

The Intellitron SDS-4000S is an RF-sensed T/R switch with a built-in receive splitter for use with a transceiver and a separate receiver such as an SDR. The splitter provides high isolation between the transceiver and SDR receive ports to reduce crosstalk and interference. The SDR port includes a protection circuit to prevent damage from transmitted RF. The strip-line PCB design reduces SWR and insertion loss and improves isolation up to 450 MHz. An SMA connector is provided for easy connection to SDR dongle receivers.

FEATURES

- RF Sensing for radios without a keying output.
- High isolation between transmit and receive ports.
- Excellent isolation between the transceiver and SDR receive ports.
- Good SWR performance up to 450 MHz.
- Receiver protection circuit to limit transmit RF spikes.
- Control Line input for radios with a key/PTT output.
- AUX output configurable for ground-on-receive or ground-on-transmit.
- Power-off bypass routes the transceiver directly to the antenna.
- Adjustable receive delay from 50 ms to 4 seconds.

CONNECTIONS & CONTROLS

- **REC** — Receiver connection.
- **ANT** — Antenna connection.
- **XCVR** — Transceiver connection.
- **AUX** — Receiver mute or amplifier keying connection.
- **CTRL** — Transmitter PTT or key line.
- **+12V** — Power input.
- **DELAY** — Receive delay adjustment.

1. Connect the transceiver to the **XCVR** connector.
2. Connect the antenna, tuner, or linear amplifier input to the **ANT** connector.
3. Connect the SDR or second receiver to the **SDR REC** connector. **Do NOT transmit** into the SDR REC input.
4. The **CTRL** terminal may be used instead of, or in addition to, RF sensing by connecting a linear amplifier control line to activate the SDS-4000S.
5. If using a power amplifier, connect the **AUX** output to the transmitter keying jack and set **JP1** to “ground when keyed.”
6. Connect a 12 V DC power source to the power terminal. We recommend a 12 VDC 1 Amp wall adapter with 2.1mm barrel connector, but you can also use a homebrew power pole to 2.1mm cable.

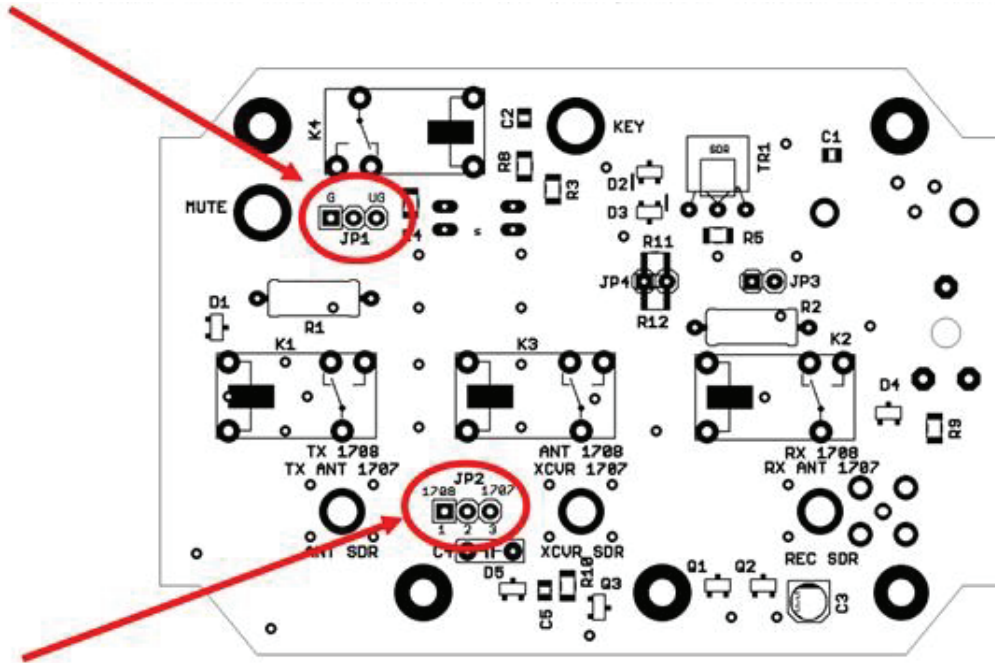
The **DELAY** control adjusts the return-to-receive time. Fully CCW provides a minimum delay of approximately 40–50 ms; fully CW provides the maximum delay of approximately 2–4 seconds.

