www.IFD-NET.com

## IFD-NET BARO


## IFD-microNET BARO


# THE NEXT GENERATION AVIONICS

USER AND INSTALLATION MANUAL

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## FEATURES

- Standard 57mm (IFD-microNET) or 80mm (IFD-NET) 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 three buttons (rotary knob for IFD-NET)
- High integration level (all sensors embedded) *
- Multi-environment software with simple switch menu
- Several functions in color/ graphic display:
    - IAS - Indicated airspeed
    - ALT - Altimeter with settable REF Pressure
    - VSI - Vertical speed indicator
    - MFD - Multi-function display (all parameters on a single page)

## MODELS FUNCTIONALITY

The IFD-microNET BARO (57mm) and IFD-NET BARO (80mm) are based on different hardware, but are designed with identical functions and user interface.

The only exception is that the IFD-NET (80mm) has a **rotary knob** while the IFD-microNET (57mm) has **three buttons**. Whenever the documentation below refers to the IFD-microNET buttons, the corresponding IFD-NET actions are:

| Action | IFD-microNET BARO (57mm) | IFD-NET BARO (80mm) |
|---|---|---|
| Move up in menus, or decrease values | Left button | Rotate knob left |
| Confirm menu selection or confirm values | Middle button | Push knob |
| Move down in menus, or increase values | Right button | Rotate knob right |

## 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.
- Dimensions IFD-MicroNET BARO: 65mm x 65mm x 75mm (width, height, depth).
- Dimensions IFD-NET BARO: 83 mm x 87 mm x 67 mm (width, height, depth), weight 500g
- 2 x 1/8 NPT Pitot and Static pneumatic connectors.
- Standard 9 SUB-D female connector for power and BUS connection.

## ENVIRONMENTS DESCRIPTION AND SCREENSHOTS

The IFD-microNET interface is based on three front buttons that give access to all the settings pilots need during flight, and possibility to adjust setup parameters.


As explained above the IFD-NET (80mm) provides a rotary knob instead, which works similarly to the three buttons on the IFD-microNET (knob rotation = left/right buttons, knob push = middle button)

On the right is shown an instrument in ALT (Altimeter) configurationPressing the right or left button will increase or decrease the reference pressure respectively. The reference pressure affects the value of the barometric altitude; setting the exact local pressure (QFE) in the reference pressure causes the altimeter to display zero altitude. Setting the pressure to the sea level (QNH), the barometric altitude will display the exact altitude AMSL.

The pilot can access the MAIN menu by pressing the center button (or pressing the knob on the 80mm) for about 1 second, until the screen shown on the right appears.

**MAIN MENU**


Within the MAIN menu the left button moves the selection up, the right button moves the selection down, and the middle button confirms the highlighted selection.

On the IFD-NET (80mm) rotate the knob to move the selection and confirm by pushing the knob itself.

**Explanation of main menu:**

- **ALT**: Switches to the Altimeter page; see “ALTIMETER GAUGE” below.
- **IAS:** Switches to the Indicated Airspeed page. See “AIRSPEED INDICATOR” below.
- **VSI**: Switches to the Vertical Speed Indicator page; see “VERTICAL SPEED INDICATOR” below.
- **MFD**: Switches to the Multifunction Display page; see “MULTIFUNCTION DISPLAY” below.
- **SETUP**: the setup menu page lists all the configuration parameters that influence the instrument behavior. The Display will appear like the image on the right.

**SETUP MENU**


## SETUP MENU

**To change a SETUP parameter** highlight it with the left/right buttons, press the middle button to enter edit mode (the parameter turns green) and use the left/right buttons to change the value.
Finally confirm the change with the middle button (the parameter becomes white again).

On the IFD-NET (80mm) the rotary knob works similarly: push to edit, then rotate to change value, push again to confirm final value.

- **EXIT:** goes back to MAIN menu.

- **START PAGE:** This parameter indicates which page will appear on the screen immediately after a power up sequence. The possible choices are “ALT”, “IAS”, “VSI” and “MFD”.

