bdi **Broadcast Devices, Inc.**

Technical Reference Manual

ISC-200- Dual Independent RF Switch Controller

READ THIS MANUAL IN ITS ENTIRETY BEFORE ATTEMPTING
INSTALLATION FAILURE TO DO SO MAY RESULT IN LIMITED CUSTOMER
SUPPORT!

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ISC-200 AVR Firmware 1.0.26 and higher
ISC-200 LAN Firmware 6.6.3 and higher

Table of Contents

I.   Introduction

This technical manual covers the installation and configuration of the Broadcast Devices, Inc. ***ISC-200 Dual Independent Motorized Switch Controller Chassis.*** The ISC-200 System family of controllers is designed to simplify the connection and operation of 4 port switches in broadcast applications and the ISC-200 series product is designed to control and sequence switches and transmitters to provide safe and reliable control of the transmitter plant. The ISC-200 is designed to automatically "steer" the interlock connections to the transmitters according to the position of the RF switches.

The ISC-200 is designed to provide completely independent control and status of up to two motorized RF switches. TX ON/OFF and Interlock control are provided for two transmitters for each switch. Operation of one switch does not impact the operation of the other switch and/or its transmitters. The ISC-200 is an economical way to provide switch control for two independent stations or for any application where more than one RF switch is being employed.

II. Unpacking and Inspection

   Carefully inspect the unit after unpacking and make certain that no damage has occurred during shipping. If damage is noted, contact the shipper immediately and file a claim for damages. Each unit is carefully packed and carries full insurance against damage. Inspect the packing list and make sure that the contents of the package match those described on the packing list.

III. IP Configuration and Other Configuration Items – Do These First!

READ THIS ENTIRELY BEFORE INSTALLING THIS EQUIPMENT!

FAILURE TO DO SO WILL RESULT IN WASTED TIME – YOURS!

We realize that this product will require at times good customer support from the factory and BDI attempts to provide a high standard of customer support. You can assist us in this endeavor by doing the following before calling for customer support:

1.   Thoroughly read this manual entirely **BEFORE YOU CALL.**
2.   Be present at the site where the ISC-200 unit is located. You may think this is obvious but it isn't to the numerous people we have talked to calling for customer support while driving their car down the highway. Please be courteous to us and do yourself a favor and heed this advice. The most expedient way to get you the help you need is for you to be prepared at the site.

3. Make sure you have a good telephone connection to call us. While we realize some sites have limited access to landlines and good cell service it is difficult to assist if we cannot communicate with you. Also, a corded telephone with a cord long enough to reach the front of our unit and wherever your computer is located. This reduces the amount of time you need to spend on the phone with us while we wait for you to put the phone down and go do something because the cord won't reach.
4. When calling be prepared at the site as some support questions will center around front panel configuration items or if you cannot access the unit from a location or observe conditions of externally connected equipment.
5. Have your computer ready with the app loaded on it and connected to the unit.
6. Have some test equipment available such as a DMM or VOM and ideally an oscilloscope if needed. Test clip leads also come in very handy. Paper and pencil are handy items to have also. It's a good idea to have some hand tools available such as a set of screwdrivers, cutting pliers and yes, a soldering iron. These things may not be needed but if they are and you don't have access to them when you call us delay in correcting any issues may ensue.

If all of the above sounds vaguely familiar it's because some teacher you had in elementary school admonished you and the rest of the class to be prepared when you come to class. Be on time, have a sharpened pencil and have paper available and have the assignment done from the night before – substitute read the manual in item 1 above for this one!

IP Configuration:

Prior to installation it is strongly urged that the IP configuration be performed first as it will be necessary to power cycle the unit in order for the changes to take effect. This should be done with the unit in front of you on a workbench with a Windows computer directly connected to the unit via the LAN connection.

Communications Interface Information

To configure the ISC-200 for LAN operation and to access the ISC-200 web site it is suggested to connect the LAN interface category 5 local area network cable directly to a laptop. You should use a standard CAT5E cable. You do not need to use a crossover cable for this purpose. **The browser interface is used ONLY for initial IP configuration. To access the control and status of the unit use**

the ISC APP provided for this purpose after configuring your IP information.

Follow these steps next:

1. With your laptop connected as suggested above power cycle the unit. This allows for a 5 minute window to access the web site. This is done for security purposes minimizing unauthorized access to the unit.
2. Next, open a browser window and enter the default IP address for the ISC-200. **The factory default IP address is: 192.168.1.107.** The web site screen should appear as shown below.
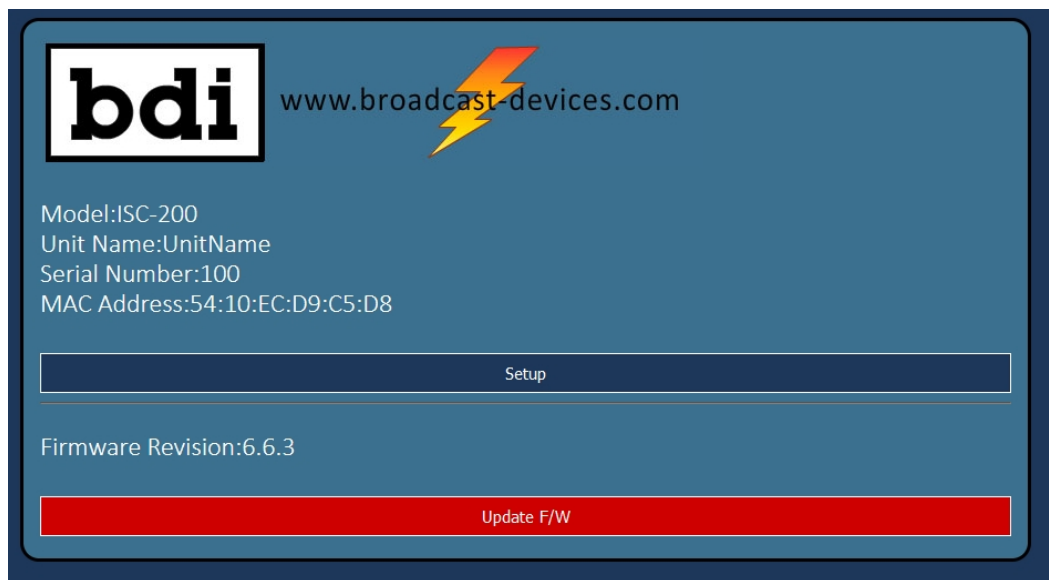
3. Hit the Setup button and enter the default username and password below or if this is not a first time setup enter the username and password previously set up. If you do not know the username and password it can obtained from the ISC-200 chassis setup screen. Press the Red "X" key and use the UP/DWN arrow keys to scroll over to the setup information shown below. **Note do not click on the Update F/W.** While no damage will occur it puts the unit in the software download mode which will prevent the rest of the configuration. If you do this either out of curiosity or by accident, simply power cycle the unit to bring it back to normal operation. This button is only used for occasional firmware updates that we may make available in the future which can be done in the field.

As stated above to enter the USR/PSW screen press the Red X key. After initial power up it may take a few minutes for the information to load but once it is loaded will be easily accessible. If you continue to sequence the UP/DWN arrow keys you will be able to gather all the existing setup information for the unit in case it is lost or setup by someone else. This information is only available in this form from the front panel of the unit so direct access to the unit is needed in order to access this information. There is no username and password recovery routine that can be done without removing the unit from service and it really shouldn't ever be necessary.

Default Username is: **username** – lower case

Default Password is: **password** – lower case

4. Once the username and password have been entered the following screen should appear and then you can make the changes that you need to be compatible with your network including the name of the unit that will appear when you start the app and the username and password that you have selected.

Model:ISC-200, Firmware Revision: 6.6.3
Serial Number:100

Unit Name
UnitName

User Name
username

Password
password

MAC Address: 54:10:EC:D9:C5:D8

IP Address
192.168.1.109

IP Mask
255.255.255.0

DNS
192.168.1.1

Default Gateway
192.168.1.1

SNMP Port
161

SNMP Read Community
public

SNMP Write Community
private

Switch 1

Switch Name
SWITCH 1

A-Position Alias
SWITCH 1: POS A

B-Position Alias
SWITCH 1: POS B

Switch 2

Switch Name
SWITCH 2

A-Position Alias
SWITCH 2: POS A

B-Position Alias
SWITCH 2: POS B

Save

This screen allows the user to change the IP address, subnet mask and default gateway to match local LAN configuration. Contact your network administrator to obtain the correct settings. You can also name the switches and then create position names for each switch that will be familiar to operators. Click the [Save] after changes are made. **In order for the changes to take effect you must power cycle the ISC-200 unit for at least 5 seconds. Failure to do this will result in the unit remaining on the default settings**

NOTE: Be sure to record the new IP address before power cycling (see below).

