# TOUCHÉ TECH
Motorized Blinds (Shade System Integration)

Summary:

What is shade system integration? Shade system integration is the process of allowing a motorized shade system and a lighting control system to communication with each other. Integration allows the shade system and lighting control system to share status information and control commands. Integration allows a user to view and control both systems from one point.
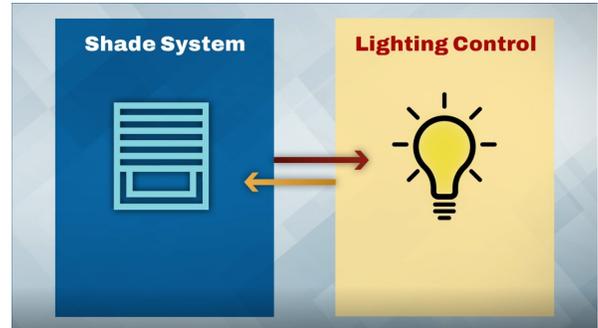
Example:

An example could involve a wall station of the lighting control system. Integrating the lighting control system and the shade system would allow the user to press a "Presentation" button on the wall station that would dim the lights AND tell the shade system to lower the motorized shades. In addition, a separate shade control page on the wall station would allow the shades to be controlled independently of the lighting.

How to Communicate:

The first requirement is to determine what form of communication is to be used. The four most common methods are listed below. Included in this list are the pros and cons of each. Touché uses RS-232 since it is the most widely adopted and it offers a great balance between flexibility, security, and ease of implementation.

Protocol	Wiring Topology	Flexibility	Security	Troubleshoot
Contact Closure	Uses dry contacts.	Not Flexible	Secure	Easy
RS-232	Uses point-to-point structure.	Flexible	Secure	Moderate
Ethernet/IP	Uses networked structure.	Flexible	Difficult to Secure	Difficult
RS-485	Uses multi-drop, multi-node structure.	Flexible	Secure	Difficult

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As noted earlier, Touché uses RS-232 as the communication protocol between a shade system and the lighting control system. RS-232 is a standardized serial communication protocol that has a defined wiring structure and communication structure.

The wiring structure. First, a Room Manager must be used as the room's lighting controller. SmartPacks do not support communication with a shade system. Second, a CI-RS232 must be used as the translator for RS-232 communication. This module is called an RS-232 Communication Interface and can be used to communicate with any other system that supports RS-232 communication (i.e. an A/V system), but in this example we are demonstrating how it is used to communicate with a shade system.
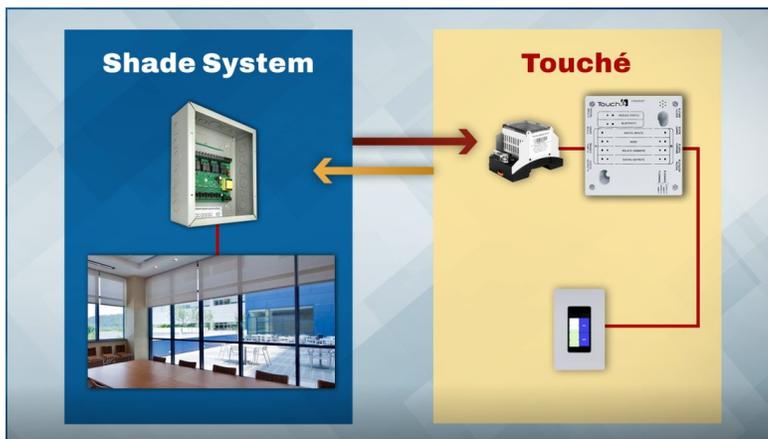
As the figure shows here, the CI-RS232 module is simply plugged into the branch port of a Room Manager (it can share the same port with other branch devices like wall stations). The Room Manager provides power and communication to the CI-RS232 using a standard CAT5 cable.

On the other side of the CI-RS232 there is a DB9 port. This is a standard termination when connecting RS-232 capable devices together, but other forms do exist (RJ-11, and RJ-45). If the shade system that is being connected to uses one of these types of termination, then a cable must be constructed or purchased that connects the correct pins at each end. Getting the correct cable with the correct terminations and pin pairing is the most common problem that Touché sees when interconnecting a shade system and the CI-RS232. If the shade system uses a DB9 port then the only item to consider is the gender of each end (male or female). If the shade system uses an alternative termination like RJ-45 then a more thorough review of the connection of both ends must be completed.

