Technical Data GPS Transmitter Module
- Mini USB jack for connecting to supplied USB power supply
- 5 VDC / 80 mA max. current consumption (during transmission)
- Integrated GPS receiver chipset: Mediatek MM329 Single Chip
- Channels: 66 channel all-in-view tracking
- Time acquisition: Cold Start: 42 sec., average
- Status LEDs: Yellow (GPS status) and red (transmission dat a)
- Transmitter: 433.92 MHz frequency range, 10 dBm output power , ASK modulation
- Antenna: omnidirectional built in
- Transmission range: up to 100 m in ideal conditions
- Dimensions: diameter 68 mm, height: 23 mm, weight: 60 grams.
- Operating temperature: -10°C to +45°C (non-condensing)
- For indoor use only
- USB power supply included

Technical Data ASK Receiver Module
- Receiver 433.92 MHz frequency range, -108 dBm input sensitivity , ASK modulation, superheterodyne receiver architecture with SNY400R chip and phase locked loop
- Antenna: omnidirectional build in or 3,5 mm pigt ail antenna
- Dimensions: width 43 mm, height: 12 mm, weight: 2.5 grams.
- Operating temperature: -10°C to +45°C (non-condensing)
- For indoor use only

Delivery content included in the „Wireless Set 1" version
1 x GPS Transmitter Module • 1 x ASK external Receiver Module
1 x USB power supply with Mini USB connection cable for the Transmitter• 1 x 1/8" TRS connection cable

Delivery content included in the „Wireless Set 3" version
1 x GPS Transmitter Module • 1 x ASK internal Receiver Module
1 x USB power supply with Mini USB connection cable for the Transmitter• 1 x 3.5 mm pigtail antenna

Delivery content included in the „only" internal ASK Receiver version
1 x ASK Receiver Module for fitting inside the Nixie clock • 1 x 3.5 mm pigtail antenna

Delivery content included in the „only" external ASK Receiver version
1 x external ASK Receiver Module for connecting to PVElectronics Nixie clocks • 1 x 1/8" TRS connection cable

MR NIXIE
Feine Röhren-Bausätze, entwickelt und zusammengestellt in Nürtingen
Finest Quality tube kits, carefully engineered and assembled in Germany

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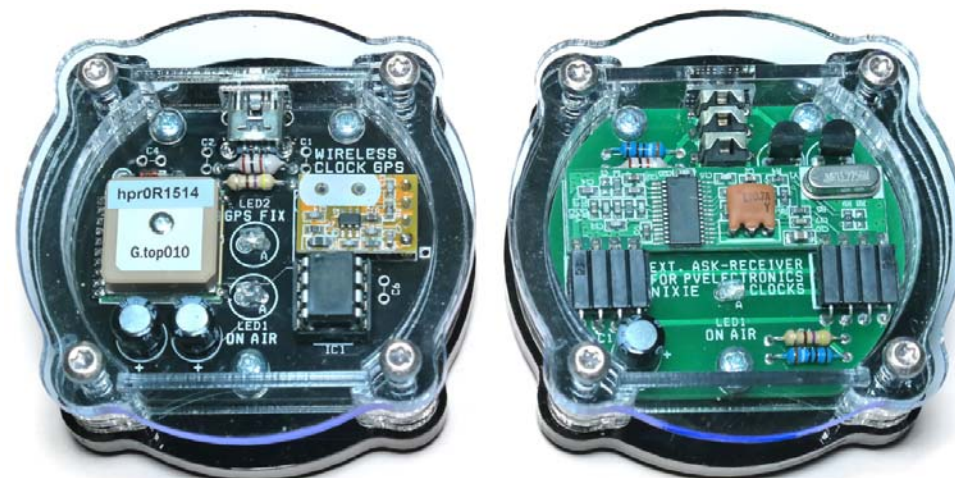E-Mail: Mr.Nixie@Nixiekits.eu • www.Nixiekits.eu

Please note: All modules are tested, ready for use and need no assembly

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Wireless GPS Modules for Nixie Clocks

Setup Instructions Owners Manual

Congratulations for purchasing this ingenious accessory for your Nixie clock to keep an exact time display . Please read the following manual carefully for correct setup instructions. Keep this manual handy for future reference.

Introduction

The „Wireless GPS Set 1+3" comprise a transmitter and receiver pair to establish a „non-wired" link for transmitting GPS data, specially the time protocol, to your Nixie clock to keep an accurate time display.

The Problem

All GPS receivers, like your car navigation system, obtain their positioning information, including time data, from several satellites. Therefore it is necessary that these modules must have a clear view to the horizon. In your car this is not a problem as the GPS receiver mouse is normally placed hidden behind the windscreen. But what happens at home, when you want to synchronizes your Nixie clock with the GPS time data? All GPS receivers, even this wireless module, must be also placed near a window to obtain their data. When using a wired receiver, like the Global Sat BR-355, you must span a connection cable from a window, on or near which the GPS receiver mouse is placed, to the clock's position. This is normally not a problem unless your clock is placed in the room far away from the window. This may be unsightly or result in a tripping hazard due to the long cable.