It is strongly recommended that you record the new IP parameters, username and password:

NEW IP ADDRESS: _____

SUBNET MASK: _____

PORT ASSIGNMENT: _____

NEW USERNAME: _____

NEW PASSWORD: _____

Before moving on did you enter the information above? Please take a moment and do that right now.

To allow remote access to the ISC-200 your router and firewall must be configured to allow requests to **PORT 161** or whatever port you decide to use to pass to the IP address configured for the ISC-200. Failure to do so will prevent access to the ISC-200 from outside the local network. Port 161 is the default port and can be changed but the new port must be forwarded as well. A note about port assignments in general is that only open ports that are absolutely necessary for operation. Opening additional ports may make your equipment vulnerable to cyber prowling and attacks which may cause your equipment to be inaccessible via Ethernet.

5. Refer to page 15 of this manual for optional one time configuration items that require removing the top cover. It is best to do this on the workbench before installing the equipment in the rack.

IV. Connection to the ISC-200 with the ISC-200 Application Software

Once the initial configuration has been confirmed you can now connect to the unit using the supplied BDI ISC-200 Applications software. Do not attempt to use a browser as the browser interface is only for initial setup. The ISC APP is available on at https://broadcast-devices.com/support-html/ After installing the software by copying the APP folder onto on a Windows computer start the app executable and the open screen will appear as shown:
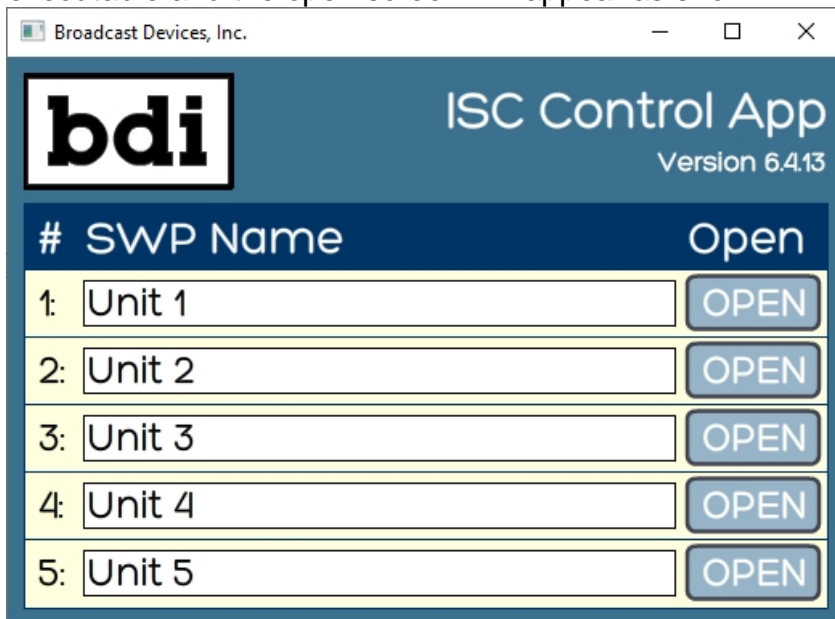
Up to 5 ISC-200 systems can be configured to run with the app. Choose the unit that is configured and select open. Once opened, the first thing to do is select the Network tab/Connection. The unit name will be that which you configured in the web setup screen for easy access.

Switch 1	Switch 2	Setup	Logging	
Connection	Servers	Switch 1	Switch 2	

SNMP

IP Address	192.168.1.109
Port	161
Read Community	public
Write Community	private

CONNECT

Unit Information

|	
Model	ISC-200-2T
Unit Name	UnitName
F/W Version	V1.0.26
LAN Version	6.6.3
Serial Number	100
Switch 1	SWITCH 1
Switch 2	SWITCH 2

Enter the IP Address, Port, Read/Write community information and then click on connect. If you have successfully connected to the unit the proper Unit Information should be displayed as shown. Make the other display settings as desired.

Next, it's a good idea to select the Servers tab and adjust the NTP server information and to select the correct time zone based on UTC for your local area. This is important for proper timed events to occur at the expected time and for logging events.

Switch 1	Switch 2	Setup	Logging	
Connection	Servers	Switch 1	Switch 2	

SNTP

Use SNTP	✖
Server	pool.ntp.org SET
Time Zone	◄ UTC-4 ► SET

Set Time - 24 Hour Format

```
+▲ ▲   ▲ ▲   ▲ ▲   +▲ ▲   ▲ ▲
 0 6 / 0 3 / 2 1    1 6 : 0 4    SET
-▼ ▼   ▼ ▼   ▼ ▼   -▼ ▼   ▼ ▼
 M M / D D / Y Y    H H : M M
```

Date and Time

Current	06/03/21 16:04:21

If you do not have access to a network time protocol server the time/date information can be adjusted and internal battery backed up real time clock will keep time. For time critical logging with correct time it is strongly recommended that network time protocol synchronization be used. The internal real time clock oscillator in the unit is very accurate the best way to keep the most accurate time is through use of an NTP server. The ISC-200 has a real time clock because it provides a log of each switch movement and power cycle to the unit which may be very useful in troubleshooting your plant.
Switch Setup Tabs:
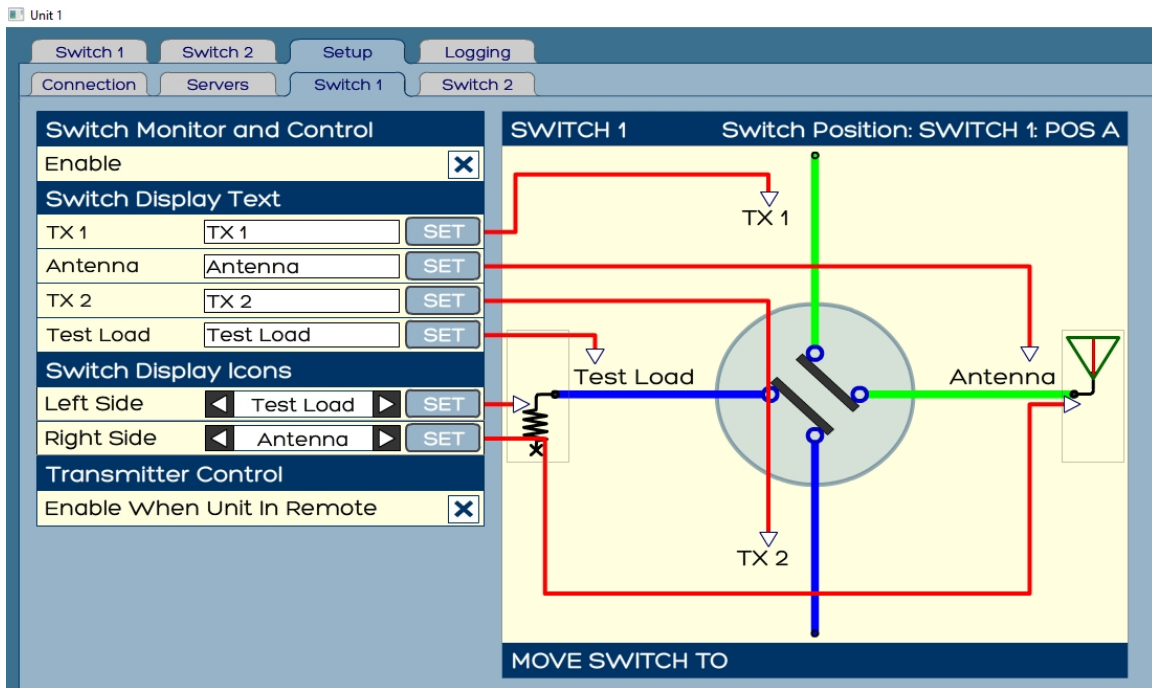
The switch tabs allow you to provide a specific name for each transmitter and load. You can also change the positions of the loads. The last selection is the enable so if you are only using one switch at present you can disable the other switch tab and it won't appear.

