

# OPERATIONS MANUAL

Coax Switch

Version 1.0



## IMPORTANT NOTICES

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## 1. Introduction

Thank you for choosing our Coax Switch. This manual provides essential information to help install, operate, and maintain the coaxial switch effectively. Designed for reliability and seamless control over multiple RF signal paths, our coax switch enables easy management and routing of signals across various devices and configurations.

Please read through this manual to become familiar with the switch's operations, features, and safety guidelines before setup. Following these instructions will ensure optimal performance and longevity of equipment, helping make the most of the coax switch.

We appreciate the trust in our product and are confident it will bring enhanced efficiency and control to signal managements.

## 2. General Safeguards

This section is written as a general guide for safe operation of the equipment and is intended for personnel having previous knowledge and experience with broadcast equipment. It is not intended to contain a complete statement of all safety precautions, which should be observed by personnel using this or other electronic equipment.

### 2.1. Documentation

Read, retain and follow these instructions before operating the equipment.

### 2.2. Environment

To reduce the risk of fire or electric shock, do not expose this equipment to rain or moisture. Refer all service requirements to qualified service personnel.

### 2.3. Servicing

Do not attempt to service this equipment. Opening or removing covers can result in personal injury and will void the warranty. Refer all service requirements to qualified service personnel.

### 2.4. Safety and First Aid

Personnel engaged in the installation, operation, maintenance, or servicing of this equipment are exposed to the hazard of high voltage. It is imperative that all safety regulations and precautions are consistently observed.

- At all times, avoid placing any part of the body between ground and circuit points, whether power is on or off.
- Dangerous voltage may be present in equipment even though power is off. Do not open the cabinet. Refer servicing to qualified service personnel.
- It is the duty of all personnel to be prepared to give adequate emergency first aid treatment and thereby prevent avoidable loss of life.
- Respiratory paralysis can cause death by suffocation within seconds. It is imperative that the

approved methods of artificial respiration are initiated immediately and continue until medical help arrives.

- A muscular spasm of unconsciousness may render the victim unable to break free of the electric power. If this is the case, turn the power off immediately.

## 2.5. Operating Safeguards

The AAT Coax Switch is designed to accept either 120/240 VAC or 12/24 VDC power input. Attempting to supply a voltage outside of these specifications or mismatching the power requirements could result in damage to the unit.

## 3. Terms & Conditions

- 1. Delivery of Goods.** Unless Purchaser requests later delivery, goods listed on the Summary page and on any additional attached sheets and any other goods purchased by Purchaser from American Amplifier Technologies, LLC, a Texas Limited Liability Company, referred to as Seller, in connection with the transaction contemplated in this Agreement (referred to hereinafter as the "Goods") shall be delivered as soon as possible after vendor availability, provided receipt of this Agreement by Seller from Purchaser is fully executed by Purchaser and in form satisfactory to Seller. Seller shall have the right to deliver all of the Goods at one time or in portions from time to time within the time of delivery herein provided. The delivery of non-conforming Goods or a default of any nature in relation to one or more installments of this Agreement will not substantially impair the value of this contract as a whole and will not constitute a breach of the contract as a whole. This is a shipment contract and the Goods shall be delivered F.O.B. place of business of the manufacturer of the Goods; Seller shall obtain and promptly deliver or tender in due form any document necessary to enable Purchaser to obtain possession of the Goods but Seller shall not be otherwise obligated to provide notification of shipment to Purchaser. Unless otherwise specified in writing by Purchaser, shipment will be by common carrier selected by Seller.
- 2. Warranty with Respect to Goods.** Seller warrants that the Goods are as described in this Agreement, but no other express warranty is made with respect to the Goods. No agent, employee or representative of the Seller has any authority to bind the Seller to any affirmation, representation or warranty concerning the Goods sold under this Agreement, and unless an affirmation, representation or warranty made by an agent, employee or representative is specifically included within this Agreement (see item 22 for specific warranties related to this proposal), it shall not be enforceable by Purchaser. The Goods are purchased by the Purchaser "as is." Seller makes no implied warranty of any kind whatsoever with respect to the Goods, and, in particular, SELLER MAKES NO WARRANTY OF MERCHANTABILITY AS TO THE GOODS, NOR DOES SELLER WARRANT THAT THE GOODS CAN BE USED FOR ANY PARTICULAR PURPOSE. Seller shall have no liability to Purchaser for any claim, loss or damage caused or alleged to be caused directly, indirectly, incidentally or consequentially by any of the Goods, by any inadequacy thereof or deficiency or defect therein, by any incident whatsoever in connection therewith, arising in strict liability or otherwise, or in any way related to or arising out of the Goods. Seller makes no warranty that the goods are delivered free of the rightful claim of any third person by way of infringement or the like. Notwithstanding any of the foregoing in this Section 2, Purchaser shall be entitled to the benefit of any applicable manufacturer's warranties with respect to any of the Goods, and, to the extent assignable, Seller hereby assigns such warranties to Purchaser for the benefit of Purchaser.
- 3. Prices Subject to Change.** Unless otherwise indicated elsewhere in this Agreement, prices of the Goods reflected on the face of this Agreement shall be subject to change at Seller's option in the event

