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IFD-NET TURN/SLIP and TURN COORDINATOR



CLASSIC MEETS MODERN

USER AND INSTALLATION MANUAL

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FEATURES

- Standard 80mm diameter installation shape
- Very bright screen, sunlight visible, up to 1000 cd/m².
- Low power consumption down to 2.3W (200mA @ 12Vdc).
- Ergonomic interface with rotary encoder / knob
- High integration level (all sensors embedded)
- Multi-environment software with simple switch menu
- Three functions in color / graphic display:
 - Turn indicator + slip/skid ball
 - Turn coordinator
 - Nearest (European point database)

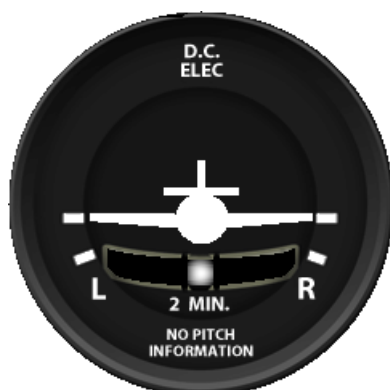
ELECTRICAL AND MECHANICAL SPECIFICATION

- Main power 10 - 30Vdc 200mA with internal filter and peak transient protection.
- Functional temperature range -20°C to 80°C 90% Rh no condensation status.
- 64mm x 64mm x 75mm (width, height, depth).
- 2 x 1/8 NPT Pitot and Static pneumatic connectors.
- SMA female connector for GPS passive antenna.
- Standard 9 SUB-D female connector for power and BUS connection.

BASIC FUNCTIONS

Switch between the two main pages (environments) by pressing **the rotary encoder / knob** (short-press):

TURN COORDINATOR

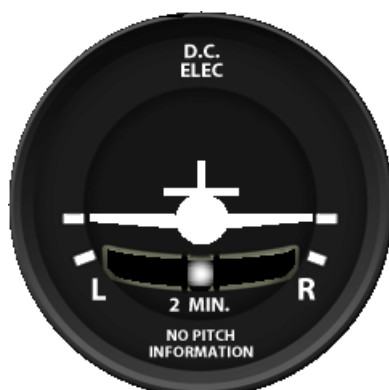


"NEAREST": GPS position and closest points

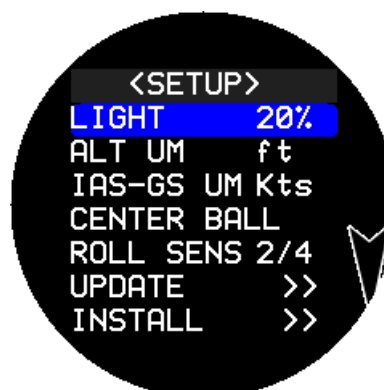


The GPS ground track, when displayed, is corrected according to the local magnetic variation (thus is a magnetic track)

To enter the **SETUP** menu **press and hold the rotary knob** (long-press, about 1 sec):



Long-press
of rotary
knob



WORKING WITH MENUS

Once a menu is displayed on the screen:

- Rotate the knob to highlight the desired menu item
- Press the knob to confirm the selection

If the highlighted item is an adjustable parameter:

- The parameter turns green
- Rotate the knob to adjust the value
- Press the knob to confirm the change
- The parameter turns white again

Menus usually have an **EXIT** item at the top or at the bottom.

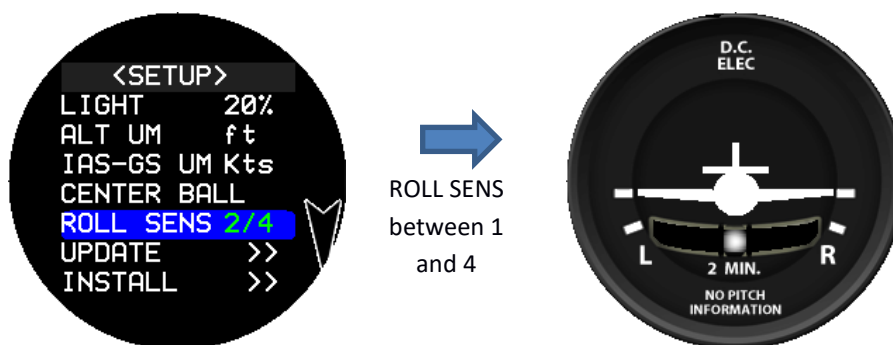


TURN COORDINATOR

Just like the mechanical turn coordinator, this instrument senses both rate of roll and rate of turn.