Logging Tab:
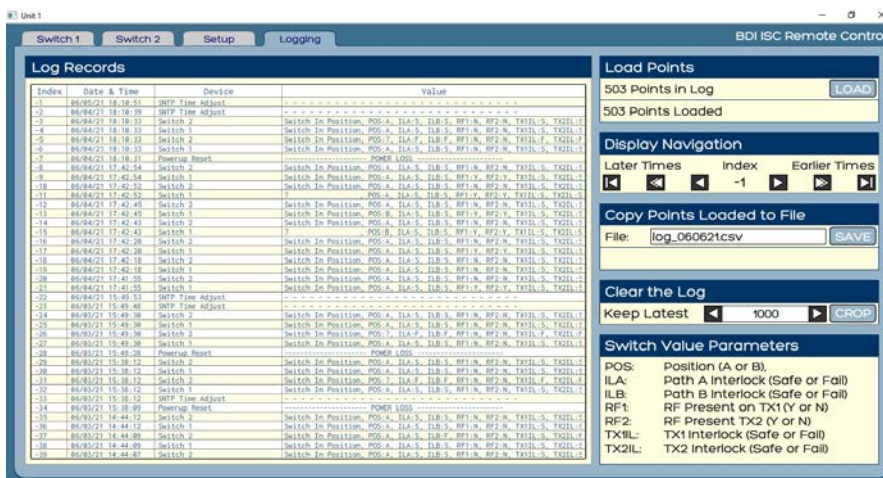
The ISC-200 logging tab allows the user the ability to display on screen the log of events and have the ability to save a log file. To load the points press the LOAD button. To save the log file give it a name and hit SAVE.

Switch Tabs:
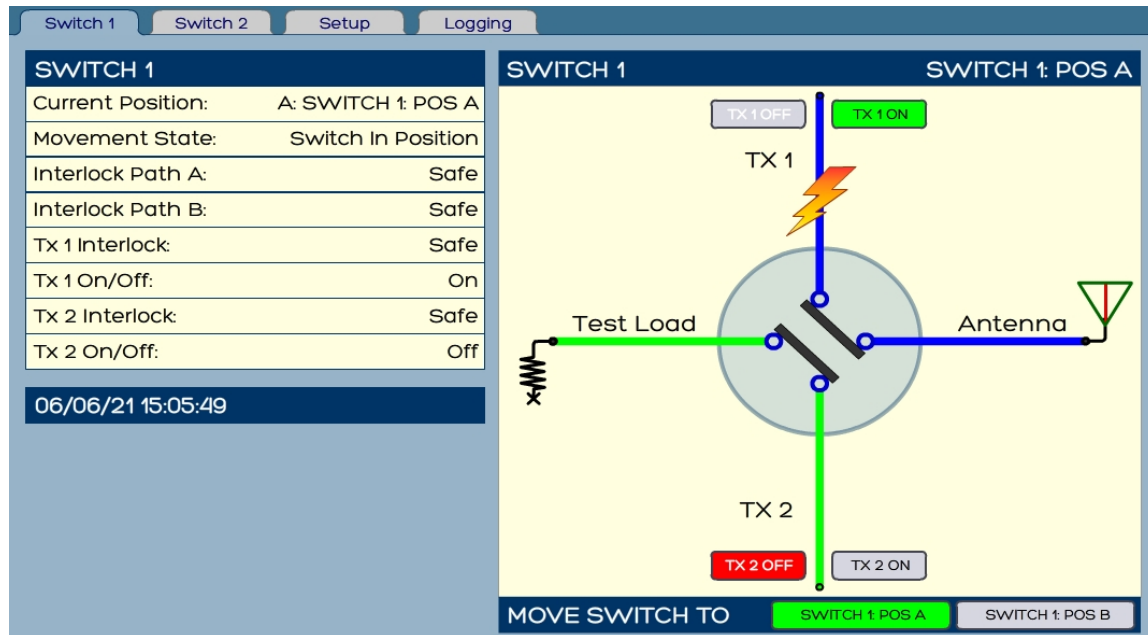
The switch tabs give you access to control turning on and off transmitter and selecting switch position.

V. Wiring Considerations and Optional Feature Configuration

The ISC-200 has the capability to automate the control of transmitters and switch operations with the touch of a button or the click of a mouse for remote operation. Selection of which transmitter is selected to each load is performed in one of four ways. First the front panel pushbuttons can be used to move each switch to either position and there is also provision from the front panel to turn each transmitter on and off. Some applications may require separate transmitter off and on control in addition to interlock closures managing transmitter on/off functions. Contacts are provided for both on J6 TX CTL/INTERLOCKS rear panel connector for switch 1 and J7 for switch 2. The wiring of these connectors is covered further on so keep reading you know you can do it! In addition front panel control instructions are also contained later in this manual. Some installations may call for interlock connections only to turn transmitters on and off. It is entirely up to the installer.

Rear Panel Connections

External interlock inputs are provided for each position of both switches on DSUB-15 connectors marked EXTERNAL INTERLOCK 1-2 Connect any external interlock inputs associated with each load in series between the pin associated with that mode and a control/status common pin. The ISC-200 automatically "steers" the interlock connections to the transmitters according to the position of the RF switches. **FAILURE TO MAKE CONNECTIONS TO THE EXT. INTERLOCK 1/2 CONNECTOR(S) WILL RESULT IN NO INTERLOCK CLOSURE OPERATION OF THE TX 1 and TX 2 INTERLOCK RELAYS! If no external interlock paths exist simply place jumpers across the pins shown on page ( ) – External Interlock connector for the respective switch 1 and/or 2.**

A. ISC-200 Install the unit in a suitable EIA rack enclosure.

As a safety precaution, never install a switch controller to a switch system that has radio frequency energy present on it or where AC/DC control power is applied. This can be dangerous and can easily damage a switch!

1. Before applying power to the ISC-200 or to the switch assembly, connect the DSUB-15 connector to the motorized switch cable or using an optional BDI switch interface cable if supplied or your own if you have made it yourself. Refer to section (VIII.) typical Switch Connections Diagrams section for suggested wiring details for most motorized switches available. If you are attempting to interface a switch assembly not covered in this section please contact the factory for assistance with your switch assembly. The DSUB-15 connection plugs into the ISC-200 "SWITCH 1 and/or 2" connector inputs on the rear of the unit. These connections are the only control/status connections to the switches required. Control of the switches, position status and interlock control are all handled by these two DSUB-15 cables, one for each switch. Additional switch position and/or interlock connections may be available on the respective manufacturer's switch connector if desired for some other use.

2. Next, apply power the ISC-200 and observe the front panel. If all connections are made properly and the switches are correctly seated in positions A (1) or B (2), the front panel display should indicate the present position of the switch assemblies. This is the default indication on the front panel of the unit as shown. Note the "R" in the upper left hand corner of the display. This indicates that the unit it in remote mode. To switch to local mode use the UP/DWN arrow keys to place it in the local mode which prevents all remote control of the unit for safety purposes.
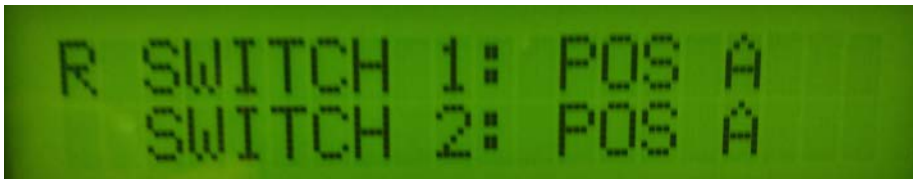
 If the switch assemblies are not connected properly or are in the middle of their travel, the front panel will indicate "Check Switch for the affected switch. In this case check that the switches are seated properly by applying A.C. power to the switch(es) **WITHOUT RF POWER APPLIED!** For some manufactures if a switch is in mid travel it will go to the position that the switch internal latching relay commands it to be in. Exercise extreme caution when doing this and do not have RF applied to the switch as damage may result if the interlock connections have not been made to the transmitters. Some switch manufacturers do not use latching relays and when plugged into an AC source will remain in the last selected position. Recheck the ISC-200 display for proper position indication. If the ISC-200 still shows "Check Switch" then the most probable cause is a defective interface cable or a problem with the switch electronics.

