

# Using the Extron CTL208 with SoundStructure

The Extron CTL208 is an 8 button control pad available from Extron Electronics ([www.extron.com](http://www.extron.com)) that can be programmed to control the SoundStructure device over an RS-232 connection. This document describes how the CTL208 may be programmed and cabled to the SoundStructure device and also provides an example of how to use the CTL208 as an interface for controlling a telephone application with the SoundStructure products.

## Setting up the CTL208

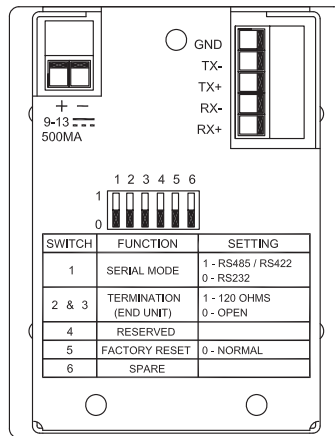
The CTL208, shown in the following figure, is available in either white or black face plates and fits into a single gang electrical box. The CTL208 uses an external power supply (included) and connects to the SoundStructure via the RS-232 interface.



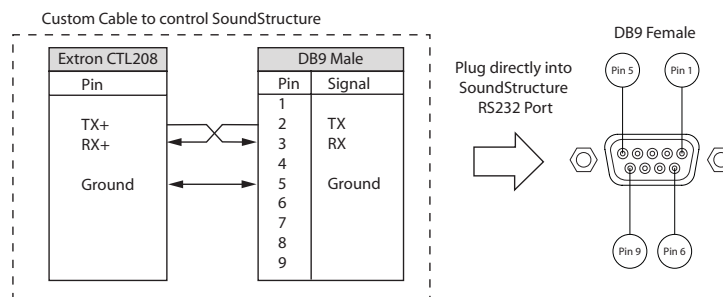
There are three steps that must be performed to integrate the CTL208 with a SoundStructure:

1. Connect the CTL208 controller to the host computer's RS-232 port
2. Program the CTL208 via the host computer's RS-232 port
3. Connect the CTL208 to the SoundStructure device via the RS-232 port on the SoundStructure device

The CTL208 serial port interface should be set to RS-232 mode by setting the rear panel DIP switches to the "0" position as shown in the following figure.

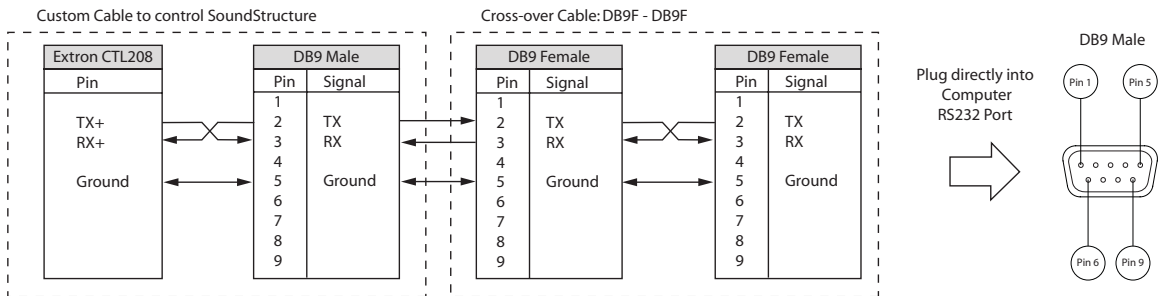


There are two cables that are required to connect to the CTL208. The first cable can be used to connect the CTL208 to the SoundStructure device. This cable should have the pin-out shown in the figure below.



This connects the TX+ signal from the CTL208 to the SoundStructure's RX signal on its RS-232 port and the RX+ signal to the CTL208 to the SoundStructure's TX signal on its RS-232 port. One end of this cable is terminated with the CTL208 phoenix connector and the other end is terminated in a DB9 male connector that may be plugged directly into the SoundStructure DB9 female RS-232 connector.

