

Table of Contents

Preface.....	2
Overview.....	3
Front Panel	3
Rear Panel	3
Installation.....	4
Settings	4
Connections.....	4
Connecting to RIO.....	5
Connecting to 32KD.....	6
Configuration	7
Configuring to RIO.....	7
Configuring to 32KD.....	9
Button Programming.....	11
Appendix A: Support and Limited Warranty.....	13

Preface

Thank you for acquiring an SAS product. We hope it will meet your requirements. Please check this module and make sure it is what you expected to get. If you need to contact us, please refer to section “Support and Other Information”.

Proprietary Notice: This document contains proprietary information, which may not be disclosed to others or used in manufacturing, or any other purpose, without written permission from Sierra Automated Systems & Engineering Corporation. The information and design disclosed herein were originated by and are the property of Sierra Automated Systems & Engineering Corporation. All patent, proprietary design, manufacturing, reproduction, use and sales rights are reserved except where those rights are expressly granted to others.

Copyright Notice: Copyright 2012 by Sierra Automated Systems & Engineering Corporation, Burbank, California, USA. All rights reserved. Reproduction in whole or in part without prior written permission from Sierra Automated Systems & Engineering Corporation is prohibited.

Limited Warranty: The products of Sierra Automated Systems & Engineering Corporation (SAS) are warranted to be free from defects in materials and workmanship for a period of one year from the date of sale (see Support and Other Information for details.)

User Guide Revision: This CP-16A user guide, revision 03 is published by the Engineering Department of Sierra Automated Systems & Engineering Corporation, which is responsible for its contents. SAS reserves the right to revise this publication and to make changes in the content hereof without obligation to notify any person or organization of such revisions or changes.

Overview

The CP-16A single channel alpha control panel offers simple and quick installation, configuration, and operation. This 1RU x 1.5" deep module provides all operational control in the front panel and connections and configuration devices in the rear panel.

Front Panel

The front panel of the module provides the following operational controls (see Figure 1):

Preset Switches: 16 push-buttons, user-programmable, user-legendeable, two-tone yellow LED-illuminated switches. These are arranged in groups of four, in clockwise numbering order, starting from the left side of the module.

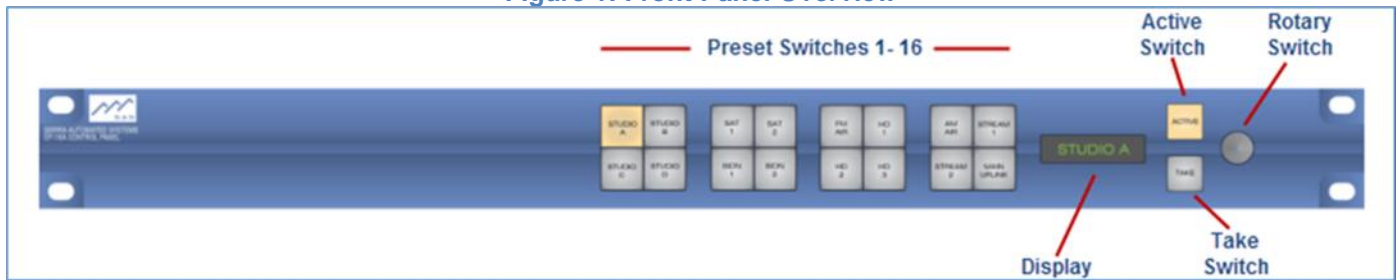
Display: 10-character, two-intensity level, green LED. It shows either the active channel or a channel to be selected.

Active Switch: when lit, it tallies the channel selected and shown in the Display. If you press it when lit, the display shows a previously displayed or preset channel. Press it again when Take switch is blinking and it returns to the active channel.

Take Switch: normally unlit, it blinks in conjunction with the Display to show a channel to be selected. Press it to switch to a pre-selected channel, which becomes the Active channel. This is confirmed by the Display.

Rotary Switch: provides channel dial-up control. Turn it to display a channel, in alphabetical order, to be selected.

Figure 1: Front Panel Overview



Rear Panel

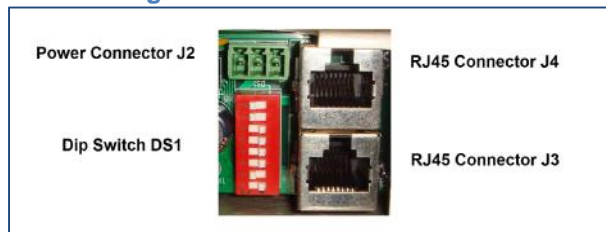
All installation and configuration devices for this module are located in the rear panel (see Figure 2):

Power Connector J2: use this 3-position connector to feed power only (+12V DC). *Note:* do not use it if using connectors J3 or J4 for power.

