

Crestron **CP2/CP2E**
2-Series Control Processor

Operations Guide



CRESTRON

This document was prepared and written by the Technical Documentation department at:



Crestron Electronics, Inc.
15 Volvo Drive
Rockleigh, NJ 07647
1-888-CRESTRON

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2-Series Integrated Control Processor: CP2/CP2E

Introduction

Features and Functions

Crestron's CP2 and CP2E 2-Series Integrated Control Processors, cost-competitive options in Crestron's 2-Series line of integrated control systems, are designed for smaller home and commercial network systems. Like all Crestron control processors, the CP2 and CP2E units house the control system software program and provide connectivity for communication and control of all devices on the network. The CP2E is functionally identical to the CP2, with the exception that it also provides LAN and Web access through its built-in 10/100 BaseT Ethernet port, which supports dynamic/static IP addressing and full-duplex TCP/IP and UDP/IP protocols.

With speed, power, and massive memory, the 2-Series control systems are ideal for enhanced applications like media help desks, videoconferencing, distance learning, and entertainment facilities.

Functional Summary

- Powered by 2-Series Control Engine
- 36 MB of Internal Memory
- 8 IR/Serial Ports
- 8 Isolated Relay Ports
- 8 I/O Versiports
- 3 RS-232/422/485 Ports
- 1 RS-232 Computer Port
- 1 Cresnet Port
- Supports SIMPL™ Windows® & SIMPL+™
- Built-In 10/100 BaseT Ethernet Port (CP2E only)
- Built-In Web Server (CP2E only)

As with all of Crestron's 2-Series control processors, the 2-Series Control Engine is a solutions-driven control technology that is at the very heart of the CP2 and CP2E products. The breakthrough 2-Series Control Engine is based on the 257 MIPS, 32-

bit Motorola ColdFire® processor. The 2-Series operating system is vastly upgraded from Crestron's X-generation products, yet compatible with existing Crestron software and programming. A key feature is the new Crestron Compiler, which allows any existing Crestron SIMPL™ Windows® control program to be easily recompiled for the 2-Series. The real-time, preemptive multi-tasking/multi-threaded operating system offers a file system that supports long file names. The enhanced SIMPL+™ instruction set is also fully compatible with existing Crestron SIMPL Windows and SIMPL+ programs.

Specifications

Specifications for the CP2 and CP2E are given in the following table.

CP2/CP2E 2-Series Integrated Control System Specifications

SPECIFICATION	DETAILS
CPU	32-Bit Motorola ColdFire® Processor
Processor Speed	257 MIPS (Dhrystone 2.1 Benchmark)
Memory	36MB (4MB flash, 32MB DRAM, 256KB NVRAM)*
Ports/Connectors**	
NET	1 – Cresnet 4-wire interface (Expandable via Cresnet Poll Accelerator)
COMPUTER	1 – DB9F PC interface
INFRARED – SERIAL OUTPUT	8 – Simultaneous one-way IR or serial output
I/O	8 – Programmable digital/analog inputs & digital outputs
RELAY OUTPUT	8 – Normally open, isolated relays (MOV suppression)
LAN (CP2E only)	1 – RJ45 10/100 BaseT Ethernet port
COM (A, B, & C)	3 – DB9 bidirectional serial ports (RS-232, -422, -485), all Cresnet Poll Accelerator ready
24VDC	1 – Male receptacle for optional external power pack.
Reset Buttons	
HWR	Initiates system hardware reset
SWR	System restart with or without program
Power Requirements	24 VDC, 1A, 24W (Power supply not included)***
Network Power Fuse Rating	Internal self-resetting fuse****
Environmental Temperature & Humidity	41° to 113°F (5° to 45°C) 10% to 90% RH (non-condensing)
Dimensions & Weight	Height: 1.7 in (4.32 cm) Width: 19.0 in (48.26 cm) – with ears 17.03 in (43.24 cm) – without ears Depth: 6.64 in (16.87 cm) Weight: 3.54 lb (1.59 kg)

* For more information on system memory usage, see Memory on page 7.

** For more information on controls, ports, and indicators, see Physical Description on page 3.

*** For information on optional power source, see Optional Power Supply on page 13.

**** Heat-sensitive device—resets within approximately 30 seconds after overload condition is removed.

Physical Description

The CP2/CP2E integrated control systems are housed in black enclosures with labeling on the front and rear panels. The front panels of both units include standard LEDs and two reset buttons. All connections to the units are made through their rear panels. The front panels of the CP2 and CP2E are shown below.

Front and Rear Panels

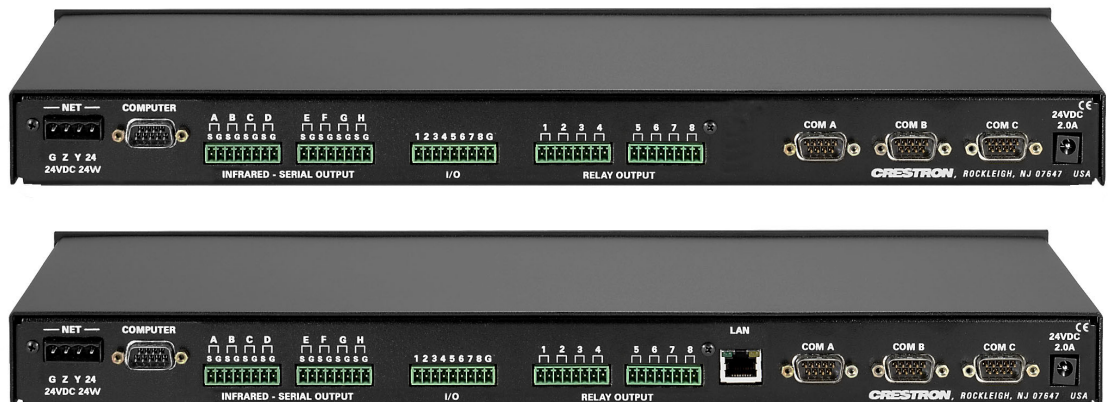
The front panels of the CP2 and CP2E are shown below.

CP2/CP2E Front Panels



The rear panels of the units are shown below. Both units contain a single RS-232 computer port, a network connector, three COM ports, eight one-way IR/serial ports, eight I/O ports, eight relay ports, and a 24VDC male receptacle for power supplied through an AC power pack (purchased separately). The CP2E also contains a single Ethernet port.

CP2/CP2E Rear Panels



Rubber feet are supplied and can be attached to the base of the unit for stability and to prevent slippage in shelf placement and stacking configurations. The unit may also be rack mounted by attaching the supplied metal flanges (ears).

Controls and Indicators

The CP2/CP2E front panel indicators and controls are described below.

PWR (Power)

This LED illuminates when the unit is connected to and receives 24VDC power from an AC power pack or the Cresnet NET connector.

NET

This LED illuminates when the central processing unit is processing or communicating with Cresnet devices (i.e., button pressed at Cresnet panel or data received from Cresnet panel).

ERR

This LED illuminates when an error condition is detected. This may be the result of hardware or software failure, or a programming error. To determine the actual error condition, examine the message available through the Viewport menu **Functions/2-Series/errorlog**.

LNK (LAN) – (CP2E only)

This LED illuminates when there is a connection to the rear panel LAN port.

ACT (LAN) – (CP2E only)

This LED illuminates when there is communication (activity) at the rear panel LAN port.

HWR

Pressing this button initiates system hardware reset. (Same effect as disconnecting and reconnecting power.)

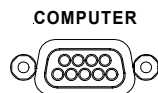
SWR

Pressing this button in combination with the **HWR** button performs a system restart without loading the program (refer to Troubleshooting Communications on page 22). Pressing it alone while the system is running restarts the program.

Ports

The CP2/CP2E rear panel ports are illustrated and described below.

