# Digital Lighting Systems, Inc
## Protocol Dimming System

# PROTOCOL

## Programming Software & RAU-96

❖

# USER MANUAL

Digital Lighting Systems, Inc.
www.digitallighting.com
305-264-8391
**SOFT-PRO**
Programming Software
To install run: A:setup.exe
V 1.32

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Your use.)**

## YOU MAY NOT NEED TO USE THIS SOFTWARE AT THIS TIME!,

The Protocol dimming system may come from the factory pre-configured to customer's specifications and be ready to plug in. The SOFT-PRO software is provided to allow changes to the factory configuration settings of the Protocol dimming systems and to perform system diagnostics if necessary.

Unless specifications have changed since the time of order, there may not be any need to make changes.

# I. SOFTWARE INSTALLATION

*THIS USER'S GUIDE ASSUMES THAT THE USER IS FAMILIAR WITH BASIC OPERATIONS OF THE WINDOWS OPERATING SYSTEM AND USING WINDOWS BASED APPLICATIONS. PLEASE REFER TO YOUR WINDOW'S MANUAL FOR QUESTIONS RELATING TO WINDOW'S OPERATION. SYSTEM CONFIGURATION MAY BE ACHIEVED WITHOUT DIMMING SYSTEM OR RAU-96. ONLY DOWNLOADING CONFIGURATION FILES TO SYSTEM AND SYSTEM DIAGNOSTICS REQUIRES COMPUTER TO BE ATTACHED TO DIMMING SYSTEM USING RAU-96.*

## A. SYSTEM REQUIREMENTS

A ready-programmed system will ship with two 3.5" floppy disks. DISK 1 containing the SOFTPRO programming software, DISK 2 containing the PROTOCOL dimming system's configuration files. The configuration files are unique to each system and describe the entire system configuration as defined at the factory per customer's specifications. Configuration files are critical for future system maintenance and must be protected and stored safely. An unconfigured system will ship with a blank DISK 2, to be used for backing up of configuration files.

In addition to the two disks, you will need a personal computer (PC) with:
►      Windows 3.1 or higher operating system (Windows 95 recommended)
►      A hard drive with minimum 2.0Mb available disk space
►      A 3.5" floppy disk drive
►      An unused 9-pin serial communications (RS232) port (COM1, COM2, COM3, or COM4). A 25-pin port with 25 to 9- pin adapter is also acceptable.
►      Serial Cable (provided with the Protocol dimming system).

## B. INSTALLATION

Locate the two disks provided with Protocol dimming system and follow the procedure below:
1-      It is advisable that other applications be closed before proceeding further
2-      Insert the "SOFT-PRO" Disk into the 3.5" disk drive and Run "A:SETUP.EXE". This document assumes that the 3.5" disk drive is called the "A" drive. Please substitute appropriate drive letter for your system.
3-      Follow the procedures as instructed.
If system has shipped preprogrammed follow steps 4 & 5:
4-      After installation is complete, insert Disk 2 into the drive and copy all files into the "C:\PROTOCOL\USER_DAT" directory.
     This document assumes that you have installed the PROTOCOL software into the C:\PROTOCOL directory on the "C" drive (your hard disk). If your hard disk is different than "C" or you have chosen to install the software under a name other than PROTOCOL, please substitute appropriate information above.
5-      Please put the disks in a safe place as this is the backup copy of the factory default settings and may be needed for future system maintenance.

NOTE:    Whenever system configuration or settings are changed using the PROTOCOL software, please insure that appropriate files from "C:\PROTOCOL\USER_DAT" directory are backed up on a floppy disk. Failure to do so may lead to loss of system configuration should your hard disk fail or should data get deleted accidentally. Only original system configuration is available from the factory, unless modifications were made by factory after system installation. It is the user's responsibility to back up changes made by them.

*Following typographic conventions are used for this section.*

| This | Represents |
|---|---|
| *Italic* | Specific examples included to clarify instructions |
| Bold | Exact names of windows, menu headings, or menu items/selections. |
| ALL CAPITALS | Directory names and filenames. |
| [text within square brackets] | "no action required" items included for reference. |

## II. HARDWARE SETUP

In order to download the configuration files (program) the Protocol dimming system, the computer containing the PROTOCOL software and the configuration files must be connected to the RAU. If the programming is being done from a remote site, the RAU must be connected to a phone line through an external modem.

### A. RAU Installation and Setup          (*Refer to figure 1 and the PROTOCOL system Installation Manual*)

- ➤   Install a Switched Wall Receptacle for the Modem Wall Adapter.
- ➤   With receptacle de-energized plug the modem Wall Adapter into the outlet.
- ➤   Connect the modem Wall Adaptor cable to the Modem.
- ➤   Connect the modem to a fax or PC phone line.
- ➤   Make sure the RAU Power Switch is in the OFF position.
- ➤   Install the RAU-CC cable between the DB44 box and the RAU.
- ➤   Plug connector (R) from the RS232-CC cable into the RAU.

### B. For Direct Access From A PC

- ➤   Plug connector (P) into your PC's COM Port and leave connector (M) unplugged
- ➤   Flip the RAU's MODE SWITCH to PC and turn the RAU Off then On.
- ➤   System is ready to be accessed by the PROTOCOL software.

### C. To Access the system via Modem

- ➤   Plug connector (M) at the modem. Leave connector (P) unplugged.
- ➤   Flip the RAU's MODE SWITCH to MODEM.
- ➤   First, energize the modem's wall receptacle. Second, turn the RAU Off then On. (This Power-Up sequence must be observed for proper operation).
- ➤   The system is ready to be accessed from a remote site by the PROTOCOL software.