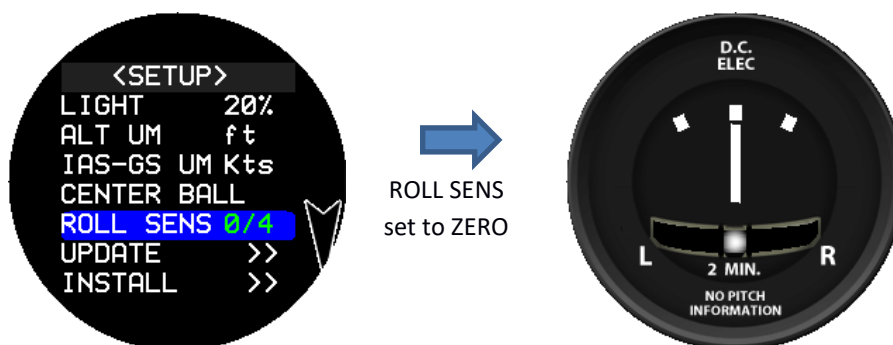
On the IFD-NET you can set the roll sensitivity (**ROLL SENS**) between 0 and 4.

Set the **ROLL SENS** parameter between 1 and 4 to see the TURN COORDINATOR:



TURN / SLIP INDICATOR

You can set the **ROLL SENS to 0 (ZERO)** and in this case the instrument will become a TURN INDICATOR (senses only RATE OF TURN but not rate of roll):