- **BRIGHTNESS:** Sets the display brightness. Set it between 5 and 30 on the IFD-microNET (range is between 20 and 100 on the IFD-NET). Select this value according to environment lighting conditions and also keeping in account that a lower value means a lower power consumption.
- **UOM ALT:** define the unit of measure for barometric altitude and GPS altitude between meter or feet.
- **UOM IAS:** define the unit of measure for IAS and GPS ground speed indicators between KPH (Km/h) and KNOTS.
- **UOM VSI:** define the unit of measure of vertical speed indicator between meters per second or 100 feet per minute.
- **UOM PRESS:** define the unit of measure of reference pressure in the relative indicator between mBar or inches of mercury. The normalized value after the power up sequence of the unit is 1013mB or 29.92 IN/HG. Pilots can vary this value by pressing the right or left button in order to increase or decrease pressure respectively.

- **PRES TRM:** This is an offset value (in hPA) that is added or subtracted to the altimeter reference pressure. Use this parameter to fine tune the IFD-NET altimeter reading. See below "FINE TUNING THE ALTIMETER".

- **IAS Vs0:** indicate the value of Vs0 speed corresponding to the white arc start. The ***speeds are entered in Km/h*** here**,** regardless of the “UOM IAS” parameter setting. Please refer to section “IAS COLORED ARCS” to learn more about the colored arc on IAS gauge screen.
- **IAS vs1:** indicate the value of Vs1 speed (Km/h).
- **IAS Vfe:** indicate the value of Vfe speed (Km/h).
- **IAS Vno:** indicate the value of Vno speed (Km/h).
- **IAS Vne:** indicate the value of Vne speed (Km/h).

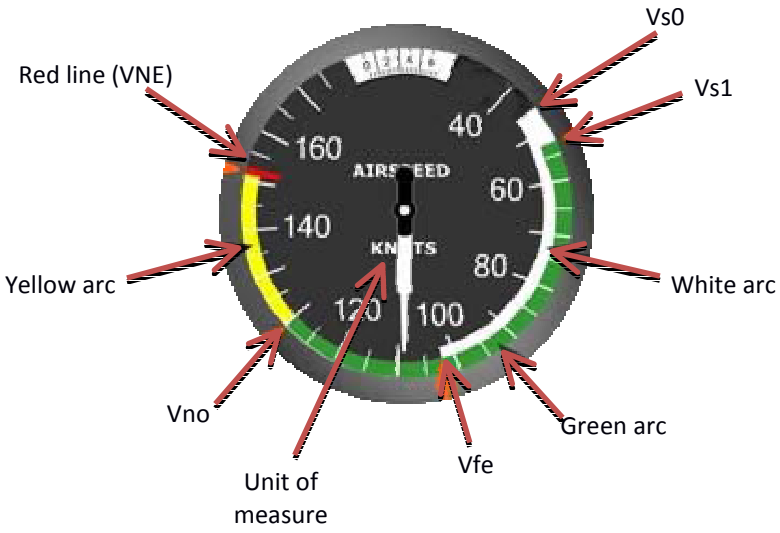
- **ALT TYPE**: defines which altimeter style is shown in the ALT page. Choices are “**3PTR**” (3-pointer) and “**DRUM**” (drum altimeter with single pointer). See “ALTIMETER GAUGE” below.

- **LOGIN ->:** Use this sub menu to enter the technical credentials in order to unlock the “CALIB” submenu.

- **CALIB. ->:** Accesses the hardware calibration menu, which contains many important settings that can compromise the functionality of the entire system if mismanaged. Please contact the vendor before accessing this menu.

## IAS COLORED ARCS

The IFD-NET BARO draws the colored arcs on the airspeed indicator according to the logic below.
Full scale speed is automatically determined by Vne parameter plus 30KPH or KNOTS.




The color ranges of the speed arcs are determined by setting the parameters listed in the SETUP menu:
* The white arc starts at Vs0 value and ends on Vfe, defining the safe area of operation for flaps and gear.
* The Green arc starts at Vs1 and ends on Vno
* Yellow arc starts from Vno and ends on Vne.

**Please refer to your aircraft manual in order to set all V-speeds accurately**.

## FINE TUNING THE ALTIMETER

All BARO instruments are factory calibrated and should show accurate airspeed and altitude out of the box.
However, due to various reasons (environmental conditions, mechanical settling of sensors … ) your instrument may need some fine tuning.

In case you observe that the given altimeter setting does not display the correct aerodrome elevation you may change an offset parameter in the instrument setup (named “PRESS TRM”) which adds or subtracts a fixed quantity from the displayed reference pressure.