3. Make all connections to ISC-200 rear panel connectors according to connector diagrams on pages (17-19). There are separate TX CTL/INT. connectors for each set of transmitters to be connected to each switch. J6 connector is for SWITCH 1 and J7 connector is for SWITCH 2. Note that the common connection for command and status is ground. The interlock connections are dry contact relays with 24 VDC 3 Ampere contact ratings which can be interfaced to an external interlock as desired.

Frequently asked Questions including Interlock Relay Operation:

Question 1: How do the ISC-200 interlock relays function?

Answer 1: The ISC-200 system is designed to be a "failsafe" system. This means that the ISC-200 provides interlock closures only when the ISC-200 has electrical power and the conditions in answer 2 are met below. This means that the ISC-200 will drop your interlocks (connection between NO and C relay contacts) if power is removed from the ISC-200 chassis or the ISC-200 fails. Failsafe by definition means that failure of the "system" designed to protect life and/or equipment must fail in a _**safe**_ way. If the ISC-200 fails it can no longer protect your transmission system from damage and therefore shut down your transmitter.

Question 2: Which set of contacts should I use, normally open/common or normally closed/common?

Answer 2: It depends on your transmitter manufacturer specification. Most manufacturers require a closure between their "external interlock" connections for the transmitter to operate. If this is the case with your transmitters then you need to connect the external interlock connection of the transmitter to the ***normally open*** and ***common*** connections on ISC-200 respective TX. CTL/INTERLOCKS. Here is why. With all connections made to the ISC-200 the ISC-200 will provide interlock closure on the normally open/common (relays energized) connections provided that:

1. All switches are in position and properly connected showing position status
2. All external interlock connections are closed either by being connected to a valid external interlock such as a dummy load air or water flow switch, lock out tag out switch or patch panel. Remember if no such external interlocks exist the external interlock inputs must be jumpered or the transmitter interlocks will not close to the transmitters.

Interlock Path Connectors – "External Interlock" connectors 1, 2
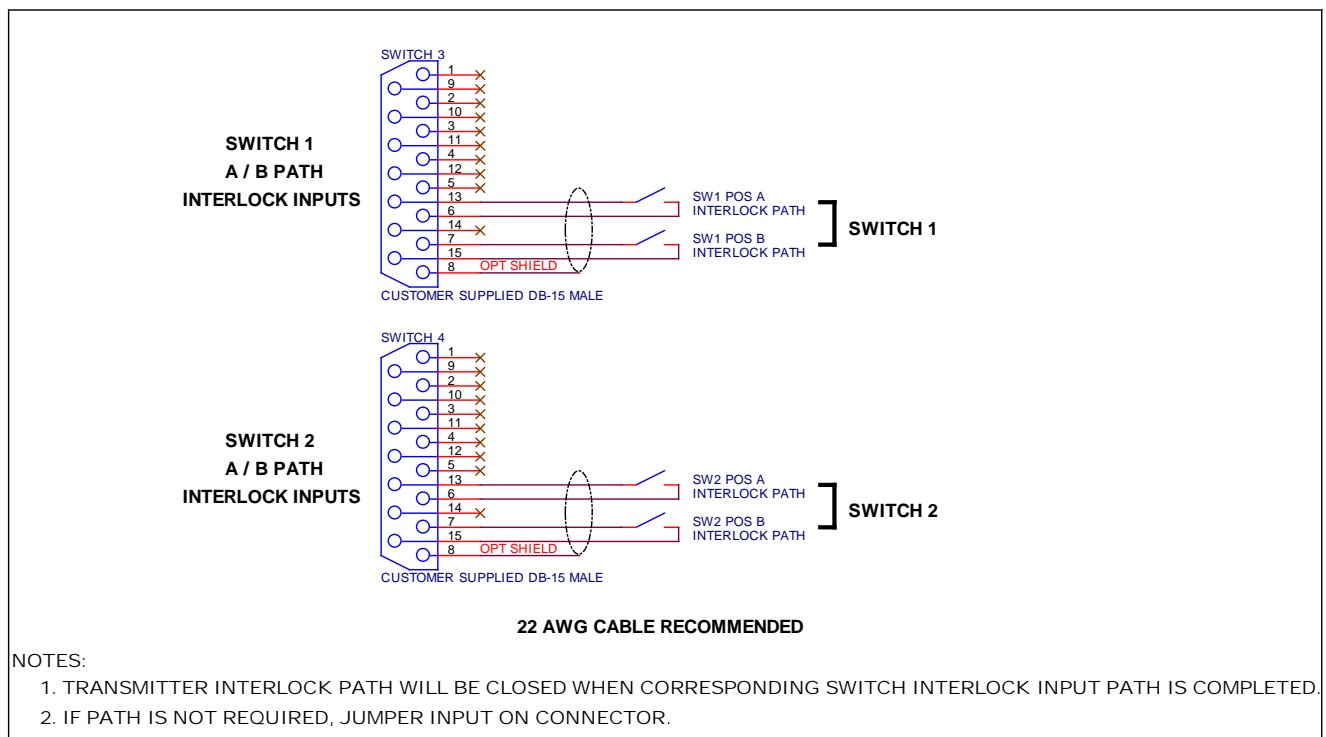
Optional Feature Configuration

The ISC-200 was designed to provide three additional user defined features. These features can be turned on or off by the installer at time of installation. First is the ability to reverse the status of the position of each switch. By default the unit assumes position A/1 to be that which the switch manufacturer designates as position A/1. If a switch is installed so that the B/2 position is the normal operating position this can be changed by setting the first two front panel DIP switches according to the chart below. This essentially reverses the status of the switch position.

Second the ISC-200 can be configured to accept relay closures from BDI DPS-100D series power meters when Relay 2 of the DPS-100D meter is configured for RF Presence. When this is done it is possible to have safe switch operations of an RF switch in that switch movement is prevented if the RF presence relay is de energized and makes connection to the proper pin of rear panel J2 RF Safe DSUB-25 connector. Refer to the "RF Safe Input" connector diagram for connection between the DPS-100D series power meter and the ISC-200 connector J2 on the rear panel of the ISC-200.

The third optional feature is whether the ISC-200 accepts a TX ON status from a transmitter. There is provision to apply these status inputs to J3 and J4 SW Local CTL/STATUS connectors for both switches. When this option is enabled status from the actual transmitter will be provided. When this feature is defeated (which is the factory default) TX ON/OFF status is provided based upon the command inputs to the GUI, local control or from an SNMP based remote control. This is a form of "artificial status" only indicating that the command was sent.

ISC-200 FRONT PANEL DIP SWITCH S1 CONFIGURATION

FP DIP SWITCH	FUNCTION
1	ON = SWITCH 1 REVERSE
2	ON = SWITCH 2 REVERSE
3	ON = RF SAFE INPUTS ENABLED
4	ON = TX ON TALLYS ENABLED

To change the DIP switch settings you must remove the top cover by removing 5 screws from the top rear cover, 2 on each side and the three top screws of the front panel. The switch is located near the center of the board. The switch numbers are from left to right when viewed from the front of the unit 1-4. Slide them down to turn them "ON" and slide them up to turn them OFF. Default state from the factory is all four switches off defeating the optional feature.

The RF Safe connector inputs to J2 RF Safe Input connector are shown below:

ISC-200 RF SAFE INPUTS

SWITCH	PATH	RF SAFE INPUT – LOW WHEN RF IS NOT PRESENT
1	A	FRONT PANEL DB-25 PIN 6
	B	FRONT PANEL DB-25 PIN 7
2	A	FRONT PANEL DB-25 PIN 8
	B	FRONT PANEL DB-25 PIN 9

External Wiring to Transmitters and Remote Controls

Wiring to your transmitters requires at minimum the external interlock input to each transmitter from the ISC-200 TX CTL./INTERLOCKS connectors J6,7 Additional connections can be made to TX OFF and TX ON inputs to your transmitter. Each time the ISC-200 is commanded to make a switch movement the following sequence occurs:

1. External Interlock NO/C connection is broken
2. TX OFF command is issued
3. Switch command is executed
4. Once switch is moved to new position External Interlock NO/C connection is restored

Refer to wiring diagrams that follow on page 17 for connector pin configuration transmitter connection and for legacy GPIO remote control connection. Note that BDI offers prewired TX CTL cable assemblies for specific transmitter models and a generic kit is available for legacy transmitters. Call the factory for more information. These kits allow for quick installation along with our optional RF switch interface cable kits available for all models switches shown in section VIII.

