SCT-8 / SCR-8

CONTACT SUPERVISORY & CONTROL SYSTEM

INSTRUCTION BOOK

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DESCRIPTION

These devices transmit relay contact control and alarm signals over any digital or analog audio link. The control signal is encoded in the audio channel prior to digitizing so it works with all digital compression systems. This system can be used with any existing audio programming to provide contact command and control information carried on the audio signal itself. Use this on your (STL) Studio To Transmitter Link or microwave system to send and receive contact information for remote control and telemetry from your transmitter site or any remote facility.

Contact closures at the SCT-8 transmitter input will be repeated as relay contact closures at the SCR-8 receiver output. The unit can be ordered with supervised resistance contact input and outputs.

The SCT-8 SUPERVISORY CONTROL TRANSMITTER and the SCR-8 SUPERVISORY CONTROL RECEIVER together make up an 8 channel alarm and control system. The transmitter unit uses a small portion of the 19KHz spectrum in the audio to insert coded contact information. At the other end of the audio link the receiver decodes the contact information and then removes the coded signal from the audio.

Simply feed your program audio into the SCT-8 prior to digital encoding and recover the program audio at the other end of the system and feed it into the SCR-8. When you close a contact at the SCT-8 a relay will close at the SCR-8.

As many as 8 Transmitters and any number of receivers may be placed on one audio signal to give you up to 64 contact alarms. There is a separate system alarm contact on the receiver that will operate upon loss of power to the transmitter terminal or loss of transmission path (audio link failure). This system can be used with existing audio in the 19KHz mode, or use it without program audio in the 1.5KHz mode. These two modes of operation will give you maximum flexibility with your installation.

When audio is applied to the SCT-8 a small portion of the audio spectrum around 19KHz is cleared to make way for a data carrier. That carrier is inserted onto the audio program material at a -45dBm level. Since the carrier is at 19KHz it will not be audible for most listeners. The carrier level is injected at -45dBm to minimize loading of the audio level on your system. After the signal is received by the SCR-8 the carrier signal is then removed from the program audio content.

In this way you can control equipment at the transmitter site over the STL or monitor conditions at the site. The ability to transmit contact controls to the transmitter site or anywhere you need to have them will help you to maintain control of your system. Can you think of a place in your system that you could use remote contact control? If so this equipment will do the trick.

The system is housed in a white ABS enclosure that has a UL flame rating of 94-VO and is powered by 24VAC power transformers.

MOUNTING INSTRUCTIONS

The rugged one piece mounting structure allows you to mount the unit firmly in place with four screws. Select a place to mount the unit away from any harsh or wet environment, mounting indoors or in a weather-tight enclosure is recommended. The SCT-8 should be located near your originating signals and the SCR-8 near your alarm panel or the place you wish to bring the signals to. Select a position that gives you the best access to your audio signal and reduces the labor of installation.

HOW TO CABLE THE SCT-8

Connect the audio signal that you wish to use to the "AUDIO INPUT" balanced screw terminal connector and connect the audio cable going to the SCR-8 to the "AUDIO OUTPUT" balanced screw terminal connector. It is not necessary for power to be on at this time, but if it is the audio path will only be interrupted during the cable attachment. If no audio source is being used, there is no need to make a connection to the "AUDIO INPUT".

Next attach the alarm or control wires for each station to the green connector block marked A through H. Each pair of screw terminals marked A through H are LOOP inputs. Attach your contact closures to these screw terminals. You may use a common ground for contact inputs by identifying the ground contact connector for each pair of contacts A through H and connecting them together or in "Common". An Ohmmeter can be used to determine which connectors are common to ground. Look for continuity between the "G" terminal on the audio input the (equipment ground) and the A-H terminals.

HOW TO CABLE THE SCR-8

Connect the audio signal coming from the SCT-8 transmitter's "AUDIO OUTPUT" to the SCR-8's "AUDIO INPUT" balanced screw terminal connector. Then connect the "AUDIO OUTPUT" of the SCR-8 to the next piece of equipment in your audio chain. This is the audio you supplied to the SCT-8 transmitter at the signal origin.

Next attach the alarm or control wires for each station to the green connector block marked A through H. These wires can go to your alarm panel or control device. Each pair of screw terminals marked A through H are the outputs of relay contacts. The outputs from connector block A through H will duplicate the input contact signal conditions from the SCT-8 transmitter inputs. A contact closure at A of the SCT-8 will result in a contact closure at A of the SCR-8 and so on for each pair of contacts A through H.

POWER SUPPLY INSTALLATION

The SCT-8 and SCR-8 are powered by two 24 VAC wall mount power transformers. Connect a 24 VAC power transformer to the Green terminal block marked AC 24V. At this time you will see the Green LED turn on to indicated power up, it will either be on or will be flashing on and off, depending on the communication status.

SET-UP OF THE SCT-8 OPERATIONAL MODE

The SCT-8 can be configured to operate in two separate modes, the 19KHz mode is to be used with and existing program audio path, and the 1.5KHz mode to be used when no audio is present in the system, this is also used on audio band-width limited (less than 4KHz) transmission paths.