of a price increase by Seller's supplier or suppliers; provided, however, any price increase to Purchaser shall be limited absolutely to the amount of the increase in Seller's supplier's or suppliers' price or prices.

4. **Payment of Purchase Price.** Unless otherwise indicated in this Agreement, the total purchase price shall be due and payable in advance, such payment to be remitted from Purchaser to Seller simultaneously with delivery of this Agreement.
5. **Taxes.** Prices indicated in this Agreement do not include any taxes of any kind, unless otherwise stated, including, without limitation, any federal, state or local taxes or taxes of any foreign governmental unit; any and all such taxes shall be payable by Purchaser.
6. **Interest.** In the event Purchaser fails to make any payment or payments when due, interest at the highest legal rate shall accrue and be payable with respect to such payment or payments from the date when such payment or payments are due until paid in full.
7. **Security Interest; Insurance.** Purchaser conveys to Seller and grants to Seller security title to and a purchase money security interest in all of the Goods, all accessories, parts and equipment now or hereafter affixed thereto or used in connection therewith, and all proceeds thereof, to secure the payment of all amounts payable or to become payable under this Agreement and all other obligations of Purchaser to Seller under the terms of this Agreement. Purchaser shall at all times keep the Goods insured against loss, damage, theft and other risks, in such amounts and companies and under such policies and in such form, all as shall be satisfactory to the Seller, which policies shall provide that loss hereunder shall be payable to the Seller as its interest may appear, and such policies or certificates thereof shall, if the Seller so requests, be deposited with the Seller; the Seller may apply any proceeds of such insurance which may be received by Seller toward payment of amounts due or to become due under this contract. Purchaser will from time to time, on request of the Seller, execute such financing statements and other documents and do such other acts and things, all as the Seller may reasonably request to establish and maintain a valid security interest in the Goods.
8. **Seller's Damages.** In the event of any default by Purchaser, Seller's damages shall include, without limitation, shipping charges, restocking charges and retuning charges for products with tuned RF stages as required or requested by the manufacturer or manufacturers of affected Goods.
9. **Costs of Collection.** Purchaser shall pay to Seller any and all costs of collection of amounts due by reason of the sale under this Agreement including, without limitation, reasonable attorneys' fees if amounts are collected by or through an attorney at law.
10. **Acceptance of Goods.** Purchaser shall have ten days after receipt of any Goods to inspect and either accept or reject them. If the Goods are rejected, written notice must be given to Seller in such manner that it will arrive no later than 24 hours after expiration of such ten day period. Failure of timely receipt by Seller of such notice with respect to any of the Goods shall constitute acceptance of such Goods. If Purchaser rejects or revokes his acceptance of any Goods tendered under this Agreement, Purchaser must notify Seller in writing fully specifying all claimed defects and non-conformities. Failure to specify any defect or non-conformity shall constitute a waiver of that defect or nonconformity.
11. **Risk of Loss.** Notwithstanding any right of rejection or revocation of acceptance of Purchaser, risk of loss with respect to the Goods shall pass to the Purchaser when the Goods are duly delivered to the carrier. Section 2-510 of the Uniform Commercial Code is to have no effect upon this Agreement.
12. **Force Majeure.** Seller shall not be liable for any delay or failure to perform as required herein if delay