TX CTL/INT connectors J6 and J7 are generally the only connections that are needed in addition to the switch interface and external interlock connections. J3 and J7 Local SW Local Control Status connectors are provided for legacy non SNMP type remote controls or for local lighted pushbutton switch panels. It is strongly recommended to use the SNMP v2 interface via the Ethernet connector for newer SNMP equipped remote controls and third party software such as that available from Rohde &Schwarz and MNC software.

J6 - SW1 TX CTL / INTERLOCKS

```
 1  ──▷  SWITCH1 TX1 INTERLOCK RELAY 1 COM
14  ──▷  SWITCH 1 TX1 INTERLOCK RELAY 1 N/C
 2  ──▷  SWITCH 1 TX1 INTERLOCK RELAY 1 N/O
15  ──────────────▷  SWITCH 1 TX1 INTERLOCK RELAY 2 COM
 3  ──────────────▷  SWITCH 1 TX1 INTERLOCK RELAY 2 N/C
16  ──────────────▷  SWITCH 1 TX1 INTERLOCK RELAY 2 N/O
 4  ──▷  SWITCH 1 TX1 TX OFF COM
17  ──▷  SWITCH 1 TX1 TX OFF N/C
 5  ──▷  SWITCH 1 TX1 TX OFF N/O
18  ──────────────▷  SWITCH 1 TX1 TX ON COM
 6  ──────────────▷  SWITCH 1 TX1 TX ON N/C
19  ──────────────▷  SWITCH 1 TX1 TX ON N/O
 7  ──▷  SWITCH 1 TX2 INTERLOCK RELAY 1 COM
20  ──▷  SWITCH 1 TX2 INTERLOCK RELAY 1 N/C
 8  ──▷  SWITCH 1 TX2 INTERLOCK RELAY 1 N/O
21  ──────────────▷  SWITCH 1 TX2 INTERLOCK RELAY 2 COM
 9  ──────────────▷  SWITCH 1 TX2 INTERLOCK RELAY 2 N/C
22  ──────────────▷  SWITCH 1 TX2 INTERLOCK RELAY 2 N/O
10  ──▷  SWITCH 1 TX2 TX OFF COM
23  ──▷  SWITCH 1 TX2 TX OFF N/C
11  ──▷  SWITCH 1 TX2 TX OFF N/O
24  ──────────────▷  SWITCH 1 TX2 TX ON COM
12  ──────────────▷  SWITCH 1 TX2 TX ON N/C
25  ──────────────▷  SWITCH 1 TX2 TX ON N/O
13  ──┴
```

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DUPLICATE INTERLOCK RELAYS FOR EACH TRANSMITTER

J3 - SW1 LOCAL CTL/STATUS

```
 1  ──◁  SWITCH 1 POS A COMMAND INPUT
14  ──◁▷  COMMAND COMMON
 2  ──────────────▷  SWITCH 1 POS A STATUS OUTPUT
15  ──◁  SWITCH 1 POS B COMMAND INPUT
 3  ──◁▷  COMMAND COMMON
16  ──────────────▷  SWITCH 1 POS B STATUS OUTPUT
 4  ──◁  SWITCH 1 TX1 OFF COMMAND INPUT
17  ──◁▷  COMMAND COMMON
 5  ──────────────▷  SWITCH 1 TX1 OFF STATUS OUTPUT
18  ──◁  SWITCH 1 TX1 ON COMMAND INPUT
 6  ──◁▷  COMMAND COMMON
19  ──────────────▷  SWITCH 1 TX1 ON STATUS OUTPUT
 7  ──◁  SWITCH 1 TX2 OFF COMMAND INPUT
20  ──◁▷  COMMAND COMMON
 8  ──────────────▷  SWITCH 1 TX2 OFF STATUS OUTPUT
21  ──◁  SWITCH 1 TX2 ON COMMAND INPUT
 9  ──◁▷  COMMAND COMMON
22  ──────────────▷  SWITCH 1 TX2 ON STATUS OUTPUT
10  ──◁▷  COMMAND COMMON
23  ──◁  SWITCH 1 TX1 ON/OFF TALLY
11  ──────────────▷  SWITCH 1 TX1 INTERLOCK STATUS OUTPUT
24  ──◁  SWITCH 1 TX2 ON/OFF TALLY
12  ──▷  +12V 1A MAX
25  ──────────────▷  SWITCH 1 TX2 INTERLOCK STATUS OUTPUT
13  ──┴
```

CONN-D25M

NOTE: TX1 & TX2 ON/OFF TALLY DISABLED BY DEFAULT
SEE MANUAL FOR DETAILS

J7 - SW2 TX CTL / INTERLOCKS

Pin	Signal
1	SWITCH 2 TX1 INTERLOCK RELAY 1 COM
14	SWITCH 2 TX1 INTERLOCK RELAY 1 N/C
2	SWITCH 2 TX1 INTERLOCK RELAY 2 COM
15	SWITCH 2 TX1 INTERLOCK RELAY 2 COM
3	SWITCH 2 TX1 INTERLOCK RELAY 2 N/C
16	SWITCH 2 TX1 INTERLOCK RELAY 2 N/O
4	SWITCH 2 TX1 TX OFF COM
17	SWITCH 2 TX1 TX OFF N/C
5	SWITCH 2 TX1 TX OFF N/O
18	SWITCH 2 TX1 TX ON COM
6	SWITCH 2 TX1 TX ON N/C
19	SWITCH 2 TX1 TX ON N/O
7	SWITCH 2 TX2 INTERLOCK RELAY 1 COM
20	SWITCH 2 TX2 INTERLOCK RELAY 1 N/C
8	SWITCH 2 TX2 INTERLOCK RELAY 1 N/O
21	SWITCH 2 TX2 INTERLOCK RELAY 2 COM
9	SWITCH 2 TX2 INTERLOCK RELAY 2 N/C
22	SWITCH 2 TX2 INTERLOCK RELAY 2 N/O
10	SWITCH 2 TX2 TX OFF COM
23	SWITCH 2 TX2 TX OFF N/C
11	SWITCH 2 TX2 TX OFF N/O
24	SWITCH 2 TX2 TX ON COM
12	SWITCH 2 TX2 TX ON N/C
25	SWITCH 2 TX2 TX ON N/O
13	

DB-25M

DUPLICATE INTERLOCK RELAYS FOR EACH TRANSMITTER

J4 - SW2 LOCAL CTL/STATUS

Pin	Signal
1	SWITCH 2 POS A COMMAND INPUT
14	COMMAND COMMON
2	SWITCH 2 POS A STATUS OUTPUT
15	SWITCH 2 POS B COMMAND INPUT
3	COMMAND COMMON
16	SWITCH 2 POS B STATUS OUTPUT
4	SWITCH 2 TX1 OFF COMMAND INPUT
17	COMMAND COMMON
5	SWITCH 2 TX1 OFF STATUS OUTPUT
18	SWITCH 2 TX1 ON COMMAND INPUT
6	COMMAND COMMON
19	SWITCH 2 TX1 ON STATUS OUTPUT
7	SWITCH 2 TX2 OFF COMMAND INPUT
20	COMMAND COMMON
8	SWITCH 2 TX2 OFF STATUS OUTPUT
21	SWITCH 2 TX2 ON COMMAND INPUT
9	COMMAND COMMON
22	SWITCH 2 TX2 ON STATUS OUTPUT
10	COMMAND COMMON
23	SWITCH 2 TX1 ON/OFF TALLY
11	SWITCH 2 TX1 INTERLOCK STATUS OUTPUT
24	SWITCH 2 TX2 ON/OFF TALLY
12	+12V 1A MAX
25	SWITCH 2 TX2 INTERLOCK STATUS OUTPUT
13	

CONN-D25M

NOTE: TX1 & TX2 ON/OFF TALLY DISABLED BY DEFAULT

SEE MANUAL FOR DETAILS

To wire connector J2 RF Safe Connector use the following diagram for connector pin information:

J2 - RF SAFE INPUT

CONN-D25M

SWITCH 1 POS A RF SAFETY INPUT
RF SAFETY INPUT COMMON
SWITCH 1 POS B RF SAFETY INPUT
RF SAFETY INPUT COMMON
SWITCH 2 POS A RF SAFETY INPUT
RF SAFETY INPUT COMMON
SWITCH 2 POS B RF SAFETY INPUT
RF SAFETY INPUT COMMON

Refer to the DPS-100D series Technical manual for conection information to the RF safe relay. Note: Use the NC/C connection for this function.

