

FRONTLINE AVIONICS

GLANCE EFIS – integral flight information and navigation device

Installation Manual

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This is a manual for Glance EFIS I device, version 4.6. If you use this document with a later version of the device, not all information in it may be relevant.

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Safety warning

CHECK THE COMPATIBILITY OF THE DEVICE WITH THE ONBOARD NETWORK PARAMETERS OF YOUR AIRCRAFT. START THE INSTALLATION USING THE COMPLETE SET OF TOOLS. CHECK THE SET OF TOOLS COMPLETENESS AFTER INSTALLATION. DO NOT PLACE FITTINGS AND TOOLS INSIDE OF THE AIRCRAFT COCKPIT AND ON ITS SURFACES. USE MAGNETIC TOOLS IN ORDER NOT TO LOSE THE FITTINGS. IF THE FITTINGS ARE LOST, DO NOT OPERATE THE AIRCRAFT UNTIL THEY ARE FOUND.

MAKE ALL ELECTRICAL CONNECTIONS ONLY WITH MAIN AUTOMATIC CIRCUIT BREAKER OR ACCUMULATOR UNIT DISCONNECTED.

Glance EFIS I Device is a complex radio-electronic device and its installation and connection to the aircraft onboard network should be performed only by a qualified specialist. If you are not sure that your level of technical training will allow you to properly install the device, please contact Frontline Avionics company for choosing your nearest service center or certified specialist.

Before starting Glance EFIS I device installation, please carefully read this installation manual. During installation, you may need certain documentation for your aircraft and its engine unit.

When installing the device please take into account the requirements for electromagnetic compatibility of radio electronic devices. The aircraft radio must be installed in strict accordance with the manufacturer's instructions, antenna and feeder must match. Engine unit sensor wires should not be installed in one harness with the radio feeder.

Device supply package

Glance EFIS I integral device	1pc
Power-supply cable	1pc
Active GPS antenna	1pc
MicroSD-card with database of Russian Aircraft owners and pilots association (RAOPA)	1pc
Bolt M4x40 HEX3	4pcs
Nylon nut M4	4pcs
Pilot's guide	1pc
Installation manual	1pc
CD (or memory stick) with SW and documentation	1pc

Change summary

Version	Date	Change summary
1.0	August, 2014	Initial release
2.1	December, 2014	Connector and wiring connection diagram changes
3.0	January, 2016	Two fuel sensors and connection changed

Abbreviations and notes

AHRS —	Attitude and heading reference system; system which determines the aircraft position in space
CHT —	Cylinder head temperature
EFIS —	Electronic flight instrument system
GPS —	Global positioning system
OILT —	Oil temperature
OILP —	Oil pressure
PTT —	push-to-talk; radio signal transfer button