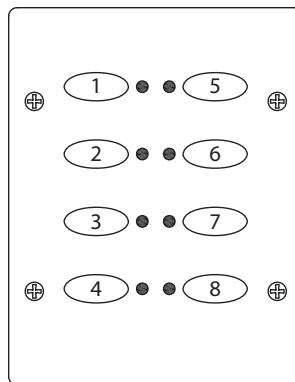
To connect the CTL208 to the host computer's RS-232 port requires connecting the CTL208 TX+ signal to the host computer's RS-232 RX signal and the CTL208 RX+ signal to the host computer's RS-232 TX signal. Taking advantage of the previous custom cable, a second "cross-over" cable should be built that connects the first cable to the host computer. The "cross-over" connects pin 2 to pin 3 and pin 3 to pin 2 and has DB9 female connectors on both ends. Because host computer RS-232 ports have TX on pin 3 and RX on pin 2, the "cross-over" cable connects the proper TX and RX signals together. The overall cable requirements are shown in the following figure.



To program the CTL208 connect the cables shown above and connect the DB9 female to the host computer's RS-232 interface.

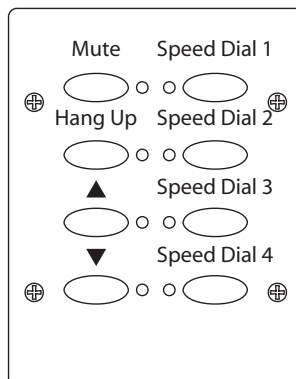
By default the CTL208 is configured for 9600 bps, no parity, 1 stop bit, and no flow control. Open a terminal program such as teraterm or hyperterminal on your computer and connect to host computer's serial port.

To program the CTL208, create a text file such as the following to program the buttons on the CTL208. Program the buttons for the functions you'd like to control. The order of the buttons is shown in the following figure. See the CTL208 manual for additional information on how to program the buttons and set the different type of button modes.



### Application Example

In this example, the Extron CTL208 will be used to take the phone on and off hook, to mute the local microphones, to increase or decrease the volume in the room, and to dial pre-defined telephone numbers. The system will be programmed to operate as the figure below.



To implement this design, it is necessary to create the appropriate command file to send to the CTL208. The text file to send to the controller is shown below.

```
[CC97]
[BKT1^]
[BKT2*]
[SWM010]
[SWM020]
[SWM030]
[SWM040]
[SWM050]
[SWM060]
[SWM070]
[SWM080]
[SWM011]
[PCLp01set mute "Mics" 1
]
[PCLp11set mute "Mics" 0
]
[PCLp02tog phone_connect "Phone Out"
]
[PCLp03inc fader "Amplifier" 1
]
[PCLp04dec fader "Amplifier" 1
]
[PCLp05run "Speed Dial 1"
]
[PCLp06run "Speed Dial 2"
]
[PCLp07run "Speed Dial 3"
]
[PCLp08run "Speed Dial 4"
]
```

If your computer is communicating to the CTL208, you may see the following response in your terminal program once this configuration file has been sent to the CTL208.

```

[RO 97 BKT1^ ][RO 97 BKT2* ][RO 97 SWM010 ][RO 97 SWM020 ][RO 97
SWM030 ][RO 97 SWM040 ][RO 97 SWM050 ][RO 97 SWM060 ][RO
97 SWM070 ][RO 97 SWM080 ][RO 97 SWM011 ][RO 97 PCLp01set mute
"Mics" 1
][RO 97 PCLp11set mute "Mics" 0
][RO 97 PCLp02tog phone_connect "Phone Out"
][RO 97 PCLp03inc fader "Amplifier" 1
][RO 97 PCLp04dec fader "Amplifier" 1
][RO 97 PCLp05run "Speed Dial 1"
][RO 97 PCLp06run "Speed Dial 2"
][RO 97 PCLp07run "Speed Dial 3"
][RO 97 PCLp08run "Speed Dial 4"
]

```

The commands in this example make several assumptions about the names of virtual channels within the SoundStructure Studio device to be controlled. For this application to work properly, you should design your SoundStructure Studio file to match these assumptions.

- There is a virtual channel group called “Mics” that contains the microphone signals
- There is a virtual channel called “Amplifier” that is used to send audio to the local room Amplifier
- There is a telephony interface whose transmit signal has the virtual channel name “Phone Out”
- There are four partial presets called “Speed Dial 1”, ... , “Speed Dial 4” that each take the phone off hook and dial particular digits.

### **CTL208 Command Descriptions**

The specific commands used in the programming text file are described in detail below.

#### **[CC97]**

Sets the address of the CTL208 to the default of 97.

#### **[BKT1^]**

Sets the first bracket character to ^. This is required because by default the CTL208 interprets the ‘ character as an escape character. SoundStructure commands make use of the ‘ character so it is required to set a different character as an escape character.