Note: Do not use the SDS-4000S with transmitters over 200 W or place it on the output of linear amplifiers exceeding 200 W. When using an SDR with a linear amplifier, place the SDS-4000S between the amplifier and the exciter. The AUX output can key the amplifier, while the exciter’s keying line connects to the **CTRL** input. In this configuration the receiver mute function is not available.

At VHF and UHF, transmit SWR and receive loss can be improved by removing **JP2** if RF Sense is not required. In that case, the **CTRL** connector must be used with a keying line from the transmitter.

BOARD JUMPERS

JP1 Left for GROUND to RECEIVE, Right for UNGROUND to RECEIVE

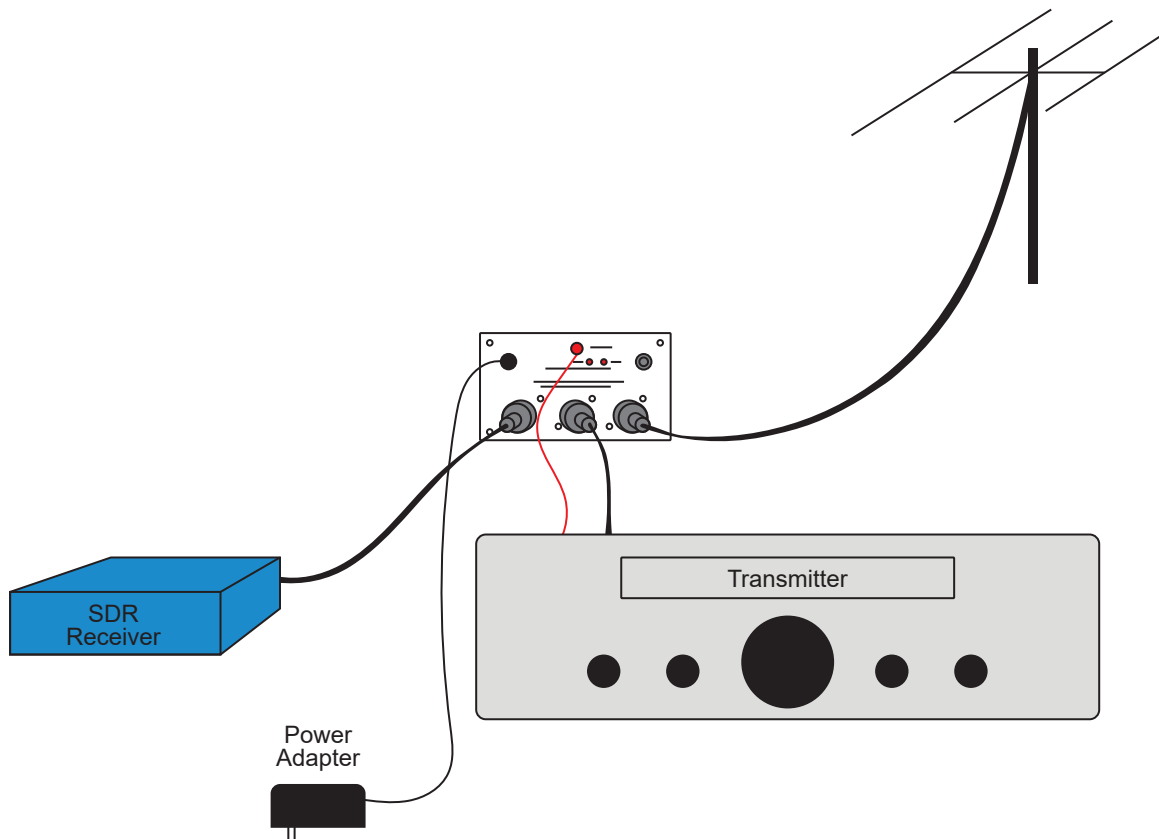


JP2 Left for RF Sense, Remove for no RF Sense

Automatic switching via the HF sensor is useful when the radio lacks a PTT output. Using the PTT line is faster and simplifies integration with an amplifier.