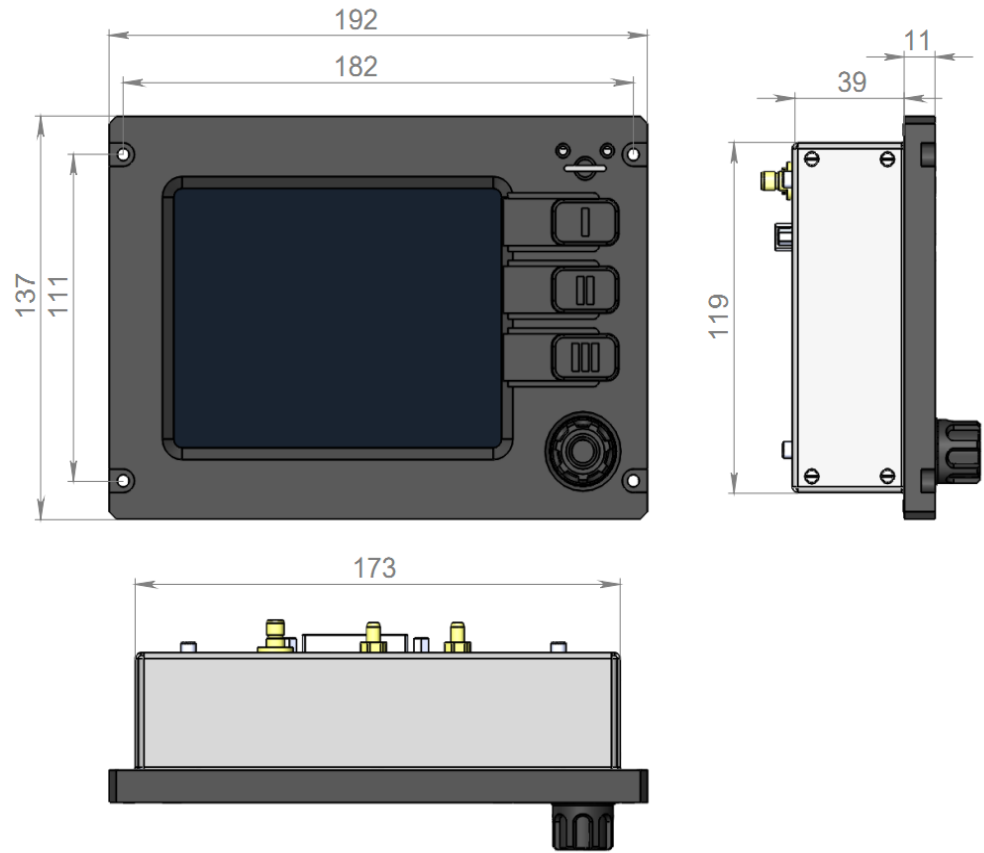
Installation and connection

Before installing the device in an aircraft instrument panel, it is necessary to think carefully about its layout, taking into account the instrumentation requirements for the aircraft class in use. According to the airworthiness standards of the Russian Federation carrying out a flight observing the VFR requires the following certified instruments: barometric pressure altimeter, airspeed indicator, aircraft watches, magnetic compass. These instruments are the minimum and mandatory instrumentation complex. This should be taken into consideration when building the aircraft instrument panel. Please contact Frontline Avionics support team to get a ready-made instrument panel layout of the aircraft. If there is a ready-made layout of necessary design it will be provided for free.

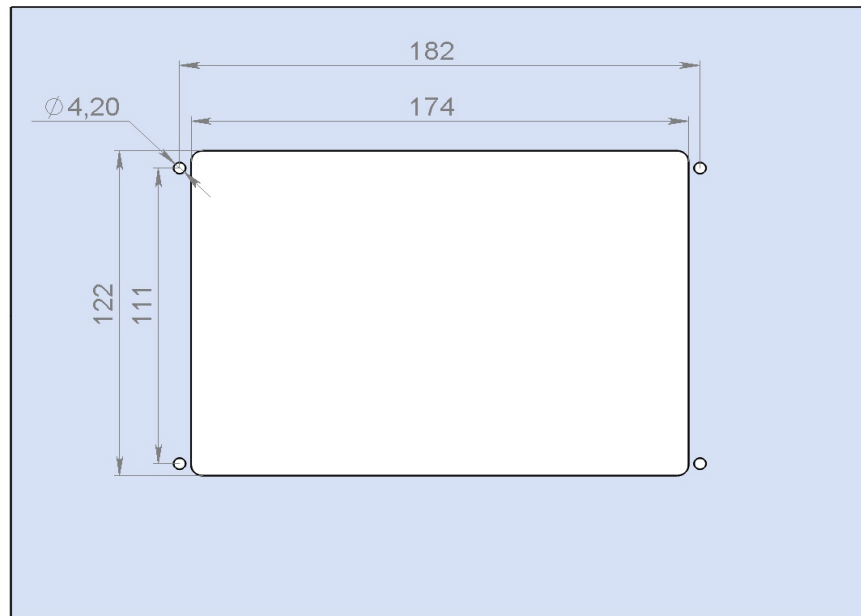
The installation drawing can be downloaded from the Frontline Avionics company website (<http://flavionics.de>). This may help you when making mounting holes in the instrument panel on CNC machines such as CNC laser, water jet cutting, milling.

When choosing a place for the device installation, please consider that it should be easy to access the device controls, easy to read instrument data and that the device is protected from sunlight – that will improve readability of the indicators.