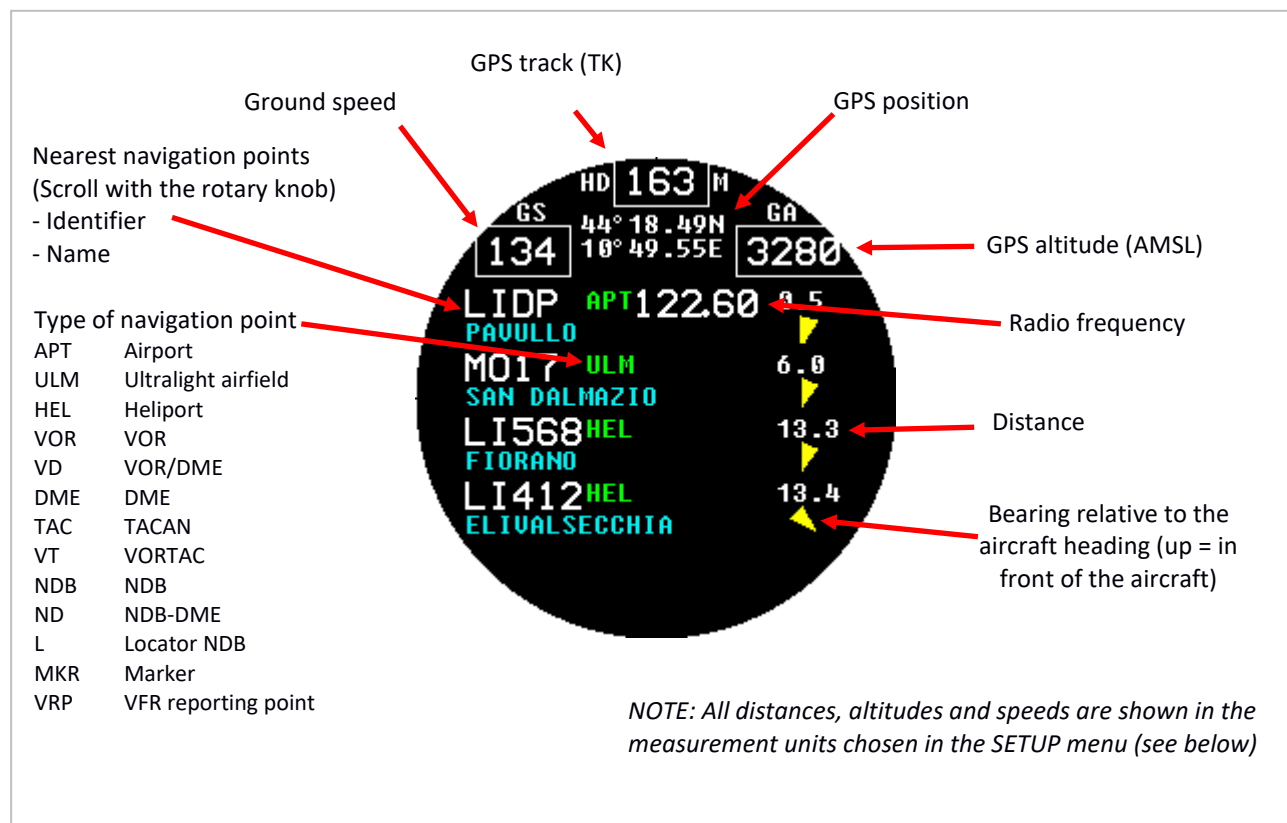


SLIP/SKID BALL

In case you observe that the ball is not centered when the aircraft is level and coordinated, select the SETUP option "**CENTER BALL**". The slip/skid indicator will immediately center.

"NEAREST" PAGE

This page shows the closest aerodromes and navigation points according to the current GPS position.



Rotate the knob to scroll through the list of nearest points.

When a point is highlighted, pressing the knob may show more details from the database:

NOTE: if the GPS antenna is not connected, or the GPS has not yet acquired the position fix, the NEAREST page will show: **NO GPS FIX**

"NEAREST" MENU (PRESS AND HOLD THE KNOB)

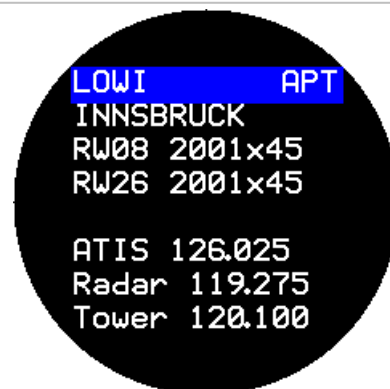
EXIT - Returns to the NEAREST screen.

NRST TYPE - Selects which point types are shown in the NEAREST page

ALL - All aerodromes and navigation points
 AD - Aerodromes, including ultralight airfields
 NAV - Only navigation points and radio aids
 HELI - Only heliports

FIND POI >> - Allows searching for navigation points by name or identification (see paragraph "FIND POI" FUNCTION below)

SETUP - Opens the setup menu, described below in detail.



"FIND POI" FUNCTION

The navigation database contains more than 10000 aeronautical points of interest (POI) available for search.

Once the FIND POI command is activated, a black window appears on the screen with a "Search: " prompt on top.

Enter the search text, one character at a time:

- Rotate the knob to scroll through the alphabet and numbers
- Push the knob to confirm each single character

As soon as 2 characters or more have been entered, the search results appear instantly under the "Search" prompt.

When enough characters have been entered, just press the knob without selecting any character.

NOTE: If the system detects that there is only a single search result, the selection is automatic.

The cursor will move to the list of search results and the knob rotation is then used to select the desired navigation point.

Push the knob again to confirm the selection of a result from the list.

The instrument will show more detailed informations if available:



NOTE: The search results are ordered first by relevance and second by identifier.