COMPUTER



This DB9F connector is used when programming the units with a PC. The port is modem compatible. The modem and/or PC program cable are not included.

NET

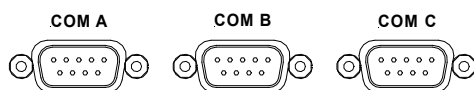


G Z Y 24
24VDC 24W

NOTE: The orientation of this connector is “upside down” compared to other Crestron network devices (e.g., CNX-BIPAD8, CNX-RMCLV). Be sure the mating Cresnet cable connector is properly aligned before attempting to insert it, to avoid damage to the CP2/CP2E unit.

This connector (typical Crestron network port labeled G Z Y 24) is used for expansion to Cresnet and SmarTouch peripherals. This connector can also serve as a 24W power source to the network when CP2/CP2E unit power is supplied through the 24VDC power supply connector by an optional AC power pack (purchased separately); otherwise, power to the unit is supplied through this connector. There is a 24W maximum load rating for power output. Refer to “Network Wiring” on page 11 for details.

COM (A – C)



These three DB9 (male) software programmable, bi-directional serial ports are available for RS-232, RS-422, or RS-485 communication, with hardware and software handshaking. Speeds are rated up to 115,200 bps. All three ports are Cresnet Accelerator ready. The Cresnet Poll Accelerator effectively increases the network speed, fan-out, and device addresses by a factor of 8 for each Poll Accelerator added to the system.

NOTE: The pinout of each 9-pin port is non-standard (refer to the table after these notes, titled "Non-Standard COM Pinout"); it contains RS-422 pins in addition to RS-232. This may result in a conflict with some equipment and therefore all nine pins should **not** be used. Only the required pins for each communication type should be connected. For RS-232 and –422, pins 2, 3, 5, 7, and 8 are wired straight through.

NOTE: Data Set Ready (DSR) and Data Terminal Ready (DTR) are not supported.

NOTE: To support RS-485, tie pin 1 (RXD-) to pin 9 (TXD-) and pin 4 (TXD+) to pin 6 (RXD+) in the cable (refer to the table after this note, titled "COM Pinout to RS-485 Bus").

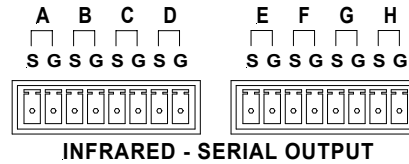
Non-Standard COM Pinout

PIN	DIRECTION	DESCRIPTION
1*	To CP2/CP2E	(RXD-) RS-422 Receive Data (Idles low)
2	To CP2/CP2E	(RXD) RS-232 Received Data
3	From CP2/CP2E	(TXD) RS-232 Transmitted Data
4	From CP2/CP2E	(TXD+) RS-422 Transmit Data (Idles high)
5		RS-232 and RS-422 Signal Common
6	To CP2/CP2E	(RXD+) RS-422 Receive Data (Idles high)
7	From CP2/CP2E	(RTS) RS-232 Request to Send
8	To CP2/CP2E	(CTS) RS-232 Clear to Send
9	From CP2/CP2E	(TXD-) RS-422 Transmit Data (Idles low)

Where: *= RS-422 transmit and receive are balanced signals requiring two lines plus a ground in each direction. RXD+ and TXD+ should idle high (going low at start of data transmission). RXD- and TXD- should idle low (going high at start of data transmission). If necessary, RXD+/RXD- and TXD+/TXD- may be swapped to maintain correct signal levels.

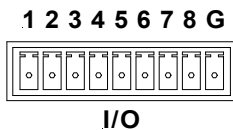
COM Pinout to RS-485 Bus

COM (DB9) CONNECTOR	RS-485 BUS
Tie Pins 1 & 9	-
Tie Pins 4 & 6	+
Pin 5	G

INFRARED – SERIAL OUTPUT

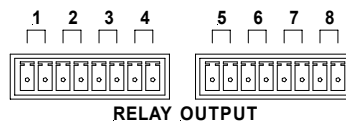
These connectors provide eight serial outputs for IR or serial interface. Each output is labeled S (signal) and G (ground). Infrared output is rated up to 1.2 MHz, at data rates up to 115K. Serial protocols include one-way RS-232.

NOTE: Transmission levels on the infrared – serial output connectors are in the 0 to +5VDC range, which may not be compatible with all RS-232 devices.

I/O

This connector provides eight software programmable analog and digital inputs as well as digital outputs. Digital outputs offer 250mA sync from maximum 24 VDC; catch diodes for use with "real world" loads. Digital inputs are rated 0 – 24 VDC, 20K ohms input impedance, logic threshold 1.25 VDC. Analog inputs are rated 0 – 10 VDC, protected to 24 VDC maximum, 20K ohms input impedance; pin-programmable 2K ohms pullup resistor to +5V.

NOTE: Digital outputs are TTL values and may not work with devices requiring a "dry" contact closure (e.g., low voltage motor controllers).

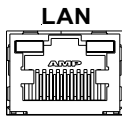
RELAY OUTPUT

These connectors provide eight normally open, isolated relay contact groups. Each relay contact closure is rated 1A, 30 VAC/DC; MOV arc suppression is provided across contacts for use with "real world" loads.

24VDC, 2.0A (Power Supply)**24VDC
2.0A**

This male connector can be used to supply 24VDC power to the CP2/CP2E from an AC power pack purchased separately. (Refer to Optional Power Supply on page 13). When power is supplied to the units through this connector, 24VDC, 24W is also available to other Cresnet system devices through the NET connector. This is typically done in small installations. In large system configurations, power is usually supplied through Cresnet wiring to the NET connector.

NOTE: Use care in wiring installations to avoid applying 24 VDC power to Cresnet wiring from an AC power pack as well as from a system device that contains its own power supply. Although this condition should not cause any damage, Crestron does not recommend it. In those network configurations that require more power than can be supplied by Crestron's Power Control Unit alone, disconnect the +24 VDC Cresnet wire from those devices that will be powered by an AC power pack.

LAN (CP2E only)

This built-in 10/100 BaseT Ethernet RJ45 port (CP2E only) provides local area network or Web access. Refer to the following table for the Ethernet connector signals and use an appropriate cable (not supplied).

LAN Port Pinout

TYPE	PIN	SIGNALS
8-Position RJ45	1	TD+
	2	TD-
	3	RD+
	4	Connected to pin 5
	5	Connected to pin 4
	6	RD-
	7	Connected to pin 8
	8	Connected to pin7

NOTE: Interface connectors for the NET, Infrared-Serial, I/O, and Relay Output ports are provided with the unit.

Memory

The CP2/CP2E has 36MB of built-in memory (non-volatile and volatile). A total of 36MB is broken down as follows: 4MB flash (non-volatile), 32MB DRAM (volatile), and 256KB NVRAM. Flash memory contains the file system inside the 2-

series control engine. Non-volatile memory contains information that is retained after loss of electrical power. Volatile memory is lost after a power failure. Refer to the lists below for a breakdown of memory usage for program-related information stored in the unit.

Flash

The 4MB flash memory consists of approximately 1.5MB used for firmware, and approximately 2.5MB available for SIMPL, SIMPL+, and Web pages. The files that reside in flash conform to a flat directory structure. The following table presents the structure of the overall file system.

TOP LEVEL	SECONDARY LEVEL	DESCRIPTION
\		Root of the file system
	DISPLAY	Legacy directory used in ISYS panels to hold display lists
	SYS	Contains various system configuration files
	SETUP	Legacy directory used in ISYS panels to hold setup files
	HTML	Web pages
	SIMPL	Control system program files
	SPLUS	Simpl+ module files
	USER	Used for user-defined files
	MAILBOX	Directory contains the user mailbox file

Although the file system is case insensitive, the case is preserved to maintain file checksums.