- Isolation (Tx): > 68 dB @ 50 MHz, > 50 dB @ 300 MHz
- Isolation (Rx): > 15 dB
- SWR: < 1.2:1 @ 50 MHz, < 1.8 @ 450 MHz

The Intellitron SDS-4000S switch operates up to 450 MHz. These automatic T/R switches sense transmitted RF and use a relay to switch your antenna from receive to transmit. They also short the SDR receiver's antenna input to ground, protecting it from transmitted RF. The switch handles up to 200 W SSB PEP and is compact, measuring only 4.0 in × 2.625 in × 1.5 in.



The SDS-4000S includes a receiver protection circuit that limits RF spikes during transmission, protecting your SDR from potential high-power damage.

A pan-adaptor lets you view all radio signals currently active across a band, particularly useful on HF. You can instantly see signal locations, strengths, and types. New signals can be spotted and clicked to listen to immediately, eliminating the need to hunt blindly with the dial—though traditional tuning remains an option.

Applications:

1. **SDR Integration:** Seamlessly connect SDR receivers with traditional transceivers, enabling advanced SDR capabilities while retaining standard transmission.
2. **DXing and Contesting:** Quick switching and receiver protection make rapid transitions between listening and transmitting safe and efficient.
3. **Field Operations:** Robust design and power-off bypass ensure reliability in outdoor and mobile environments.
4. **Educational Settings:** Demonstrates differences between SDR and traditional radios for students or enthusiasts.
5. **Remote Operation:** Automated switching and protection simplify remote station operation.

HOW THE SDS-4000S WORKS: AUTOMATIC, PROTECTIVE SWITCHING

- **While Receiving (RX):** Routes the antenna signal to both your transceiver and SDR, allowing simultaneous listening and visual waterfall display on the SDR.
- **While Transmitting (TX):** The RF-sensing circuit detects transmission power instantly, disconnects the SDR from the antenna, and grounds it to protect the sensitive front end.

CRITICAL PROTECTION

A standard coax "T" splitter cannot safely connect both radios. Even a few watts of transmission from the main radio can destroy an SDR's front end. The SDS-4000S prevents this with two main protection methods:

1. **RF Sensing (Default):** Detects transmission RF and immediately disconnects and grounds the SDR. Reconnects automatically when transmission stops.
2. **PTT / Control Line (Recommended):** Connect the switch's CTRL port to the transceiver's PTT or TX GND. When transmitting, the switch protects the SDR before RF is emitted, eliminating risk of damage.

ADVANCED FILTERING

- **Traditional Radio:** Limited to physical filters; nearby strong signals can bleed over and interfere.
- **SDR:** Software-based filters allow precise control. Adjust filter bandwidth visually to isolate weak Morse code signals or widen for high-fidelity audio, carving out interference that analog radios cannot handle.

RECORD THE ENTIRE SPECTRUM

SDRs can record the entire band, not just one station. This allows you to capture a mystery signal while listening to another conversation, and later analyze it as if you were there live.



TWO YEAR LIMITED WARRANTY

This Limited Product Warranty is provided by the Dealer where your Intellitron product was purchased. The Product Warranty extends only to the original purchaser of the product and is valid for a period of two years from the date of purchase. Please keep your dated sales receipt as evidence of the date of purchase. You will need it to receive warranty service. Your Dealer warrants the product will be free from defects in workmanship and materials under normal use. If the product fails to conform to the warrant and is within the warranty period of two years, contact your original dealer for a return authorization. Your dealer may choose to either repair or replace the non-conforming product.