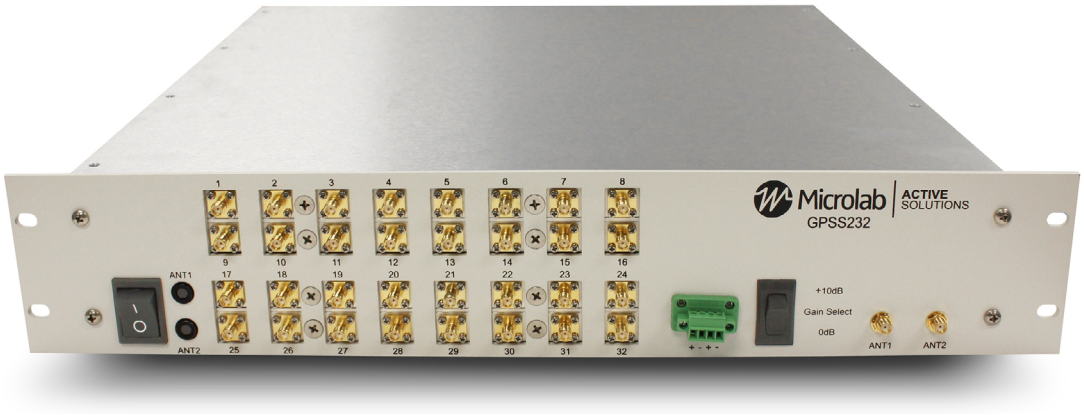

GPSS232
Quick Start Guide

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GPSS232 Quick Start Guide

Lossless GPS Signal Splitter, 32 RF Ouput
Rev 1

Introduction

Microlab's Lossless GPS Signal Splitters can be used to distribute UTC synchronization to up to 32 remote units located where the GPS signals are not readily available. The GPS signal quality is actively monitored by this system and can be combined other Microlab Lossless GPS Signal Splitters to expand the RF outputs.

GPS Signal Splitter Models

Model	Description
GPSS216	Lossless GPS signal splitter, 2RF inputs, 16 RF output, 1RU
GPSS232	Lossless GPS signal splitter, 2RF inputs, 32 RF output, 2RU

Unpacking and Inspection

Carefully unpack the **GPSS232** remote unit and check for damaged or missing parts. The remote unit ships with the following:

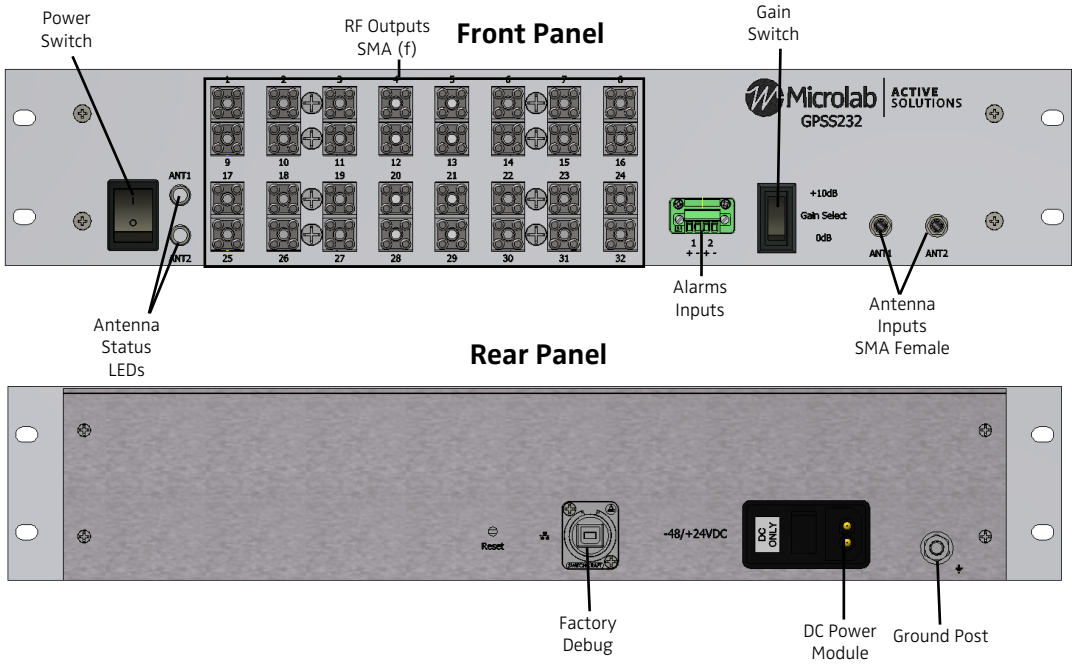
- **GPSS232** Head-End Unit (2 RU EIA Rack)
- **PSM-129** Pre-assembled connector power cable (72" long)
- Mid Mount Brackets
- Quick Start Guide