Non-volatile

1. SIMPL+ Modules
2. SIMPL+ Variables (using "nonvolatile" qualifier or #DEFAULT_NONVOLATILE)
3. SIMPL Program
4. Operating System (.cuz file)
5. Signals explicitly written to NVRAM (by symbols such as Analog RAM, Analog RAM from database, Serial RAM, Serial RAM from database, Analog Non-volatile Ramp, Digital RAM, etc.)

NOTE: If you extract NVRAM values to a file (**Viewport, File transfer | Save NVRAM to File**), to simplify restoring them in the event of file corruption or to distribute to identical control systems, remember that NVRAM values are position sensitive in the program. When saving the NVRAM is crucial to your application, it is recommended to place all symbols and/or modules that use NVRAM at the beginning of your program. When NVRAM (.nvr file) is re-installed, all the values should line up with the program. If the program is modified, and logic is placed before any symbols using NVRAM, the previously stored values will not line up and your presets will have to be re-entered

Volatile

1. Digital, analog and serial signal values
2. SIMPL+ Variables (Default if no options are specified, or if "volatile" qualifier is used, or #DEFAULT_VOLATILE is used)

DRAM

DRAM is used by the operating system for dynamic storage of variables, signals and other constructs used at runtime. The actual amount of DRAM used at any given time depends on the particular program that is running, i.e., usage is variable, or dynamic, during normal operation.

Industry Compliance

As of the date of manufacture, the CP2/CP2E integrated control processors have been tested and found to comply with specifications for CE marking and the Australian Compliance Mark.



NOTE: This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Setup/Installation

Rack Mounting

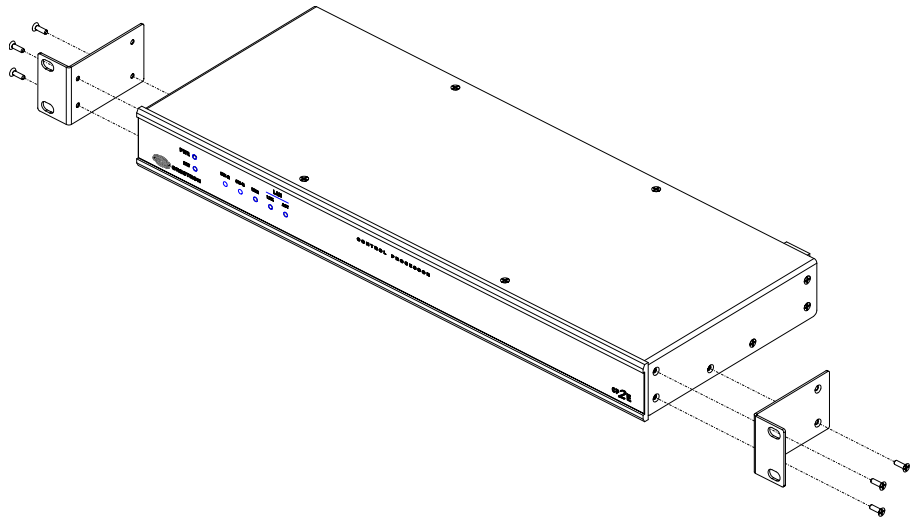
WARNING: To prevent bodily injury when mounting or servicing this unit in a rack, take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
 - If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
-

NOTE: If rack mounting is not required, rubber feet are provided for tabletop mounting or stacking. Apply the feet near the corner edges on the underside of the unit.

NOTE: Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit. (e.g., use of power strips).

Two “ears” are provided with the unit and must be installed so that it can be rack mounted. Refer to the following illustration and complete the procedures below to attach ears to the unit. The only tool required is a Phillips screwdriver.

Ear Attachment for Rack Mounting (CP2E shown in illustration)

1. Using a Phillips screwdriver, remove and retain the three side screws closest to the front panel.
2. Position a rack ear so that its mounting holes align with the vacated holes, and secure the ear to the unit with the three screws from step 1
3. Repeat the procedure to attach the remaining ear to the opposite side.

Bussing Strip Installation

The 2-Series integrated control system is supplied with two brass bussing strips to facilitate commoning (linking) of multiple terminal block connections. The bussing strips are constructed with four terminal block position, and may be trimmed to size for various applications or different devices. One strip is supplied for each 8-position terminal block.

1. To utilize the bussing strip, determine the number of relays to be commoned for the equipment being installed. If less than four, the strip can be trimmed to size with a pair of scissors or wire snips.
2. Loosen the terminal block screws and insert the first leg of the bussing strip into the first common position on the terminal block. The strip engages the other common positions automatically.
3. Remove approximately 1/8" of the jacket from the common wire and insert the conductor into one of the terminal block common positions. Tighten the terminal block screws to lock the wire and bussing strip into place. Insulate the strip by folding a piece of 3/4" wide vinyl electrical tape (such as Scotch 33+) over the spine and as much of the individual legs as possible. Excess tape at each end of the strip should be pressed closed, then trimmed to within approximately 1/16" of the end of the strip.
4. When wiring the remaining conductors, remove approximately 1/8" of the jacket and insert the wires into the proper terminal block positions. To prevent the possibility of electrical shorts, it is essential that these conductors do not touch any uninsulated portion of the bussing strip.

5. Secure the wires connected to the terminal block with a tie wrap around the bussing strip to provide strain relief.

Network Wiring

NOTE: When making wire connections, refer to the latest revision of the Cresnet Network Interconnect Drawing (Doc. 5411). The document can be obtained from the Downloads section of the Crestron website (www.crestron.com). Search for the CRESNET.PDF files.

CAUTION: Exceeding the power output (maximum 24W) of the CP2/CP2E can result in system shutdown or a blown fuse.

CAUTION: Possible equipment damage if miswired.

NOTE: The orientation of this connector is “upside down” compared to other Crestron network devices (e.g., CNX-BIPAD8, CNX-RMCLV). Be sure the mating Cresnet cable connector is properly aligned before attempting to insert it, to avoid damage to the CP2/CP2E unit.

NOTE: Do not power up system until all wiring is verified. Care should be taken to ensure data (Y, Z) and power (24, G) connections are not crossed. Data “Y” was data “+”; data “Z” was data “-”.

NOTE: All network wiring must consist of two twisted-pairs. One twisted pair is the +24V conductor and the GND conductor and the other twisted pair is the Y conductor and the Z conductor.

NOTE: For larger networks (i.e., greater than 28 network devices), it may be necessary to add a Cresnet Hub/Repeater (CNXHUB) to maintain signal quality throughout the network. Also, for networks with lengthy cable runs, it may be desirable to add a hub/repeater after only 20 network devices.

When calculating the wire gauge for a particular network run, the length of the run and the power factor of each network unit to be connected must be taken into consideration. If network units are to be daisy-chained on the run, the power factor of each network unit to be daisy-chained must be added together to determine the power factor of the entire chain. The length of the run in feet and the power factor of the run should be used in the following resistance equation to calculate the value on the right side of the equation.

Resistance Equation

$$R < \frac{40,000}{L \times PF}$$

<p>Where: R = Resistance (refer to table below). L = Length of run (or chain) in feet. PF = Power factor of entire run (or chain).</p>
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The required wire gauge should be chosen such that the resistance value is less than the value calculated in the resistance equation. Refer to the following table.

Wire Gauge Values

RESISTANCE (R)	WIRE GAUGE
4	16
6	18
10	20
15	22
13	Doubled CAT5
8.7	Tripled CAT5

NOTE: When daisy-chaining Cresnet units, strip the ends of the wires carefully to avoid nicking the conductors. Twist together the ends of the wires that share a pin on the network connector, and tin the twisted connection. Apply solder only to the ends of the twisted wires. Avoid tinning too far up the wires or the end becomes brittle. Insert the tinned connection into the Cresnet connector and tighten the retaining screw. Repeat the procedure for the other three conductors.

