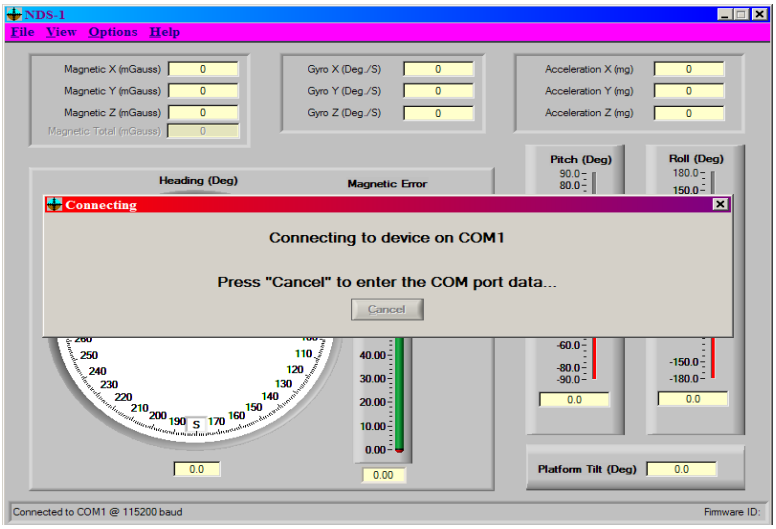


FIGURE 4 AUTODETECT AT BOOT UP

Manually Setting the COM port:

If auto-search is cancelled, a dialog box will be displayed (Figure 5) to allow manual entry of the COM port and baud rate. Enter a COM port and baud rate, or choose auto detect to restart the auto detection process. Choose cancel to exit the dialog box.

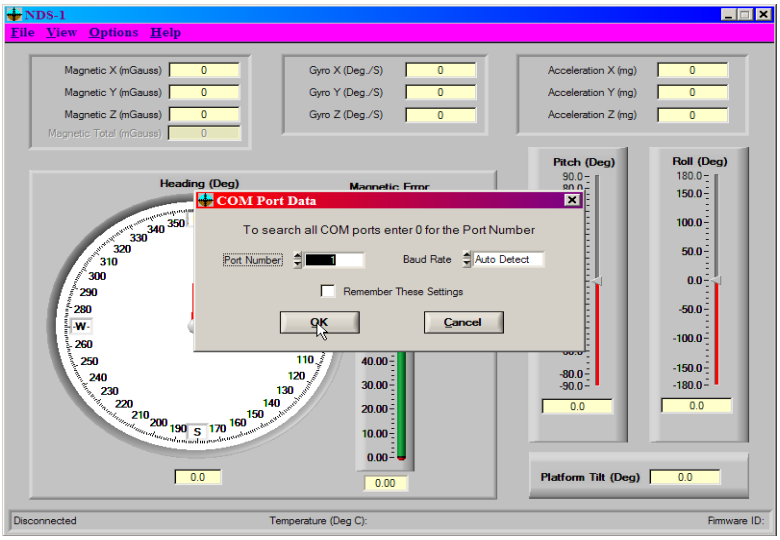


FIGURE 5 COM PORT DIALOG BOX

Home Screen:

After successfully connecting to the NDS-1 adapter board, the NDS-1 Host Application dashboard will be displayed. The home screen dashboard includes meters to display the navigation sensor heading, pitch, roll and magnetic error. In addition, the raw data from the magnetometer, gyro (if applicable), accelerometer and heading are displayed. Tilt is displayed in the lower right hand corner.

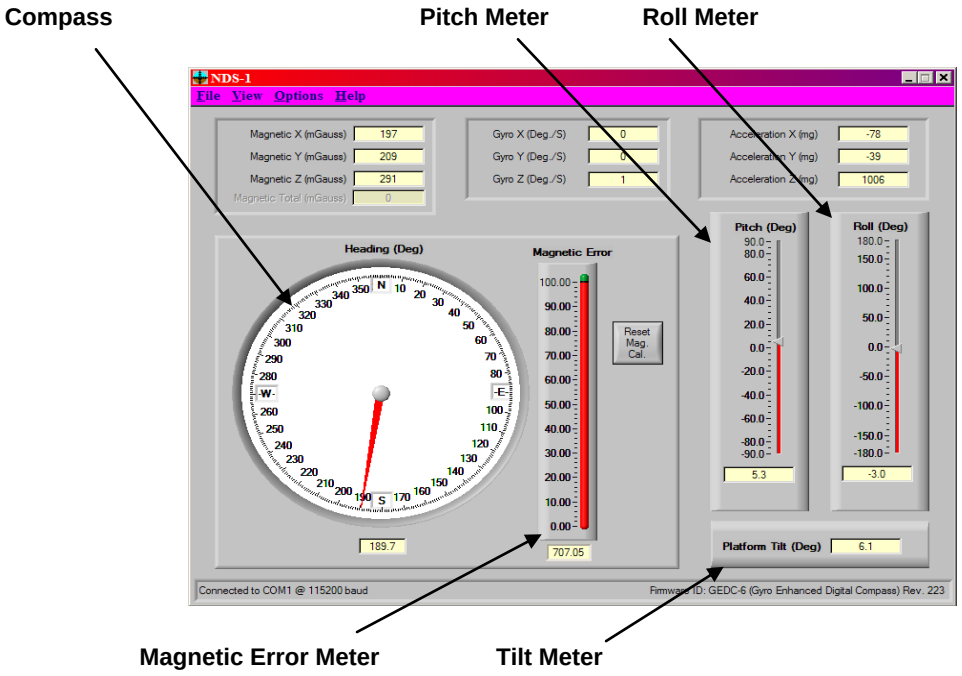


FIGURE 6 HOME SCREEN DISPLAY

The dashboard has four pull down menus: File, View, Options and Help.

This Quick Start Guide is intended to provide a brief overview of the NDS-1 Navigation Development System hardware and graphic user interface environments. For further information, specifications and calibration instructions on the DC-4, GEDC-6 and AHRS-8 Navigation Sensors, please reference the NDS-1 Navigation Development System Users Guide, the Sparton Navigation Sensor Product Guide and the associated Software Interface Manual. These documents are provided on the NDS-1 CD for your reference, or at www.spartonnavex.com.

For support and a listing of frequently asked questions please visit our website at www.spartonnavex.com