VI. Front Panel Operation of the ISC-200 Site Controller Chassis

Local/Remote – In the remote position allows the unit to accept commands from both J3/4 Local CTL/STATUS connector inputs and web interface remote control. In the local position the unit will respond only to front panel commands. To enable remote operation press the up arrow on the front panel. Remote operation will be designated by an "R" in the upper left hand corner of the display. To enable local operation press the down arrow. Local operation will be designated by an "L" in the upper left hand corner of the display.

System Information – This menu item allows you to interrogate the unit to determine ISC and LAN firmware revisions, IP address, subnet mask, port, read and write community passwords and username and password for remote access.

To change the display to this mode press the red "X" button. This can only be done on site with access to the unit to prevent a security breach. It assumes that anyone gaining access to the site has authorization to do so.

Switch Control – To access the switch control menu press the green check mark key. The display shown below will be shown. The current position of the switch will be shown in a steady state. The "next" switch position will be shown blinking at a 1 Hz. Rate. To select a switch position press the appropriate F key as shown.
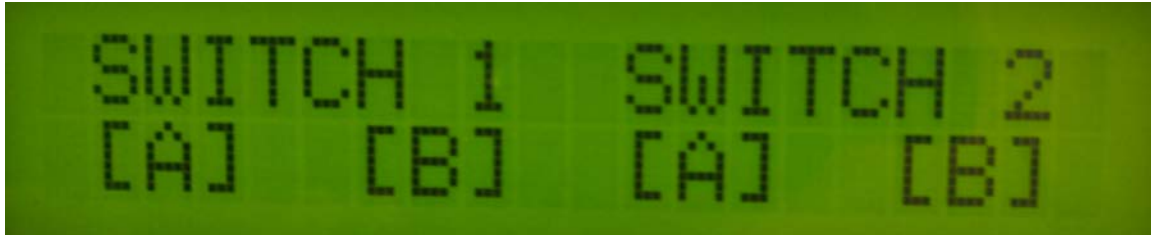
    F1   **F2**   **F3**   **F4**

TX Control – To access the transmitter control for Switch 1 press the left arrow button. The display will change to the one shown below:
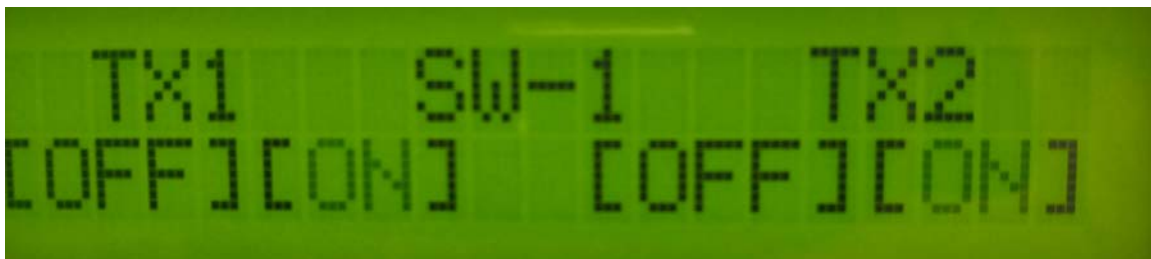
    F1   **F2**   **F3**   **F4**

The last action will be a steady on indication. The "next" action will flash at a 1 Hz rate. To actuate the OFF command for TX1 press F1. To actuate the On command for TX 1 press F2. To actuate the OFF command for TX 2 press F3. To actuate the ON command for TX2 press F4. A similar menu appears for Switch 2 by pressing the right arrow key. Functions are identical to those described above.

Note: These menus will time out on their own after 30 seconds of disuse. To exit a menu before time out press the red X key.

## Basic Theory of Operation:

Upon front panel or remote control command the ISC-200 operation sequence is as follows:

1. Command from the CPU board is issued to the transmitter control/interlock board to issue a TX OFF (PLATE OFF) command and open the safety interlocks of both transmitters connected to the four port switch prior to its movement.
2. Approximately 2 seconds after these commands are issued the ISC-200 issues a switch command to the appropriate pin of the SWx I/O interface connector.
3. Once the switch reaches its commanded position the ISC-200 receives new position information from the switch via the SWx I/O interface connectors and issues an interlock closure command. Approximately 2 seconds later the chosen "Position relay" closes the ISC-200 connects the correct A/B interlock path inputs to the transmitters for the path they are feeding.

Note:

It convention that the ISC-200 uses the use of A and B positions and A and B transmitters is interchangeable with 1 and 2 throughout this manual and the unit status. TX 1 = TX A, TX 2 = TX B, additionally Switch POS A = SWITCH POS 1 and SWITCH POS B = SWITCH POS 2. The ISC-200 assumes switch position A or 1 to be TX 1 or A feeding the AIR path and SWITCH POS B or 2 to be TX 2 feeding the AIR path.

The accompanying diagrams show the switch position relative to the interlock steering for each position and transmitter. The only connections needed at the transmitter external interlock input are those that are connected to the J7/P7 TX CTL/INTERLOCKS connector. This allows the ISC-200 to steer the interlocks for a given path to the appropriate transmitter.

21
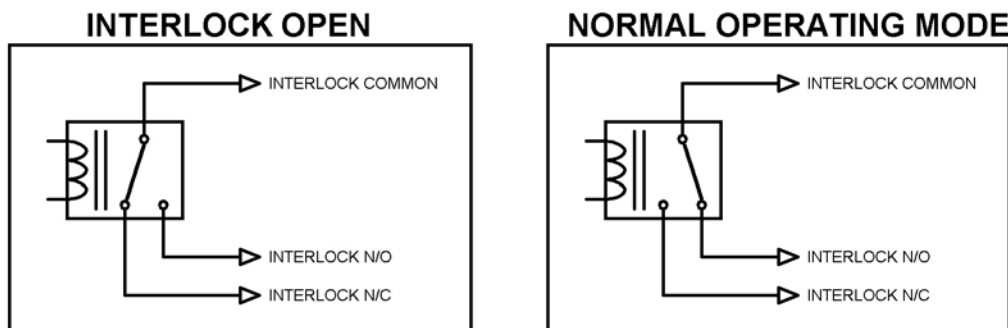
VI. Specifications

ISC-200-1/2

Control Input	Momentary contact to ground or SNMP v2
Status Output	Open collector output – Active Low pulled up to 5 VDC
Drive Output to Switch	Dry relay form C contact closure Contact Rating 24VDC @3A.
LAN connection	RJ45 TCP/IP – SNMP v2 Agent
Physical Specification	19" L X 1.75" H X 10" D – Standard EIA rack
Electrical Requirements	100-240 VAC 50-60 Hertz
Environmental	0 – 60 degrees C. non condensing atmosphere

VII. Warranty

Broadcast Devices, Inc. products manufactured for Electronics Research, Inc. are warranted against failure due to faulty materials or workmanship for a period of two years from the date of shipment to the ultimate user. The warranty covers repair or replacement of defective parts at the factory, provided the unit has been returned prepaid by the user. All shipments to the factory shall have affixed to the outside of the container an R. A. number obtained from the factory. The above warranty is void if the unit has been modified by the user outside of any recommendations from the factory or if the unit has been abused or operated outside of its electrical or environmental specifications. If customer conducted field tests suggest that the unit may be faulty, whether or not the unit is in warranty, a full report of the difficulty should be sent to Broadcast Devices, Inc. factory at Buchanan, New York. The office may suggest further tests or authorize return for factory evaluation.

Units sent to the factory should be well packed in the original packing if possible and shipped to Broadcast Devices, Inc. Please go to www.broadcast-devices.com for shipping address. Remember to affix the R.A. number to the outside of the carton. Any packages received without such R.A. number will be refused. Note: freight collect shipments will also be refused. When the unit has been received, inspected and tested, the customer will receive a report of the findings along with a quotation for recommended repairs, which are found falling outside of the standard warranty. Units returned for in-warranty repairs which are found not to be defective will be subject to an evaluation and handling charge. In-warranty units will be repaired at no charge and returned via prepaid freight.

Out-of-warranty units needing repair require a purchase order and will be invoiced for parts, labor, and shipping charges.