**For example:**
- The Tower gives a QNH of 1017 and the aerodrome elevation is 150ft

- You set the reference pressure at 1017 and the instrument reads 120 ft.

- However, if you set 1018, you read just about 150 ft on the altimeter

- Therefore you want to set an offset (PRESS TRM) of +1.0 hPa


**Proceed as follows:**
1. Press and hold the knob of the instrument until the main menu appears

2. Rotate the knob clockwise to select SETUP; click the knob to confirm

3. Rotate the knob clockwise to select the item PRESS TRM; press the knob briefly.

4. The number to the right of PRESS TRM becomes green. You can adjust that parameter in steps of 0.1 hPa by rotating the knob

5. Set PRESS TRM as desired (1.0 in the example)

6. Press the knob briefly when done; the parameter turns white again.

7. Rotate the knob counter-clowkwise to select EXIT, then press the knob briefly

8. Select ALT and press the knob briefly to go back to the altimeter page (or wait few seconds, the menu disappears automatically)


The altimeter should now read 150ft over the QNH 1017 hPa

## ALTIMETER GAUGE

The altimeter gauge (ALT) screen displays a typical analog altimeter gauge.

There are two altimeter styles available:

- Three-pointer ("3PTR"): The classical analog altimeter
- Drum-pointer ("DRUM"):Altitude shown in digits, plus a pointer indicating hundreds of feet. This is typically used in high-performance airplanes.


**Three-pointers altimeter style**

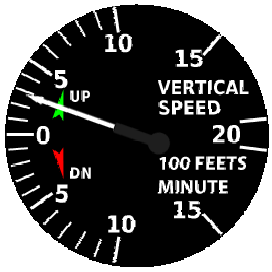

**Drum-pointer altimeter style**

The unit of measure used by the altimeter depends of the setting in the SETUP parameters "UOM ALT" and "UOM PRES".

The user can adjust the reference pressure by pressing right button to increase its value or left button for decrease. After a power up sequence the value of the reference pressure will be 1013mB or 29.92InHg in accordance to the parameter "UOM PRES".

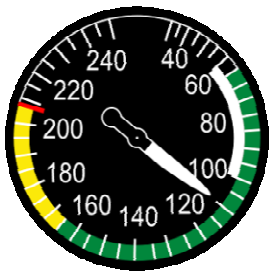
## VERTICAL SPEED INDICATOR

The vertical speed indicator reproduces an analog gauge that indicates the climb or descent rate in the unit of measure selected by "UOM VSI" parameter in the SETUP menu. This information is based on a derivative calculation of the barometric altitude and for this reason its accuracy depends on the optimal status of the pitot-static system of the aircraft. The available units of measure are m/s or hundreds of ft/min.




## AIRSPEED INDICATOR

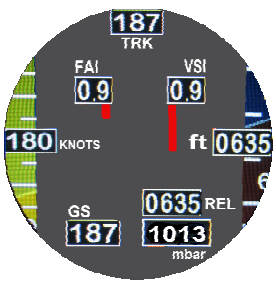
The IAS screen displays the airspeed of the aircraft calculated by converting the pressure sampled from the PITOT inlet (differential between STATIC and DYNAMIC pressure). By setting some SETUP parameters, the installer can vary the ranges of the colored arcs. Please refer to "*IAS COLORED ARC DESCRIPTION*" section in order to find more details on how to set these parameters.



## MULTI FUNCTION DISPLAY

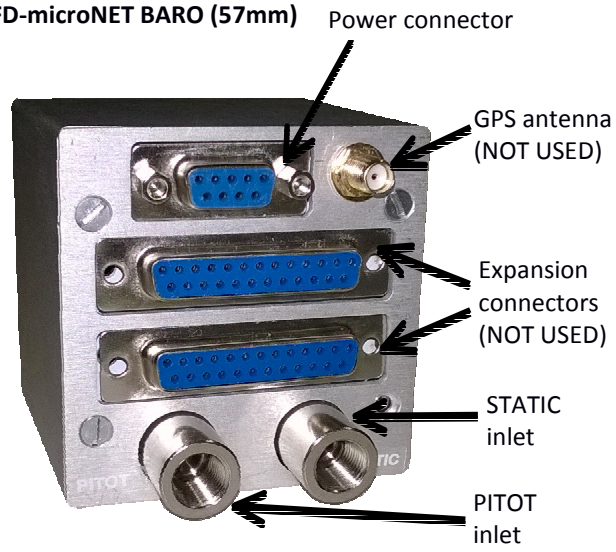
The MFD screen groups all barometric and pneumatic data in a clear and immediate screen.