Dip Switch DS1: provides 8 switches for configuring power enable, address, and mode.

RJ45 Connector J3 and J4: 8-position jacks connected in parallel. They provide RS485 and power connections. You can use these connectors to daisy-chain several controllers together.

Figure 2: Rear Panel Overview



Installation

This module offers simple and quick installation including settings and connections.

Settings

Your first step during installation is to set up Dip Switch DS1 as follows:

Power: you can feed power (+12V DC) through either one of three different connectors.

- Power Connector J2: sw7 off and sw8 off
- RJ45 J3: sw7 on and sw8 off. If you set sw7 on, then pins 4 and 5 of J3 connect to power
- RJ45 J4: sw7 off and sw8 on. If you set sw8 on, then pins 4 & 5 of J4 connect to power

NOTE: Do not use Power Connector J2 if you apply power to either J3 or J4, *not both*.

Figure 3: Dip Switch DS1 Settings

sw7	sw8	Power	sw1	sw2	Address	sw3	sw4	Mode	sw6	Display
on	off	J3	off	off	A0	off	on	controller	on	bright
off	on	J4	on	off	A1	off	off	intercom	off	dim
			off	on	A2	on	off	console/turret		
			on	on	A3					

Address: you can connect up to four controllers to each RS485 control port. Thus you can choose four different addresses (A0 through A4) for each controller

- A0: sw1 off & sw2 off
- A1: sw1 on and sw2 off
- A2: sw1 off and sw2 on
- A3: sw1 on and sw2 on

Mode: you can set up the module as a controller (most common), intercom, or console/turret.

- Controller: sw3 off and sw4 on
- Intercom: sw3 off and sw4 off
- Console/Turret: sw3 on and sw4 on

Figure 3 below shows all the settings provided by Dip Switch DS1. *Note* that sw5 is not implemented.

Connections

Your second step during installation is to connect the CP-16A module to either a RIO station or a DRC-16 module installed in a 32KD frame. You can use either RJ45 connectors J3 or J4 as they are internally connected in parallel. Refer to Figure 4 and 5 below to help you wire your connections.

Note: if you power the module through J3 you must turn sw7 on and sw8 off. This connects pins 4 and 5 to power (+12VDC). Likewise, if you power through J4 then turn sw7 off and sw8 on in order to connect pins 4 and 5 to power.

Figure 4: J3 & J4 Connector Pinout

Pin	Description
1	RS485+ (Primary)
2	RS485- (Primary)
3	Power ground
4	Power (see <i>Note</i>)
5	Power (see <i>Note</i>)
6	Power ground
7	RS485+ (Auxiliary)
8	RS485- (Auxiliary)

Figure 5: RJ45 Wiring Diagram TIA/EIA 568B Standard



Connecting to RIO

The best way for you to connect the CP-16A to a RIO is by using a breakout device such as an 89D-2132 block or a Krone block shown in Figure 6 below. The RIO provides sixteen RS485 control ports through an RJ21 connector on its rear panel labeled **RS485 J1501**. You can distribute these RS485 ports to either individual RJ45 connectors using the 89D-2132 block, or to IDC punch-down terminals using the Krone block

RJ21 connector on its top. The RJ21 connector breaks out the RS485 control ports to sixteen RJ45 jacks in the middle column. You can connect the CP-16A module to the appropriate RJ45 connector. Refer to Figures 4 and 5 above for RJ45 pinout and color code information. Furthermore, the 89D-2132 block provides a power connector at the bottom. This connector distributes power to all the RJ45 connectors