To set the SCT-8 for 19KHz mode of operation, position the jumper on J4-P4 “ON”. When this jumper is “OFF” the unit will operate in the 1.5KHz mode. The power supply must be cycled off and on to initiate this change in operational mode.

Other jumpers must be set to coordinate with the J4-P4 jumper. See the jumper table below for the proper jumper positions for each mode of operation. Position the jumpers so that the jumper clip is on the center pin and one of the two side pins. Use the PC board graphics to determine the position of these jumpers.

MODE	19KHz Operation	1.5KHz Operation	Notes
J4-P4	“ON”	“OFF”	Cycle Power
J3	“19KHz”	“1.5KHz”	Output Filter
J2	“19KHz”	“1.5KHz”	Input Filter

SET-UP OF THE SCT-8 BAND CLEAR FILTER

When using the 19KHz mode of operation the first transmitter unit in the chain must have its band clear filter engaged. This band clear filter prevents program audio signals in the 19KHz region from interfering with the data signal. If the unit you are installing is the first unit or the only unit being used on this audio path then select the jumper J1 to the "Primary" position. If this is the second or more unit in a row then select J1 in the "SECONDARY” position, the secondary position will allow the signals from other transmitter units up-stream to pass through the system.

J1	Primary (First Unit)	Secondary (Second unit in a row)

CHANNEL SELECTION FOR MULTIPLE UNITS

This system can use as many as 8 transmitter units on any one audio channel. That gives you up to 64 contact signals for control and monitoring. The units are shipped set to channel 1. If you add additional transmitters to the audio path the additional units must occupy their own channel. If two transmitters are set to the same channel and used on the same audio path the second units data will replace the first unit and only the second unit will exercise control. Use the table below to set a new channel for any additional units. An “X” means jumper “ON” and “0” means jumper “OFF”. When the jumper is off hang it onto one pin only to retain the jumper for later use.

Channel	J4-P1	J4-P2	J4-P3
1	X	X	X
2	X	X	0
3	X	0	X
4	X	0	0
5	0	X	X
6	0	X	0
7	0	0	X
8	0	0	0

SET-UP OF THE SCR-8 OPERATIONAL MODE

The SCR-8 can be configured to operate in two separate modes, the 19KHz mode is to be used with an existing audio path, and the 1.5KHz mode to be used when no program audio is used, this is also used on audio band-width limited (less than 4KHz) transmission paths.

To set the SCR-8 for 19KHz mode of operation, position the jumper J4-P4 “ON”. When this jumper is “OFF” the unit will operate in the 1.5KHz mode. The power supply must be cycled off and on to initiate this change in operational mode.

Other jumpers must be set to coordinate with the J4-P4 jumper. See the jumper table below for the proper positions for each mode of operation. Position the jumpers so that the jumper clip is on the center pin and one of the two side pins. Use the PC board graphics to set these jumpers.

MODE	19KHz Operation	1.5KHz Operation	Notes
J4-P4	“ON”	“OFF”	Cycle Power
J2	“19KHz”	“1.5KHz”	Input Filter

SET-UP OF THE SCR-8 BAND CLEAR FILTER

When using the 19KHz mode of operation the last receiver unit in the chain must have its band clear filter engaged. This band clear filter removes the contact data from the program audio signal in the 19KHz region. If the unit you are installing is the last unit or the only unit being used on the audio path then select the jumper J1 to the "LAST" position. If this is not the last unit in a row then select J1 in the "FIRST" position, the "FIRST" position will allow the signals from other transmitter units up-stream to pass through the system.

J1 "LAST" (Last Unit in the system) "FIRST" (Not the last unit in the system)

OPERATION

When the units have been installed and are operating you will see that when a contact on the SCT-8 is closed a relay on the SCR-8 closes. Through the audio\data path the alarm sense is relayed to the alarm panel or other equipment directly. If the power fails on the SCT-8 or the audio is prevented from reaching the SCR-8, an alarm contact relay marked "ALM" will close on the SCR-8 this is the System Alarm. If a system alarm communication failure occurs between the SCT-8 and the SCR-8 all contacts on the SCR-8 will maintain in the state they were in before the alarm condition and the system alarm contact will close. When communication is restored the contacts will change to match the transmitter contacts. If during a communications failure the power to the receiver unit is removed, all contacts will go open until the power and communications are restored.

CARE AND MAINTENANCE

There is no routine maintenance or calibration required with this equipment. There are no controls to adjust inside the box. Open the box if necessary only to choose the desired operating mode and channel.

APPLICATIONS (WHERE TO USE THE SYSTEM)

This system can be used anywhere that an audio signal exists. It will work on any equipment that will pass a 20KHz audio signal (for the 19KHz mode) or any narrow-band audio signal with a bandwidth of 500Hz to 4KHz (1.5KHz mode). Digital compression will not affect its operation. If the audio bandwidth is narrow the 1.5kHz operation can be selected. Program audio cannot be used in the 1.5KHz Mode.

Some uses are in LASER OPTIC, Fiber Optic transmission, STL microwave applications, Digital TV Broadcast transmissions, Cable TV, Alarm and Control and many other applications. Basically anywhere an audio signal goes, you can monitor and control contact closures to control your system.