

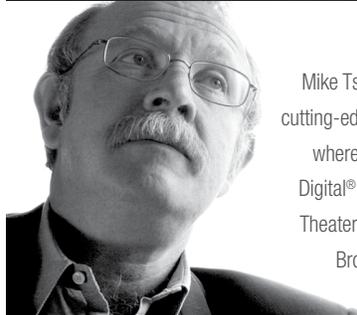


Rev 1 – Oct 2017

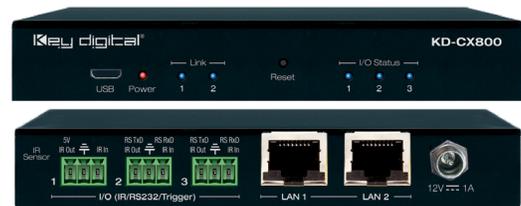
KD-CX800

Control Interface with
IR and RS-232 Over IP Routing

Operating Manual



Key Digital®, led by digital video pioneer Mike Tsinberg, develops and manufactures high quality, cutting-edge technology solutions for virtually all applications where high-end video and control are important. Key Digital® is at the forefront of the video industry for Home Theater Retailers, Custom Installers, System Integrators, Broadcasters, Manufacturers, and Consumers.



Key Digital® Systems :: 521 East 3rd Street :: Mount Vernon, NY 10553
Phone : 914.667.9700 Fax : 914.668.8666 Web : www.keydigital.com

Key digital®
The Experts in Digital Video Technology and Solutions™

Contents

Introduction	1
Connections & LEDs	2
Usage Modes	5
Installation.	13
Web Control Interface	14
KeyCode Open API Specification	19
Specifications	29
Important Product Warnings	30
How to Contact Key Digital®	32
Warranty Information.	33

Please use weblink or the QR code to
download current version of the manual:

[http://www.keydigital.com/Downloads/KD-CX800/
KD-CX800_Manual.pdf](http://www.keydigital.com/Downloads/KD-CX800/KD-CX800_Manual.pdf)



**Always follow the instructions provided in this Operating Manual.
Please check the Key Digital Website for the most up-to-date Manual.**

© 2017 Key Digital, Inc. All rights reserved.

Introduction

KD-CX800 is a control over IP device with three multi-function control ports supporting bi-directional RS-232, IR out (emitter), IR in (sensor or hardwire), voltage trigger, or voltage sensor.

About KD-CX800

KD-CX800 is very flexible, with four supported modes of use:

- > Mode 1: Control gateway for Enterprise AV Over IP system**
 - » Enables more third-party control options than other HD Over IP systems
 - » Accepts commands from third-party control systems or Compass Control®
 - » Supports generic RS-232, TCP/IP, and IR Key Digital matrix switching command strings
- > Mode 2: Compass Control® Master Controller**
 - » Supports communication to/from licensed iOS and Android devices
 - » Flexible port configuration (IR, RS-232, trigger, sensor) set in Compass Navigator™ program
 - » IR learner/sensor built-in
 - » Supports up to two real-time bi-directional RS-232 ports
 - » TCP/IP device control direct from iOS/Android controller – no ports used
- > Mode 3: Third-Party Control via KeyCode Open API**
 - » Cost-effective control expansion with advanced third-party control systems
 - » Adds reliable hardware interface to network-based control apps
 - » Enables IR, RS-232, and voltage device control
 - » Robust API allows for bi-directional communication
- > Mode 4: Control Extension via IP**
 - » Carry any supported combination of IR, RS-232, and voltage triggers over the network
 - » Extends control signals up to 400ft / 121m. Greater distances possible with adapters.
 - » Supports systems with or without network switches

Connections & LEDs

The three multi-function I/O ports can be configured as IR sensor, IR input, IR emitter, RS-232, voltage trigger, or voltage sensor. However, there are limitations per port:

I/O Port	IR Sensor	IR Input	IR Emitter	Serial RS-232	Trigger
1	Yes	Yes	Yes	No	Yes
2	No	Yes	Yes	Yes	Yes
3	No	Yes	Yes	Yes	Yes

I/O port configurations:

> IR sensor

- » Compatible port: I/O Port 1
- » Used for IR input or IR learning
- » Supported signal level: 0V – 5V
- » Supported IR frequency: 20kHz – 60kHz
- » IR Sensor (included) pinout:

Note: KD-CX800 must be set to Compass Control Master Controller mode if you wish to learn IR remote commands

Pin # (Phoenix)	Wire Color	Wire Signal
1	Red	Power 5V
2	Black	Ground
3	White	IR Signal