There are three levels of relevance:

1. Exact match either on the identifier or the name of the point.
Example: a search for "LIPO" matches exactly the ICAO code of the Brescia / Montichiari airport in Italy.
Other matches, for example "EGBC / Cheltenham Heliport", will have lower relevance even if the identifier comes before in alphabetical ordering (EGBC is alphabetically before LIPO)
2. Search term is at the beginning of the identifier or the name of the navigation point.
3. All other matches

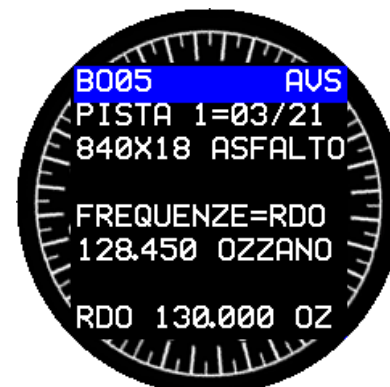
FIND POI - EXAMPLE

We want to get informations about the "Guglielmo Zamboni" airfield (Italy). The search will be done on a partial match of the name, by entering the search term "ZAMB"

- Press and hold down the rotary knob for about one second.
- Rotate the knob to select "FIND POI >>" and push it (short press)
- Rotate the knob right to scroll through the alphabet, up to "Z". Push the knob.
- Repeat until "ZAMB" has been entered near the "Search: " prompt
- Rotate the knob left until the asterisk "*" is shown (will look like: "Search: ZAMB*"), then push the knob.
(the asterisk is an alternative way to end the text input)



- Rotate the knob to the right to scroll down to the desired result "B005 - Guglielmo Zamboni", push the knob.
- The details page will appear:
- Scroll the text information up/down by rotating the encoder; press the knob to close the window



SETUP MENU**LIGHT** [20% .. 100%]

Adjusts the brightness of the screen; the selected backlight intensity is maintained on next power up.

ALT UM [m, ft]

Selects the measurement unit for altitude

IAS-GS UM [Kph, Kts]

Selects the measurement units for the GPS ground speed and the distance shown in NEAREST page (Kts/Nm or Km/Km)

CENTER BALL

Uses the current aircraft attitude to set the center position of the slip/skid indicator ("the ball")

This is usually done on the ground, but may also be done in flight when the aircraft is flying coordinated.

ROLL SENS [0..4]

Sets the sensitivity to the rate of roll. Factory default is 2 (**2/4**).

When set to **0/4** (ZERO) the instrument becomes a TURN INDICATOR (does not sense rate of roll, only rate of turn).

UPDATE >> (sub-menu)**SW VER** xxxxxx

Indicates the software release (same as "SW xxxxxx" in main setup menu)

UP NAV AIR [yyymm]

yyymm =AIRAC cycle of installed navigation database

This item is used to start a database update from the SD card.

The manufacturer will provide instructions with the update.

UP FW

To be used for firmware update.

Follow instructions provided by the manufacturer with the update.

REBOOT

Restarts the instrument

EXIT

Returns to the main screen

INSTALL >> (Only for factory usage)**SW xxxxxx**

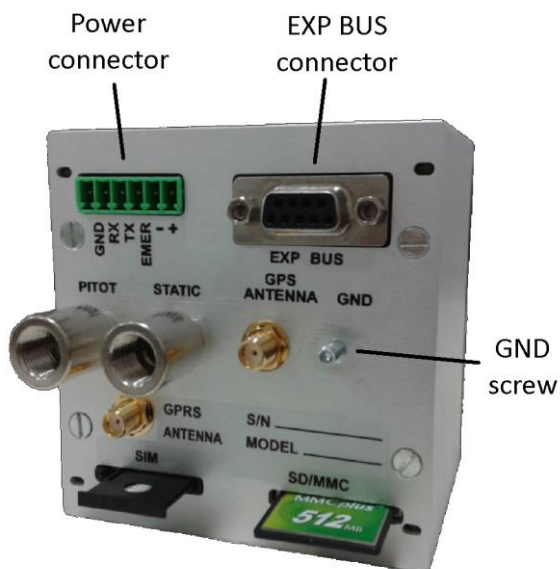
Indicates the software release, e.g. "SW 280716"