Figure 6: 89D-2132 & Krone Blocks

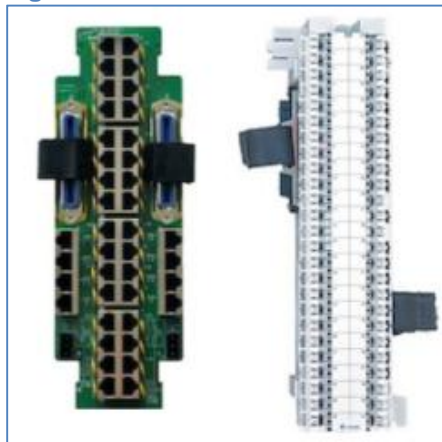


Figure 7: CP-16A to RIO with 89D-2132 Block

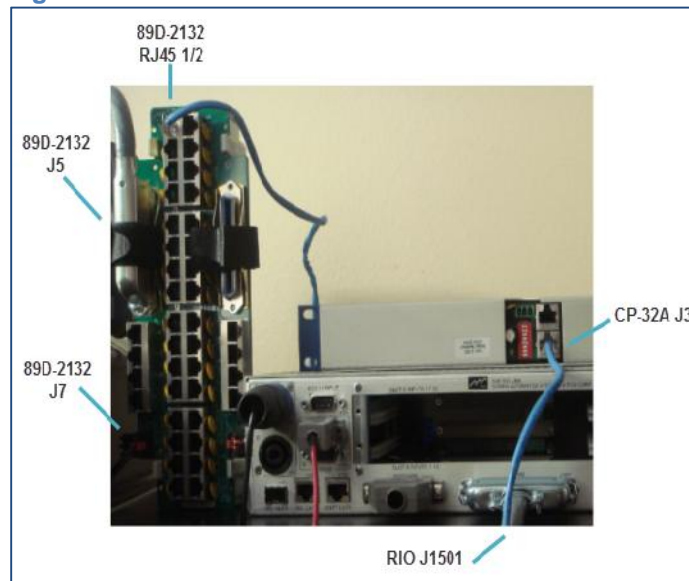


Figure 7 below shows an example of a CP-16A connected to a RIO station through the use of an 89D-2132 breakout block. Note that the 89D-2132 block has two identical sides, each providing an

If you are using a Krone block to connect the CP-16A to a RIO please refer to Figure 8 below. This table shows the connection between a RIO and a

Krone Punch Block using a 25-pair CAT5 cable. All sixteen RS485 ports are shown with pinout and wire colors.

Figure 8: RIO to Krone Block

J1501 RS485 Port#	J1501 RJ21 Hi, Lo, (Sh)	Cable / Pair # Hi, Lo (Sh)	RJ-21 Hi, Lo (Sh)	Punch Block Clip #
1	27, 2 (1)	C WHT[2] ORG[2] (BLU[1])	27, 2 (1)	3, 4 (2)
2	28, 3 (29)	C WHT[3] GRN[3] (WHT[4])	28, 3 (29)	5, 6 (7)
3	30, 5 (4)	C WHT[5] SLT[5] (BRN[4])	30, 5 (4)	9, 10 (8)
4	31, 6 (32)	C RED[6] BLU[6] (RED[7])	31, 6 (32)	11, 12 (13)
5	33, 8 (7)	C RED[8] GRN[8] (ORG[7])	33, 8 (7)	15, 16 (14)
6	34, 9 (35)	C RED[9] BRN[9] (RED[10])	34, 9 (35)	17, 18 (19)
7	36, 11 (10)	C BLK[11] BLU[11] (SLT[10])	36, 11 (10)	21, 22 (20)
8	37, 12 (38)	C BLK[12] ORG[12] (BLK[13])	37, 12 (38)	23, 24 (25)
9	39, 14 (13)	C BLK[14] BRN[14] (GRN[13])	39, 14 (13)	27, 28 (26)
10	40, 15 (41)	C BLK[15] SLT[15] (YEL[16])	40, 15 (41)	29, 30 (31)
11	42, 17 (16)	C YEL[17] ORG[17] (BLU[16])	42, 17 (16)	33, 34 (32)
12	43, 18 (44)	C YEL[18] GRN[18] (YEL[19])	43, 18 (44)	35, 36 (37)
13	45, 20 (19)	C YEL[20] SLT[20] (BRN[19])	45, 20 (19)	39, 40 (38)
14	46, 21 (47)	C VIO[21] BLU[21] (VIO[22])	46, 21 (47)	41, 42 (43)
15	48, 23 (22)	C VIO[23] GRN[23] (ORG[22])	48, 23 (22)	45, 46 (44)
16	49, 24 (50)	C VIO[24] BRN[24] (VIO[25])	49, 24 (50)	47, 48 (49)

Connecting to 32KD

If you are connecting the CP-16A directly to a SAS32KD frame, you need to have a DRC-16E controller module installed. The DRC-16E provides sixteen RS-485 control ports. There are two different types of connectors you can use with the DRC-16E module: a Euro connector or an RJ21

connector (see Figure 9 below). If you are using an RJ21 connector then refer to Figure 8 above for wiring and pinout information. If you are using the Euro connector option to wire to an RS-485 port, you can use the connector pinout in Figure 10 below as a guide.