DB9 to DB9

The communication structure. The communication structure is the communication parameters that must be set up on both ends for the two systems to communicate. The following is a table representing the communication parameters for RS-232 communication. The highlighted parameters represent a typical configuration.

| Baud Rate	Data Bits	Parity	Stop Bits	Flow Control	Handshaking
1200	5	None	0	Software	Enabled
2400	6	Odd	1	Hardware	Disabled
4800	7	Even	2	None	
9600	8				
19200					
38400					
57600					
115200					

A definition of each parameter is provided below:

Baud Rate: Speed at which the two systems communicate

Data Bits: The quantity of bits in each piece of the message

Parity: Error checking mechanism

Stop Bits: The number of bits representing the end of a message

Flow Control: A method of managing the rate of data transmission

Handshaking: Another level of error checking

If this all sounds Greek, don't worry. The important thing to remember is that they must match on both ends. This is done in the shade configuration software on the shade system side and the Touché Insight configuration APP on the Touché lighting control system side (that is the same APP used to configure anything in the Touché network).

The message structure Messages are sent between the two system unidirectionally (one-way) or bi-directionally (two-way). Touché support bi-directional communication meaning the messages can be sent from the lighting control system to the shade system or vise-versa. Messages are comprised of a series of printable ASCII characters followed by a carriage return (<CR>). In laymen terms this means any character that you can type on a keyboard can be part of the message. The end of the message is the return key. It is that simple. Using this type of message structure allows messages to be human readable. In other words the message from the shade system to the lighting control system to indicate the shades are 50% open can be "50% open." A message to the shade system to go close the shades can be "close shades." (assuming the shade system supports human readable messages). The only criteria is that both ends (the lighting control system and the shade system) have to be able to interpret the command. Some systems have a pre-defined command set. This means that the person integrating the two systems has to look up what they are wanting to do from a list of commands and then use the command (ASCII string) for the desired function. Touché does not have a predefined command set, the commands can be any ASCII string. This works both ways for Touché, the commands being received from the AV system can be any ASCII string and the commands to the AV system can be any string.
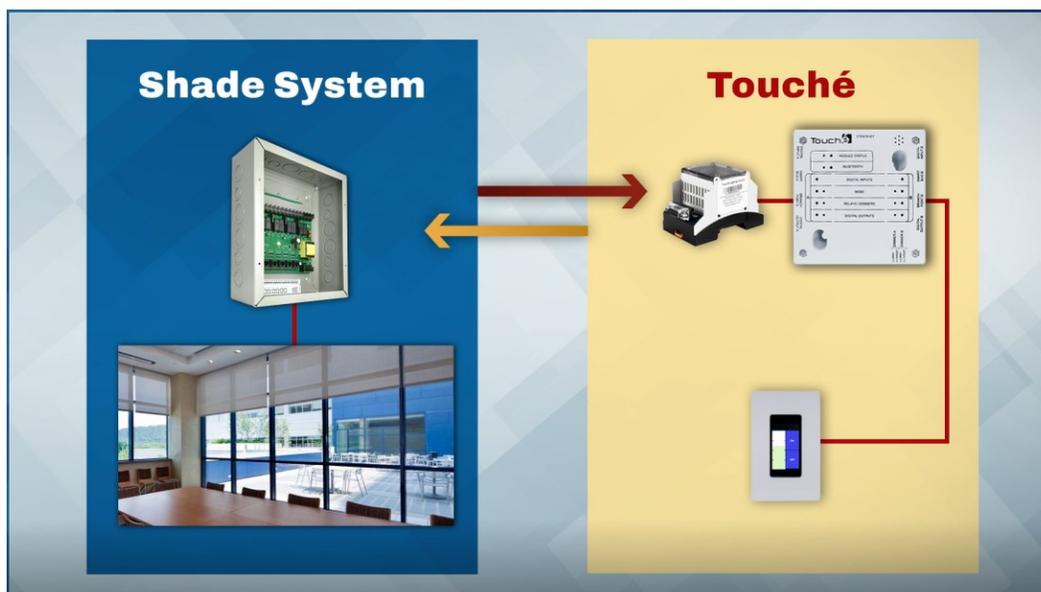