or failure is caused by labor disputes, strikes, war, riots, insurrection, civil commotion, fire, flood, accident, storm or any act of God, or other causes beyond Seller's control, nor shall Seller be responsible for delay, non-delivery or default in shipment if Seller has made timely delivery of Goods in good order or condition to the carrier or carriers at the point of shipment or such timely delivery has been made on Seller's behalf.

- 13. Limitation of Liability With Respect to Sale of Goods.** In the event of non-delivery or repudiation of this contract as to the sale of the Goods by Seller, Purchaser's right to damages shall be limited to the difference between the contract price of the Goods and the market price thereof. In the case of any other breach by Seller with respect to the Goods, Purchaser's remedy shall be limited to return of the Goods and repayment of the purchase price of non-conforming Goods or parts; PURCHASER SHALL HAVE NO RIGHT TO INCIDENTAL OR CONSEQUENTIAL DAMAGES. The remedies of Purchaser provided in this Section 13 are Purchaser's exclusive and sole remedies; in the event any such remedy shall fail of its essential purpose, Purchaser's sole and exclusive remedy shall be refund of whatever portion of the purchase price has been paid with respect to Goods as to which a breach or default has occurred.
- 14. Tower, Antenna and Related Services.** See Tower Terms & Conditions Addendum attached if applicable.
- 15. Final Agreement.** This writing is intended by the parties as a final expression of their agreement and is intended also as a complete and exclusive statement of the terms of their agreement.
- 16. Modification.** This Agreement may be modified or rescinded only by a writing signed by both of the parties or their duly authorized agents.
- 17. Assignment.** Seller may assign its rights under this Agreement in whole or in part to any other party. Purchaser shall assign no right or interest in this contract without the prior written consent of Seller; any assignment contrary to the foregoing shall be wholly void and totally ineffective for all purposes.
- 18. Applicable Law.** This Agreement shall be governed by and construed in accordance with the laws of the State of Texas and venue for any action arising from this contract shall be brought exclusively in a court of proper jurisdiction located in Lubbock, TX. Use of the term "Uniform Commercial Code" in this Agreement means the Uniform Commercial Code as adopted in the State of Texas as effective and in force on the date of this Agreement.
- 19. Validity and Acceptance.** Notwithstanding any other provision therein, this Agreement, when executed by Seller, is not a firm offer, and Seller reserves the right to revoke it at any time prior to acceptance. This Agreement must be accepted on its exact terms, and if additional or different terms are proposed by Purchaser, Purchaser's response will constitute a counter offer, and no contract shall come into existence without Seller's assent to such counter offer. This Agreement become effective only upon its receipt by Seller at Seller's offices in Lubbock, Texas, fully executed and in forms satisfactory to Seller.
- 20. Captions.** The captions, which appear in this contract, are for the convenience of the parties only and shall not constitute a part of the contract or affect its construction.
- 21. Additional Provisions.** (Attach additional sheets if needed)
- 22. Standard Two (2) Year Product Limited Warranty:** American Amplifiers Technologies, LLC (AAT) warrants products (referred to in this proposal only) to the original Buyer that it's Product is free from defect in material of workmanship

## 4. Installation

This section contains unpacking, inspection, and installation instructions for the Power Meter. Please read the following sections carefully prior to setting up the equipment.