> Hardwired IR input

- » Compatible ports: 1, 2, and 3
- » Supports serial (hardwired) IR input with modulated IR signal
- » Supported signal level: 0V – 12V
- » Supported IR frequency: 20kHz – 100kHz
- » NOTE: Supports maximum of one (1) IR input at any time (sensor and hardwired)

> IR output

- » Compatible ports: 1, 2, and 3
- » Supported signal level: 0V – 11.4V
- » Supported IR frequency: 20kHz – 100kHz

> RS-232

- » Compatible ports: 2 and 3
- » Supported output signal level: 0V – 11.4V
- » Supported input signal level: -12V – 12V
- » Does not support H/W Flow Control
- » Maximum baud rate is 115200bps
- » Supports up to 2 real-time ports

> Voltage Trigger:

- » Compatible ports: 1, 2, and 3
- » Supported signal level:
 - » Low: 0V (ground) fixed
 - » High: 3.3V – 11.4V
- » Does not support relay or contact closure functionality
- » Does not support extension of digital data

› Voltage Sensor

- › Compatible ports: 1, 2, and 3:
- › Supported signal level:
 - › Low: -12V – 2V
 - › High: 2V – 12V
- › Uninterrupted voltage sensing updated every 5ms
- › Voltage trigger is very low bandwidth. Does not support extension of digital data.

Power

- › POE or traditional power supply (screw-type)
 - › 12V/1A (12W) power supply included
 - › PoE supported on either LAN port
 - › OK to connect external power supply plus PoE

LAN ports

- › KD-CX800 must be connected to the network via hardwire IP connection (no wi-fi)
- › The two (2) LAN ports act as an unmanaged network switch
 - › Support IGMP with connection of IGMP supported network switch
 - › See Key Digital's Verified Network Switch document for list of network switches verified to support Enterprise AV HD Over IP system.
- › Supports 10/100BaseT up to 100Mbps
- › Supports PoE
- › Default IP address: 192.168.1.239

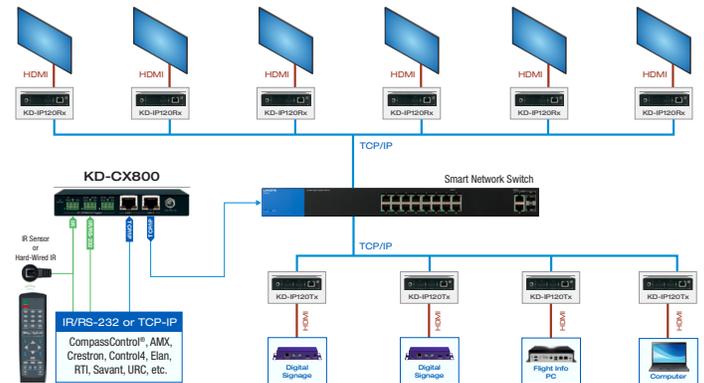
Usage Modes

Mode 1:

RS-232/IR/TCP-IP gateway for third-party control of Enterprise AV Over IP system

- › KD-CX800 can be used to control Key Digital's Enterprise AV Over IP system via RS-232, TCP-IP, or IR.
- › The KD-CX800 will listen for RS-232, TCP-IP, or IR commands from the third-party control processor/PC and executes the appropriate switching command.
- › Default (fixed) I/O port configurations:
 - › I/O Port 1: IR Sensor IN
 - › I/O Port 2: RS-232
 - › I/O Port 3: Compass Control® or Key Code Open API

Application Example



Connectivity

- › KD-CX800 must be on the network, connected to either LAN port 1 or LAN port 2
 - › If controlling via RS-232, connect from third-party control processor or computer into I/O port 2
 - › If controlling via IR, connect to IR Sensor or IR In on I/O port 1
- › Any Enterprise AV Tx or Rx unit can be connected to LAN port 1 or 2 if needed
- › Port 3 is available for Compass Control or KeyCode Open API mode

Supported RS-232 & TCP-IP commands from third-party control system

- › Use KD-CX800 as an RS-232, IR, or TCP-IP control gateway
- › **All commands require a carriage return at the end of the string**
- › The baud rate is adjustable, with 57,600 bits per second as the default
- › KD-CX800 accepts all existing Key Digital matrix switching command strings:

Command Structure	Note
SPOxxSlyy	Already Supported. Similar to KD-Pro8x8CC.
SPOASlyy	All outputs select input yy
SPO<sp>xx<sp>yy	Similar to KD-HD16x16ProK
SPO<sp>A<sp>yy	
xxByy.	Similar to KD-16x16CS. Requires "."
xxAll.	
Bxyy.	Similar to KD-MSW8x4Pro. Requires "."