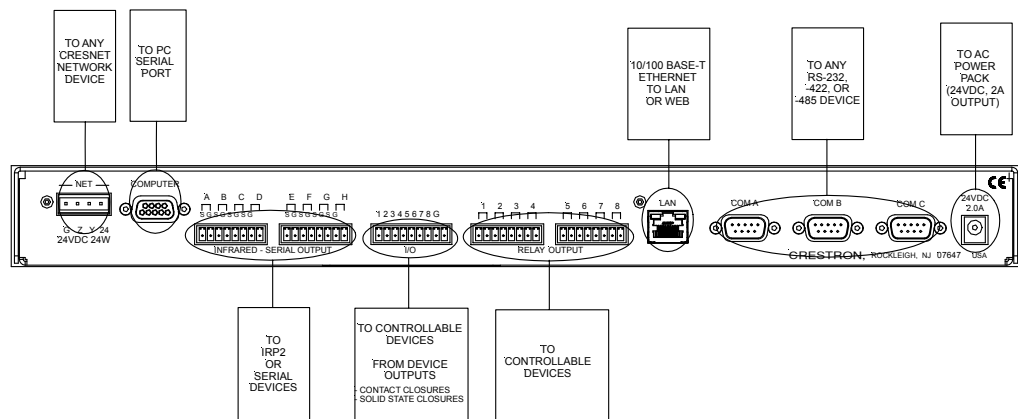
Hardware Hookup

Refer to the following hookup diagram and, aside from attaching power last, complete the connections in any order. Refer to "Network Wiring" on page 11 when making network connections.

NOTE: To prevent overheating, do not operate this product in an area that exceeds the environmental temperature range listed in the table of leading specifications. Consideration must be given if installed in a closed or multi-unit rack assembly since the operating ambient temperature of the rack environment may be greater than the room ambient. Contact with thermal insulating materials should be avoided on all sides of the unit.

NOTE: The maximum continuous current from equipment under any external load conditions shall not exceed a current limit that is suitable for the minimum wire gauge used in interconnecting cables. The ratings on the connecting unit's supply input should be considered to prevent overloading the wiring.

Hookup Connections for the CP2/CP2E



Optional Power Supply

The units can be powered through the NET network connector, or by an optional AC power pack (purchased separately). If an external power supply is to be used, Crestron recommends its CNPWS-75 External Power Supply or PW-2420RU Universal Power Pack, or equivalent.

NOTE: Use care in wiring installations to avoid applying 24 VDC power to Cresnet wiring from an AC power pack as well as from a system device that contains its own power supply. Although this condition should not cause any damage, Crestron does not recommend it. In those network configurations that require more power than can be supplied by Crestron's Power Control Unit alone, disconnect the +24 VDC Cresnet wire from those devices that will be powered by an AC power pack.

Programming the CP2 and CP2E

SIMPL Windows is Crestron's graphical, Windows-based development tool for programming control systems. The SIMPL Windows interface provides two workspaces: the Configuration Manager, for configuring the control system, touchpanels, and controlled network devices; and Program Manager, for designing the logic and functionality of the control system.

In addition, you can use Crestron's powerful Viewport utility to accomplish multiple system tasks, such as uploading the program to the control system and performing diagnostic functions. Together with the Crestron Database, these tools provide you with the essential components you need to program the CP2/CP2E. Crestron software is available on CD-ROM, or can be downloaded from the Crestron website (www.crestron.com)—registration is required for downloading.

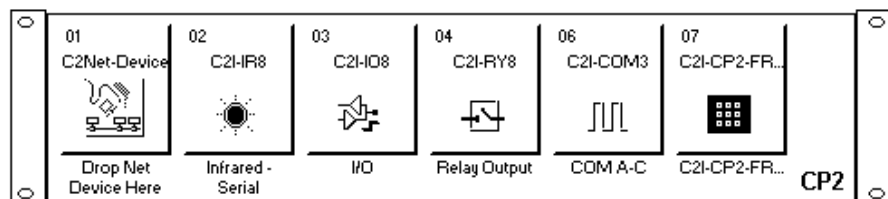
Following are the minimum software requirements for the PC:

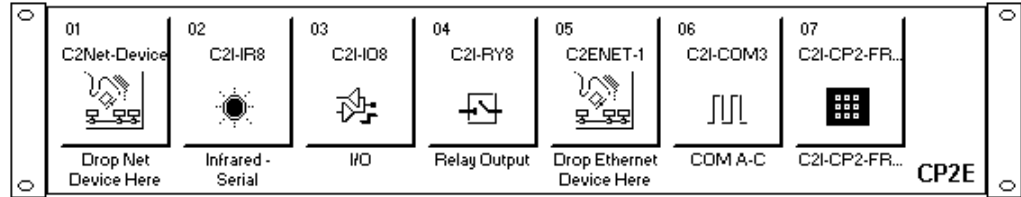
- SIMPL Windows version 2.00.28, with Library Update 145
- Crestron Database version 15.6.2
- (Optional) VisionTools Pro-e software for designing touchpanel pages
- (Optional) Application Builder (also requires SIMPL+ Cross Compiler) software for automatic residential and commercial programming
- (Optional) DEAL for Windows IR learning software version 2.07

CP2/CP2E Device Library Symbols

In Configuration Manager, drag the CP2 or CP2E from the Control Systems folder of the Device Library to *System Views*. The CP2 and CP2E appear nearly identical, except that the CP2E provides an additional slot for Ethernet devices, as shown below.

System Views of the CP2 and CP2E





Slot 1: C2Net-Device

The C2Net-Device slot enables the CP2 and CP2E to control up to 252 Cresnet devices. Each Cresnet device is assigned a unique identifier called a Net ID, which is a hexadecimal value ranging from 03 to FE.

To view the list of supported devices, expand the control system in the bottom pane of *System Views* and double-click the C2Net-Device slot, or right-click and select **Add Item** from the submenu. Supported devices include network control modules, lighting modules and a variety of Crestron wired touchpanels.

To add a device to the system expand the C2 Net-Device slot and double-click the desired Net ID, or right click and select **Add Item** from the submenu. Then select the device you want to add. Alternatively, you can drag the device from the Cresnet Modules folder onto the Net ID.

In Program Manager, the C2Net-Device symbol contains no signals; to program a controlled Cresnet device, expand the C2Net-Device symbol in *Program View*. Then drag the device to *Detail View*.

Slot 2: C2I-IR8

The CP2 and CP2E provide 8 output ports (A through H) that enable serial communication in a variety of formats, including infrared and one-way RS-232. Of course, different devices may require additional receiving equipment, cables, adapters, etc.

To add an IR device to the system, drag the device driver from the Crestron or User IR Database to a C2I-IR8 port.

To add an RS-232 device, drag the C2IR one-way serial driver from the Serial Drivers folder to a C2I-IR8 port. Alternatively, you can double-click a C2I-IR8 port and select the C2IR one-way serial driver (or right-click and select **Add Item** from the submenu).

Next, double-click the serial driver to specify the communication settings that are required by the device. These settings define the protocol that the controlled serial device expects, and include the speed of data transmission (baud rate), error checking (parity), and the number of data bits and stop bits. The exact protocol will be described in the manufacturer's documentation.

NOTE: The C2IR serial driver, being one way, does not provide hardware or software handshaking.

In Program Manager, the C2I-IR8 symbol contains no signals; to program an IR device or serial driver, expand the C2I-IR8 card by clicking the plus sign in *Program View*. Then drag the symbol to *Detail View*. (Alternatively, double-click the symbol.)

Slot 3: C2I-IO8

The CP2 and CP2E provide eight I/O ports called Versiports, each of which can function as a digital input, a digital output, or an analog input. Each Versiport has a corresponding pullup resistor.