#### **[BKT2\*]**

Sets the second bracket character to \*. This is required because by default the CTL208 interprets the “ character as an escape character. SoundStructure commands make use of the “ character so it is required to set a different character as the second escape character.

#### **[SWM010]**

This sets the button mode for button 1 into a single push mode.

#### **[SWM011]**

This sets the button mode for button 1 into a toggle mode where when the button is pushed, the LED will light up and the primary command string will be sent to the RS-232 interface. When the button is pushed a second time, the LED will turn off and send the secondary command string will be sent to the RS-232 interface.



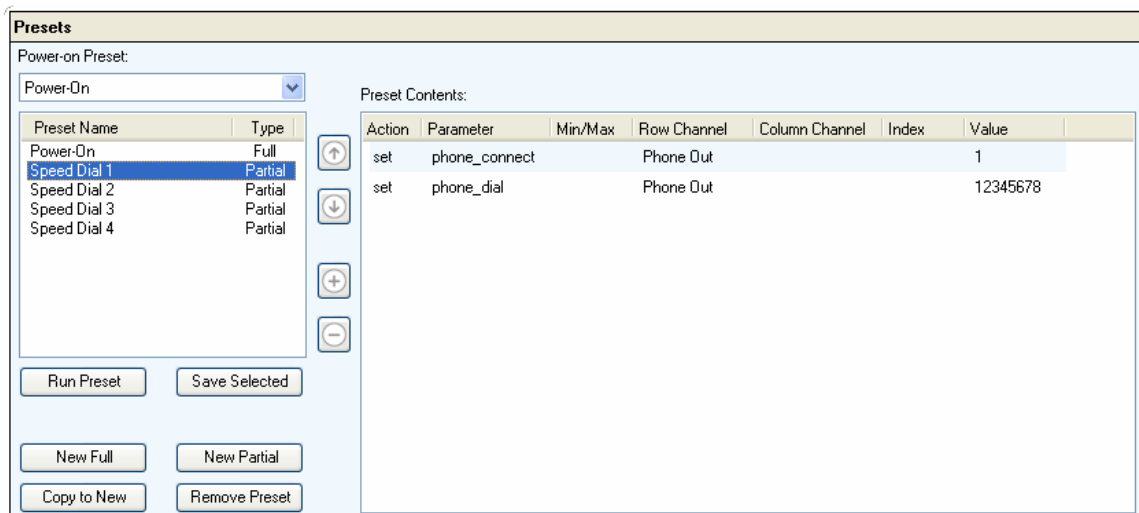
```
[PCLp02tog phone_connect "Phone Out"  
]
```

This command toggles the hook status of the phone channel "Phone Out" when it is pressed. If the phone is already offhook, this will hangup the phone. If the phone is onhook, this will take the phone offhook and answer the call.

```
[PCLp05run "Speed Dial 1"  
]
```

This assigns the string 'run "Speed Dial 1" <LF>' to the button 5 on the CTL208 where <LF> is a line feed that is used to terminate commands sent to SoundStructure devices. The run "Speed Dial 1" command will execute the preset named "Speed Dial 1" on the SoundStructure device. The blank line with the right bracket is important because the blank line represents the <LF> that is used to terminate the command for SoundStructure devices.

The "Speed Dial 1" partial preset should be defined as shown in the figure below. The first command in the partial preset will take the phone off hook and the second command in the partial preset will dial the phone number specified.



The remaining commands program the other buttons on the CTL208 and are similar to the commands described and will not be described separately.

*Please note the commands that are sent may be any valid SoundStructure command – these commands shown in this example are only one way to program the CTL208.*

Once all the buttons are programmed on the CTL208, it is now possible to remove the programming crossover cable between the host computer and the CTL208 and connect the CTL208 to the SoundStructure device.

To test the system after it has been connected to the CTL208 via RS-232, press the buttons on the CTL208 and watch the command acknowledgements from the SoundStructure Studio console when the host computer is connected to the SoundStructure over Ethernet. Remember that the SoundStructure Studio console will only show the acknowledgement of parameters that have changed value – if you send a command that doesn't change the value of any parameters you will not see the acknowledgement in the SoundStructure Studio console. If CTL208 programming changes are required, connect the crossover cable and connect the system to the host computer and send an updated command file to the CTL208 and test again.