Supported IR commands and sequence

- › KD-CX800 can be used as an IR gateway to control Key Digital's Enterprise AV Over IP system.
- › Supported remote: KD-REMOTEHM88 (sold separately)

› IR command sequence:

- › **X**, Video Mode, **Y**, Video Mode
 - › X = Output / Rx number
 - › Y = Input / Tx number
- › X and Y may be up to 4 button presses (1 – 9999)
- › X may be 0 to switch all outputs
- › Y may be the UP or DOWN keys to select the next or previous Input
- › Y may be the LEFT key to select the pass-thru input (ie 1 to 1, 2 to 2, etc) for the entire system
 - › Must be used with "0" as value for X (all outputs)
 - › If system has more outputs than inputs, the pass-thru begins at input 1 again

Load completed Enterprise AV system file into KD-CX800

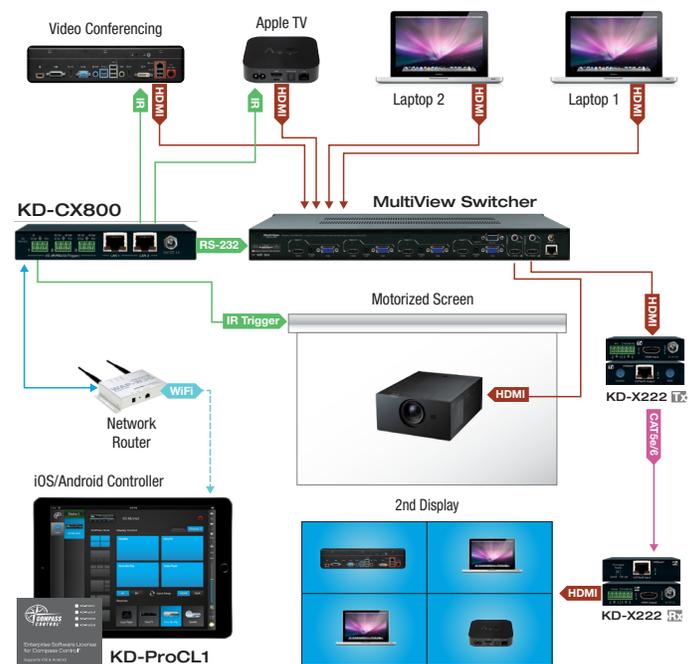
- › Open **Enterprise AV Tool** software
- › Select desired system file from Switching drop-down menu
- › Press Network Scan to view system Rx and Tx units in respective windows
 - › Ensure that all Input and Output assignments are completed. See Creating Switcher System section.
 - › **Press Download button**
 - › Enter IP address of KD-CX800 as set via web control interface or device manager software



Mode 2: Compass Control® Master Controller

- KD-CX800 can be used as a Master Controller for Key Digital's Compass Control® system
- KD-CX800 lives on the network and communicates with iOS or Android controllers to execute IR, RS-232, TCP-IP, or Voltage control commands and sends status values of connected bi-directional devices for a rich GUI.
- I/O ports, 1, 2, and 3 are configured in any possible type according to the loaded Compass Navigator project.
- Use as many KD-CX800 units as needed. Can also be used in combination with other Compass Control master controller units
- KD-CX800 does not support loaded scheduled events or the Compass Control Zigbee remote.
 - » Use model KD-MC1000 if those functionalities are needed.

Application Example



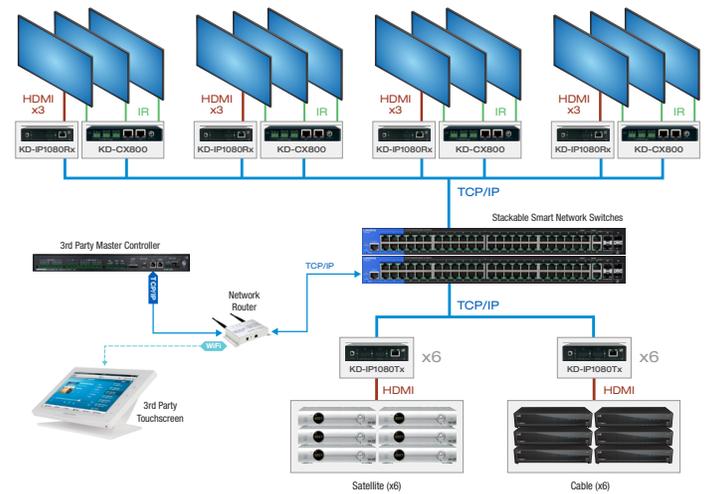
Additional Links & Info

- Create a Key Digital dealer profile to begin training on the Compass Control® system:
- http://www.keydigital.com/dealerSignUp_v2.asp