EXIT

Exits the SETUP menu



REAR CONNECTORS VIEW AND DESCRIPTION



POWER CONNECTOR:

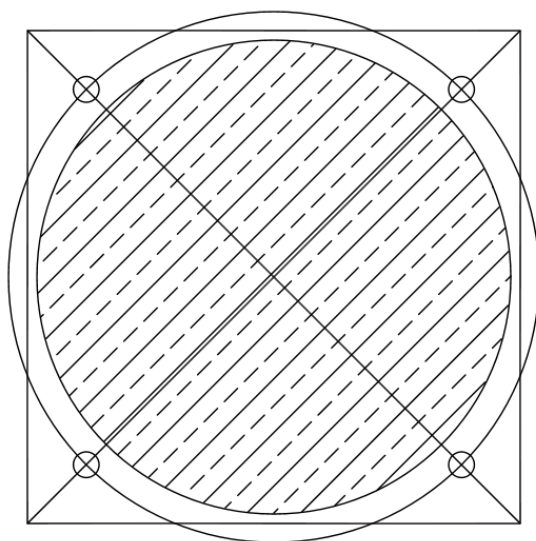
- +12V (10 to 30Vdc) 250mA: use 5A Fuse
- - 0V -> connect to GND
- EMER -> [NOT USED]
- TX -> [NOT USED]
- RX -> [NOT USED]
- GND -> GND for internal GPS

EXP BUS CONNECTOR: NOT USED by TURN/SLIP instrument

PITOT/STATIC is NOT REQUIRED for the TURN/SLIP indicator.

GPS ANTENNA is OPTIONAL – if antenna is connected, the instrument can show the nearest airfields and aeronautical points. It will also display GPS altitude, speed and ground track.

INSTALLATION GUIDE



3 1/8 (80mm) Instrument Hole

1. Draw a 3.25" X 3.25" Square
2. Scribe 2 diagonal lines corner to corner
3. Using the center of the lines, scribe a 3.5" diameter circle.
4. At the intersection of the diagonals and the 3.5" dia circle drill 4 holes to clear #8 screw (.170" dia.)
5. Using the center of the diagonal lines cut a hole with a hole saw 3.125" dia.

The IFD-NET series has a standard 80mm aeronautical panel shape.

This means the installer should observe the standard way in order to obtain a correct installation on the unit. Refer to the hole template on the left in case your panel doesn't have 80mm holes already prepared.

The IFD-NET is installable in a standard hole, keeping in account that the lower-right screw hole shall be enlarged to a diameter of 7.41mm to accommodate the rotary knob.

The screws on the remaining three holes shall be tightened with appropriate torque, in a way to keep the instrument fixed and not introduce any vibration which would decrease the accuracy of the gyro sensors.

Remove the aluminum knob by turning on the little screw. This is because the encoder shaft need to pass throw the 7.5mm diameter hole in the bottom right corner of the 80mm hole.

After putting the instruments in the reworked slot, install the aluminum knob and turn its screw to lock it; use the plastic profile template to obtain a thickness of about 1.5mm between the cockpit surface and the bottom part of the aluminum knob.

Use the provided 4mm MA black screws (length 10mm) to fix the instrument to the panel. Do not over-tighten the screws in order to avoid damage to the IFD-NET chassis. Use a medium thread locker to ensure screws will not come off due to vibrations.

GPS ANTENNA

The TURN/SLIP instrument can use the GPS antenna to get the GPS track over the ground, AMSL GPS altitude, and provide the aircraft position for the NEAREST page.

In the figures below there are two different types of GPS antenna. These are terminated by a SMA MALE standard connector.



There are some rules to observe on how to install GPS antenna:

- Choose between magnetic or adhesive type in order to obtain a perfect coupling between the parts, antenna and aircraft.
- Choose a location where no electromagnetic noise is present.
- GPS antenna must not be covered by metallic or conductive shields. Keep in account that carbon fiber is a conductive material and may reduce the sensitivity of the antenna.
- GPS antenna cable must not pass near electromagnetic noise generators like radio, transponder or ELT.

