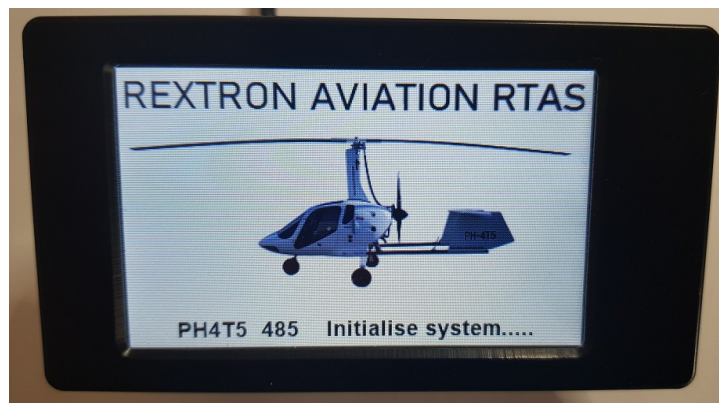




# RTIS101

## ADSB RECEIVER WITH TOUCH TERMINAL



### **INSTALLATION-/USER MANUAL** Rextron Traffic Information System

## REVISION LIST

Revision	Date	Description
0100	30 nov 2022	First release
0101	05 july 2023	Add pre-flight checklist. Market release

## SERVICE BULLETINS

Service bulletins have to be printed, added to this manual and the information written in the list:

Number	Revision	Date provided	Date added to this manual	Name

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## **1. Introduction:**

The RTIS ADSB receiver is a complete system that receives ADSB transponder/squitter data from airplanes over a distance of up to 50Nm and presents the data on a Small TFT touch terminal in both text mode or graphical mode, thus providing information about the distance (horizontal/vertical) between airplanes and therefore help to avoid collisions in the air.

For each airplane that is within the selected horizontal and vertical distance, the horizontal distance, the vertical distance and the callsign and/or ICAO number are shown. In TEXT mode also the heading and speed of the other airplanes are shown. (In graphical mode speed, heading and altitude can be seen by pressing the desired airplane icon).

The system comes complete with GPS and ADSB antennas that can easily be mounted in any airplane.

The TFT touch terminal contains 4 mounting nuts on the backside. It can be mounted directly on a dashboard using double sided tape, polymer or the mounting bracket available for it.

The system parameters can be configured via a setup menu on the TFT touch terminal.

The RTIS ADSB system is very low priced in order to make it available to many pilots and improve safety.

## **Disclaimer:**

This device can only be used as an AID to VFR navigation!

All information is presented for additional reference only! By no means does this device replace any action or any information the VFR pilot needs to take before and during the VFR flight in order to conduct a (safe) VFR flight!

By using this device, the user accepts total risk and responsibilities associated with the use of this device!

## 2. Specifications:

### 2.1 The set contains:

- RTIS main unit (90 \* 60 \* 30 mm).
- LCD touch terminal 480 \* 320 with cable and M8 4-pin connector.
- 1090MHz antenna with SMA connector.
- GPS receiver with M8 5-pin connector.
- Power cable.
- Mounting bracket.

### 2.2 Technical specifications:

#### 2.21 ADSB:

- Tracking of airplanes up to 99Nm distance and up to 20000 feet vertical distance (configurable).
- ADSB modes A/C/S and squitter.
- RF sensibility -80dBm.

#### 2.22 GPS:

- Channels: 167
- Accuracy: 2.5m CEP
- Velocity: 0.1m/sec
- Sensitivity: -165 dBm
- Limits: height < 18.000m / speed < 515m/sec

#### 2.23 LCD:

- Resolution: 480 \* 320
- Touch panel: RTP
- Colors: 65535
- Type: TFT

### 2.3 General:

- Power supply: 7.5 to 28V.
- Power consumption: 94mA/12V, 55mA/24V.
- Operating temp range: -25 to +70gr.
- Moisture: 0..95%, non condensing.

### 3 Installation:

#### 3.1 Hardware:

The main unit of the RTIS101 system should be mounted in a protected area, like inside the console, a tunnel etc. Be sure it is not in the way of any moving part for safe operation!