There is an additional parameter labeled "FAI" (Frontal Acceleration Indicator) which displays the acceleration along the longitudinal aircraft axis. It is calculated as the derivative of the indicated airspeed and expressed in "G".



## REAR CONNECTORS VIEW AND DESCRIPTION

**IFD-microNET BARO (57mm)**




The power connector is the only electrical connection needed. The details about this connector are explained in the next section "POWERING AND EXPANSION BUS". The expansion connectors are not used in IFD-NET BARO models. Pneumatic inlets, STATIC and PITOT pressures, are provided by two nickel-plated brass 1/8 NPT female plugs. **Use adequate adapters with rubber O-rings and do not tighten hoses with too much force to avoid damage to internal parts of the unit.** GPS connector is not used in BARO units.

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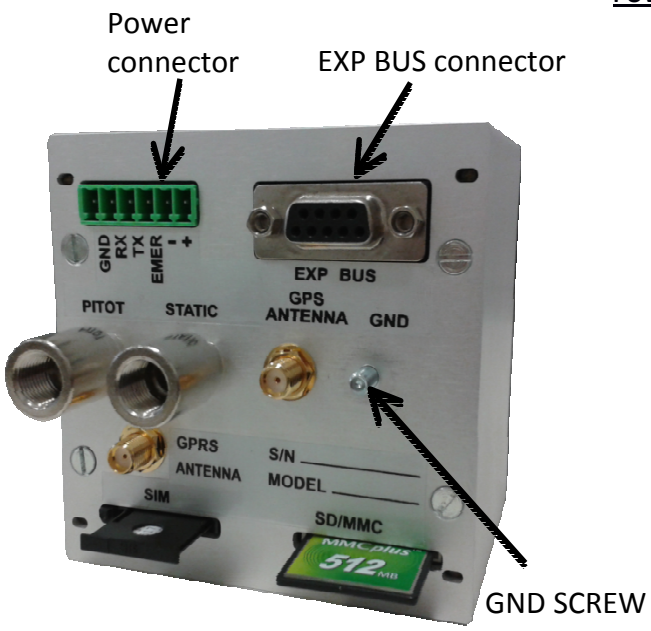
**IFD-NET BARO (80mm)**




**POWER CONNECTOR**:

- "+" -> Accepts 10 to 30 Vdc, 250mA. Use 5A Fuse.
- "–" -> 0V, connects to GND
- EMER -> NOT USED in BARO units
- TX - NOT USED
- RX - NOT USED
- GND -> Ground

**EXP BUS CONNECTOR (NOT USED IN BARO UNITS)**:

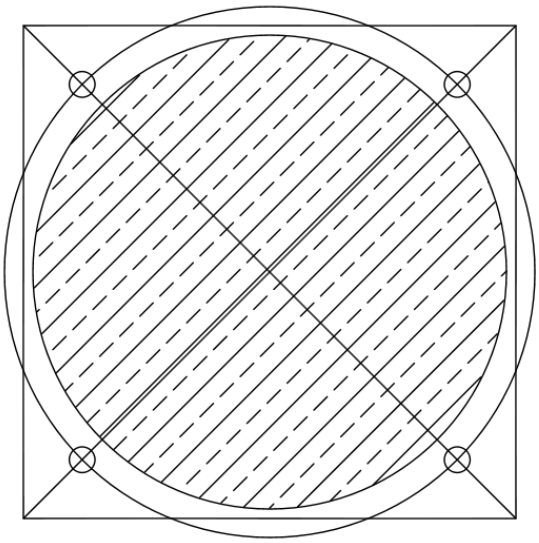
- 12/24 Vdc out (max 500mA)
- RS232 TX out to external Autopilot (NMEA)
- RS232 RX in from external Autopilot
- RS485 A+ signal for FLY BUS®
- GND
- +5 Vdc out (max 250mA)
- +5 Vdc out (max 250mA)
- GND
- RS485 B- signal for FLY BUS®

Note that in the BARO units only PITOT and STATIC inlet, other than POWER CONNECTOR, have to be connected in order to achieve the full functionality of the instrument.