Figure 9 : Euro & RJ21 connector

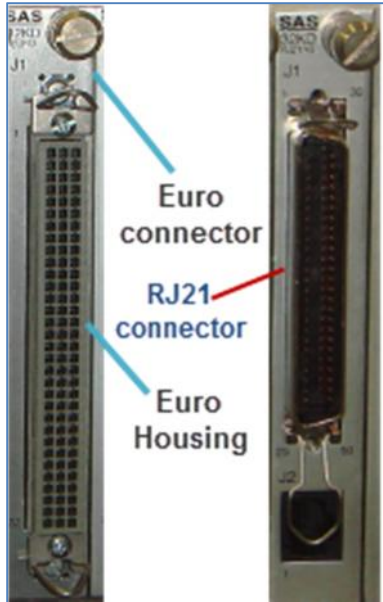


Figure 10: Euro Connector Pinout

DRC-16E Module - Rear View					
C		B		A	
1	Ctl 1 +	1	Ctl 1 -	1	Ctl 1 Gnd
2	Ctl 2 +	2	Ctl 2 -	2	Ctl 2 Gnd
3	Ctl 3 +	3	Ctl 3 -	3	Ctl 3 Gnd
4	Ctl 4 +	4	Ctl 4 -	4	Ctl 4 Gnd
5	Ctl 5 +	5	Ctl 5 -	5	Ctl 5 Gnd
6	Ctl 6 +	6	Ctl 6 -	6	Ctl 6 Gnd
7	Ctl 7 +	7	Ctl 7 -	7	Ctl 7 Gnd
8	Ctl 8 +	8	Ctl 8 -	8	Ctl 8 Gnd
9	Ctl 9 +	9	Ctl 9 -	9	Ctl 9 Gnd
10	Ctl 10 +	10	Ctl 10 -	10	Ctl 10 Gnd
11	Ctl 11 +	11	Ctl 11 -	11	Ctl 11 Gnd
12	Ctl 12 +	12	Ctl 12 -	12	Ctl 12 Gnd
13	Ctl 13 +	13	Ctl 13 -	13	Ctl 13 Gnd
14	Ctl 14 +	14	Ctl 14 -	14	Ctl 14 Gnd
15	Ctl 15 +	15	Ctl 15 -	15	Ctl 15 Gnd
16	Ctl 16 +	16	Ctl 16 -	16	Ctl 16 Gnd
17	USI 1 Tx	17	USI 1 Rx	17	USI 1 Gnd
18	USI 2 Tx	18	USI 2 Rx	18	USI 2 Gnd
19	USI 3 Tx	19	USI 3 Rx	19	USI 3 Gnd
20	USI 4 Tx	20	USI 4 Rx	20	USI 4 Gnd
21	USI 5 Tx	21	USI 5 Rx	21	USI 5 Gnd

RS-485 Serial Control Ports. To Alpha Numeric Control Panels

RS-232 Serial Control Ports. User Serial Interface To Automation or DAD

Configuration

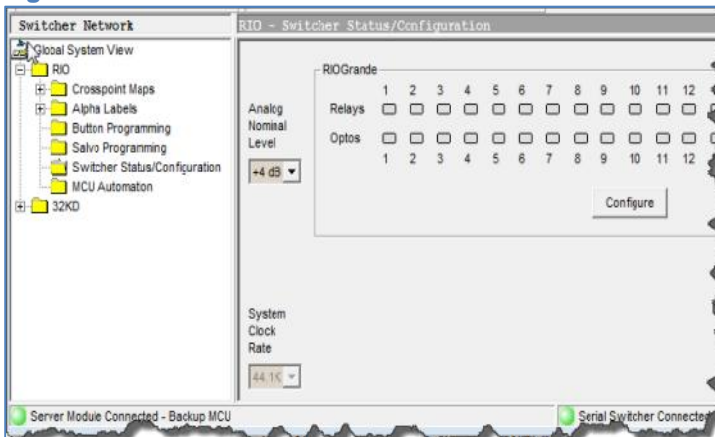
After installation, your next step is to configure the CP-16A module. At this point, you should have setup the CP-16A according to your requirements (see Settings). Likewise, you should have connected the CP-16A to an RS485 port (see Connections). Finally, you should have the PC that contains the SAS software connected to either your RIO or 32KD system.

Configuring to RIO

Now that you have connected the CP-16A to a RIO station (see Connecting to RIO), follow the steps below to begin configuration:

1. Open both the server module and the RCS module and log in to your Windows Router Control Software (RCS).
2. Click RIO folder icon and select Switcher Status/Configuration folder to open a window similar to Figure 11 below.