Please refer to safety aeronautical rules in order to make a reliable antennas installation. Consider all the radio frequency based installed equipment needs in order to avoid electromagnetic conflicts.

SELECTING AN APPROPRIATE INSTALLATION POSITION

The IFD-NET is a multi-sensor system based on a variety of sophisticated transducers. Every sensor has a sensitive element, which measure a different physical quantity.

The GPS unit is embedded in the body of the instrument. For this reason, a high level of electromagnetic radiations may cause a degradation of its sensitivity and performance. Choose an install position not so close to radio-frequency emitter units like radios, ELTs or transponders. Pay attention in antennas position also in order not to compromise the proper operation of all the aircraft instruments.

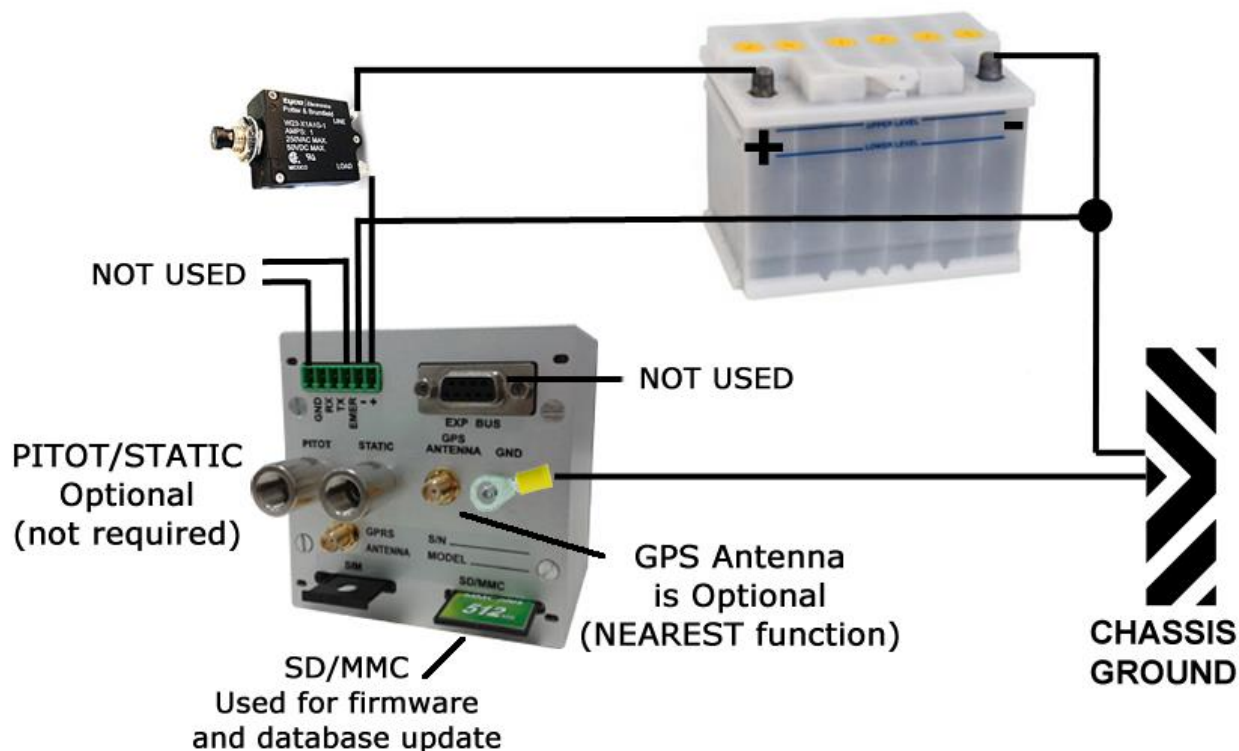
- As the unit contains GYROSCOPE and ACCELEROMETER sensors, we recommend to install the instrument as much aligned as possible with the aircraft axes. A maximum tilt of 5 degrees in roll and pitch should be respected.
- Choose a position not affected by residual and unwanted vibration. The instrument uses a sophisticated algorithm to determine the real gravity vector from the total sensed acceleration. Too much resonant vibration can further complicate the computation resulting in reduced performance of this compensation.
- Avoid installing the equipment near hot surfaces. A good idea could be to ventilate the rear of the cockpit in order to protect instruments from overheating during exposure of the aircraft to direct sunlight.