In Program Manager, drag the C2I-IO8 symbol from *Program View* to *Detail View*. The symbol contains the following signals, arranged here according to mode:

Signals

Digital output mode

- 8 digitals: <o1> through <o8>

Digital input mode

- 8 digitals: <i1> through <i8>

Analog input mode

- 8 analogs: <i1> through <i8>
- For each analog, one corresponding minimum change value: <MinChange1> through <MinChange8>

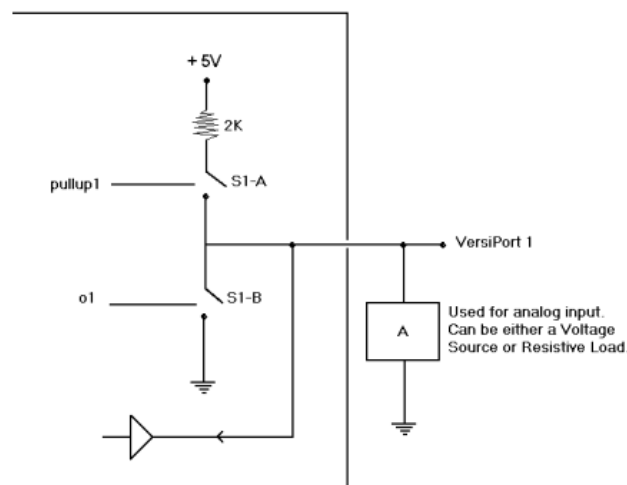
All Versiport modes

- For each Versiport, one corresponding pullup resistor: <pu-disable1> through <pu-disable8>

Defining a signal puts the signal into the corresponding mode. For example, defining the analog input <i1> configures that Versiport as an analog input. A Versiport can only operate in one mode. That is, if you define <o1> you should not also define <i1>.

Description

Internal configuration of a Versiport



Digital Output Mode

When a Versiport is operating in digital output mode, the output pin will be shorted to ground on the rising edge of the corresponding <o> signal (switch S1-B in the Versiport diagram will be closed). When <o> goes low, the output pin is driven to a value of +5V (switch S1-B is open).

Driving the corresponding <pu-disable> signal high can modify this behavior. This is not recommended, though, since it will cause the output pin to float when <o> goes low.

Example 1 (recommended):

The <pu-disable1> signal is driven low or left undefined. When <o1> goes low, Versiport 1 is at +5V. When <o1> goes high, Versiport 1 is shorted to ground.

Example 2 (not recommended):

The <pu-disable1> signal is driven high. When <o1> goes low, Versiport 1 is floating. When <o1> goes high, Versiport 1 is shorted to ground.

Digital Input Mode

When a Versiport is operating in digital input mode, the corresponding <i> signal will go high whenever the C2I-IO8 detects that the Versiport is shorted to ground (threshold < +2.5V).

NOTE: Here, as with digital output mode, the corresponding pullup resistor should be enabled. That is, <pu-disable> should be given the signal name 0 or left undefined; otherwise the input will always read as logic low.

Example 3:

When Versiport 3 is shorted to ground, <i3> will go high. When Versiport 3 is not shorted to ground, <i3> will go low (so long as <pu-disable> equals 0 or is undefined).

Analog Input Mode

In analog input mode, the Versiport is typically tied to a resistive load (such as a humidity sensor) or a voltage source (both can be represented by box "A" in the Versiport diagram).

When a resistive load is tied to a Versiport, the corresponding pullup resistor must be enabled (again, this means that <pu-disable> should be given the signal name 0 or left undefined). This creates a voltage divider and provides a varying voltage level, based on the current resistance of the sensor for the C2I-IO8 to read.

Example 4:

A resistive humidity sensor is tied to Versiport 1 (and <pu-disable1> is low or undefined). <i1> will assume the corresponding analog value.

When a voltage source is tied to a Versiport, the corresponding pullup resistor should be *disabled* (the only case where the default setting should be overridden). This allows the C2I-IO8 to read the value of the voltage source directly.

Example 5:

A voltage source is tied to Versiport 1 and <pu-disable1> is given the signal name 1. <i1> will assume the corresponding analog value (ranging from 0 to 65535, or 0 to +10V on the input pin).

The C2I-IO8 does not propagate all changes in the analog values of its Versiports, since this can lead to undesirable results if the input source is not clean or has jitter. Rather, the <MinChange> signals should be used to specify a "minimum change" value, such that the C2I-IO8 will not propagate the new value until it changes by <MinChange>. (The default minimum change value is 2048.)

Example 6:

A voltage source is placed on Versiport 1 and **<MinChange1>** is set to 10 via an Analog Initialize symbol. The value of **<i1>** will not be propagated until it changes by at least 10. If the current value is 500, then a new value will not be reported until it changes to 510 or 490.

Slot 4: C2Y-RY8

The C2I-RY8 provides eight isolated relays for controlling low voltage contact closure devices such as drapes, screens and lifts.

In Program Manager, drag the C2I-IO8 symbol from *Program View* to *Detail View*. The symbol contains the following signals, arranged here according to mode:

Signals

- 8 relays: **<A1>** through **<A8>**

When a signal goes high, the corresponding relay closes for as long as the signal remains high. When the signal goes low, the relay opens. If a signal is undefined, the relay is open.

Slot 5: C2ENET-1 (CP2E Only)

The C2ENET-1 port enables the CP2E to control up to 252 Ethernet devices. Each Ethernet device is assigned a unique identifier called an IP ID, which is a hexadecimal value ranging from 03 to FE.

To view the list of supported devices, expand the control system in the bottom pane of *System Views* and double-click the C2ENET-1 slot. Supported devices include Ethernet control modules, PC and Web browser interfaces, and a variety of Crestron Ethernet touchpanels. To add a device to the system expand the C2ENET-1 slot and double-click the desired IP ID, or right-click and select **Add Item** from the submenu. Then select the device you want to add.

In Program Manager, the C2ENET-1 symbol contains no signals; to program a controlled Ethernet device, expand the C2ENET-1 symbol in *Program View*. Then drag the symbol to *Detail View*. (Alternatively, you can double-click the symbol.)

About the IP Table

In order for the CP2E (or any Ethernet-enabled control system) to control devices via Ethernet, the IP ID of the device must be associated with an IP address, and both the IP ID and IP address must be entered into the IP Table of the control system.

You can create an IP Table in two ways. The first method is to double-click the device in Configuration Manager to open the “Device Settings” window. Click the “IP Net Address” tab and enter the IP address of the device in the “IP Address” field. Repeat this procedure for all Ethernet devices in your system. This creates what is referred to as a “default” IP Table. When the program is compiled and ready to be uploaded to the control system, you will have the option to upload this default IP Table.

The second method is to use the Crestron Viewport. This method is especially useful on site, if you want to change one or more IP addresses without changing the program.

1. Select **Functions | Setup IP Table**.
2. Click **Add** and select the IP ID of the device from the drop-down list, then enter the IP address.

3. When all the IP IDs and associated IP addresses have been added to the IP Table, click **Send IP Table to Control System**.

As with all 2-Series control systems, the CP2E has the capability to function as a peripheral device, or “slave”, in a master/slave arrangement with another control system. Here the IP Table of the CP2E must contain just one entry, for the master control system.

To access the IP Table of a “slave” CP2E, use the **Setup IP Table** command on the Viewport **Functions** menu, as just described. The settings are as follows:

- Enter the IP ID of the CP2E itself, as specified in the program of the master control system and select **OK**. Notice that the “slave” CP2E is listed with TRUE in the *Master?* column.
- 2) Enter the IP address of the master control system.
- 3.) Click the **Set as Master** check box.

When operating as a slave device, the CP2E can accept commands only from one control system. Therefore, there must only be one entry in the IP Table.

For further information about e-Control applications, including basic concepts and terminology, see Crestron’s e-Control Reference Guide, DOC. 6052, available in PDF format on the Crestron website.

Slot 6: C2I-COM3

The CP2 and CP2E provide three serial COM ports (A through C) that enable RS-232, RS-422, and RS-485 communication.