Figure 11: RCS Window



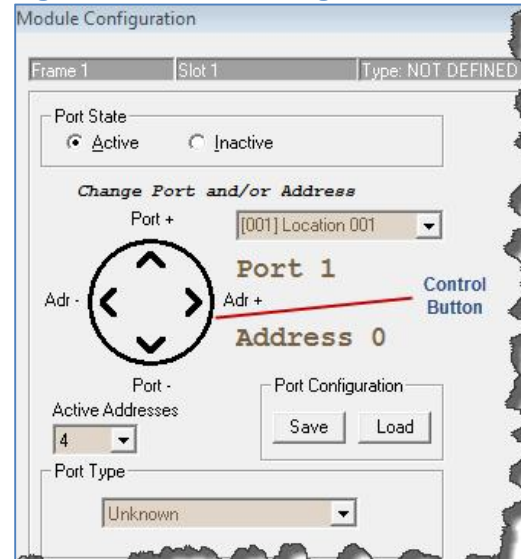
Note that it may take a few minutes for the Server module to complete communicating with the RIO. You are ready to proceed when you see both green lights (Server Module and Serial Switcher) at the bottom of the screen.

3. Click the Configure button to open the Module Configuration window.
4. Click the Control Module Config tab at the bottom of the Module Configuration window.
5. Click the appropriate button under Edit Port to open the Module Configuration window similar to Figure 12 below. *Note* that the program defaults to Port State Inactive, Port

Undefined, Address 0, and Port Type Unknown.

6. Activate the port and ensure you have the correct Port and Address selected. *Note* that you can use the Control Button to change Port and Address if needed.

Figure 12: Module Configuration Undefined



7. Choose a Port Type according to how you set up the CP-16A mode of operation (see Settings). *Note* that at this point more choices become available on the right side of the Module Configuration window. Below are the options you may choose for the module.

SOC Panel: choose the Output you want the CP-16A to control, as well as the Input List and the Button Template you want the module to use.

SIC Panel: choose the Input you want the CP-16A to control, as well as the Output List and the Button Template you want the module to use.

Intercom Panel: choose Speaker and Mic channels you want the CP-16A to control, as well as the Output List and the Button Template you want the module to use.

Console: choose the Console Name and Input Lists. *Note* that Output List is displayed but not used by this port type. *Note* that Device ID Button Template are automatically assigned for console ports and should only be overwritten in rare circumstances.

At this point you have finished configuring the CP-16A module. You can now click Ok to exit the Module Configuration window and then click Send to send the configuration to the system

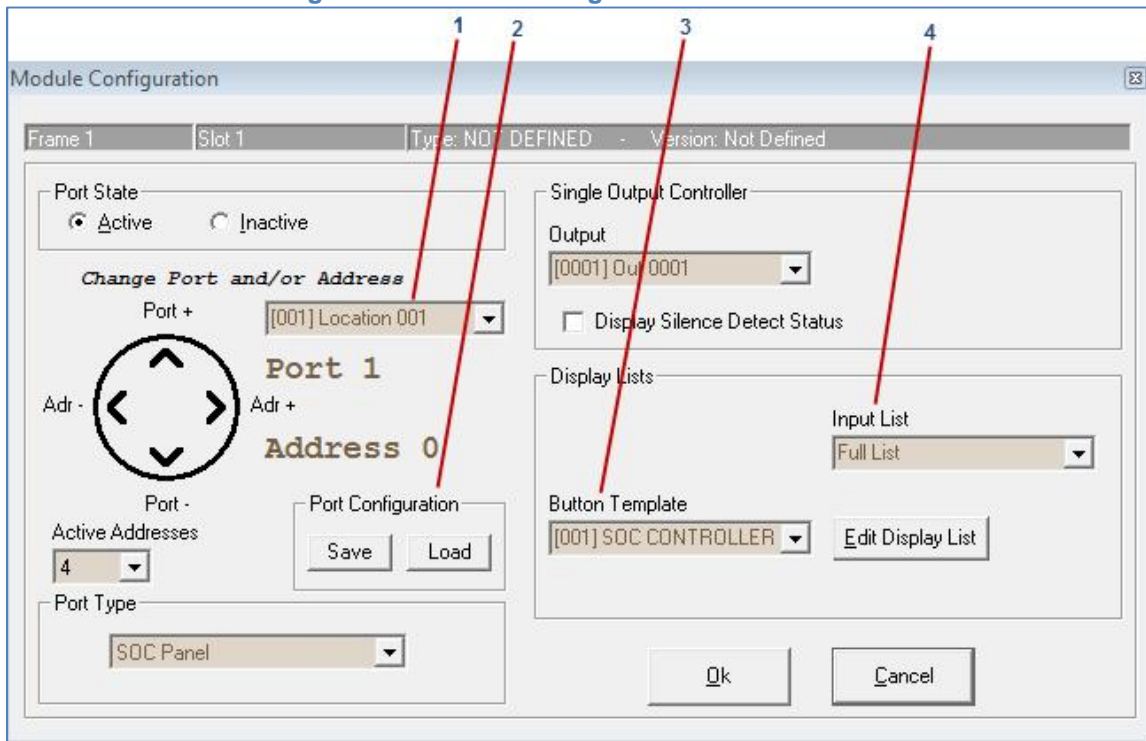
Figure 13 below shows an example of a window for a CP-16A configured as a single output controller or SOC Panel. *Note* the following items:

1. **Location** is used for console ports. This allows the RIO to display the local alpha instead of the system alpha when the location of the console and the source match.
2. **Port Configuration** allows the user to save and load a copy of the configuration for a single slot (RIO or DRC). This is usually only used as a backup and occasional restore.
3. **Button Template** is the button template assigned to the Port/Address. The button

template is used to program the individual button action on a panel. On most console and turret modules, the button programming can be accessed from the port configuration screen as well as from the Button Programming folder. For SOC, Intercom and X-Y panels, the button programming can only be done from the Button Programming folder. Typically button templates assigned to console and turret modules are only assigned to one panel. Templates for SOC and intercom panels may occasionally be assigned to multiple panels (port/addresses).

4. **Input List** defines which display list is to be used by the panel. (There is also an output display list for intercoms and X-Y panels.)The display list allows the panel to be configured to display only a subset of the available alphas to the user in the dial.

Figure 13: Module Configuration for SOC Panel



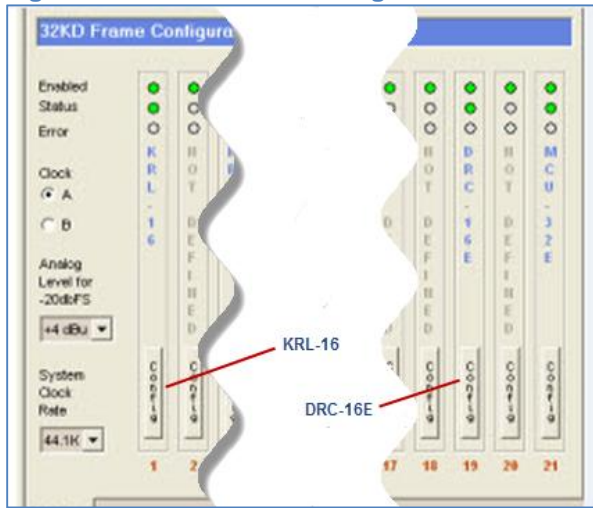
Configuring to 32KD

In order to begin configuration, follow the steps below if you have connected the CP-16A to a RIO, which is in turn connected to a 32KD frame through a KRL-16 module. Likewise, follow the steps below if you have connected the CP-16A directly to a DRC-16 controller module (see Connecting to 32KD).

1. Open both the server module and the RCS module and log in to your Windows Router Control Software (RCS).
2. Click 32KD folder icon and select Switcher Status/Configuration folder to open a window similar to Figure 14 below.

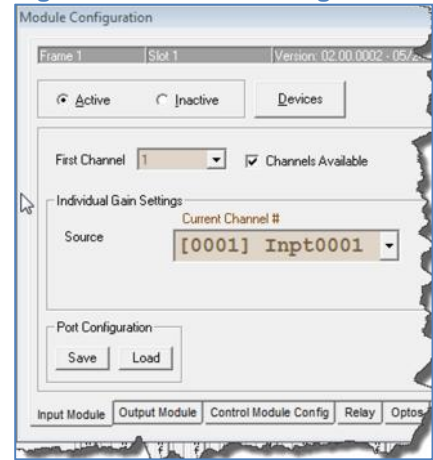
Note that it may take a few minutes for the Server module to complete communicating with the 32KD. You are ready to proceed when you see both green lights (Server Module and Serial Switcher) at the bottom of the screen.

Figure 14: 32KD Frame Configuration



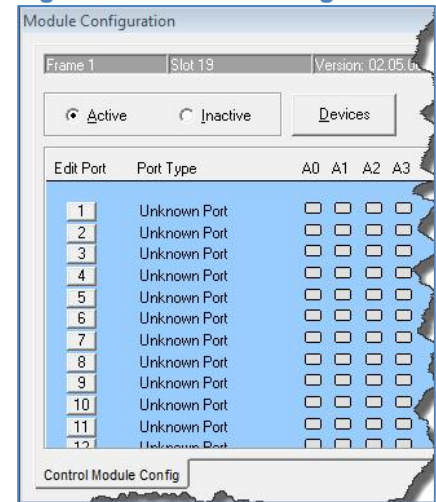
3.
 - A. If you have connected the CP-16A to a RIO, click the Config button on the appropriate KRL to bring up the window shown in Figure 15. Click the Control Module Config tab below to get to the Module Configuration window shown in Figure 16.

Figure 15: Module Configuration KRL-16



- B. Click the Config button on the DRC-16 that connects to the CP-16A. This opens the Module Configuration Window shown in Figure 16 below.