## INSTALLATION GUIDE

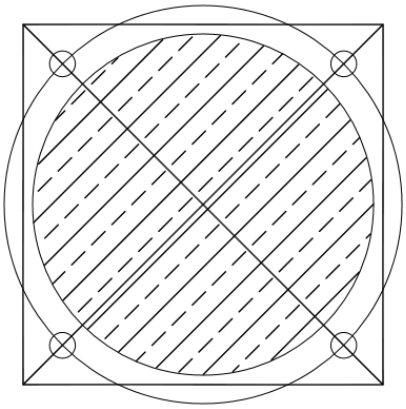
The IFD-microNET BARO has a standard 57mm aeronautical shape, while the IFD-NET BARO is designed for an 80mm hole.

This means the installer should observe the standard way in order to obtain a correct installation on the unit. Refer to the hole templates below in case your aircraft doesn't have 57/80mm holes already prepared.



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.



2 1/4 (57mm) Instrument Hole

1. Draw a 2.375" X 2.375" Square
2. Scribe 2 diagonal line corner to corner
3. Using the center of the lines, scribe a 2.625" diameter circle.
4. At the intersection of the diagonals and the 2.625 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 2.250" dia.

To install the IFD-microNET (57mm) unit on you cockpit use the four black screws provided in the purchase box, otherwise select different screws with same dimension of 3MA x 10mm MAX.

No modifications to standard 2 ¼ inches (57mm) holes are required to obtain a perfect unit installation.

The IFD-NET (80mm) 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 additional vibration that could affect the sensors.

Remove the aluminum knob by turning its little screw. This is because the encoder shaft needs to pass through 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.

## IMPORTANT NOTES ON PITOT/STATIC CONNECTION

Ensure that during installation the PITOT and STATIC tubes don't develop any twist and/or kinks, otherwise the IAS and Baro-Altitude indications will not work correctly.

When fixing the PITOT/STATIC pipes 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 using pipe hose adapters with rubber o-ring in order to avoid pressure leaks, and in any case don't lock them 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.

## POWERING AND EXPANSION BUS

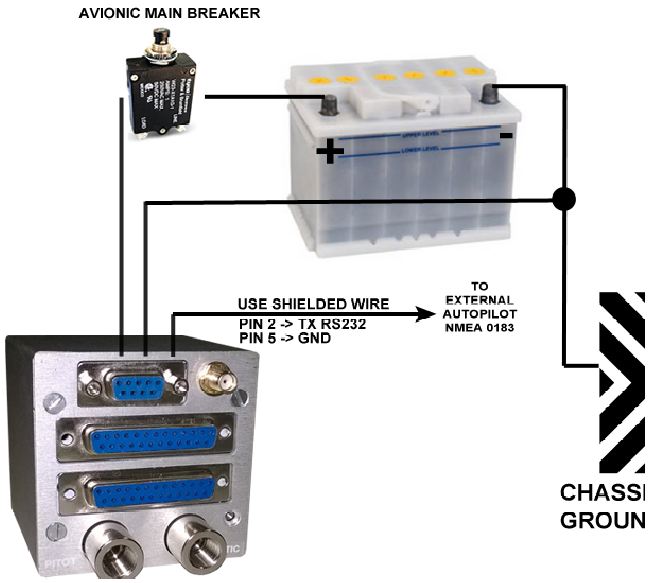
The electrical connection of the IFD BARO models is very simple. As all of the sensors are inside the metal housing, the only electrical connection it needs is the main power line (10 to 28Vdc using an aeronautical safety breaker) and an optional connection to the expansion BUS. Please contact vendor in order to find out more details on the expansion accessories designed for this unit.

On the right is a simple wiring diagram for electrical connection of the IFD-microNET.