### 4.1. Unpacking and Inspection

Inspect the outside of the container. Carefully open the container and remove the unit along with any accessories. Retain all packing material in the event that the equipment must be returned to the factory.

 **Exercise care in handling equipment during inspection to prevent damage to the equipment. Some pieces of the equipment may be heavy.**

Visually inspect the enclosure for damage that may have occurred during shipment. Inspect for evidence of water damage, bent or warped chassis, loose screws or nuts, or extraneous packing material in connectors or fan failures. Inspect all connectors for bent connector pins. If the equipment is damaged, a claim should be filed against the freight carrier once the extent of the damage is assessed.

### 4.2. Mechanical Installation

The AAT coax switch can be mounted in any position without affecting its operation; however, it is recommended to position it so that the knobs can be manually operated. The switch connects using standard EIA flanges. As with any EIA flange connection, care should be taken when interconnecting the inner conductors with the anchor connectors at the ports to prevent damage to the components.

Improper handling of the coax line and ports can cause the inner conductor to exert excessive force on the bullets, potentially leading to improper mating of the inner conductor and hindering the switch rotor. It is recommended to assemble the coax switch section first before working outward from the switch.

### 4.3. Mounting

It is not recommended to support the switch using only the inner connecting lines. The switch should be mounted to a rigid bracket or frame for additional or primary support. Use all four mounting pads at the base of the switch, which are equipped with clearance holes for mounting bolts.

When mounting switches in tandem, ensure there is enough space between each switch to prevent interference with the inner conductor bullets. A minimum spacing of 5.5 inches is required to ensure proper clearance.

The switch should be installed in a location where it is protected from severe environmental conditions and has adequate ventilation. This includes avoiding exposure to rain, high humidity, blowing dust, and extreme temperatures.

