Application Note
iW Translator RS-232 Serial Protocol

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One function of iW Translator is to interpret commands it receives on its RS-232 serial port and convert the commands into the appropriate signals on the Zone Control network. This function allows third party devices to control Color Kinetics iW series power/data supplies and lights via a general purpose RS-232 interface.

This document describes the RS-232 interface on iW Translator and the command set that it understands.

Electrical

The RS-232 serial port connection on iW Translator is a DB9M (male) connector, labeled SERIAL. The pinout of the DB9M connector is as follows:

Pin	Description
2	Transmit data
3	Receive data
5	Ground

The other pins are not connected.

This pinout allows you to connect iW Translator to many third party controllers with a standard straight-through serial cable, such as Radio Shack part number 26-117.

Protocol

- The serial protocol is 9600 baud, 8 data bits, no parity, 1 stop bit. There is no flow control.

- Each command to iW Translator consists of 9 printable ASCII characters. The first character is always **X**. The next 8 characters are the ASCII representation of four bytes, expressed in printable hexadecimal characters (**0** – **9**, **A** – **F**).

- For example, the number 31 (decimal) is equivalent to **1F** (hexadecimal), and would be represented by the two ASCII characters **1** and **F**.

- Characters are not echoed by iW Translator when they are received.

- When iW Translator successfully receives a command, it replies by transmitting a single **>** character.

- When iW Translator receives a badly formed or illegal command, it replies by transmitting a **?** character.

iW Translator Commands

Note: Italic letters (such as *BB*) are used to represent one hexadecimal byte.

The first hexadecimal byte following the **X** represents the command type.

The second byte is the zone number to which the command will be applied. This corresponds to the zone number set on the iW power/data supplies attached to the Zone Control network. Most iW power/data supplies support 15 zones, numbered 1 through 9 and A through F (hexadecimal bytes **01** through **0F**). Zone zero (**00**) is a special *broadcast* zone to which all lights will respond.

The third and fourth bytes are arguments to the command. For most commands, the third byte represents a light level and the fourth byte the transition time.

The light level is in the range of **00** to **06** (7 discrete levels). These levels correspond to the same levels used by iW Scene Controller keypad.

The transition time is the number of 0.02 second ticks the lights will take to smoothly fade from their current level to the new commanded level, in the range 0 to 255 (**00** to **FF**). Thus, for a two second fade you would choose 100 (decimal) ticks, which would be sent as hexadecimal **64**.

Command	Description
X10*ZZBBTT*	Set Brightness Level Commands the lights in zone *ZZ* to transition to brightness level *BB* over the next *TT* ticks. The color temperature level is not changed. The range of *BB* is **00** (off) to **06** (full on).
X11*ZZCCTT*	Set Color Temperature Level Commands the lights in zone *ZZ* to transition to color temperature level *CC* over the next *TT* ticks. The brightness level is not changed. The range of *CC* is **00** (warmest) to **06** (coolest).
X12*ZZBBTT*	Increment/Decrement Brightness Level Commands the lights in zone *ZZ* to transition to the next higher or lower brightness level over the next *TT* ticks. The color temperature level is not changed. If *BB* is **01**, the brightness level is incremented by 1 (but will not exceed level 06). If *BB* is **FF**, the brightness level is decremented by 1 (but will not exceed level 00).
X13*ZZCCTT*	Increment/Decrement Color Temperature Level Commands the lights in zone *ZZ* to transition to the next higher or lower color temperature level over the next *TT* ticks. The brightness level is not changed. If *CC* is **01**, the color temperature level is incremented by 1 (but will not exceed level 06). If *CC* is **FF**, the color temperature level is decremented by 1 (but will not exceed level 00).
X18*ZZWWCC*	Direct Set Warm and Cool Channels. Sets the warm and cool channels for zone *ZZ*. *WW* and *CC* are DMX values, range **00** to **FF**. This is an advanced command and is not recommended for normal operation. Subsequent level transitions may behave unexpectedly after issuing this command.

Examples

The following are examples of typical command strings. Note that multiple command strings can be concatenated together.

X10010632
Transition zone 1 to full brightness over 1 second.

X10010032
Transition zone 1 to zero brightness (off) over 1 second.

X110A0364
Transition zone A to medium color temperature over 2 seconds.

X10020632X11020032
Transition zone 2 to full brightness and warmest color temperature over 1 second.

X12010132
Increment brightness of zone 1 by one level over 1 second.

X1301FF32
Decrement color temperature of zone 1 by one level over 1 second.

About iW Translator

iW Translator is the bridge between Color Kinetics white lights and master controllers. It can serve as both a translator and an expander. As a translator, it interprets the commands from a 3rd party controller, enabling a master controller to manipulate the intensity and color temperature of Color Kinetics lights. As an expander, it operates in two modes. First, it serves as a hub to connect up to two iW Scene Controller keypads to a single iW power/data supply. Second, it can be daisy-chained to serve as a relay for installations requiring more than 50 feet of cabling between iW Scene Controller keypad and the iW power/data supply.

About Color Kinetics

Color Kinetics Incorporated (NASDAQ: CLRK) is a pioneer in the design, marketing and licensing of intelligent solid-state lighting systems and technologies. The company's award-winning product lines apply the practical and aesthetic benefits of LEDs to transcend the limits of traditional light sources for use in high-performance lighting and OEM and licensing applications. Its products and technologies leverage a patented layer of digital intelligence, called Chromacore®, to generate and control millions of colors and dynamic lighting effects.