Mode 3: Third-Party Control via KeyCode Open API

- KD-CX800 can be controlled by any third-party control system supporting TCP/IP
- Set the desired configuration for each I/O port using the web control interface. See Web Control Interface section for more information.
 - » The desired configuration can only be applied to an I/O port using the web control interface. It is not adjustable via the API commands.
 - » **Future Key Digital software releases** will support dynamic I/O port assignment functionality
- KD-CX800 KeyCode Open API commands contain parameters about the executed command's format and protocol, as well as the controlled device's command
- **IMPORTANT:** Each I/O port has a specific TCP port number assignment.
 - » Ports numbers are adjustable, but all port numbers must be unique.
- Please see KeyCode Open API Specification section for all commands

Application Example

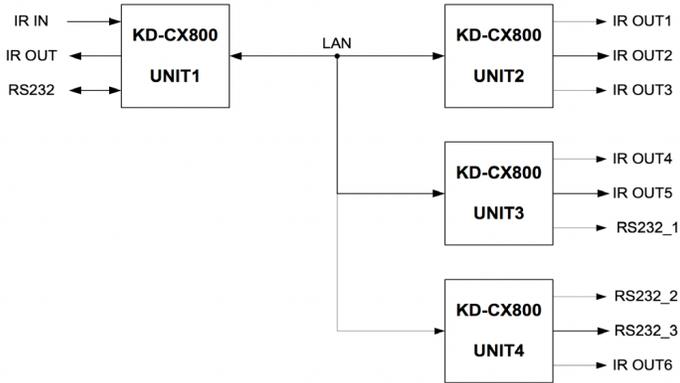


Mode 4: Control Extension via IP

- KD-CX800 can be used to carry IR, RS-232, or voltage trigger over the network
- It can be configured as point-to-point with or without a network switch:

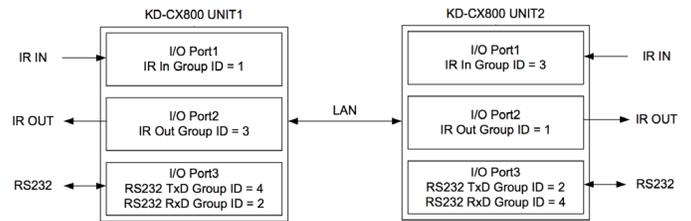


- **Future software updates** will enable network-based control distribution/matrix blocks to be created using many units:



- Currently, I/O configurations are fixed (non-adjustable) as follows:
 - » I/O Port 1: (Default) IR In (sensor or serial IR), or trigger In
 - » I/O Port 2: (Default) IR out, or trigger out
 - » I/O Port 3: RS-232

- However, **future software updates** will enable flexible I/O configuration per port
- **IMPORTANT:** Each I/O port has a specific multicast group ID number assignment
 - » Multicast group ID numbers are assigned using the web control interface.
 - » See the Web Control Interface section for more information
 - » Pair desired IR In or RS-232 Rx/D ports with desired IR Out or RS-232 Tx/D port by assigning the same multicast group ID number.
 - » IR In or RS-232 Rx/D at each I/O port must have a unique multicast group ID number assignment.
 - » Example:



Installation

Install up to eight units in an equipment rack using KD-RK120PLT. KD-RK120PLT also houses Enterprise AV Tx or Rx units.



Web Control Interface

Enter the IP address of your KD-CX800 unit in a web browser to access a web control interface for unit and I/O port setup

Web control interface home page:

- > Displays unit information
- > Network setup options, including enable/disable DHCP

KD-CX800	
Device Information	
Device Name :	UN000001 <input type="button" value="Apply"/>
Bootloader Version :	Ver1.0.6
Firmware Version :	Ver1.0.8
Release Date :	Jan. 4 2017
Network Setup	
MAC Address :	60-89-B1-30-00-01
Host IP Address :	<input type="text" value="192"/> <input type="text" value="168"/> <input type="text" value="1"/> <input type="text" value="239"/>
Subnet Mask :	<input type="text" value="255"/> <input type="text" value="255"/> <input type="text" value="255"/> <input type="text" value="0"/>
Router IP Address :	<input type="text" value="192"/> <input type="text" value="168"/> <input type="text" value="1"/> <input type="text" value="1"/>
DHCP Enable <input checked="" type="checkbox"/>	<input type="button" value="Apply"/>