Hardware Needed

The following items are recommended for Setup and operation:

- Four (4) screws/washers (consult your rack requirements)
- Screwdriver
- -48/+24VDC power supply with included power cable
- **TA-1MF** SMA(m) terminations for each unused output port (Recommended)

GPSS232 - Front and Rear Panels



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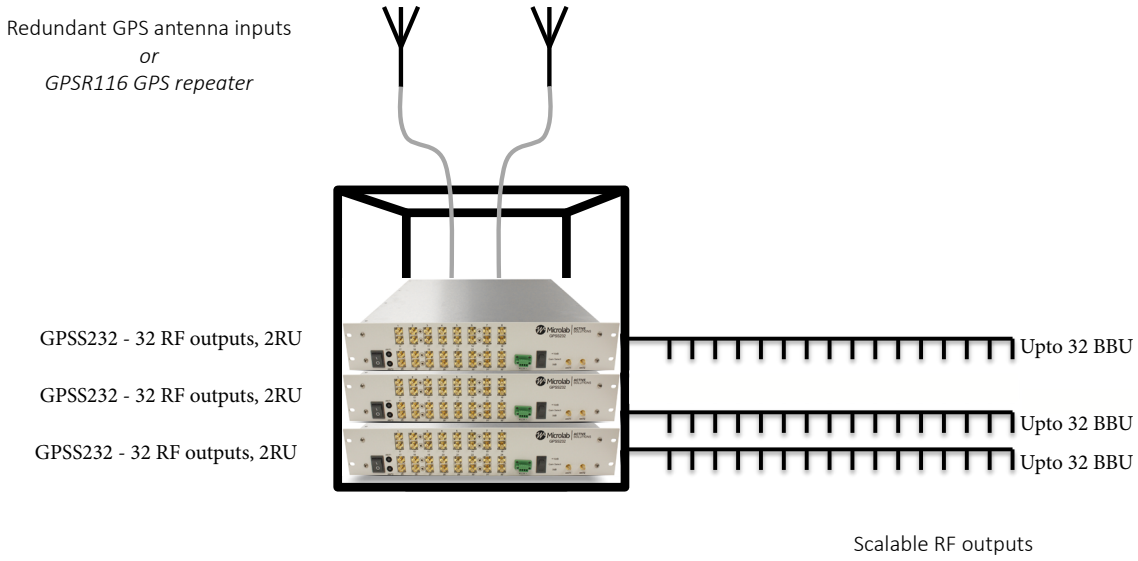
System Connection Diagram

The following diagram illustrates how the GPS signal splitter is utilized



Mounting Installation

This GPS signal transmission system is designed to be setup by professional communications systems installers.

The **GPSS232** requires DC Power (-48/+24VDC). The DC interface mates with the included power cable model **PSM-129**. Mount the **GPSS232** Head-End Unit in close proximity to the eNodeB or BBU to minimize cable lengths.

Install the rack-mount **GPSS232** on an EIA standard 19" rack using standard hardware and practices

Connections RF and Ground

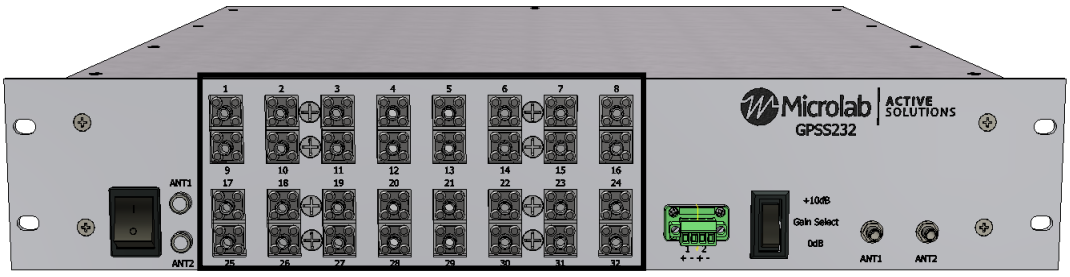
Follow these steps for connecting and disconnecting RF cables to the unit. Ground the unit, make all RF connections and terminate all unused RF connections before applying DC Power.