Set-up & Commissioning Earlier it was noted that Touché uses the free Insight smart phone APP to configure the CI-RS232 module for the correct communication parameters. The same APP is used to create the event and command ASCII strings for the messages. A command message is a message sent from one system to the other. An event message is that is received by one of the systems. Every message between systems will start as a command and end as an event. For example, if we want the lighting control system to tell the shade system to open the shades, we first need to determine if there is a specific command that the shade system requires in order to enter that mode. Some of the commercial grade shade systems support customizable messages (just like Touché), but many do not. But, if this is the case, then we simply need to make sure the same ASCII string is used by both systems for opening the shades. In this case we could simply use the message : "open shades<CR>" (remember that a <CR> is required at the end of a message to tell both systems where the message ends). If the shade system has a pre-determined message to open the shades, then we would simply use that ASCII pre-determined string.
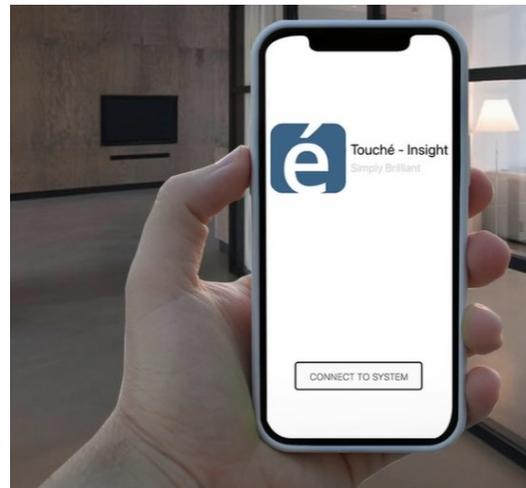
To aid in testing whether the integration is working, Touché has added a status LED to the CI-RS232 module. As the figure below demonstrates, if the module is sending (i.e. the lighting control system is sending a message) then the module will blink red. When it is receiving it will blink green. This indication will be in real-time. In other words, when a button is pressed on the wall station to enter open the shades, the wall station will tell the Room Manager to enter this mode and the Room Manager will tell the CI-RS232 module to send the ASCII string. So when the button on the wall station is pressed, the CI-RS232 will blink red.
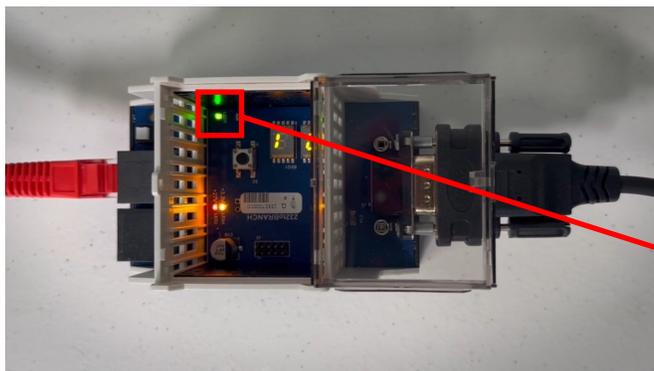
RED = SEND

GREEN = RECEIVE

Conclusion:

Touché has made integration with shade systems simple. Using a common interface module, the CI-RS232, to communicate with multiple types of systems (including shade systems), using the same APP to configure the integration as is used with the configuration of the lighting control system, and being able to provide the same remote support through the APP—even for the shade integration, is what sets Touché apart from other lighting control manufactures.

In closing there is one additional consideration that may have not been obvious in this tech document: how does the wall station obtain its shade integration page? When the user selects shade integration as the purpose for using a CI-RS232 module, the user is prompted by the Insight APP to select the graphic to be used on the color wall station for control of the shades. The user is presented with several configurations of the controls to be displayed including simple open/close controls, to dual-shade, multi-level options. This process is very similar to that used when selecting the lighting control scene page configuration—the user simply swipes through the available options in the Insight APP until they see the configuration that best suits the applications need. Once again, Touché just makes it Simply Brilliant.