When ordering replacement part, always specify A) Part number or Description, and Quantity; B) Date of Purchase, Where Purchased; C) Any Special Shipping Instructions. Always specify a street address, as shipping companies cannot deliver to a postal box.

Broadcast Devices, Inc. is not responsible for any other manufacturer's warranty on original equipment. Nor are we responsible for any failure, damage, or loss of property that may occur due to the installation or operation of our equipment outside of recommended specifications.
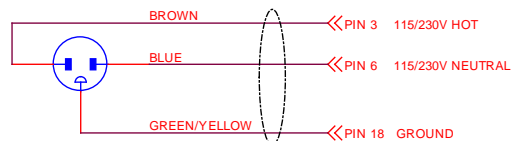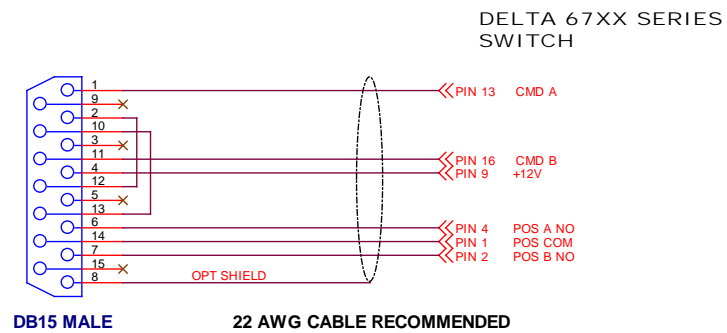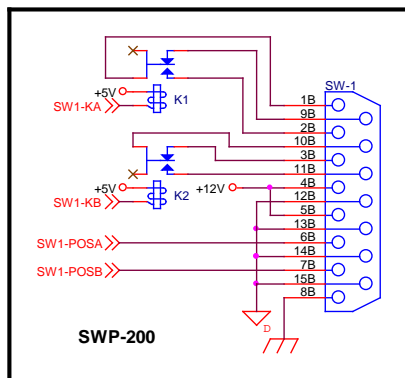
Broadcast Devices, Inc. may from time to time make changes to the materials used in the manufacture of its equipment and reserves the right to do so without further notice.

VIII. Typical Switch Connection Diagrams

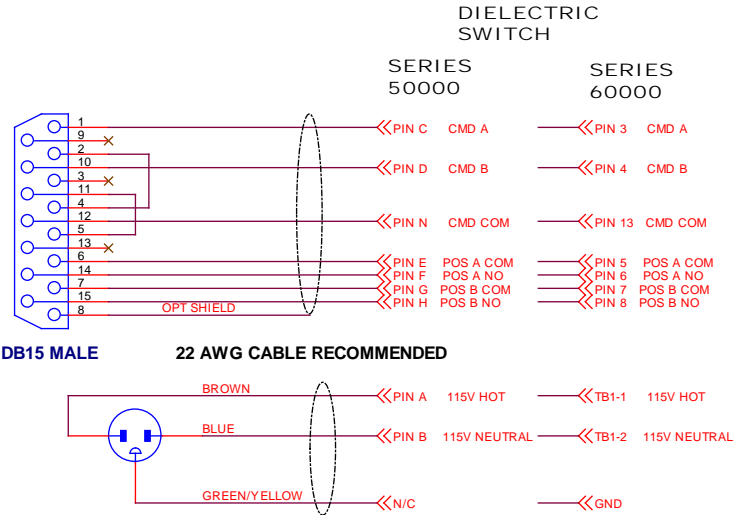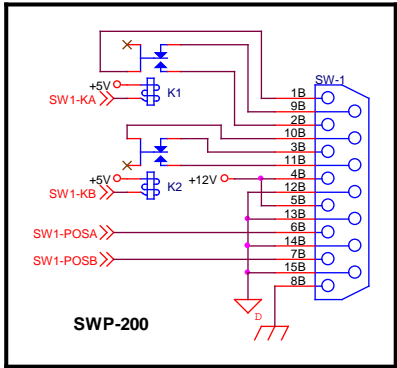### *Electronics Research, Inc. Coaxial and Waveguide Motorized Switches*
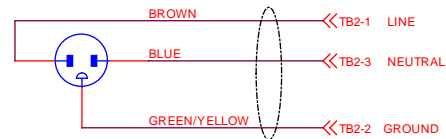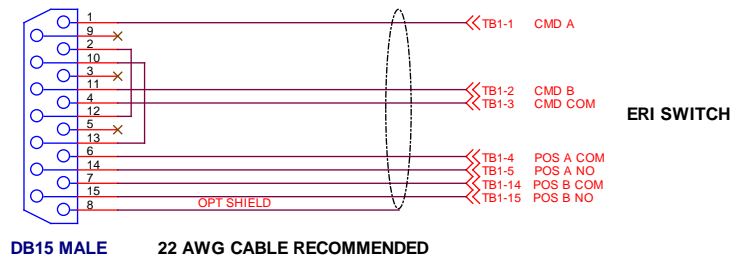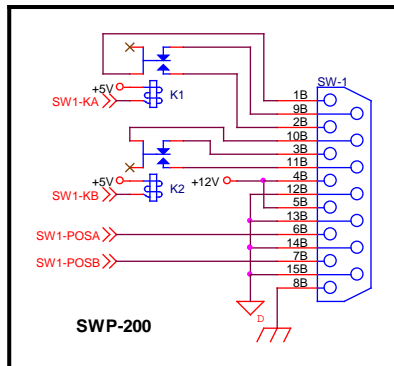
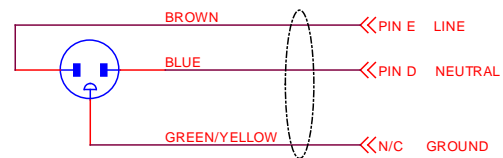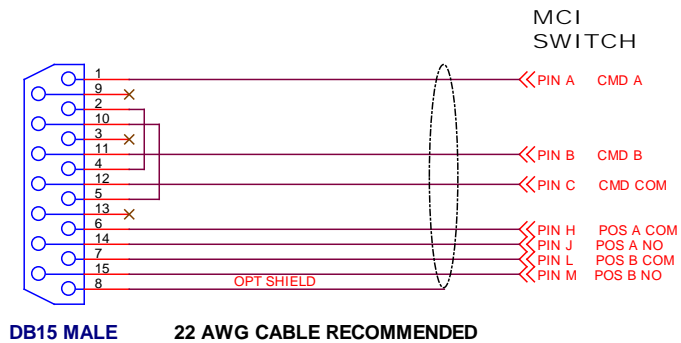### *Delta Electronics. Motorized Coaxial Switches*
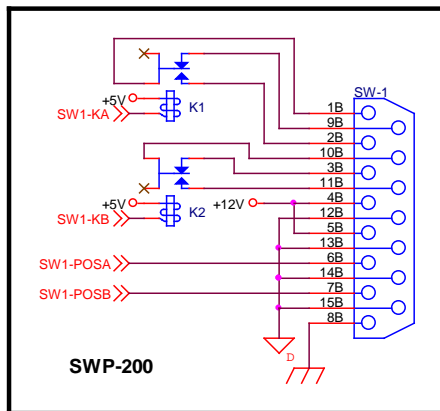

NOTE:
SWITCH MUST HAVE DELTA D42-87-1 12V RELAY
KIT INSTALLED.

