Introduction

Instrument or Radio Receiver

The AFS105 is a universal input AFC unit with regulated 12V output that can be directly connected to a RF source. It is designed to improve the stability of an RF system by adjusting the frequency of the local oscillator. The AFS105 is easy to use and requires no external power supply.

Theory of Operation

The AFS105 can be used in conjunction with a variety of communication receivers and scanners to improve the stability of the local oscillator. The AFS105 is sensitive to interference and can be used to reduce the effects of RF signals on the local oscillator.

Introduction
Panel Controls/Indicators

Press and turn the KNOB to change values for manual or automatic sweeping.

Push / Turn Knob

Press the SWEEP button to start or stop automatic sweeping.

Sweep Button

The display will default back to the Clipped menu.

Press the SET UP button to enter each menu and change values. Note: After 5 seconds of inactivity the display will default back to the Clipped menu.

Stop Button

Press the SWEEP button to select between the five menus: Prem Center Pref, Prem Sweep, Mode Button

Prem Start. Prem SWEEP STOP, and Prem SWEEP TIME. Note: After 5 seconds of inactivity the display will default back to the Clipped menu.

Remote Mode

The feature can automatically sweep between two preset frequencies.

Remote Mode

Press the POWER button once quickly and firmly to turn on the APS105. Lumin Power up the display.

Power

Circuit 40 MHz

Will default to the Circuit Frequency Display, For example: press the POWER button once quickly and firmly to turn on the APS105. Lumin Power up the display.

From / Top Panel Controls and Indicators

Operating Modes

Sweep Mode

Center Frequency Accuracy: +/- 0.1 MHz

Maximum Full Range Sweep Period: 17 minutes

Minimum Full Range Sweep Period: 20 seconds

Sweep Rate: 1.00 MHz per second

Use SWEEP button to start and stop

Automatic Sweep Mode

Press the SWEEP button to select between the five menus: Prem Center Pref, Prem Sweep, Mode Button

Prem Start. Prem SWEEP STOP, and Prem SWEEP TIME. Note: After 5 seconds of inactivity the display will default back to the Clipped menu.

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From / Top Panel Controls and Indicators

Operating Modes
Panel Controls/Indicators

BNC In
Antenna input. Use 50 Ohm antenna with BNC connector to detect incoming signals.

BNC Out
Signal output to connected device. Use BNC to BNC coaxial cable (supplied) between the BNC out of the APS105 and the BNC input of the connecting device.

Data 2.5mm jack
Used for remote tuning from computer. Note: Software required. No software available at current time. Serial interface specification is supplied on page 17 for software development.

Lock LED
The LOCK LED indicator monitors the synthesizer lock condition and should always be lit.

Charge LED
ON- When the AC adapter is plugged in the LED will stay lit and the batteries will be charged.

12VDC
Input for the supplied 12 volt adapter.

Understanding how the APS105 operates is very important in determining what type of sweep to use. Please consult the following in helping you determine which sweep is right for your application.

Manual Tune
Manual tune is achieved by manually moving the top knob into the desired center frequency range. Because the filter is 4MHz wide, the APS105 can actually see frequencies 2MHz on either side of the center frequency. For example, if the center frequency display read 450MHz the APS105 could pass a signal from 448MHz to 452MHz. Each time the knob was moved up or down the 4MHz filter would follow that center frequency. The APS105 may be manually tuned in 1, 10, or 50MHz steps. It is recommended when first using the APS105 to tune to a known transmitting frequency using manual tune. This will allow you to become familiar in how to use the manual tune mode. Tuning too fast may not allow the device being used with the APS105 enough time to determine whether there was an actual signal present.

Automatic Sweep
Automatic Sweep is achieved by programming a start frequency and a stop frequency. Selecting a sweep rate of 1, 10, or 50MHz per second. Automatic sweep is useful for sweeping a desired range to quickly determine the activity of that range.