The main unit can be mounted using a good quality double sided tape, polymer or self tapping bolts.

Try to mount the main unit in a place that does not have direct sunlight as sunlight can increase the temperature significantly.

Further is it a good idea to mount additional electronics as far as possible from RF equipment like VHF radios and surely transponders.

The GPS receiver can best be mount in the nose of the airplane, on top of the dashboard or under the top of the body, on any surface that “looks directly up to the sky”.

Use good double sided tape or polymer (preferably) to mount the antenna.

No metal part can be mounted above the antenna.

Also avoid to mount the GPS antenna near the antenna of devices like the VHF radio and the transponder.

The ADSB antenna is a small 1090MHz dipole. Mount it vertically on any ABS part of the airplane's body. (not on metal). For this purpose, the antenna is already equipped with a piece of double sided tape.

Also avoid to place the ADSB antenna near other antennas of HF devices.

The TFT touch terminal has a M8 connector. Insert it into the main unit and rotate the ring until it stops so the connector is locked. Do not use a tool to rotate/fix the ring!



The RTIS ADSB system installed in a Trendak Tercel Gyro.

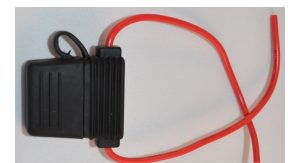
#### 3.2 Electrical:

There are only 2 wires to be connected to the main power of the airplane, the red and black wires of the main unit.

Connect the black wire to a ground terminal of the airplane.

Connect the red wire to the switched +12V (or +24V) of the airplane's main power.

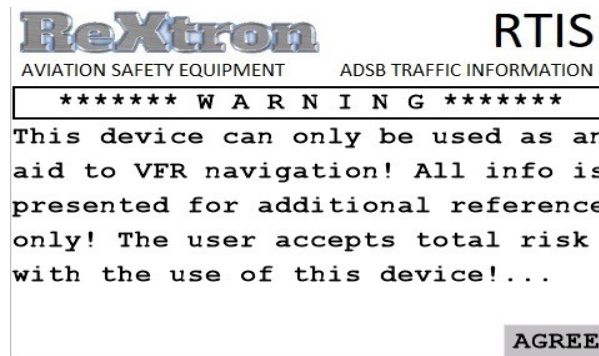
Be sure to have a fuse in the +12/+24V line and the RTIS system. A fuse of 0.5A slow would be enough, but car-type fuses usually do not have values lower then 2A.



Switched power means connect the +12V or +24V after the airplane's ignition switch or use a separate on/off switch for this ADSB receiver. As the current consumption of the RTIS is very low, the power can be supplied directly after the main power switch. This way, the GPS can start to search for satellites already and it will be online before engine warm-up is finished.

## 4 Operation:

As soon as the power is supplied to the system (airplane main switch on), the internal ADSB receiver and the internal GPS modules are switched on. At the same time the TFT touch terminal will light and it will show a disclaimer message:



The AGREE buttons needs to be touched to confirm that the user has read and accepted the disclaimer.

NOTE: any extra device in an airplane distracts from the main task witch is: flying.  
Be sure to only look at the RTIS TFT terminal during “scanning” time!

After touching the AGREE button, the the start-up screen is shown:



The picture in this screen can be adjusted with any JPG picture (in the correct resolution).

This picture will be loaded at order time and can be provided by the user or airplane manufacturer.

Following this, the callsign, ICAO code and firmware version are shown on the bottom line of the TFT screen.

Finally, the main screen appears in which 2 options are available:  
CHECKLIST & ADSB

When choosing for: checklist, the system will show all checklist entries that are stored in the RTIS system.  
(Storage of the checklist and/or updates via the UPDATE button, but a small interface converter is needed between the RTIS main unit and a PC).



Press on the NEXT button to see the next checklist entry and on the PREV button to see the previous one.  
Pressing the RETURN button will bring you back to the main screen.

Following the main screen will appear. Here the graphical main screen is shown, but in the configuration menu, a text screen can be chosen instead of this graphical version.



