

MARINE ELECTRONIC SYSTEMS

After many years of successful service the NAVTALK is updated especially for high speed data distribution.

NAVTALK – 2

- 2 data channels input
 - NMEA 0183, IEC 61162, RS232, RS422,
 - Baud rate up to 38,400 bits/sec
 - Ch 1 priority, changes over to Ch 2 if Ch 1 input stops
- 10 data channels output
 - NMEA 0183, IEC 61162, NMEA 0183-HS, IEC 61162-2
 - Standard and high speed data
 - All outputs are isolated from power source and data input
 - Data common is grounded.
 - Cable screens grounded for effective EMC control
 - Each output A & B line 10 mA max, 5volts, via 47 ohms
- 9 to 30 volts DC at less than 100 mA

INSTALLATION

- The NAVTALK ground plane should be grounded effectively. Cable screens should be prepared and made fast to the PCB with nylon cable ties. Cable ties are provided.
- Terminal blocks lift off and may be refitted horizontally or vertically. The vertical orientation is easier to grasp for removal.
- The NMEA 0183, IEC 611-62 standard specifies that 2 core twisted pair screened cable should be used.
 - Data connections, "A" and "B"
 - Cable screen to ground plane or "GND / 0 / C " terminal
- For high speed data NMEA 0183-HS, IEC 61162-2, an additional wire for the common connection is required
 - Common connection to "C" terminal.
 - Screen to ground.
 - Typically 2 twisted pair cable, or Cat5 LAN cable, can be used for the connection
- You can select Ch1 or Ch2 permanently by fitting a link to SK2. When no link is fitted the mode is "auto" and Ch1 will be selected as long as data is present, timing out after 5 or more seconds to select Ch 2.

CHECKING OPERATION

1. LD1 flashes in time with channel 1 data input
2. LD2 flashes in time with channel 2 data input
3. LD3 on when Channel 1 data is being passed through
4. LD4 on when Channel 2 data is being passed through
5. Flashes in time with the output data
6. To test each individual output connect a red/green bi-colour LED across the A-B output and watch it flash red/green in time with the data.

TECHNICAL NOTES

DESIGN NOTES

The NAVTALK is designed to make interfacing multiple navigation aids easy, and ensure that the cable screens are grounded correctly. It acts as a junction box for the 14 possible cables. Cable glands are not used for several reasons, practicality, cost, and efficiency of grounding the cable screens. Plastic glands inevitably mean that cable screens are not properly grounded, and zero ohm metal glands are VERY expensive. The cable entry through the plastic box ensures that cables can be led in, secured and grounded properly.

From time to time the use of the unscreened plastic box is queried from an EMC point of view. The signal levels and speed in the NAVTALK are not going to cause harmful emissions or be susceptible to radiation. The NAVTALK CURES problems, it does not cause them. However, if anyone feels an RF screened box is needed the answer is easy. Remove the NAVTALK PCB and spray the inside of the enclosure with Nickel Screening Compound such as Farnell 521-450.

The NAVTALK PCB has sometimes been taken out of its box and fitted in a metal box, and if a customer wishes to do that it is fine. I heard reports of how it was done by one customer who used plastic glands with the cable screens either

not grounded at all or grounded by long pigtailed. That spoils the EMC performance of the system because the cables can then radiate. To be effective the cable screens must be grounded as they enter the enclosure. Zero ohm cable glands would be good.

Shipyards commonly use cables that are too big to enter the NAVTALK, which is drilled for 8 mm diameter cables. In that case the NAVTALK in its own enclosure may be installed on the back plate of an electrical enclosure so the shipyard cables can be terminated at its gland plate. Shipyard electricians have ready access to these enclosures.

OUTPUT DRIVERS

The SN74HCT240 are the output driver chips. Each line is via a 47-ohm resistor R7 to R26. These chips and resistors are not affected by a short circuit. If you connect to a device which feeds voltage out and INTO the NAVTALK the resistors and chips will burn out. Occasionally we have seen a NAVTALK with a burnt-out resistor, a sure sign of it having a data line connected to a 24-volt supply. This is damage through misuse and is not a failure covered by warranty. Fortunately the NAVTALK is easily repairable on board.

POWER SUPPLY

The NAVTALK takes very little power, and is protected by a solid-state re-settable fuse.

RELIABILITY

Of the 3000 or so NAVTALKS made not one has ever been returned to me with a genuine fault.

Designed by Andrew Fairgrieve. Document reviewed 10/10/2005