Each port has a built-in serial driver with communication settings that must be specified in Configuration Manager: double-click a COM port to open the “Device Settings” dialog box, and then click the “Serial Settings” tab. These settings define the protocol that a controlled serial device expects, and include the baud rate, parity, and the number of data bits and stop bits. In addition, a device might require hardware or software handshaking, which controls the flow of data between two devices. The exact protocol will be described in the manufacturer’s documentation.

The Crestron database includes numerous serial devices, with default logic and pre-configured communication settings, that are compatible with the ports on the COM card. Simply drag the serial device from the Crestron Database folder to one of the ports on the COM card and click **Yes** when prompted to replace the built-in serial driver for that port. In most cases, the default logic should be loaded as well.

In Program Manager, the C2I-COM3 symbol contains no signals; to program a serial driver expand the C2I-COM3 card by clicking the plus sign in *Program View*. Then drag the desired serial driver to *Detail View*. (Alternatively, you can double-click the symbol.)

Converting Programs and Modules Created for other Systems

A useful feature of SIMPL Windows is that you can convert a program created for another type of control system, simply by changing the target to a CP2 or CP2E.

To do this you first open the program, and then replace the existing control system with the CP2 or CP2E. That is, drag the CP2 or CP2E from the Control Systems folder onto the existing control system in *System Views*, and click **Yes** when prompted to confirm the replacement.

If the program contains SIMPL+ or User modules, the conversion might generate error messages. This is because modules and programs often contain symbols with “ambiguous” signals. For example, the inputs of the Serial to Analog symbol can be defined as either analog or serial. Although X-Series processors support ambiguous signals, the 2-Series processor requires all signal types to be strictly defined.

If the program you want to convert contains SIMPL+ or User modules, Crestron recommends that you first convert each module before converting the larger program. In this way, the compiler can resolve any ambiguous signals in the modules and minimize errors when the larger program is converted.

Converting SIMPL+ Modules

1. Open the SIMPL+ module you want to convert.
2. Choose the 2-Series processor as the target by clicking the toolbar button, as shown in the following illustration.

SIMPL+ Toolbar



NOTE: Note that you can select both X and 2-Series as the targets, so that the module will work for both types of control systems. However, you will be limited to SIMPL+ keywords and functions that are supported on both systems. If you do not choose a target, then the module may or may not work, depending on the constructs that are used.

3. Save and compile the module by clicking the **Save and Compile** toolbar button; alternatively, click **Save and Compile** on the **Build** menu (or press **F12**).

Converting User Modules

1. Open the User module you want to convert.
2. Click **Project | Edit Program Header**.
3. Click **2-Series** in the “Target Control System Classes” list box.

You can select other types of control systems as well, but then you will be limited to symbols that are supported by all of these platforms. The module may still work on unselected control systems so long as unsupported symbols are not used. Selecting a control system means that you are *requiring* the module to work there.

Module Header Information

After you convert each module in a program, you can convert the program as described previously: drag the CP2 or CP2E onto the existing control system in *System Views* and click **Yes** to confirm the replacement.

For further information about compile-time errors and detailed explanations about working with modules, refer to the SIMPL Windows online help file.

Establishing Communication with the CP2/CP2E

Before uploading a program to the CP2/CP2E or performing diagnostic functions, you must connect the control system to the PC. With the CP2, this connection must be serial; with the CP2E the connection can be either serial or TCP/IP.

Serial Connection

Connect the COMPUTER port on the control system to one of the COM ports (usually COM 1) on the PC. Use a straight-through RS-232 cable with a DB9 male connector on one end and a DB9 female connector on the other. Most commercially available cables are acceptable; they should have at least 5 pins for transmit, receive, ground, and hardware handshaking.

Open the Crestron Viewport and click **Setup | Communication Settings** to display the “Port Settings” dialog box. Then click **RS-232** as the connection type.

The PC communication settings specified here should match the protocol that the CP2/CP2E expects. The settings are as follows:

- Port = COM 1 through COM 8. Select the correct COM port on the PC.
- Baud rate = 115200 (You can set the PC and the control system to a different baud rate, by using the **Functions | Set Baud Rate** command.
- Parity = None.
- Number of data bits = 8.
- Number of stop bits = 1.

- Hardware handshaking (RTS/CTS) enabled.
- Software handshaking (XON/XOFF) not enabled.

“Port Settings” dialog box: Default PC settings for RS-232 communication with the CP2/CP2E.

To verify communication, click **Diagnostics | Establish Communications (Find Rack)**. This should display a dialog box that gives the COM port and baud rate.

TCP/IP Connection

Before you can communicate with the CP2E over TCP/IP, you must use the RS-232 connection just described to configure the unit’s TCP/IP settings.

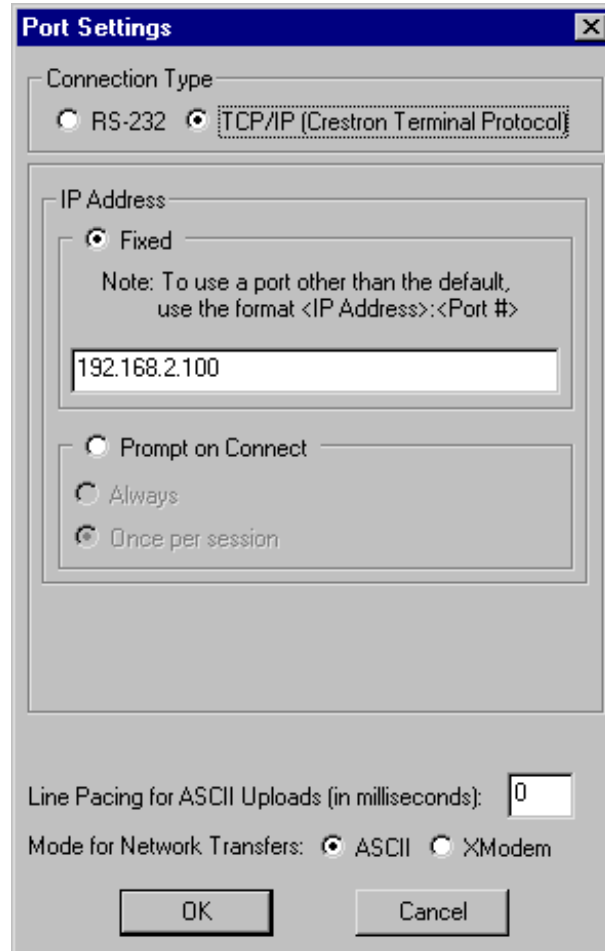
1. Open Viewport and click **Functions | Set Control System IP Information**.
2. Enter the IP address, IP mask and default router in the text fields. (All of these terms are explained in detail in Crestron’s e-Control Reference Guide, DOC. 6052, available as a PDF on the Crestron website.)
3. Click **OK** to set the new IP information.

Once you have assigned the IP settings, you can continue to communicate with the CP2E using the RS-232 connection, or you can establish a TCP/IP connection.

For TCP/IP, use CAT5 cables with 8-pin RJ45 connectors to connect the LAN port on the CP2E and the LAN port on the PC to the Ethernet hub. Alternatively, you can

use a CAT5 crossover cable to connect the two LAN ports directly, without using a hub.

Once the cable connections are made, open the Crestron Viewport and click **Setup | Communication Settings** on the menu to display the “Port Settings” dialog box. Then click **TCP/IP** as the connection type. Enter the IP address of the CP2E.



To verify communication, click **Diagnostics | Establish Communications (Find Rack)**. This should display a dialog box that gives the IP address and port number.

Troubleshooting Communications

Use the following checklist if communication cannot be established with the CP2/CP2E.