The Solution: Use radio waves as a "connection cable"

So why not use a wireless data connection from the GPS receiver to your Nixie clock, similar to when you're using WLAN instead of a wired ethernet connection?
Certainly, as the data from the GPS receiver will not meet at all the standards for computer networking, we cannot use the WLAN standard, especially as we need an alphanumeric display or a similar monitoring device for configuring the system.
The *Wireless GPS Set 1+3* from Mr.Nixie uses the 433 MHz transmitting band to broadcast the data from a high grade integrated GPS receiver module to the *external or internal ASK Receiver Module*, which is connected to your Nixie clock. This enables simple unidirectional transmission, similar to when you are listening to the FM radio stations. This gives a great advantage: several clocks are able to receive the data using more than one *ASK Receiver Module* at the same time from only one *GPS Transmitter Module*. So if you own more than one Nixie clock, simply connect an External ot Internal ASK Receiver Module into each clock and place the one and only *GPS Transmitter Module* on a window frame for obtaining the necessary clear view to the horizon. A transmission distance up to 50 m is possible in an optimum environment. As the 433 MHz frequency range is used by many other devices like garage door openers, outdoor weather measuring devices etc, it is not possible to broadcast the GPS data continuously because of the possibility of interference with these other devices. To avoid interference therefore, the GPS data are normally retransmitted every two minutes for only a few seconds.
During "cold start", the initial powering up of the *GPS Transmitter Module,* a nine minutes transmission time is enabled to allow setup of the Receiver module(s) with your clock(s).

Set up the Nixie clocks / Receiver Modules first

After you have connected the External or Internal ASK Receiver Modules to the clock and set up the jumpers correctly you need to set up the clock for "listening" to GPS data: Refer to the manual how to setup the GPS time synchronization (on Mr.Nixie's Nixie Clocks you must set option #12 to value 4 for example and option #13 to the values shown below in the drawings). Now the clock is waiting for a valid GPS data string. When using the external ASK receiver for PVElectronic clocks please refer to their manual to set the clock for GPS time synchronization and baudrate. Monitor the DATA LED on the clock or on the external ASK receiver module. It should light up and may start flickering.

Set up the GPS Transmitter Module next

Place the *GPS Transmitter Module* near a window. Connect the supplied USB charger to the USB connector on the rear. The SAT-FIX LED on the module should start to flash and the red LED should blink three times. Now the 1 minute transmittion "time out" is actived to force the satellite fix for the GPS module. After this 1 minute the 9 minutes continuous transmittion time starts for easy setup the receiver modules. Within the first minute after powering up (normally during transmittion time out period) or if at least three GPS satellites signals are properly received, the SAT-FIX LED shows the status as described in the pictures below. Now the *GPS Transmitter Module* is turned on and transmitting data via the 433 MHz frequency band; monitor also the red flickering LED after this 1 minute time out. Now it is time to check all your clocks. They should now be synchronisized to the GPS time data and display all the exact UTC time. For correct time offset adjustment according to your location refer to the clock's manual. If one clock is not synchronisized check the DATA LED on the Clock or the external ASK receiver module for a proper bright "on" and lower brightness "flickering". Maybe you need to reposition the module for better reception. When the clock receives a valid time data string the synchronization occurs within two seconds.
Please connect also the supplied pigtail antenna to the 1/8" TRS jack on Mr.Nixie's clock's rear side. The extrenal ASK receiver module has a build in antenna.
The initial 9 minutes data transmission should give you enough time for proper setup all your ASK receiver modules. After this long transmission time period the data are transmitted every 2 minutes for only around 4 seconds.
Tip: If you need to start the "power up sequence" again, pull out the USB jack from the *GPS Transmitter Module* for 2 seconds and re-connect. This will start the power up transmission period again but the GPS data are held in the module's memory during this short power-down so that a satellite fix is obtained within a few seconds.
Note: Due to the number of other RF devices which use the 433 MHz frequency range it cannot be guaranteed that proper reception is possible over a long distance from the GPS transmitter module or that this device will not interfer with other RF controlled devices, especially during transmission of data and / or the power up sequence.

Wireless GPS Transmitter Module version 1 and 3

Mini USB connector for 5VDC power supply from the USB charger

NOTE: Set option #13 on Mr.Nixie clocks to value 0 for 4800 baud

Green flashing: Aquiring satellite fix, no valid data are received at the moment
Green lighting (Version hpr0U1608) **or**
continuously off (Version hpr0R1514) Satellites are fixed, valid data receiving

Red flickering: Data transmitted via 433 MHz enabled
Off: Transmitter is disabled (during the 2 mins. timeframe)

Wireless GPS Transmitter Module version 2

Mini USB connector for 5VDC power supply from the USB charger

NOTE: Set option #13 on Mr.Nixie clocks to value 1 for 9600 baud

Yellow slow blinking: Aquiring satellite fix, no valid data are received at the moment
Yellow slow flashing: Satellites are fixed, valid data receiving

Red flickering: Data transmitted via 433 MHz enabled
Off: Transmitter is disabled (during the 2 mins. timeframe)