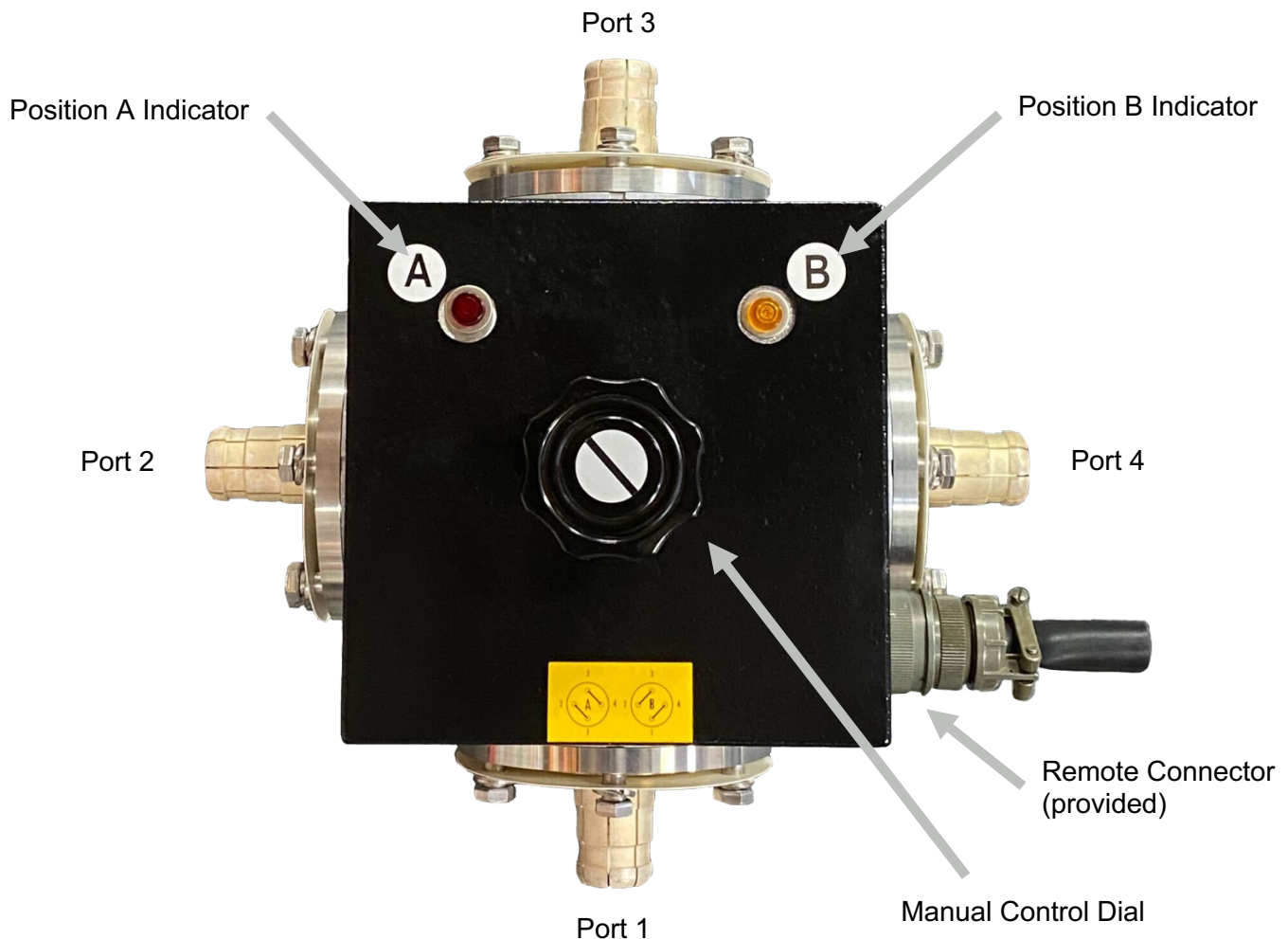


## 5. Overview

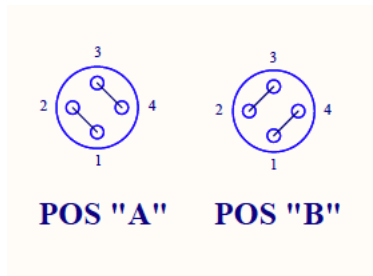
The AAT coax switch is a 4-port transfer switch designed for switching between two sources and two loads. The switches are designed for high power, broadcast and communications applications. This switch includes the following features:

- High Switching Speed  
The switching time for each switch
- Compact Layout
- Small Size and Weight
- DC Controlled

### 5.1. Overhead View



## 5.2. Switch Paths



## 5.3. Operation Instructions

**⚠ CAUTION: NEVER OPERATE SWITCH WHILE IT IS CONDUCTING RF POWER.**  
 Serious damage to the switch may result. Evidence of "Hot Switching" voids manufacturer warranty.

Once installed, the AAT coax switch can be operated manually or through an optional external controller. Our switches can be controlled with either AC or DC voltage. Standard units are equipped with latching relays, allowing momentary DC voltage operation. When continuous AC voltage is used for control, relays are not provided.

The switch can be operated remotely or locally by activating a control switch or relay to apply voltage to the motor. After the switch completes its cycle, the control circuit opens, preventing repeated commands in the same direction. To reverse the motor, apply voltage to the opposite command; **do not apply voltage to both commands simultaneously.**

## 5.4. Maintenance

The switch is designed to operate without regular maintenance, as all components are permanently lubricated at the factory. No additional lubricant should be applied by the user. However, we recommend an annual inspection by cycling the switch five to six times both manually and with power. During this check, ensure that the switch moves quickly and smoothly in both directions, with no unusual sounds.

When operated manually, the torque and smoothness should feel consistent in both directions. For continuity testing, disconnect the transmission lines from the ports and use an ohmmeter to measure resistance between the anchor connectors on each connected port. The resistance should be less than 1 ohm.