1. Verify that you are using the correct cables. As described previously, an RS-232 connection requires a straight-through serial cable. That is, pin 1 on one end is connected to pin 1 on the other end. Pin 2 connects to pin 2, etc. With a TCP/IP connection, you must use a CAT5 cable with 8-pin RJ45 connectors.
2. With a serial connection, verify that the correct COM port on the PC has been selected. Some computers have more than one COM port;

some may be internal (e.g., for a modem). Consult the manufacturer's documentation for further information about the COM ports on your PC.

3. Check the **ERR** LED indicator on the front panel of the CP2/CP2E. If this LED is illuminated, unplug the unit and reapply power after a few seconds. If the LED illuminates again, call Crestron customer service.
4. With a serial connection, reset the control system as follows:
 - a. Open Viewport and click **Setup | Communications Settings** to display the "Port Settings" dialog box. Choose **RS-232** as the connection type.
 - b. Set the baud rate of the PC to **115200**.
 - c. Set the baud rate of the CP2/CP2E control system to 115200, as follows:
 - Press and release the **HWR** button on the unit's front panel.
 - Press and hold the **SWR** button for approximately three to five seconds. The Viewport console should display the following message:


Viewport Message

```
CP2E>  
Control Console  
Changing to default Comm Specs. 115200 N81 RTS/CTS  
Switch to new settings....  
Bypassing Program Load!!!
```


- Release the **SWR** button.
- d. If communication still cannot be established:
 - Remove power from the control system.
 - Press and hold the **SWR** button on the front panel of the CP2/CP2E.
 - Reapply power to the control system.
 - The Viewport console should display the message shown above.
 - Release the **SWR** button.
 - e. Select **Set Baud Rate** on the Viewport **Functions** menu (or press **F8**) and choose any baud rate from the drop-down list. This will attempt to establish a connection at the indicated baud rate. If the connection is successful, both the PC and the control system will be set to the new baud rate.
 - f. Reinitialize the unit by recycling the power or pressing the **HWR** button. If the connection is established, the Viewport console should display some text and the **<CP2>** or **<CP2E>** prompt.
 - g. If communication still cannot be established, contact Crestron Customer Support.

Compiling and Uploading a Program to the Control System

After you have completed your SIMPL Windows program you must compile and upload the program to the control system.

To compile the program, simply click the **Convert/Compile** button  on the SIMPL Windows toolbar, or select **Project | Convert/Compile** (you can also press **F12**). A status bar will indicate the progress of the compile operation. After the operation is complete, a dialog box will display information about the program such as the number and type of signals, and memory usage.

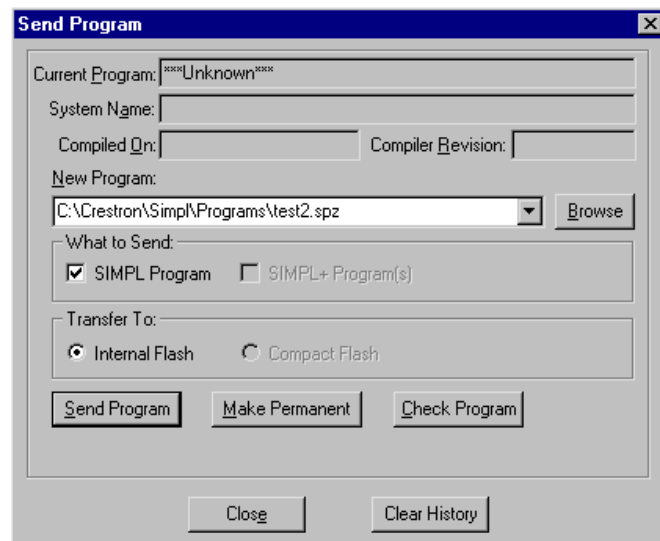
The compiled program will be stored as an SPZ file in the same directory as the source file. There are a number of ways to upload an SPZ file to the control system.

1. Immediately after compiling the program you have the option to transfer the file to the control system.
2. Alternatively, click the **Transfer** button  on the SIMPL Windows toolbar, or open Viewport and click **File Transfer | Send Program**.
3. Click **Browse**, locate the SPZ file and click **Open**. This will display the program's header information and enable one or both of the **What to Send** check boxes. If the program does not contain any SIMPL+ modules only the **SIMPL Program** check box will be enabled. If it does contain SIMPL+ modules, then the **SIMPL+** check box will also be enabled. Select one or both check boxes and then click **Send Program** to begin the transfer.

NOTE: Unlike X-Series processors, the 2-Series processor does not require a permanent memory image. Also, the 2-Series adds the ability to automatically retrieve the current program from the control system. Simply verify that the “Retrieve Current Program before overwriting” check box is selected.

You can also click **Check Program** to display the header information of the currently loaded program.

“Send Program” Dialog Box



Another way to verify that the program has been transferred successfully is to select **Report Program Information** on the Viewport **Functions** menu. Program information is also displayed in the Viewport console whenever power is removed and re-applied to the CP2/CP2E.

Uploading Web pages to the CP2E

The CP2E provides a built-in Web server for e-Control applications. The CP2E allots 2.5 MB of memory for “user files” such as Web pages, mailbox, and the compiled SPZ file.

VisionTools Pro-e

In most cases, you will create a VisionTools Pro-e browser project to generate the Web pages that will be uploaded to the CP2E. Whenever a browser project is created, VT Pro-e automatically creates a folder with the name of the project and a .web extension. This .web project folder itself contains a .Java subfolder, in addition to all the HTML files that will be sent to the CP2E. In designing and creating a browser project, keep in mind that you must assign an IP ID to all the project pages and specify the IP address of the CP2E. (For further information on this procedure, refer to the VT Pro-e online help file.)

SIMPL Windows

For each IP ID in the VT Pro-e browser project, there must be one corresponding e-Control PC Interface symbol defined in the SIMPL Windows program. The PC Interface symbol is one of the Ethernet Modules that can be dropped into the C2ENET-1 card slot.

As with all Ethernet devices, the PC Interface must receive an entry in the IP Table of the CP2E. Here the IP ID must match the IP ID that was assigned in VT Pro-e, while the IP address must be set to localhost: 127.0.0.1.

Viewport

To transfer the Web pages to the CP2E, use the **File Transfer | Send Web Pages** command.

The options are to send an entire project, only files that have changed, or a single HTML file. With the “Transfer Entire Project” option, click **OK** when reminded to select a default page, then browse to the appropriate VT Pro-e .web project folder. Select the file that was designated as the “first” page of the project. This will be the default Web page that is displayed whenever the IP address of the control system is accessed by a Web browser. Click **Open**, and then **OK** to begin the transfer.

If any files in the VT Pro-e project change, the changed files can be transferred to the CP2E without resending the entire project by choosing the “Only Transfer Files that have Changed” option. Here again, browse to the .web project folder and select the default page. Click **Open**, and then **OK** to transfer the changed files.

Finally, selecting Transfer Single File can send a single HTML file. Browse to the file and click **Open**. Then specify the file’s relative path (from the root directory) and click **OK**.

Uploading Touchpanel Projects via the CP2/CP2E

You can use a connection to the CP2 or CP2E to upload VisionTools Pro-e projects to any Cresnet touchpanel. Compiled projects for TPS panels are contained in VTZ files; projects for all other touchpanels are contained in HEX files.

Before uploading, open Viewport and click **Diagnostics | Report Network Devices** to verify that the touchpanel is being detected by the control system. (As with any network device, touchpanels must be identified by unique hexadecimal network IDs. These IDs are set in the SIMPL Windows program.)

To upload a project:

1. From VT Pro-e: Click the **Project | Upload** button  on the toolbar, or click **File | Upload Project**.

From Viewport: Click **File Transfer | Send Touchpanel** or press **Alt+T**.

2. Select the network ID of the touchpanel, as set in SIMPL Windows, from the drop-down list.
3. Browse to the HEX or VTZ file to be uploaded. If the file is a HEX file, click **Open** to begin the transfer.