Control Mode Setting page

Select desired usage mode for KD-CX800 and apply desired configuration for each I/O port:

- > **Image 1:** RS-232/IR/TCP-IP gateway for third-party control of Enterprise AV Over IP system
- > **Image 2:** Compass Control Master Controller

- > **Image 3:** Third-Party Control via KeyCode Open API
- > **Image 4:** Control Extension via IP

Image 1: Setting control mode for Enterprise AV master control usage

Control Mode Setting	
Control Mode:	Enterprise AV Control <input type="button" value="Apply"/>
TCP Port :	<input type="text" value="23"/> <input type="button" value="Apply"/>
I/O Port1 Configuration	
I/O Port1 :	IR Sensor In <input type="button" value="Apply"/>
Output Signal Level :	MAX(7) <input type="button" value="Apply"/>
I/O Port2 Configuration	
I/O Port2 :	RS232 <input type="button" value="Apply"/>
Baud Rate :	57600 bps <input type="button" value="Apply"/>
Data Length :	8 bit <input type="button" value="Apply"/>
Parity Bit :	None <input type="button" value="Apply"/>
Stop Bit :	1bit <input type="button" value="Apply"/>
Output Signal Level :	MAX(7) <input type="button" value="Apply"/>
I/O Port3 Configuration	
I/O Port3 :	Compass Control <input type="button" value="Apply"/>
Output Signal Level :	MAX(7) <input type="button" value="Apply"/>

Image 2: Setting control mode for Compass Control master control usage

Control Mode Setting	
Control Mode:	<input type="text" value="Compass Control"/> <input type="button" value="Apply"/>
TCP Port :	<input type="text" value="23"/> <input type="button" value="Apply"/>
I/O Port1 Configuration	
I/O Port1 :	<input type="text" value="N/A"/> <input type="button" value="Apply"/>
Output Signal Level :	<input type="text" value="MAX(7)"/> <input type="button" value="Apply"/>
I/O Port2 Configuration	
I/O Port2 :	<input type="text" value="N/A"/> <input type="button" value="Apply"/>
Output Signal Level :	<input type="text" value="MAX(7)"/> <input type="button" value="Apply"/>
I/O Port3 Configuration	
I/O Port3 :	<input type="text" value="N/A"/> <input type="button" value="Apply"/>
Output Signal Level :	<input type="text" value="MAX(7)"/> <input type="button" value="Apply"/>

Image 3: Setting control mode for KeyCode Open API usage

Control Mode Setting	
Control Mode:	<input type="text" value="KeyCode Open API"/> <input type="button" value="Apply"/>
TCP Port for I/O Port Configuration :	<input type="text" value="4850"/> <input type="button" value="Apply"/>
I/O Port1 Configuration	
I/O Port1 :	<input type="text" value="IR Out"/> <input type="button" value="Apply"/>
Output Signal Level :	<input type="text" value="MAX(7)"/> <input type="button" value="Apply"/>
TCP Port :	<input type="text" value="4851"/> <input type="button" value="Apply"/>
I/O Port2 Configuration	
I/O Port2 :	<input type="text" value="IR Out"/> <input type="button" value="Apply"/>
Output Signal Level :	<input type="text" value="MAX(7)"/> <input type="button" value="Apply"/>
TCP Port :	<input type="text" value="4852"/> <input type="button" value="Apply"/>
I/O Port3 Configuration	
I/O Port3 :	<input type="text" value="IR Out"/> <input type="button" value="Apply"/>
Output Signal Level :	<input type="text" value="MAX(7)"/> <input type="button" value="Apply"/>
TCP Port :	<input type="text" value="4853"/> <input type="button" value="Apply"/>