INSTALLATION AND CONNECTION



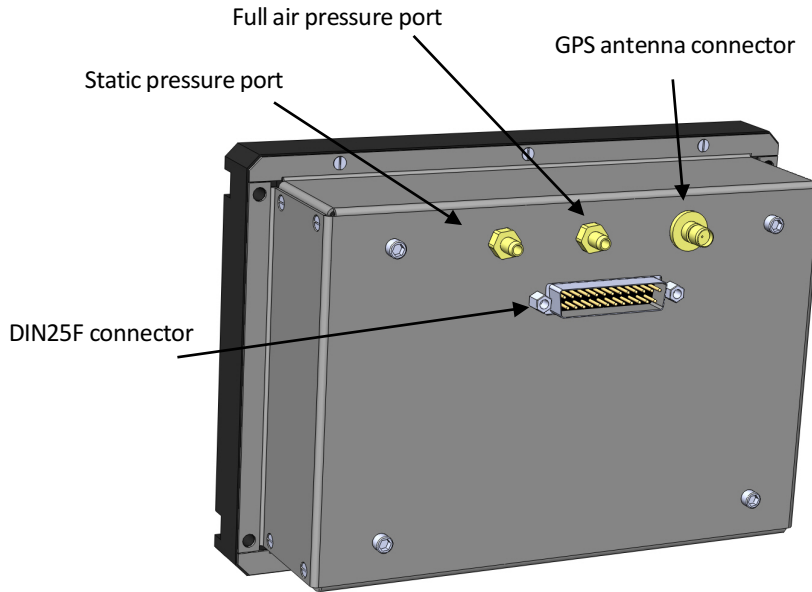
Picture 1. Outline drawing



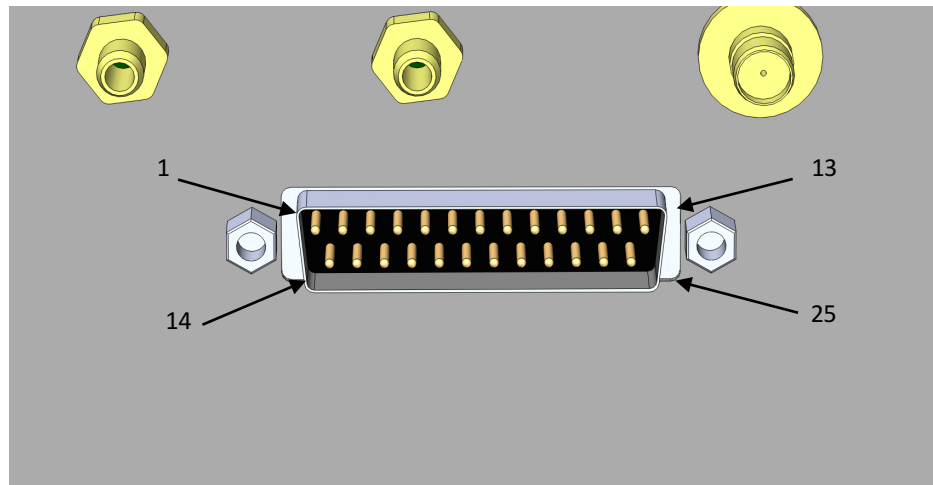
Picture 2. Installation drawing

INSTALLATION AND CONNECTION

The device is bolted by M4x40 hexagon socket head bolts and nylon nuts, supplied with the device. The tightening torque should be no more than 5 Nm.



Picture 3. Position of connectors on the back panel of the device



Connection to aircraft electrics

The connection of the device is recommended in the following sequence:

- 1) Power-supply and CANaerospace bus cable
- 2) Aircraft cockpit signals cable
- 3) Engine sensors cable

This cable is available in 2 variants. The first variant is the cable with free ends and a connector for connecting to a CANaerospace bus hub. In the second variant, the connection of the cable is accomplished by attaching one connector to the device, and the other connector to the hub. In this case power and bus signals pass through the hub.

In case when installation is performed without using a hub, the wiring should be performed in the following order:

- 1) Ground (the 1st connector pin). GND marker. The device ground must be connected to the main assembly of the aircraft ground behind the instrument panel or directly to the negative terminal of the aircraft battery. Also, please make sure that the connection point of the device ground is connected to the aircraft engine ground by a cable of sufficient size (at least 10 sq. mm) and has a good contact with the resistance less than 0.1 ohm. This is important to obtain the correct sensor readings of the engine.
- 2) Positive power wire of the device (the 25th connector pin). +PWR marker. Connect this wire to the main power supply circuit of the aircraft, protected by an automatic circuit breaker or by a fuse. Power on this wire should be supplied by a separate toggle switch labeled with a tag "EFIS". Current consumption on this chain is up to 0.5 A (when turning on the peak current is up to 3 A). The maximum voltage on this wire - 35 V. A resettable fuse is installed on this circuit inside the device itself, which does not require any replacement or service.
- 2) CANaerospace bus. The bus has two signal wires: CAN HI (CANas HI marker, the 8th connector pin) and CAN LO (CANas LO marker, the 9th connector pin). These wires laid in a twisted pair cable are connected to the respective wires of other units and blocks of the Glance avionics

complex. If the CANaerospace bus is not used, the wires must be carefully insulated to avoid the possibility of its ground fault on the aircraft and on the other wires.