There is plenty of documentation available that explains how to correctly install avionic instruments. Please refer to technical literature for more information.

POWERING THE INSTRUMENT

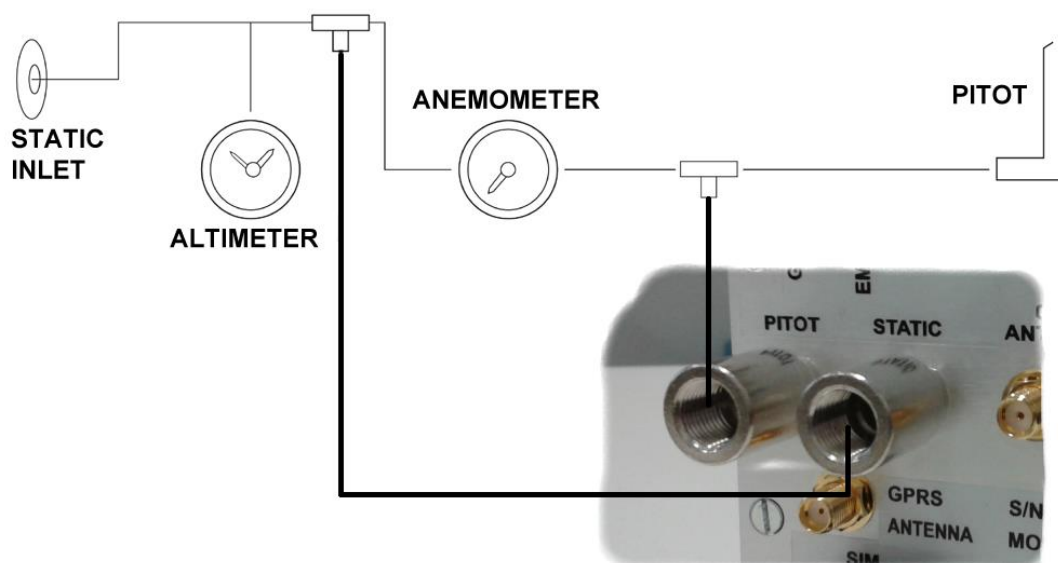
The electrical connection is very simple. As all of the sensors are inside the metal housing, the only electrical connection needed is the main power line (10 to 28Vdc using an aeronautical safety breaker).

Use wires with a cross section not less than 1.5 square millimeters. Keep connections as short as possible.



PNEUMATIC CONNECTION (OPTIONAL)

PITOT/STATIC, if connected, will be used to detect frontal accelerations and compensate the drift of the gyroscopes. However, the effect on the turn coordinator algorithm is negligible and these ports can be left unconnected.



When fixing the PITOT/STATIC lines to the instrument, please be especially careful to not twist the 1/8 NPT female adapters on the back of the unit.