Image 4: Setting control mode for Control Extension usage

Control Mode Setting	
Control Mode:	<input type="text" value="Control Extension"/> <input type="button" value="Apply"/>
TCP Port :	<input type="text" value="23"/> <input type="button" value="Apply"/>
I/O Port1 Configuration	
I/O Port1 :	<input type="text" value="IR Sensor In"/> <input type="button" value="Apply"/>
Output Signal Level :	<input type="text" value="MAX(7)"/> <input type="button" value="Apply"/>
Multicast Group ID :	<input type="text" value="0"/> <input type="button" value="Apply"/>
I/O Port2 Configuration	
I/O Port1 :	<input type="text" value="IR Out"/> <input type="button" value="Apply"/>
Output Signal Level :	<input type="text" value="MAX(7)"/> <input type="button" value="Apply"/>
Multicast Group ID :	<input type="text" value="0"/> <input type="button" value="Apply"/>
I/O Port3 Configuration	
I/O Port3 :	<input type="text" value="RS232"/> <input type="button" value="Apply"/>
Output Signal Level :	<input type="text" value="MAX(7)"/> <input type="button" value="Apply"/>
Baud Rate :	<input type="text" value="57600 bps"/> <input type="button" value="Apply"/>
Data Length :	<input type="text" value="8 bit"/> <input type="button" value="Apply"/>
Parity Bit :	<input type="text" value="None"/> <input type="button" value="Apply"/>
Stop Bit :	<input type="text" value="1bit"/> <input type="button" value="Apply"/>
Multicast Group ID for TxD :	<input type="text" value="0"/> <input type="button" value="Apply"/>
Multicast Group ID for RxD :	<input type="text" value="0"/> <input type="button" value="Apply"/>

KeyCode Open API Specification

If a KD-CX800 port is configured for use in KeyCode Open API mode, the device will listen on a dedicated TCP port for that particular I/O port.

The user application can then make a TCP connection to that port and send to and/or receive data from that I/O port.

The default TCP port 4580 is used for I/O port configuration commands. The Configuration port assignment is flexible, and can be adjusted using the SetTCPC:<TCP port#>\r.

Separate TCP ports are used for I/O port traffic data. IP Port number assignments for I/O ports are flexible, and assigned using the SetTCPP:<port#>,<TCP port#>\r.

It is recommended that TCP Port assignments always be no lower than 1024.

All I/O port traffic is limited to only one TCP connection at a time.

Available TCP Ports

TCP Port	Usage
4580	I/O Configuration Port
4581	Port 1 Traffic Data
4582	Port 2 Traffic Data
4583	Port 3 Traffic Data

Command Protocol

- All commands/responses are in ASCII text and are terminated with a (\r) carriage return.
- All commands written in the following format:
 - » **COMMAND:<port#>,[<parameter 1>,<parameter 2>,...]\r**
- Here COMMAND is the command name and <port#> is the I/O port number from 1 to 3. <parameter> will vary depending on the command.
 - » For example, to set port 1 to IR sensor mode, the command is
 - » **SetIRL:1\r**
- All commands are case sensitive
- All commands do not include "<" and ">" characters
- All commands contain no spaces

Configuration Commands

Command	Parameter Description	Usage
SetIRL: <port#>	<port#>: Multi-function I/O port number	Set I/O Port to IR Sensor Mode Ex: SetIRL:1\r
SetIRO: <port#>	<port#>: Multi-function I/O port number	Set I/O Port to Emitter Mode Ex: SetIRO:3\r
SetIRIN: <port#>	<port#>: Multi-function I/O port number	Set I/O Port to IR Input Mode Ex: SetIRIN:3\r
SetRS: <port#>, , <char length>, <stop bit>, <parity>, <timeout>	<port#>: Multi-function I/O port number : I/O Port baud rate. Ranges from 4800 and 115200. <char length>: 5- 5 bits, 6- 6 bits, 7- 7 bits 8- 8 bits <stop bit>: 1- 1 bit, 2- 1.5 bit, 3- 2 bit <parity>:Parity of RS. 0- no parity, 1- odd, 2- even, 3-mark, 4- space, 5- multidrop <timeout>: Time in milliseconds that the I/O port will be open. More info in the notes section.	Set I/O Port to RS-232 Mode Ex: SetRS:2,57600,8,1,0,6000\r

SetTR: <port#>, <time interval>	<port#>: Multi-function I/O port number <time interval>: Frequency in milliseconds that the I/O port will return current voltage state. More info in the notes section.	Set I/O Port to Trigger Mode Ex: SetTR:3,1000\r
SetTCPCC: <tcp port#>	<TCP port#>: Desired TCP port number for configuration port	Sets the configuration port for KD-CX800 Ex: SetTCPCC:4766\r
SetTCP: <port#>,<TCP port #>	<port#>: I/O port (1 – 3) <TCP port#>: Desired TCP port number	Sets the TCP port number for specified I/O port Ex: SetTCP:1,4767
TRO: <port#>, <level>	<port#>: Multi-function I/O port number <level>: HIGH, LOW	Set I/O Port Trigger Output High or Low Ex: TRO:2,HIGH
GetRS: <port#>	<port#>: Multi-function I/O port number	Get I/O Port RS-232 Configuration Ex: GetRS:3\r
GetTR: <port#>	<port#>: Multi-function I/O port number	Get I/O Port Trigger State Ex: GetTR:2\r
TRIN: <port#>	<port#>: Multi-function I/O port number	Get I/O Port Trigger Input Level Ex: TRIN:3\r

GetCFG: <port#>	<port#>: Multi-function I/O port number	Get I/O Port Configuration Ex: GetCFG:1\r
--------------------	---	--

Parameters

All parameters that may be part of a configuration command or a control or configuration response.