To work properly, the bus needs terminators enabled at its outer units. Glance EFIS I device has a built-in bus terminator, the second terminator should be enabled in the unit most distant from the device. The rest of the terminators in the units should be turned off. Usually the typical configuration and arrangement of units is already provided in the sets supplied by the manufacturer. By default terminators are turned on in the Glance EFIS device and also in the Glance AHRS unit. In all other units terminators are off. In case of non-standard hardware configuration make sure the terminators are on. Malfunction of the bus may occur if one or more than two terminators are used.

Constant power from the battery (+BCKP marker, the 24th connector pin). Must be connected to the wire permanently connected to the aircraft accumulator battery. The wire supplies power to the device clock and the memory unit of GPS / GLONASS receiver. With no power on this wire the internal backup lithium battery of the device is able to support these functions for approximately 1 year.

Relay contacts are reserved for further use with new functions (the 12th connector pin - common (COM), PTT COM marker, the normally open (NO) 13th connector pin, PTT NO marker and the normally closed (NC) 11th connector pin, PTT NC marker).

Signal input 2 of the fuel level (the 14th connector pin, FUEL2 marker). Must be connected to the fuel level sensor of the aircraft. Compatible to resistive float fuel level sensors and capacitive fuel sensors with a range of output voltages of 0-5 volts DC. If resistive fuel level sensor is used, the signal is received from a moving contact. In this case the contact of the lower level should be connected to the ground. After connecting calibrate the fuel level sensor readings in the setup wizard of the fuel level sensor of the CANaerospace settings menu of Glance EFIS I (see Pilot's Guide).

ATTENTION! Recommended resistance of the fuel level sensor should be not less than 100 ohm. Fuel level sensors with 0-5 v of output voltage require 2:3 divider for external EMS connection to display fuel level correctly.

Warning system audio output (the 15th connection pin, AUDIO marker). Must be connected to the intercom auxiliary input or to the microphone input of a headset through an interfacing module GL-AUD1. The connection example is shown on the wiring connection diagram.

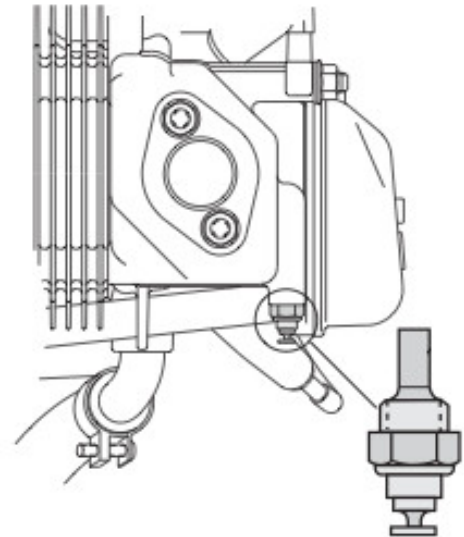
Signal input 1 of the fuel level (the 2nd connector pin, FUEL marker). Must be connected to the fuel level sensor of the aircraft. Compatible to resistive float fuel level sensors and capacitive fuel sensors with a range of output voltages of 0-5 volts DC. If resistive fuel level sensor is used, the signal is received from a moving contact. In this case the contact of the lower level should be connected to the ground. After connecting calibrate the fuel level sensor readings in the setup wizard of the fuel level sensor of the CANaerospace settings menu of Glance EFIS I (see Pilot's Guide).

CHT signal input from the cylinder heads temperature sensor or the coolant temperature sensor of Rotax™ 91x/582 engines (the 3rd connector pin, CHT marker). On engines 91x-series the wire must be connected to the pre-installed cylinder head temperature sensor with a higher operating temperature (usually – a sensor farthest from the frontend of the aircraft).