- PH4T5 The call-sign of the airplane in which this system is installed (will be set before delivery).
- GS The GPS is valid. GA means GPS not yet valid, G! Means GPS hardware issue.
- TR will be shown if the airplane has a transponder that supports squitter (has a GPS connected). Then the pressure altitude from the transponder is used.
- 1140Ft Our GPS MSL height.
- 68Kt Our GPS speed in knots. (Speed Over Ground).
- 1070Ft Height given by our transponder (or RTIS internal pressure sensor value).
- 250FM Our VSI, here descending at 250 feet per minute.
- 225 Our GPS Coarse Over Ground is 225 degrees. (Shown above the airplane icon).
- 10000 The maximum altitude to be monitored, here 10000Ft (FL100).
- 10Nm The maximum horizontal distance to us we look at. Here 10Nm.
- On the bottom of the screen, the date and time are shown (UTC) synchronized to the GPS.
- MODE Button to be touched to switch between graphical and text mode.
- CONF Button to be touched to open the configuration screen.

In the above example screen, 4 airplanes are shown that are within the horizontal and vertical distance that is configured in the configuration screen. The direction the other airplanes are flying is easy to see. A small arrow indicates if the other airplane is climbing or descending. The airplane icon changes to a blue icon if it gets to near to us. Up to 12 airplanes can be shown simultaneously. There are 2 “circles” around our own position (icon in the center). The outer circle is the distance set in the configuration screen, fe 20Nm. The inner circle is 50% of this value set, so 10Nm.

Under the head: “NO DISTANCE” airplanes are shown that do not have Squitter (so no GPS connected to their transponder) so the horizontal distance to us can not be calculated. In this example, 485E33 is the ICAO code of the airplane. If the airplane's transponder sends its callsign, then the callsign will be shown instead of the ICAO code. 350 is the COG (Coarse Over Ground) of the airplane. 4100Ft is the pressure altitude of the airplane. If the altitude is not send, then ----- will be shown and if the airplane is on the ground, then: -GND- will be shown. -100 is the VSI of the airplane, in this example it is descending at 100 feet/minute.

By touching an airplane icon on the TFT screen, some details are shown for 5 seconds. Example on the right bottom of the TFT screen:  
RZR89UM Callsign of the airplane. Here a Ryan Air.  
103Kt The speed of that airplane.  
5 The distance of the airplane to us.  
214 The COG of the airplane.  
2239Ft The pressure altitude of the airplane.



## 4 Configuration:

By touching the CONF button on the screen, the settings menu will be opened:

*** CONFIGURATION MENU ***			RETURN	
Max hor dist	[10] Nm		UP	DOWN
Max vert altitude	[10000] Ft		UP	DOWN
Max vert spacing	[1000] Ft		UP	DOWN
Hor dist unit	[Nm]		KM	NM
Vert dist unit	[Ft]		METE	FEET
Hor speed unit	[Knots]		KM/H	KNOT
Vert speed unit	[F/M]		M/S	F/M
ADSB valid	[8] sec		UP	DOWN
Icon	[Heli]	GYRO	HELI	FIXW

By touching the buttons, values can be increased or decreased and unit types can be altered.

Max hor dist	The maximum horizontal distance. 1,2,3,45,10,20 or 50 nautical miles or kilometers can be set.
Max vert altitude	The maximum vertical distance. 1000,2500,5000,10000 or 20000 feet or meters can be set.
Max vert spacing	The minimum distance an other airplane must be away from us. If the distance is smaller, the other airplane will be shown on the TFT screen.
Hor dist unit	Set the horizontal distance unit to Nautical Miles or Kilometers.
Vert dist unit	Set the vertical distance unit to Feet or Meter.
Speed unit	Set the speed unit to kilometer per hour or knots.
ADSB valid time	Set the data valid timeout to 2..30 seconds. When no ADSB update received anymore, then after this time, the icon on the screen (or text row) will be cleared.
Text/Graphic	Set the main screen to text of graphic mode.
Icon	Set the icon in the middle of the screen to Gyro, Heli or Fixed wing.
RETURN	Touch this button to return to info mode. When not altering any parameter for 20 seconds, the screen will automatically return to the info screen.