Command Field	Parameter	Possible Value
<port>	Port number	1: KD-CX800 I/O Port 1. 2: KD-CX800 I/O Port 2. 3: KD-CX800 I/O Port 3.
 	RS-232 baud rate	Baud rates supported by KD-CX800 RS-232 mode are: 2400, 4800, 9600, 19200, 38400, 57600,115200.
<char length>	RS-232 character length	5: Character length is 5 bits. 6: Character length is 6 bits. 7: Character length is 7 bits. 8: Character length is 8 bits.

<stop bit>	RS-232 stop bit setting	1: 1 stop bit. 1.5: 1.5 stop bits. 2: 2 stop bits.
<parity>	RS-232 parity type	PAR_NONE: No parity. PAR_ODD: Odd parity. PAR_EVEN: Even parity. PAR_MARK: Parity force to 1(Mark). PAR_SPACE: Parity force to 0(Space). PAR_MULTIDROP: Multidrop mode.
<time interval> / <timeout>	This value sets the time interval / timeout value for a port timer. -For Trigger usage, time interval is the frequency that the port will return its current sensed voltage state. -For RS-232 usage, timeout is the amount of time in milliseconds that Rx data is stored in the buffer	From 0 to 65535 milliseconds

<TCP port>	TCP port number	From 0 to 65535
<port level>	Trigger port level	LEVEL_HIGH: I/O port trigger input pin is high state. LEVEL_LOW: I/O port trigger input pin is low state.
<set level>	Trigger level to set	HIGH: Change I/O port trigger output pin to high state. LOW: Change I/O port trigger output pin to low state.
<CFG_RSP>	Standard configuration command response	See table below: " Possible Responses "
<port mode>	Port mode	IRL: I/O port is IR Sensor mode. IRIN: I/O port is Serial IR Input mode. IROUT: I/O port is IR Output mode. RS: I/O port RS-232 mode. TR: IO port is Trigger Input/output mode.

Possible Responses

Response	Meaning
ERR_OK	Command executed successfully
ERR_CMD	Command not recognized
ERR_PORT	I/O Port doesn't match the command received
ERR_PARAM	Bad parameter in command
ERR_MODE	I/O Port doesn't match the command received
ERR_CONF	Port not configured for KeyCode Open API Mode
LEVEL_HIGH	Trigger Input High Level
LEVEL_LOW	Trigger Input Low Level

IR Sensor and Emitter

For the KD-CX800, data received from the IR sensor traffic port is formatted in ASCII text. It is started by the carrier frequency and followed by a series of pulses.

» <Frequency>:<Pulse 1>,<Pulse 2>, ... <Pulse n><End Pulse>\r

The <Frequency> field is the carrier frequency and the <Pulse n> field is the IR pulse. An IR

Pulse is started with the on duration and the pause duration until the next pulse. All durations are calculated in microseconds and the duration value 65535 is used to mark the end of the IR burst.

For example, the following string is a 36-pulse IR burst with a carrier frequency of 37974Hz:

» 37974:8955-4516,526-618,501-618,525-594,497-620,499-620,522-595,547-573,499-1711,548-1717,499-1712,571-1693,499-1712,525-1738,499-712,527-1712,543-601,500-620,499-1712,565-579,499-

1712,525-1740,499-618,527-1684,525-1738,499-1713,551-594,523-1690,551-592,525-594,502-1736,525-592,525-594,533-40000,901-8-2292,525-65535\r

The format for an IR Emitter burst is as shown below.

» <Frequency>,<Mask>,<Repeat>,<Repeat Start>,<Repeat End>,<Repeat After>:<Pulse 1>,<Pulse 2>, ... <Pulse n><End Pulse>\r

The <Frequency> field is the carrier frequency of the IR burst. <Repeat> is the amount of times the repeat is to be done. The repeat pulses are specified by <Repeat Start> and <Repeat End>.