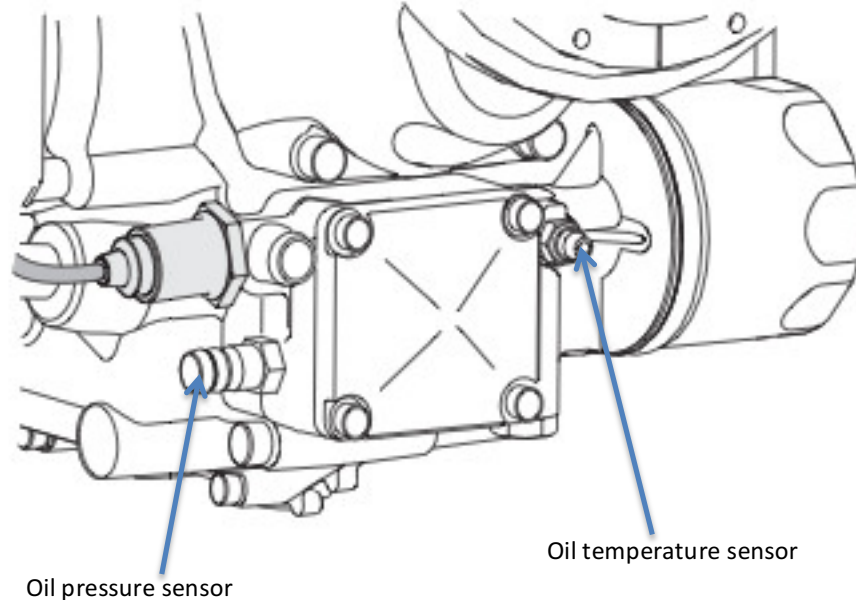
OILT input signal from the oil temperature sensor of Rotax™ 91x-series engines (the 4th connector pin, OILT marker). On engines of the 91x-series the wire must be connected to the pre-installed oil temperature sensor.

OILP input signal from the oil pressure sensor of Rotax™ 91x-series engines (the 5th connector pin, OILP marker). On 91x-series engines the wire must be connected to the default oil pressure sensor. The device supports electronic pressure sensors of two types only: new (part number 456180) and old (part number 456413). In case a **new type sensor** is used, the input is connected to the contact C of the oil pressure sensor (the white wire of the sensor default cable). Contact B of the sensor (the red wire of the sensor cable) is connected to the aircraft power supply with voltage of 8 V to 28 V via a separate fuse or an automatic circuit breaker, rated at no more than 5A.

The old type sensor does not have a connector. The sensor cable goes directly out of the case and has 3 wires: a black wire – not used, red – sensor supply, white – signal. The old type sensor is connected the same way as the new type sensor.



Picture 4. Position of the cylinder head temperature sensor.



Picture 5. Position of oil temperature and oil pressure sensors

ENGINE RPM input – a signal input of engine speed sensor (tacho signal) (the 6th connector pin, TACHO marker). ENGINE RPM input must be connected to the engine tacho signal output directly or through a matching unit. To connect to Rotax™ 91x / 582 engines this wire must be connected to one wire of the engine speed sensor. The other wire of the engine speed sensor must be connected to the ground. Set the correct number of tacho pulses per one engine revolution so that the engine speed indicator operates correctly with the given aircraft engine. For Rotax™ 91x engines this value is equal to 1, for Rotax™ 582.99 engines - 6. For other engines probably you need a tacho-signal optoisolation unit which you can order through Frontline Avionics resellers.

ROTOR RPM input – a signal input of a helicopter/gyrocopter rotor speed sensor (the 7th connector pin, R/TACHO marker). The input is designed for connection to a tacho circuit with voltage amplitude of 5-20 V and also for direct connection to digital Hall sensors with an "open collector" output or a "push-pooling" output. When using an inductive speed sensor, a FL-MRI matching module is required.