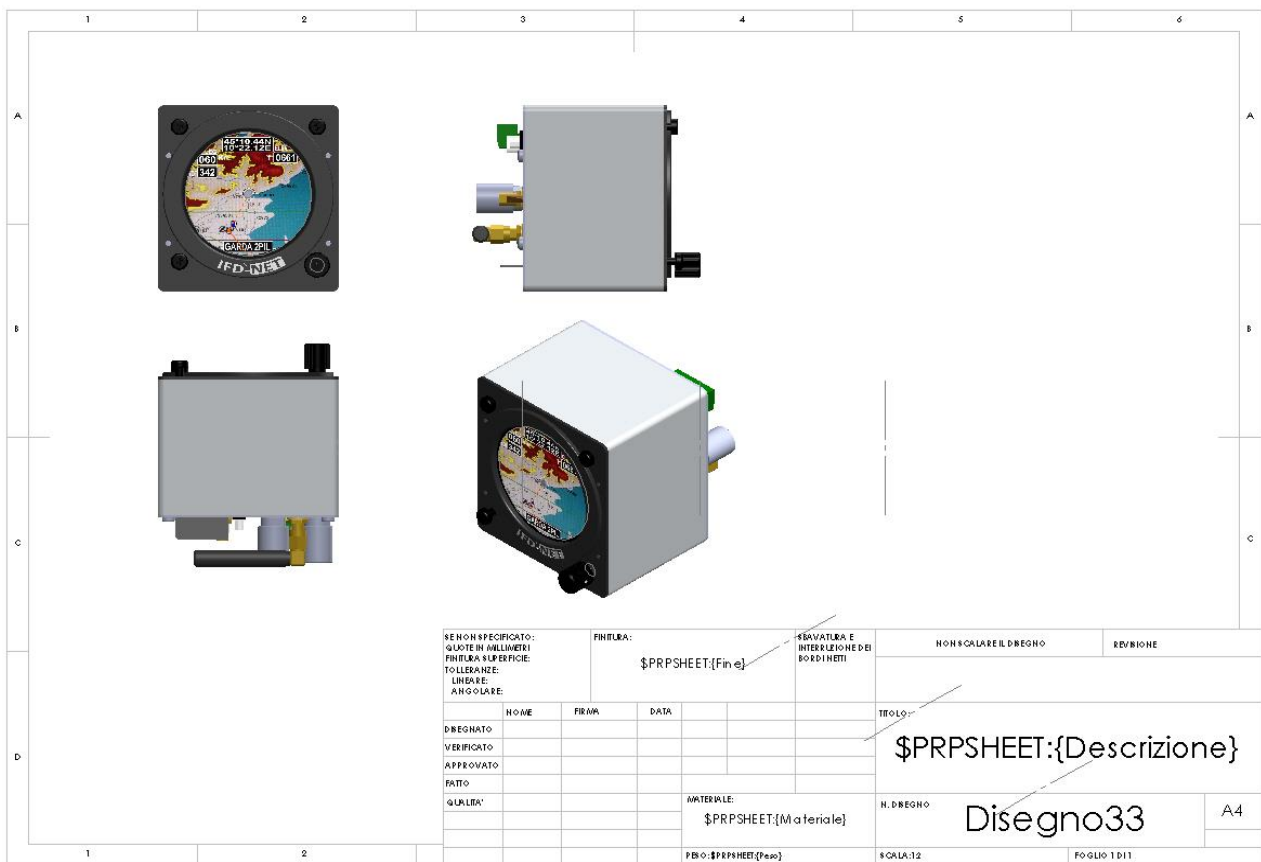
If a too strong torque is applied, these adapters may rotate and twist the internal silicon pipes, causing a malfunction.

We suggest to use pipe hose adapters with rubber o-ring in order to avoid pressure leaks, and in any case don't lock it too strongly.

The hose adapters should be locked by hands and not by wrench. Otherwise, during screw operation, hold the 1/8NPT units adapter with a second wrench to avoid that they rotate and twist the internal pipes.

MECHANICAL DIMENSIONS

The IFD-NET dimensions are: 64 x 64 x 75 mm



ORDERING INFORMATION

The IFD-NET series is available in several models (BARO, EFIS, EFIS/MAP ...). Because of their differing internal electronic configuration, is not possible to switch between the different models after final testing. Please select the model keeping in account your exact needs or talk to our technical department for guidance to meet your aircraft configuration.

Below you'll find the ordering codes for applicable to the product described in this manual, and its optional tools/spare:

- IFD-NET Turn/Slip
- GPS ANTENNA
- 1/8 NPT MALE to RUBBER PIPE HOSE ADAPTERS

Note:

- Please contact vendor for more information about this product and other commercial offers.
- This equipment is not certified and was developed for ultralight and experimental aircraft. Users must observe VFR policy during flight.