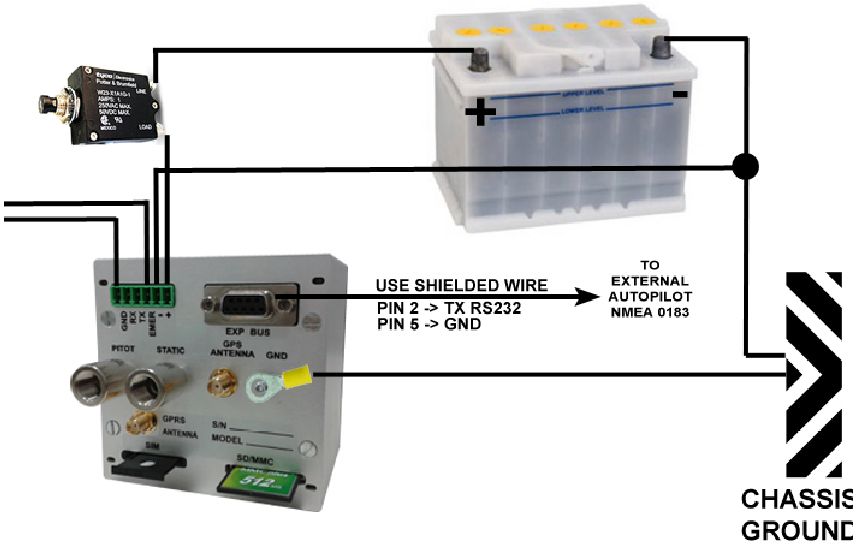
See below for the IFD-NET wiring diagram.