Connect RF cables as shown in the *System Connection Diagram*.

Sequence to connect:

1. Connect System Ground.
   - The remote unit comes with a .25-20FLANGENUT grounding lug. A grounding wire of suitable gauge must be used to ground to a common bus bar in the Telecom room according to local and building regulations.

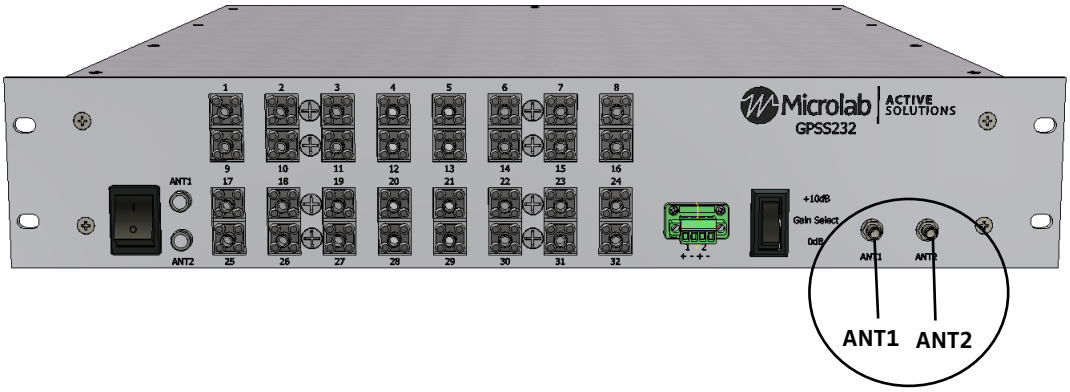
2. Connect each RF Output (**Ports 1 through 32)** to each eNodeB or BBU GPS inputs
   - *Apply appropriate torque to SMA connectors*
   - *It is recommended that all unsued RF outputs MUST be terminated with a 50Ω load*
     See Microlab **TA-1MF** *terminations*



SMA RF Outputs

Connections RF and Ground (Continued)

3. Connect GPS Antennas to ports **ANT1** and **ANT2**
   - *Two (2) Antennas recommended for redundancy*
   - One (1) *Antenna required for operation*
     - *Terminating unused Antenna port is not required. High Input Isolation.*
   - *Only use operator approved GPS Antennas*
   - *Apply appropriate torque to SMA connectors*



Note: DC supply to antenna ports is +5V nominal, 100mA max

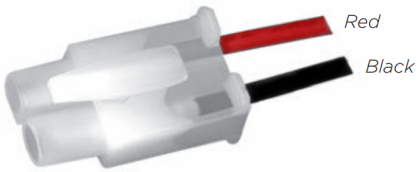
Connecting Power

Power up Sequence:

Required:

• *-48/+24VDC power source with the included power cable model* **PSM-129**. *Follow wiring diagram shown*

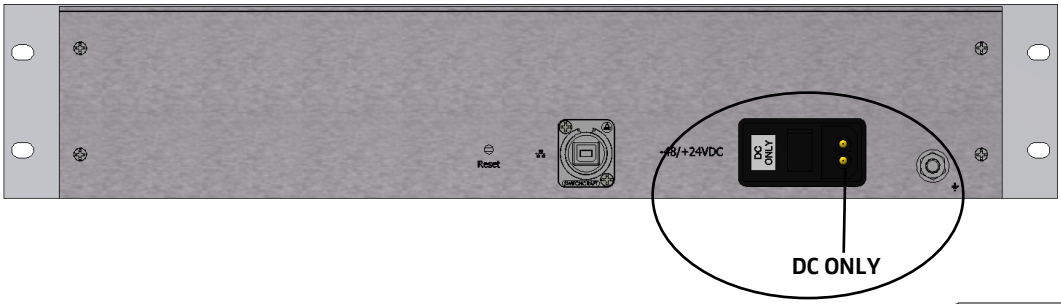
Power Cable



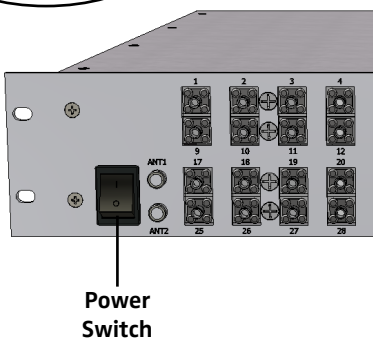
Connect DC Positive and Negative terminals as follow:

1. Red (Positive (+)/**Required**)
2. Black (Negative (-)/**Required**)

1. Carefully align and mate the power cable DC connector to the Head-End unit's **DC ONLY** power receptacle

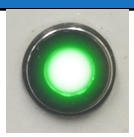
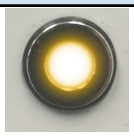


2. Turn on DC power source and **Switch On** the unit
   - Both Antenna Status LEDs will flash **Yellow** during bootup
     - Wait 1 minute for device bootup
   - Solid **GREEN** Antenna LEDs indicate normal operation
     - See ***LED/Antenna Verification*** section for details
   - Off Status LEDs indicate that power supply is not functioning

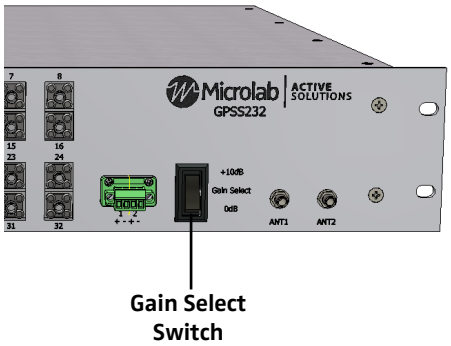


LED/Antenna Verification

1. Verify Antenna LEDs turn solid **GREEN** to ensure Normal operation
   - Allow up to 5 minutes for GPS signal acquisition.
   - If GPS signal is locked on a given antenna, respective LED will illuminate solid **GREEN**.
     - Mask Requirements: SNR > 15 dB, Elevation > 10 degrees, PDOP > 6
   - Antenna will automatically switch over to secondary when primary goes into abnormal condition

Antenna Status/GPS Lock Status	LED Status
Normal (**GPS Lock**)	Solid **GREEN** 
Fault (**GPS No Lock**)	Flashing **GREEN** and **RED** 
Open Circuit or no connection	Solid **Yellow** 
Short circuit	Solid **RED** 

Gain Select



The LNAs (low noise amplifiers) inside the **GPSS232** provide a +10dB system gain. Gain is defined as the ratio in the amount of RF power of the output and input of the **GPSS232**.

1. Verify all unused outputs are terminated with 50Ω loads.
2. Set **Gain Select** switch to the +10dB position (maximum gain)
3. Verify signal level at the ouput is sufficient for the next system stage

Disconnecting/Uninstalling

Sequence to Disconnect:

1. **Turn Down** gain (Set **Gain Select** switch to the 0dB position)
2. **Switch OFF** the unit
3. Remove/Disconnect DC power to the device
4. Disconnect the RF (input/output) connections of the unit.
5. Disconnet Ground
6. Unmount Unit

Disclaimer

GPS and GNSS re-transmission to an antenna requires regulatory approval. These approvals are granted on an individual basis by regulating bodies. Microlab cannot grant these approvals, and cannot be held responsible for violating these regulations using the system.
The FCC requires commercial users within the US to acquire and maintain a Part 5 experimental license to re-broadcast GPS signals. Licenses are not required if they are inside an RF shielded environment. European regulations vary by country. Consult local authorities for additional details.

Contact Microlab - Active Solutions

To contact Microlab, visit our website at www.microlabtech.com or send email to sales@microlabtech.com. For operating assistance in the USA, call (973) 386-9696.

Safety Information

To avoid possible electric shock or personal injury, the following general safety precautions must be observed during all phases of operation, service, or repair of the Microlab Unit . Failure to comply with these precautions or with specific warnings in this guide violates the safety standards of design, manufacture, and intended use of the Microlab Unit. Microlab assumes no liability for the customer's failure to comply with these require-ments.