Figure 16: Module Configuration Window



4. Click the appropriate button under Edit Port to open the Module Configuration (see Figure 12 in Configuring to Rio). Note that the program defaults to Port State Inactive, Port Undefined, Address 0, and Port Type Unknown.
5. Activate the port and ensure you have the correct Port and Address selected. Note that you can use the Control Button to change Port and Address if needed.

6. Choose a Port Type according to how you set up the CP-16A mode of operation (see Settings). *Note* that at this point more choices become available on the right side of the Module Configuration window. Below are the options you may choose for the module.

SOC Panel: choose the Output you want the CP-16A to control, as well as the Input List and the Button Template you want the module to use.

SIC Panel: choose the Input you want the CP-16A to control, as well as the Output List and the Button Template you want the module to use.

Intercom Panel: choose Speaker and Mic channels you want the CP-16A to control, as well as the Output List and the Button Template you want the module to use.

Console: choose the Console Name and Input Lists. *Note* that Output List is displayed but not used by this port type. *Note* that Device ID Button Template are automatically assigned for console ports and should only be overwritten in rare circumstances.

You may now click Ok to exit Module Configuration and then click Send to send the configuration to the system. Please refer to Figure 13 above to review a few configuration options

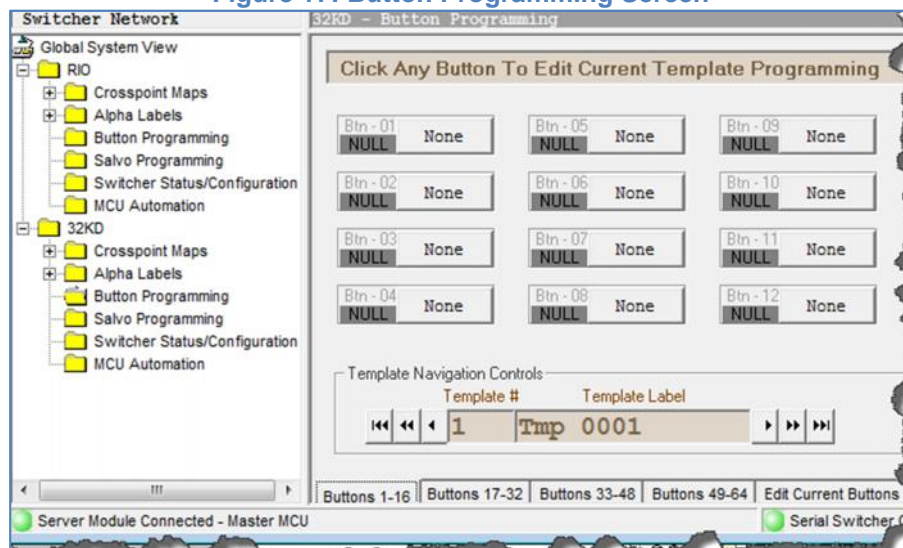
Button Programming

Your next step in configuring the CP-16A controller is to program its buttons. Note that the button programming procedure is the same whether the module is connected to a RIO or to a 32KD. To get started follow the next steps:

1. Click the Button Programming icon on the main menu of the Router Control Software to open a Button Programming Window similar to Figure 17 below.
Note that by clicking the tabs at the bottom of the screen you can select up to 64 buttons

2. Type in the name, up to sixteen characters, of the template for storage and retrieval.
Note that for easier template management, we recommend you handle templates as distinct groups such as Controller SOC, Controller SIC, Intercom, or Console.
3. Choose the button you want to program either by clicking on the appropriate button (Btn – XX) or by clicking the Edit Current Buttons tab at the bottom of the screen.

Figure 17: Button Programming Screen



4. Select Button Type from Buttons Selection Screen shown in Figure 18 below.
Note: you can choose among many different button types depending on the mode of operation of the CP-16A (see Settings). The

Button Type menu is divided into two sections by a dotted line. Choose from the upper section for controller and intercom mode. Choose from the lower sections for console/turret mode.

Figure 18: Button Selection Window



Note that the Button Type lists below are arranged by the most commonly used types.

Controller SOC/SIC: Listen, Output Select, all Relay and Opto types, Salvo and Group.

Intercom: Talk, Listen, Priority Listen, Group, and all Relay and Opto types, Call Answer and Dial Up.