If the file is a VTZ file, choose the pages to send to the TPS panel. The choices are as follows:

- **All Files in Project:** sends the entire project.
- **Only Changed Files:** sends only the files that are different from those that are currently stored in the panel. Note that if any pages in the panel are not present in the project, those pages will be deleted from the panel.
- Additional choices include **Do not send graphic files** and **Do not send sound files**. These are often very large files that need not be reloaded with every transfer.

Updating the Operating System

As with all 2-Series control systems, operating system files for the CP2 and CP2E have a .cuz extension. You can obtain .cuz updates (when available) from the software downloads area of the Crestron website. To download an update, click the .cuz file and choose the **Save to Disk** option, then specify the directory where the update will be stored.

NOTE: In some cases Microsoft's Internet Explorer may append a .zip extension to a downloaded .cuz file. For example, a file called "C2-1008.cuz" may appear as "C2-1008.cuz.zip." If this happens, rename the file, removing the .zip extension.

To upload the new .cuz to the control system:

1. Open Viewport and select **File | Update Control System**.
2. Browse to the .cuz file and click **Open** to start the transfer.

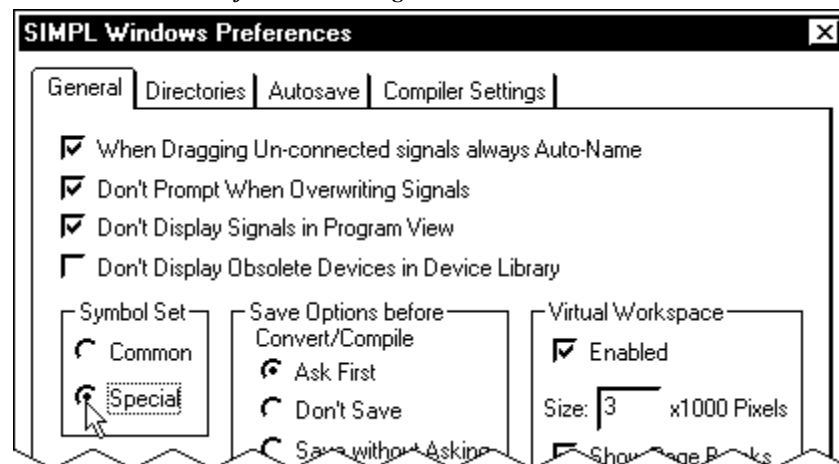
- After the transfer is complete, the CP2/CP2E will automatically reboot. To confirm the transfer, click **Diagnostics | Check Ops Version**. The Viewport console should display the new .cuz version number.

Advanced Console Commands

The SIMPL Windows online help file provides a full listing of console commands that are valid for **2-Series** control systems. You can access the CP2/CP2E console in a variety of ways: via a serial connection (RS-232) with a PC, over Ethernet via the LAN port, or through Telnet, among many other methods. It is also possible to issue console commands through logic, by adding a Console symbol to the SIMPL Windows program.

The Console symbol is only visible in the Symbol Library when “Special” is selected as the Symbol Set. Click **Edit | Preferences**. In the *Symbol Set* area of the *General* tab, select **Special** as shown below.

"SIMPL Windows Preferences" Dialog Box



Console commands are provided for advanced programmers. However, most functions and commands can be selected from the various Viewport menus.

Troubleshooting

The table below and on the next page provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

CP2/CP2E Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Unexpected response from control system.	Network devices are not communicating to the control system.	From the Viewport, poll the network (F4) to verify communication.
PWR LED does not illuminate.	Control system is not receiving power.	If power is supplied through an AC adapter, verify that the DC output plug is properly attached to the control system and that the adapter is securely plugged into an outlet. If power is supplied through Cresnet cabling, ensure that the cable is securely plugged into the NET connector.
ERR LED illuminates.	Hardware or software failure, hardware incompatibility with software definitions, or programming error.	Verify that hardware configuration matches software configuration. Poll the network (F4) from the Viewport; check error log for SIMPL, SIMPL+ program reload errors.
Compilation error RLCMCVT166 & RLCMCVT177.	Poor analog versus serial signal definition in the SIMPL Windows program.	Confirm properly defined signal definition in the program.
System locks up.	Various.	Press front panel SWR and HWR buttons at the same time to bypass program and communicate directly with processor (refer to "Troubleshooting Communications").
A/V system device does not respond.	IRP2 or serial port not placed properly.	Verify placement of IRP2 (hold phosphor card under IRP2 while pressing button) and tighten serial cables.
	Used wrong IR/serial port.	Verify that proper IR or serial port is defined.
	Serial cable miswired.	Verify that serial cable is wired correctly for RS-232, 422, or 485.

Network Analyzer

To assist with troubleshooting, the unit contains Crestron's patent-pending network analyzer to continuously monitor the integrity of the Cresnet network for wiring faults and marginal system performance or other network errors. For more information on how to use the network analyzer, refer to the SIMPL™ Windows® help file and use the index to search for "Network Analyzer".

Battery Replacement

A Lithium battery is used to power the system clock within the CP2/CP2E. Under normal conditions, it will last for approximately 10 years. In the event that the clock fails, only an authorized technician should replace it. Refer to caution statement below.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Passthrough Mode

Passthrough Mode enables Viewport access to any serially controlled device on the network. That is, it allows direct communication between the PC and a network device (effectively "passing through" the CP2 or CP2E). While Passthrough mode is running, the program currently in memory is suspended and will not execute. When Passthrough mode is exited, the program resumes operation. The TX and RX LEDs for the given port illuminate when in Passthrough mode.

Entering Passthrough mode for one of the internal COM ports reinitializes it, which clears the data for that port.

To establish communication, click **Functions | Enter Passthrough Mode**. Then select the connection type that exists between the CP2/CP2E and the device. The choices are Slot (for devices connected to the control system via one of the card slots on the back panel), Cresnet, or Ethernet. If the connection is through a card slot then select the slot number from the **Slot** drop-down list. For Cresnet, select the Cresnet ID of the device; for Ethernet, the IP ID.

NOTE: The IP ID and associated IP address of the Ethernet device must be listed in the IP Table.

Specify the port (Port A through Port F) that the device is connected to, if applicable.

Next, specify the serial protocol that the device expects. The parameters include the baud rate, parity, the number of data bits and stop bits, the protocol (RS-232, RS-422 or RS-485), and the settings for software or hardware handshaking. This information is provided by the manufacturer's documentation.

Passthrough Mode Dialog Box

Passthrough Mode

Setup

Type: Slot

Slot: 4

Port: A

Baud Rate: 9600

Parity: None

Data Bits: 8

Stop Bits: 1

Protocol: RS-232

Handshaking: None

To Exit Passthrough Mode:

Select "Exit Passthrough Mode" from the "Functions" menu

OK Cancel

The PC will now be communicating directly with the device.

To exit Passthrough mode, simply click **Functions | Exit Passthrough Mode**. A system reboot will also exit Passthrough mode.

Further Inquiries

If after reviewing this Operations Guide, you cannot locate specific information or have questions, please take advantage of Crestron's award winning customer service team by calling:

- In the US and Canada, call Crestron's corporate headquarters at 1-888-CRESTRON [1-888-273-7876] or 1-201767-3400.
- In Europe, call Crestron International at +32-15-50-99-50.
- In Asia, call Crestron Asia at +852-2341-2016.
- In Latin America, call Crestron Latin America at +5255-5093-2160.
- In Australia and New Zealand, call Crestron Pacific at +613-9480-2999.

Future Updates

As Crestron improves functions, adds new features, and extends the capabilities of the CP2/CP2E, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

Manual updates are posted in PDF format in the Product Manual area of the Crestron website (www.crestron.com).

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Crestron Electronics, Inc.
15 Volvo Drive Rockleigh, NJ 07647
Tel: 888.CRESTRON
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