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

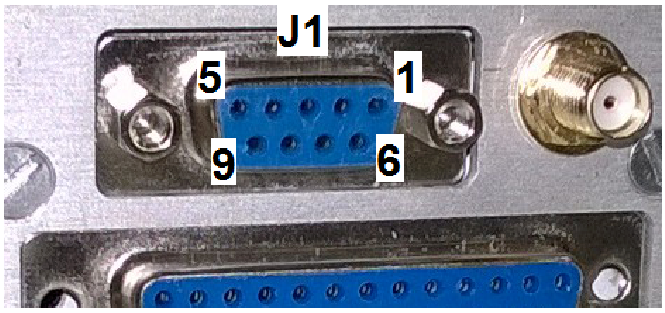
**IFD-microNET wiring**




**IFD-NET wiring**



**IFD-microNET J1 connector pins**



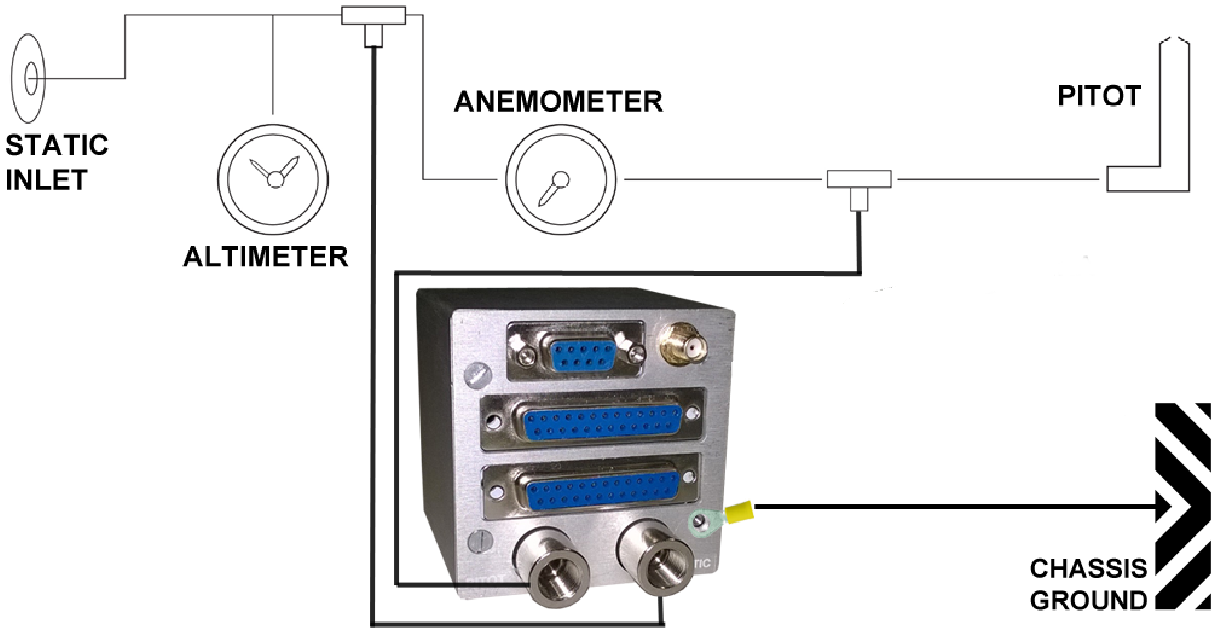

1. Main power supply (accepts voltages 10 - 28Vdc).
2. (TX output) pole of RS232 BUS.
3. (RX input) pole of RS232 BUS.
4. (A) pole of RS485 BUS.
5. Ground. Connect to Ground chassis of aircraft or to negative pole of electric circuit.
6. Main power supply (accepts tension between 10 to 28Vdc).
7. Not connected. Leave unplugged.
8. Ground. Connect to Ground chassis of aircraft or to negative pole of electric circuit.
9. (B) pole of RS485 BUS.

Pins 1 and 6 must be connected both to the positive pole of aircraft electric circuit. Pins 5 and 8 must be connected both to negative pole of aircraft electric circuit.

A good idea would be to connect one of four screws on the rear of the instrument directly to the metal ground chassis of the aircraft by a dedicated “faston terminal” and by a black cable with 2.5 square millimeters section. This practice may decrease radio frequency noises generated by the device and improve the filtering efficiency of internal electronic components (see “Pneumatic, GPS and Ground chassis connections” figure below).