## 5.5. Troubleshooting

### 5.5.1. Unusual Scraping or Rubbing Noises

If an unusual scraping or rubbing noise is heard, begin by removing the manual actuating knob and switch cover. Ensure the mounting posts are securely fastened to the switch top plate, and check that the screws holding the mounting plate are tight. Confirm that the motor does not wobble when actuated either manually or electrically.

To further inspect, remove the locking flange from any port by unscrewing the socket head screws. Carefully pull the connector/insulator assembly out of the casting, taking care to note the two Teflon

pins that prevent rotation. These pins must be reinstalled correctly upon reassembly. Look inside for any rubbing marks, broken contact fingers, or foreign particles. Clean as necessary and make sure the switch moves smoothly.

For inner conductor contact fingers that may need replacing, these can be swapped out on-site. However, contact fingers between the rotor isolation plate and the switch housing should be replaced at the factory.

### **5.5.2. Sluggish Switch Action**

If the switch action is sluggish, start by ensuring there are no mechanical issues by following the inspection steps mentioned in the previous section. Verify that the source voltage matches the required 115 or 230 VAC. A common cause of sluggishness can be a failed starting capacitor, so be sure to inspect it as well.

### **5.5.3. Switch Fails to Operate**

If the switch fails to operate entirely, perform a complete mechanical inspection to check for any interference, binding, or jamming. If the switch operates manually but not electrically, inspect the wiring for continuity according to the schematic, and examine the snap-action switches for proper function. Replace any defective components as needed.

## **5.6. RF Problems; High VSWR, Low Isolation**

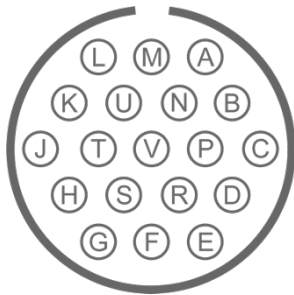
High VSWR or low isolation issues in RF may be caused by mechanical or electrical problems. First, ensure that the switch moves smoothly, following the mechanical inspection procedures outlined previously. Then, inspect the interior for signs of arcing, corrosion, or oxidation, particularly around the contact points, and check for any broken contact fingers.

It is important to note that arcing can occur if the switch is actuated without disconnecting RF power. Additionally, high standing waves due to reflections in other parts of the RF system can lead to arcing as well. Verify that the RF system is properly tuned and that the switch is applied correctly. Inner conductor contact fingers that are worn, broken, or have lost their temper can be replaced in the field, but other repairs should be conducted by the factory.

## 5.7. Connector Pinout

A 19-Pin MS3106A2214S Connector comes with the Coax Switch. The customer is responsible for terminating the Coax Switch to the Coax Switch Controller. It is the customers responsibility to provide the proper connector for the coax switch controller end. If the optional AAT Coax Switch Controller was purchased, the necessary cabling and connector for the controller are provided.

The overall functions of each pin on the Switch are indicated in the following pinout. These pins correspond to specific function of the Coax Switch.



PIN	FUNCTION	DESCRIPTION
A	"A" DRIVE	SET POS "A" RELAY COIL S+
B	"B" DRIVE	SET POS "B" RELAY COIL R+
C	DC COMMON	RELAY COIL-
D	AC COMMON	MOTOR POWER
E	120 VAC	MOTOR POWER
F		
G	"A" INTERLOCKS	NO
H	"A" INTERLOCKS	COM
J	"A" INTERLOCKS	NC
K	"B" INTERLOCKS	NO
L	"B" INTERLOCKS	COM
M	"B" INTERLOCKS	NC
N	"A" INTERLOCKS	NO
P	"A" INTERLOCKS	COM
R	"A" INTERLOCKS	NC
S	"A" INTERLOCKS	NO
T	"B" INTERLOCKS	COM
U	"B" INTERLOCKS	NC
V		

## 5.8. Schematic



# THANK YOU

Thank you for choosing American Amplifier Technologies. We're here to support your success every step of the way—please reach out if there's anything we can assist you with. Your feedback on product improvements or feature enhancements is always welcome, as we strive to meet your needs even better.



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