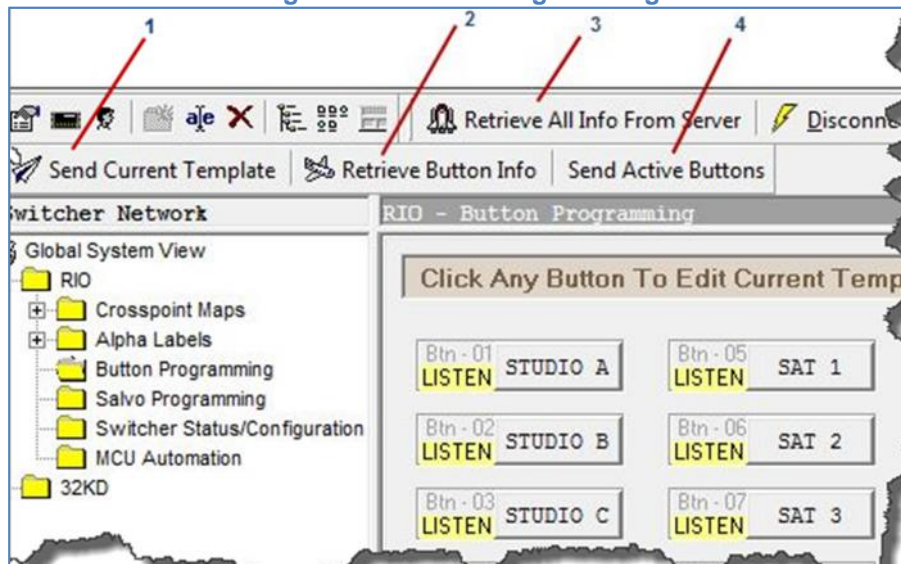
Console/Turret: Only the types in the lower section. Button Types in the upper section are not supported.

5. Choose the type of Alpha that corresponds to the Button Type. Note: the type of alpha is displayed by the RCS based on the button type selected. For example, you select an Input channel or Alpha with a “Listen” Button Type.
6. Select the next button by either clicking the button on the screen or by clicking the Edit Current Button tab and choosing the desired button number. Repeat steps 3 and 4.
7. Click Send Current Template button at the top of the window to save your button template.

Note the names or legends that appear on your screen such as STUDIO A or STUDIO B (Figure 18 below). These are the same legends that were programmed using the Source Alphas submenu under the Alpha Labels main menu. Alpha Label programming is beyond the scope of this user guide. Before leaving the Button Programming section, we define the Send and Retrieve buttons shown in Figure 19 below.

1. **Send Current Template:** sends the button template you currently have displayed.
2. **Retrieve Button Info:** retrieves all the button programming from the Server Module.
3. **Retrieve All Info From Server:** retrieves all system data (alphas, buttons, etc.) from the Server Module. This is available on most switcher screens.
4. **Send Active Buttons:** sends all templates that are in use by Port/Address of the system.

Figure 19: Button Programming



Appendix A: Support and Limited Warranty

Customers can contact Sierra Automated Systems & Engineering Corporation (SAS):

Phone: 818-840-6749

Fax: 818-840-6751

Website: <http://www.sasaudio.com/>

After Hour Emergency Support: 818-410-4310.

Our business hours are Monday through Friday, from 9am to 6pm Pacific Time. If you need to contact us after hours for emergency support, call us at 818-400-4310 - please leave a message if you do not get an answer and we will be contacted.

If your SAS product needs to be returned to the factory, contact us to obtain an RA number. SAS is located at 2821 Burton Avenue, Burbank, California 91504. Before you contact us about support or returns, please have the following ready:

- Model number of the product (ex: CP-16A)
- Serial Number (s/n number printed on a silver label)

Limited Warranty: The products of Sierra Automated Systems & Engineering Corporation are warranted to be free from defects in materials and workmanship for a period of one year from the date of sale. Sierra Automated Systems & Engineering Corporation's sole obligation during the warranty period is to provide, without charge, parts and labor necessary to remedy covered defects appearing in

products returned prepaid to Sierra Automated Systems & Engineering Corporation, 2821 Burton Avenue, Burbank, California, 91504, U.S.A.

This warranty does not cover any defect, malfunction or failure caused beyond the control of Sierra Automated Systems & Engineering Corporation, including unreasonable or negligent operation, abuse, accident, failure to follow instructions in the Technical Manual, Owner's Manual or User Guide, defective or improper associated equipment, attempts at modification and repair not authorized by Sierra Automated Systems & Engineering Corporation, and shipping damage. Products with their serial numbers removed or effaced are not covered by this warranty.

This warranty is the sole and exclusive express warranty given with respect to Sierra Automated Systems & Engineering Corporation products. It is the responsibility of the user to determine before purchase that this product is suitable for the user's intended purpose.

Any and all implied warranties, including the implied warranty of merchantability are limited to the duration of this express limited warranty. Sierra Automated Systems & Engineering corporation is not liable for incidental or consequential damages of any kind.