Dielectric/SPX 50000/60000 Series Coaxial Switches

DIELECTRIC SWITCH

SERIES 50000

SERIES 60000

SWP-200

+5V SW1-KA K1
+5V SW1-KB K2 +12V
SW1-POSA
SW1-POSB

SW-1

1B 9B 2B 10B 3B 11B 4B 12B 5B 13B 6B 14B 7B 15B 8B

D

DB15 MALE

22 AWG CABLE RECOMMENDED

1 9 2 10 3 11 4 12 5 13 6 14 7 15 8

OPT SHIELD

SERIES 50000		SERIES 60000	
PIN C	CMD A	PIN 3	CMD A
PIN D	CMD B	PIN 4	CMD B
PIN N	CMD COM	PIN 13	CMD COM
PIN E	POS A COM	PIN 5	POS A COM
PIN F	POS A NO	PIN 6	POS A NO
PIN G	POS B COM	PIN 7	POS B COM
PIN H	POS B NO	PIN 8	POS B NO

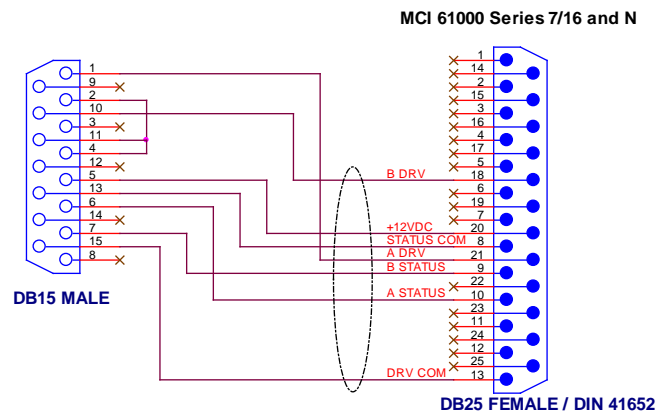| BROWN | PIN A | 115V HOT | TB1-1 | 115V HOT |
| BLUE | PIN B | 115V NEUTRAL | TB1-2 | 115V NEUTRAL |
| GREEN/YELLOW | N/C | | GND | |

Mega/MCI and MCI/Rymsa Coaxial Motorized Switches

SWP-200

DB15 MALE   **22 AWG CABLE RECOMMENDED**

MCI SWITCH

PIN A   CMD A
PIN B   CMD B
PIN C   CMD COM
PIN H   POS A COM
PIN J   POS A NO
PIN L   POS B COM
PIN M   POS B NO
OPT SHIELD

BROWN   PIN E   LINE
BLUE   PIN D   NEUTRAL
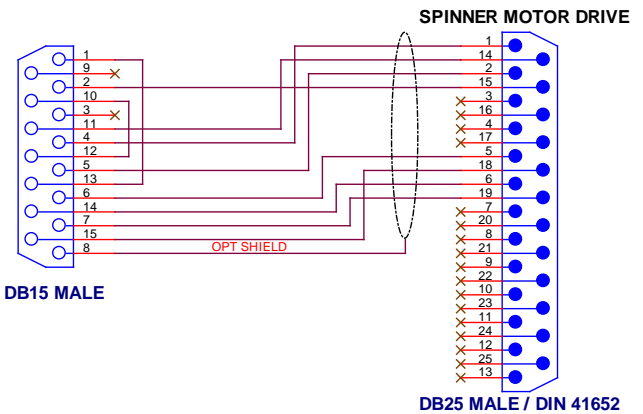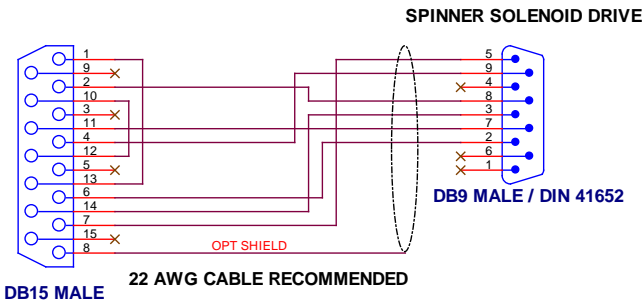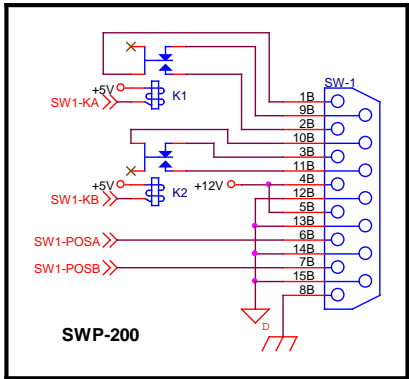GREEN/YELLOW   N/C   GROUND

NOTES:
1. CONNECTOR: MIL TYPE MS3102A2214P
2. SWITCH MUST HAVE K1 INSTALLED FOR 12VDC OPERATION.
3. K1 P/N: 7/8" & 3 1/8" SWITCHES: DS2E-ML2-DC12V - ALLIED 788-1057
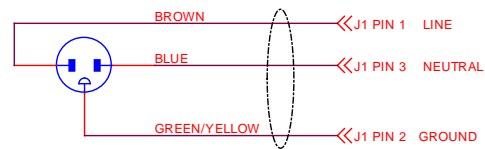4. K1 P/N: 4 1/16" & 6 1/8" SWITCHES: KUL11D15D-12 - ALLIED 886-0129

MCI 61000 7/16 DIN/N Type Switch

SWP-200

DB15 MALE

MCI 61000 Series 7/16 and N

B DRV
+12VDC
STATUS COM
A DRV
B STATUS
A STATUS
DRV COM

DB25 FEMALE / DIN 41652

26
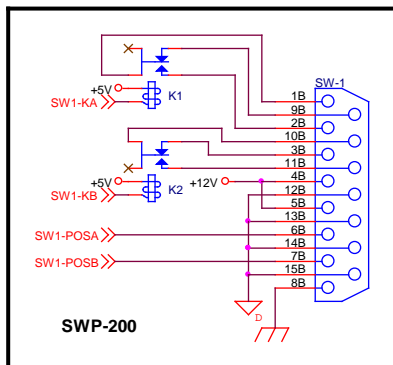
Spinner GMbH Motorized Switch Series

SPINNER SOLENOID DRIVE

DB9 MALE / DIN 41652

22 AWG CABLE RECOMMENDED

DB15 MALE

OPT SHIELD

SPINNER MOTOR DRIVE

DB25 MALE / DIN 41652

DB15 MALE

OPT SHIELD

SWP-200

SW-1

SW1-KA   +5V   K1

SW1-KB   +5V   K2   +12V

SW1-POSA

SW1-POSB

1B
9B
2B
10B
3B
11B
4B
12B
5B
13B
6B
14B
7B
15B
8B

Myat 201-180-X Motorized Switch Series

MYAT 201-180-X SWITCH

SWP-200 / DB15 MALE / 22 AWG CABLE RECOMMENDED

J2 PIN 1 CMD A
J2 PIN 2 CMD B
J2 PIN 3 CMD COM
J2 PIN 24 INDICATOR +12V
J2 PIN 16 POS A COM
J2 PIN 17 POS A NO
J2 PIN 7 POS B COM
J2 PIN 8 POS B NO
OPT SHIELD

BROWN — J1 PIN 1 LINE
BLUE — J1 PIN 3 NEUTRAL
GREEN/YELLOW — J1 PIN 2 GROUND
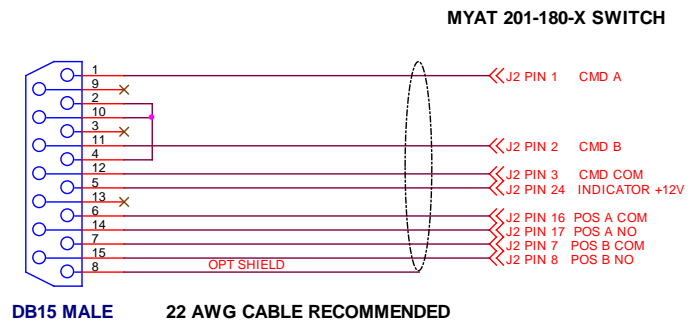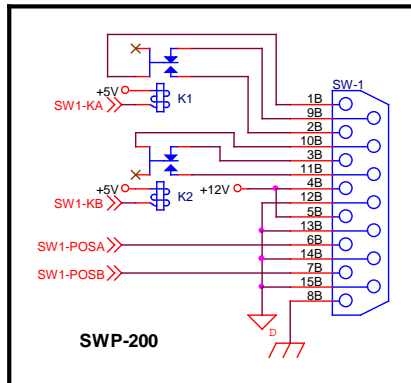
NOTES:

1. 24 PIN CONTROL CONNECTOR: MYAT P/N 180-135
2. SWITCH MUST HAVE K1 - MYAT P/N 175-40 INSTALLED FOR 12VDC OPERATION

Dow Key Solenoid Type 412-420132, 412-480132, 412-430132 Switch Series

DOW KEY SWITCH

SWP-200 / DB15 MALE / 22 AWG CABLE RECOMMENDED

PIN 1 CMD 1 — COIL 1
PIN 3 CMD 2 — COIL 2
PIN 2,4 CMD COM
PIN 5 POS 1 NO
PIN 7 POS 2 NO
PIN 6 POS COMMON
OPT SHIELD
POS STATUS