GPS antenna

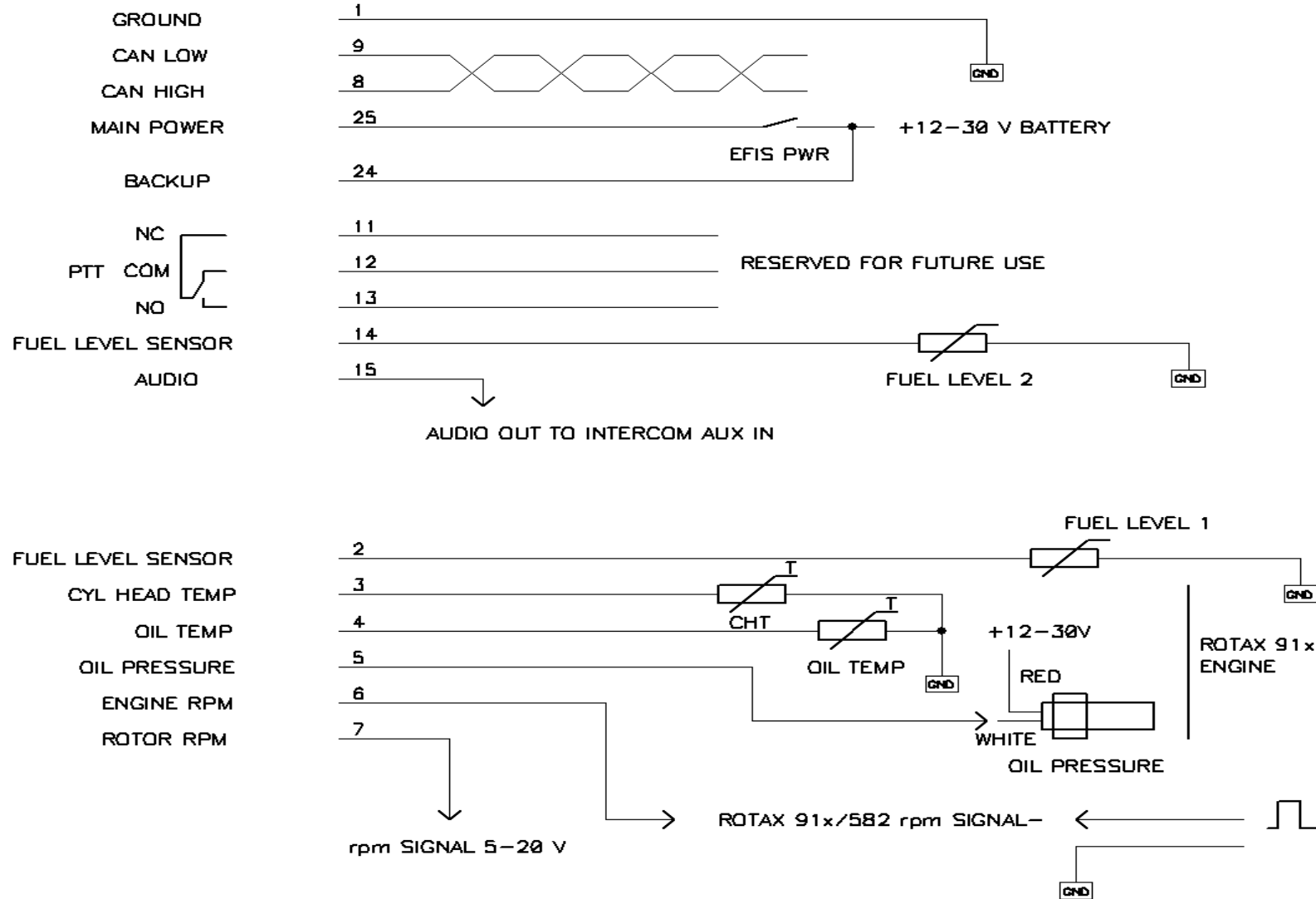
An active GPS / GLONASS antenna is supplied with the device. It should be installed in a place where it will not be covered from satellite signals by the aircraft metal structural elements. It is possible to attach the antenna with a magnetic mount or with a Velcro™ tape coming with the antenna.

You can connect other active GPS antennas with a power supply voltage of 3-5 V. The antenna connector type is SMB.

Connection to the aircraft air data system

For the airspeed indicator operation, the device full air pressure port (FULL AP) should be connected to the full air pressure line (pitot) of the air data system. The air pressure line (pitot) must be connected to the port (S). If an aircraft pitot tube is connected directly to the existing airspeed indicator, a tee for airflow division must be installed. A silicone tube for connection to the port comes with the device. In aircrafts with unpressurized cabin and no pitot the port must be kept free (do not cover the port!)

Wiring connection diagram



Picture 6. Wiring connection diagram

Specification

Power supply voltage:	9 — 35 V
Input current, less than:	0.5 A
Temperature range:	from -20 to +80 °C
IP:	IP54
Weight:	0.85 kg

Measuring range

Air speed:	30 — 500 km/h
Ground speed:	10 — 999 km/h
Vertical speed:	Up to ± 100 m/s
Altitude:	-500 — 10000 m
Engine temperature:	0 — 250 °C
Oil pressure:	Up to 10 bar
Engine rpm :	Up to 10000/min