GNDAPP (SMOG-P, ATL-1, SMOG-1 demod software) user manual

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1 About

This document is intended to help you use the demodulation/decryption and packet upload software (gndapp) of SMOG-P, SMOG-1 and ATL-1. The application can be downloaded from here: gndapp Windows gndapp Linux

2 Installation

Does not require installation on Linux just download the binary and add execute permission. example: chmod u+x ./gndapp_linux.AppImage

On Windows install the gndapp program. When installing, make sure the installation path does not contain any non-ASCII characters.

3 First steps after installation

Scroll down to the bottom of the Settings tab and please choose the satellite, that you want to track as shown in Figure 2. Currently ATL-1 and SMOG-P are in orbit. SMOG-1 will be on orbit in 2020 summer.

If you would like the program to track the satellite azimuth and elevation, fill the latitude, longitude and altitude of your station. The NORAD ID of the satellite to be tracked must be explicitly specified in the "Satellite ID" field. ATL-1 is 44830, SMOG-P is 44832. See Figure 1

SMOG-P GND Client Software	- 0 😣
Options V Settings Packets Status	
Soundcard	
Demodulate soundcard	
Show waterfall	
Software Defined Radio	
SDR demodulation is only allowed if a device is connected. Refresh the devices after connecting one.	
Doppler correction	
Device Refresh devices	
Error [PPM] 0 🗘 Offset [Hz] 0 1 Doppler frequency [Hz] 0 1	
Tracking	
Track the satellite	
Latitude [°] 47,48675 North • Longitude [°] 19,04804 East •	
Altitude [m] 275 Satellite ID 44832	
Azimuth [°]: N/A Elevation [°]: N/A Doppler@437.15Mhz [Hz]: N/A AOS: N/A LOS: N/A	
Radio	
Radio controlling is only allowed if tracking is running and a radio is connected	
Model SMOG -	
COM port ttyS4 • Offset [Hz] 0 \$ Vout	
Rotator	
Antenna rotator controlling is only allowed if tracking is running and a rotator is connected	
Park between passes	
Model G5500 • Maximum elevation [°] 90 • Azimuth stops at [°] 0 ‡	
COM port tty54 Parking azimuth ["] 0 Parking elevation ["] 90	
Baud rate 4800 -	
andina parkatr: 0 Parantupland error: 0 Patrate: 1250 Parkat langth: 70	Packata racaivada (

Figure 1: Satellite settings

If you would like to upload the received packets please register here: gndupload page. After the registration you can enter the user name and password in the Upload section of the Settings tab. Click on the Login button. If the login succes the username, password field and the login button will be gray as shown in Figure 2

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Figure 2: Login success

4 Sound card demodulation

On the settings tab check the "show waterfall" in the sound card section. You will then see a menu at the bottom of the program where you can select the sound source and you can plot the signal. Under Linux, you can select sound card input and output source. Under windows, you can only select input source. If you want to use sound card output (speaker) you must use virtual audio cable or the sound card output must be connected to the input by a jack-jack cable.

The center of the signal should be kept in the 1300-1500 Hz band as shown in Figure 3.

imestamp	Source Type	Encoding	Satellite	Packet	(▼)(
019-11-11T14:03:47Z	Audio 1250 BF RX Sync	-	SMOG-P	Timestamp	2019-11-11T13:46:25 UTC
019-11-11T14:03:46Z	Audio 1250 BF Telemetry 4/4	AO40Short	SMOG-P	Signature	755e8de6385f74066ed2
019-11-11T14:03:38Z	Audio 1250 BF Telemetry 3/4	AO40Short	SMOG-P	ACK1	ID=0 (RSSI=0)
019-11-11T14:03:36Z	Audio 1250 BF Telemetry 2/4	AO40Short	SMOG-P	ACK2	ID=0 (RSSI=0)
019-11-11T14:03:33Z	Audio 1250 BF Telemetry 1/4	AO40Short	SMOG-P	ACK3	ID=0 (RSSI=0)
019-11-11T14:03:30Z	Audio 1250 BF TX Sync		SMOG-P	Beacon	
019-11-11T14:03:30Z	Audio 1250 BF TX Sync	-	SMOG-P	Message	Fustolt szalonna
019-11-11T14:03:19Z	Audio 1250 BF RX Sync	-	SMOG-P	Version info	
019-11-11T14:03:18Z	Audio 1250 BF Telemetry 4/4	AO40Short	SMOG-P	Diagnostic info	
019-11-11T14:03:08Z	Audio 1250 BF Telemetry 2/4	AO40Short	SMOG-P	OBC flash checksum	1
019-11-11T14:03:06Z	Audio 1250 BF Telemetry 1/4	AO40Short	SMOG-P	Last uplink timestamp	1970-01-01T00:00:00 UTC
019-11-11T14 [.] 02 [.] 447	Audio 1250 BF Telemetry 3/4	AQ40Short	SMOG-P	OBC uptime	0 min
019-11-11T14:02:417	Audio 1250 BF Telemetry 2/4	AO40Short	SMOG-P	COM uptime	0 min
019-11-11T14:02:397	Audio 1250 BF Telemetry 1/4	AO40Short	SMOG-P	TX voltage drop	0 mV
019-11-11T14:02:367	Audio 1250 BETX Sync	-	SMOG-P	Enorgy mode	0
019-11-11T14:02:257	Audio 1250 BERX Sync		SMOG-P	TCXO works	NO
019-11-11T14:01:427	Audio 1250 BETX Sync	_	SMOG-P		110
019-11-11T14:01:317	Audio 1250 BERX Sync	-	SMOG-P		
019-11-11T14:01:307	Audio 1250 BF Telemetry 4/4	AO40Short	SMOG-P		
019-11-11T14:01:237	Audio 1250 BF Telemetry 3/4	AO405hort	SMOG-P		
019-11-11T14:01:207	Audio 1250 BF Telemetry 2/4	AQ40Short	SMOG-P		
019-11-11T14:01:107	Audio 1250 BF Telemetry 1/4	AO40Short	SMOG-P		
019-11-11T14:01:157	Audio 1250 BF TX Sync	-	SMOG-P		
019-11-11T14:00:567	Audio 1250 BF TA Sync	AQ40Short	SMOG-P		
019-11-11114:00:502	Audio 1250 BF Telemetry 3/4	AO405hort	SMOG-P		
019-11-1114.00.312	Audio 1250 BF Teleffieldy 1/4	AO405HOIL	SMOG P		
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Figure 3: Signal tune

5 RTL-SDR

To run rtl-sdr stick under Windows you will need to install winusb driver. To do this, download the zadig program from zadig

6 Known bugs

The serial port handling (radio and rotator control) on Windows might be flaky.

7 Feedback

Feedback on this program is welcome at bmegnd@gnd.bme.hu. The subject should include gndapp feedback. In the case of a program error, we would ask for a more detailed description of the error and the environment used (operating system, sound card or rtl-sdr source, etc.). We will try to correct these errors as soon as possible.