Sweeping in 50MHz per second will allow the APS105 to sweep its entire frequency range in just 2 seconds. This may be useful in finding consistently strong signals quickly. However, it is not recommended to use this sweep rate when looking for weaker and inconsistent signals, or when sweeping a narrow frequency range.
Operation

1. Press the SET button once to enter the sweeping mode. Press again to return to normal operation.
2. Hold down the SET button for 5 seconds to activate the Auto Calibration feature. The unit will perform an automatic calibration cycle and then return to normal operation.
3. To start a manual sweep, press and hold the SET button for 5 seconds. The unit will sweep from the lowest frequency to the highest frequency.
4. To change the sweep direction, press the SET button while in sweep mode. The sweep will reverse direction.
5. To turn off the unit, press and hold the SET button for 5 seconds until the display blanks.

Note: The unit will automatically power off after 5 minutes of inactivity.
1.25 V (+15dBm, 32mW)

Operation

SPECIFICATIONS

Maximum Input Signal: 1.25V (±15dBm, 32mW)

Equipment: Battery Charge

BATTERY CHARGE

To charge the battery, press and hold the POWER button for two seconds.

BACKLIGHT

Plug the supplied 12V adapter into the APS105 to begin charging.

SPECIFICATIONS

- Configuration
- Ripple in Passband
- Insertion Loss
- Limitation of Reflection
- Filter Bandwidth
- Input Impedance
- Frequency Range

For example: 1.1 MHz

After 5 seconds of operation, the display will default back to the default sweep time.

To set a sweep time, press the SET button once to enter the change mode. Press the SET button once again to change the sweep time.

STATEMENT

When changing the sweep time, the current sweep time will be displayed at the top of the display.
Typical Applications

Specifications
Applications
Calibration

Calibration requires one of the following:

- A digital multimeter
- A known resistance value

To perform calibration:

1. Set the multimeter to the resistance measurement mode.
2. Connect the multimeter probes to the calibration points.
3. Record the readings.
4. Adjust the multimeter settings if necessary to achieve the desired accuracy.

5. Repeat the process for all required calibration points.

6. Verify that the readings match the expected values within the specified tolerances.

7. If the readings are within acceptable limits, the calibration is successful.

8. If necessary, repeat the process to improve accuracy.

 Calibration procedures may vary depending on the specific model and specifications of the device being calibrated.

- Calibration procedures typically follow the manufacturer's guidelines or industry standards.
- Proper calibration and maintenance are essential to ensure accurate and reliable measurements.

- Calibration should be performed at regular intervals to maintain the accuracy of the device over time.

- Calibration results should be documented and retained for future reference and comparison.

- Calibration services may be available through authorized dealers or service providers.

- Ensure that the device is properly calibrated to meet the required specifications and standards.

- Calibration procedures should be conducted by trained personnel with the appropriate tools and equipment.

- Calibration certificates and reports may be required for compliance with regulatory and quality assurance requirements.

- Calibration services are subject to additional costs and may require additional equipment or resources.

- Calibration procedures should be reviewed and updated as necessary to accommodate changes in technology or standards.
Serial Interface Specification

Command Set Details:

INITIATE SWEEP - Initiates Sweep Process starting from the start freq.

ABORT SWEEP - Aborts Sweep Process and returns unit to the Manual Entry Mode.

PAUSE SWEEP - Temporarily Pauses Sweep Process.

RESUME SWEEP - Resumes Sweep Process from last frequency.

SET MANU SWEEP - Program the Center Frequency.

Response: PE in la PA or PB

Enable Battery Charge

SET SWEEP RATE

Request SW Key

Set Sweep Rate

Set Start freq.

Set Manual freq.

Reset Sweep

Pause Sweep

Abort Sweep

Initialize Sweep

OK: PE in la PA or PB

Fault: PE in la PB or PD

Command: PE in la PA or PB

OK: PE in la PA or PB

Fault: PE in la PB or PD

Serial Interface Specification
SET SWEET SPEED

SET STOP FREO