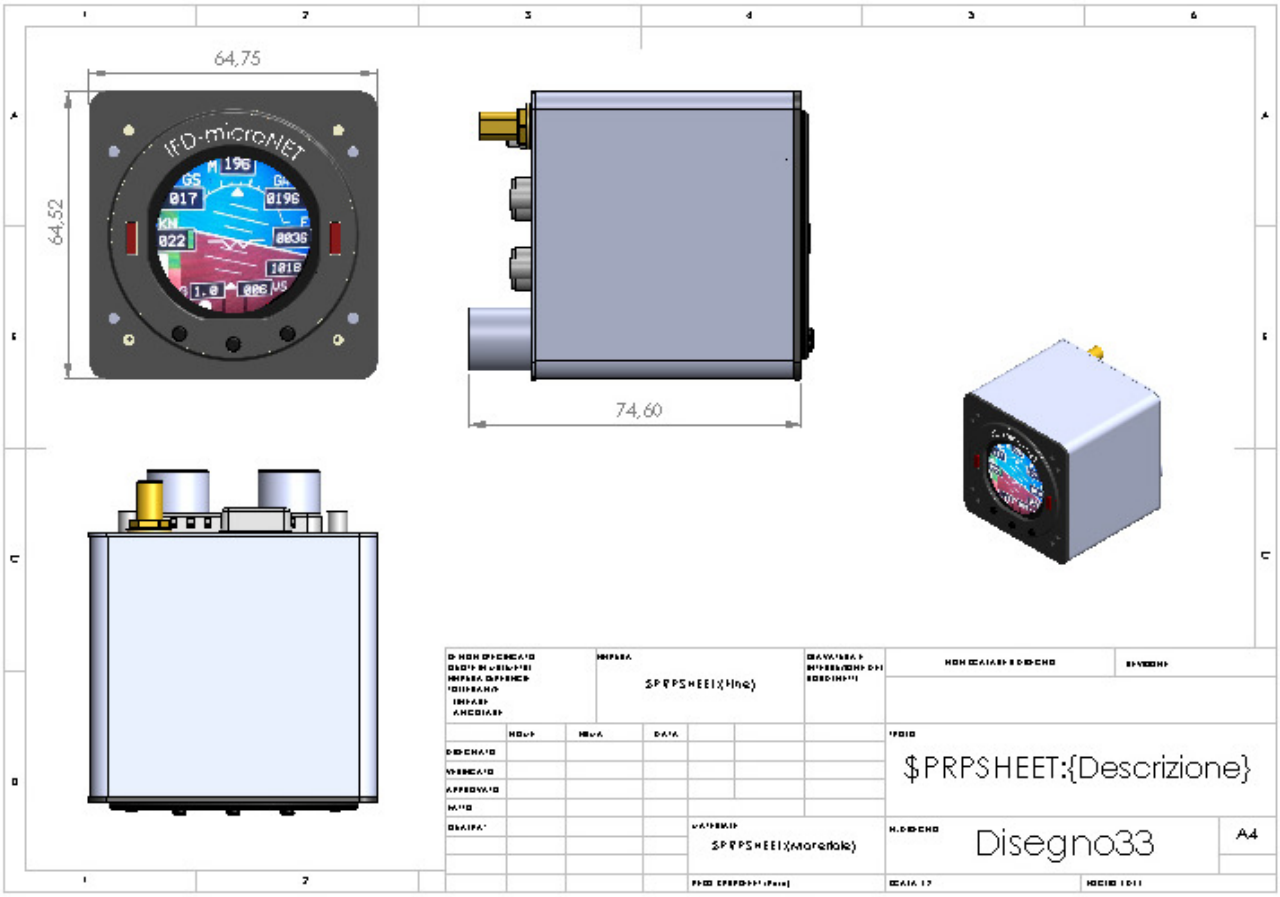
## PNEUMATIC (PITOT/STATIC) CONNECTION

The pneumatic circuit functionality is very important in order to obtain correct avionic data. Please observe normal safety rules by connecting rubber pipes to the STATIC and PITOT inlet. Contact vendor for any questions regarding the right way to setup the aircraft plant. See below a diagram of pneumatic and GPS antenna connections.

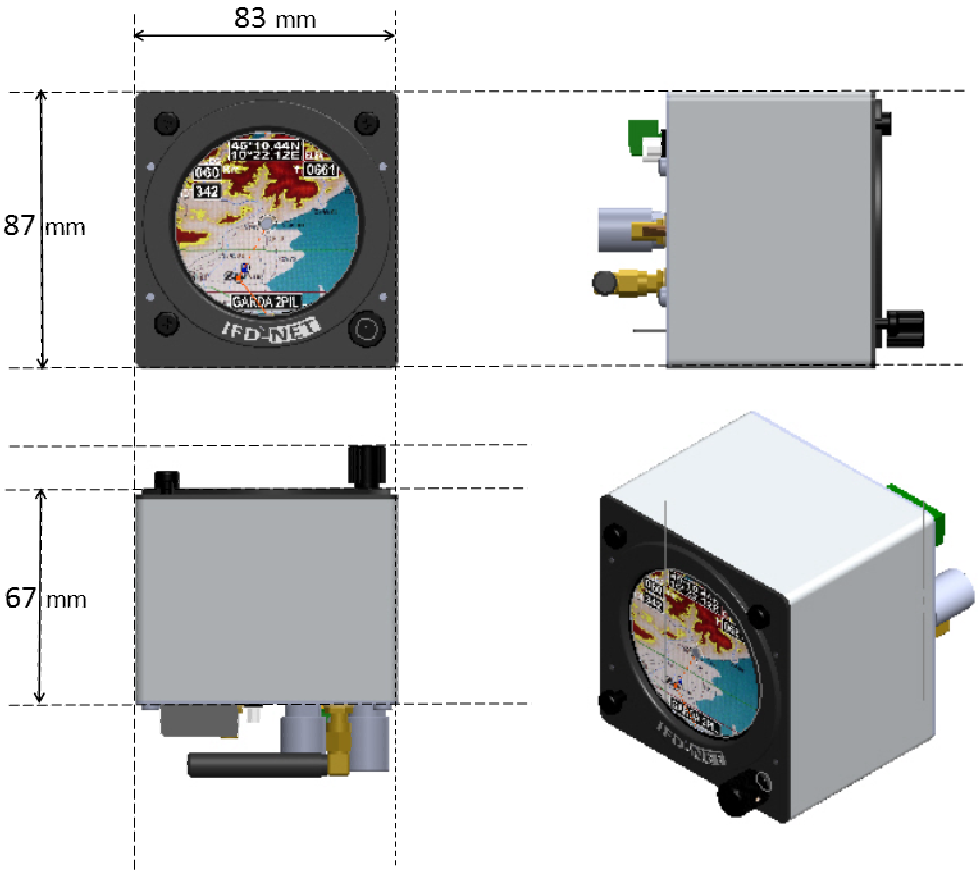



Pneumatic and ground chassis connections

## MECHANICAL DIMENSIONS (IFD-microNET BARO - 57mm)



## MECHANICAL DIMENSIONS (IFD-NET BARO - 80MM)



## ORDERING INFORMATION

Below you'll find the ordering codes for different versions of the BAROinstruments and its optional tools/spare:

- IFD-microNET BARO (57mm)
- IFD-NET BARO (80mm)
- 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. Must observe VFR policy during your flight.