The device will generate the repeat pulse after the position specified by <Repeat After>. For <Repeat End> and <Repeat From>, the value of zero means the end of the burst. The <Mask> field specifies the IR output ports of the burst. The values 1, 2, and 3 belong to I/O ports 1, 2, and 3, respectively. These mask values can be summed together to specify more than one port for the same IR burst. An example IR burst is shown below:

» 38000,2,2,33,34,34:9043-4544,534-618,506-622,506-1723,534-620,536-590,549-579,506-622,506-620,503-1725,535-1746,508-620,527-1700,535-1720,538-1715,535-1720,557-1697,532-622,506-1721,560-594,506-622,506-620,508-620,520-606,506-622,506-1723,564-590,549-1679,532-1722,532-1725,532-1722,554-1729,503-1725,538-40348,9019-2312,504-65535\r

If the I/O port 2 of a KD-CX800 is configured for KeyCode Open API mode and the above data is received on TCP port 4582, the device will send that IR burst to I/O port 2 with 2 repeats. The repeated pulses are 538-40348 and 9019-2312. They will be inserted after the 9019-2312 pulse.

Notes:

- » Only I/O port 1 is capable of Sensing IR Data and requires an official Key Digital IR Learning Sensor
- » All I/O ports can be set to IR Input Mode but multiple I/O ports cannot be in that mode at the same time

- › All 3 ports share the same resources for IR burst generation. If more than one port is configured for IR Emitter Mode, the data received will be queued by KD-CX800. The device will then check the data buffer and generate the burst one by one. The receive buffer size of each I/O port is 1024 bytes. If the receive buffer is full, all incoming data will be discarded until all data found in the receive buffer is processed by the device.
- › If KD-CX800 I/O port is configured for Serial RS-232 mode, all data received from linked TCP traffic port will be forwarded back through this TCP port. If the traffic connection is closed, the timeout timer will start and the device will keep receiving data. If the traffic connection is opened again before the timer has expired, the data will be sent back. If there is no connection before the timer has expired, the device will close the port and clear any received data found in the buffer.
- › The RS-232 data buffers for I/O ports 2 and 3 can hold a maximum of 2048 bytes.
- › For I/O ports configured as trigger mode, output and input is enabled. The trigger output can be set by both the TCP control port and the TCP traffic port. For trigger input, a timer can be set to get the input state periodically. The trigger input state is also automatically updated through the TCP traffic port when the input state has changed. It is possible to query the input state directly on the TCP traffic port by sending the string:
 - › TRINr

Specifications

Technical:

- › Power Supply: KD-PS12V1ASC, 12V/1A, 100-240VAC, 50-60Hz, Interchangeable head, screw-in connector

General:

- › **Regulation:** CE, RoHS, WEEE
- › **Enclosure:** Black Metal
- › **Product Dimensions:** 5.06" x 3.08" x 0.78"
- › **Packaging Dimensions:** 5.78" x 4.01" x 3.46"
- › **Product Weight:** 0.5 lb
- › **Shipping Weight:** 1.5 lb

Important Product Warnings:

1. Connect all cables before providing power to the unit.
2. Test for proper operation before securing unit behind walls or in hard to access spaces.
3. If installing the unit into wall or mounting bracket into sheet-rock, provide proper screw support with bolts or sheet-rock anchors.

Safety Instructions:

Please be sure to follow these instructions for safe operation of your unit.

1. Read and follow all instructions.
2. Heed all warnings.
3. Do not use this device near water.
4. Clean only with dry cloth.
5. Install in accordance with the manufacturer's instructions.
6. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
7. Only use attachments/accessories specified by the manufacturer.
8. Refer all servicing to qualified service personnel. Servicing is required when the device has been damaged in any way including:
 - » Damage to the power supply or power plug
 - » Exposure to rain or moisture

Power Supply Use:

You **MUST** use the Power Supply provided with your unit or you **VOID** the Key Digital® Warranty and risk damage to your unit and associated equipment.

How to Contact Key Digital®

System Design Group (SDG)

For system design questions please contact us at:

- › Phone: 914-667-9700
- › E-mail: sdg@keydigital.com

Customer Support

For customer support questions please contact us at:

- › Phone: 914-667-9700
- › E-mail: customersupport@keydigital.com

Technical Support

For technical questions about using Key Digital® products, please contact us at:

- › Phone: 914-667-9700
- › E-mail: tech@keydigital.com

Repairs and Warranty Service

Should your product require warranty service or repair, please obtain a Key Digital® Return Material Authorization (RMA) number by contacting us at:

- › Phone: 914-667-9700
- › E-mail: rma@keydigital.com

Feedback

Please email any comments/questions about the manual to:

- › E-mail: customersupport@keydigital.com

Warranty Information

All Key Digital® products are built to high manufacturing standards and should provide years of trouble-free operation. They are backed by a Key Digital Limited 3 Year Product Warranty Policy. <http://www.keydigital.com/warranty.htm>