## III. CONFIGURING THE PROTOCOL DIMMING SYSTEM

### A. Configuration Overview

Configuring the system consists of defining the station switches by assigning each switch a function and a list of loads to control. Throughout this documents the terms "Station", "Wall Station", "Control Station", and "Station Module" refer to the "PS Series" Stations. The terms "Load Driver", "Dimmer Module", "Load Module" and "Dimmer" refer to the "PD Series" Load Drivers. The terms "Switch" and "Button" refer to a switch in the station. It is advisable to plan the configuration before beginning to enter data into the PROTOCOL software program as outlined in step1 of the configuration summary below. Blank worksheets are provided with this manual to help organize your work. Make as many copies as necessary.

### B. Configuration Summary          ( Refer to Fig. 2 )

①   Fill-out the Load Schedule and Station Assignment forms using copies of the Sample Sheets provided with this Manual.
②   Enter the Station and Load Configuration Data from the Sheets using the PROTOCOL software.
③   Save the master configuration file under "filename.DAT". Another text file named "filename.TXT" is automatically created.
④   Generate System Files for the Stations and the Dimmer Modules.
⑤   Download the Individual files to the Stations and the Dimmer Modules.

### C. Changing an Existing System Configuration

1- Launch the PROTOCOL software.
2- From the Main window, Select File. From the File pull-down menu, select Read From Disk. Select the file (.DAT) that needs to be changed.
3- Skip to section D7 below.

### D. Configuring a New System

1-   Launch the PROTOCOL software.
2-   From the "Main" window , Select File. From the "File" pull-down menu select "New System".
3-   [The New System Specification Box is displayed.]
4-   Enter the number of system stations.
5-   Enter the number of system Load Modules.
6-   Click "Create System".
7-   The Station Configuration form showing station #1 is displayed.

## E. Configuring a Station  *(Refer to Fig. 2-5)*

1- In the Station Title Box enter any particular information about the station such as its location or any other helpful reference information.
2- Set the station size (No. of switches) in Panel 1 (SW's 1-8) and in Panel 2 (SW's 9-16).
   [You are now ready to configure/re-configure the station switches].
3- Click on a switch and continue with the following 8-step Switch Configuration Procedure.

## Switch Configuration Procedure     *(Refer to Fig. 2-5)*

Some information and/or options depend on the Function selected and may not be applicable to all switches.

### ❶ SELECT A FUNCTION FROM LIST

| | |
|---|---|
| UNASSIGNED | Select if you want the switch to have no operation. |
| TOGGLE | This type of switch works alternately. When it is pressed, its load(s) will go to ON if previously Off or will turn OFF if previously ON. |
| DIMMER | This type of switch combines Dimming with Toggle. About half a second after the switch is pressed and held, the lighting level will start to increase until maximum level is reached. After 1.5 seconds if the switch is still being held, the lighting level will start to decrease until minimum level is reached. This up-down ramping cycle continues until switch is released at the desired light level (last dim level). Once released, momentarily pressing the switch will toggle the lighting level alternately between the last dim level and OFF. |
| MOMENTARY | This type of switch mimics a door bell push-button. It is useful for controlling curtains, shutters and projection screens. *Connect Garbage Disposals to conventional wall switches and not to the Protocol system.* |
| ON | Momentarily pressing this type of switch turns the lights to the level specified in the EXTERNAL LEVEL Box. |
| OFF | Momentarily pressing this type of switch turns Load(s) OFF. |
| PRESET | This type of switch is used to store or recall lighting scenes for a group of loads. A Preset Number is associated with this switch since several scenes may be desired for the same group of loads. To store a scene, adjust the lights to the desired levels for that scene, press and hold the Preset switch until the LED's on the same station flash (in approx. 4 seconds). To recall a stored scene, press the switch momentarily. Upon release, the loads will take on the levels stored in the scene. If loads are dim-able and the Soft-switch option is selected, the loads will fade from one level to another. Otherwise, they will change levels instantly. Please see Appendix F for information on locking and unlocking station to allow setting of preset scenes. |
| RESERVED | No Action Taken. |
| RAISE | Pressing this switch keeps increasing the light level until released. The maximum level that can be reached is determined by the Hi-Trim value set for the load(s). |
| LOWER | Pressing this switch keeps decreasing the light level until released. The minimum level that can be reached is determined by the Lo-Trim value set for the load(s). |

### ❷ SOFT SWITCH OPTION

Check this box if you want the load(s) to fade from one level to another during a Preset Recall. Also TOGGLE, ON and OFF transitions are similarly affected by this option. When left blank or un-checked transitions from one level to another are instantaneous.

### ❸ DIM-ABLE LOAD OPTION

This option box indicates whether the load(s) are allowed to dim or forced to switch ON-OFF by the dimmers. It is automatically checked when a DIMMER, RAISE or LOWER function is selected, otherwise it remains un-checked

### ❹ GLOBAL OPTION

Checking this option causes all loads in the load list to be selected. The Switch will then control the loads in the entire system. You may un-check up to 24 loads from the list to exclude them from a Global operation.

### ❺ FADE RATE

This value determines the fade rate between lighting levels. Non-Preset functions accept a value from 1 to 10, "ten" being the fastest rate (approximately 2 seconds to go from a 0% to 100% change in level) . The rate may be left at its default value of 9. The default value is appropriate in most applications. When a Preset Function is selected, the rate can be specified either in seconds (2-59) or in minutes (1-60) by checking the appropriate radio buttons located under the rate box. The default value is 9 seconds.

### ❻ EXTERNAL LEVEL

This value affects the "ON" function only. When the "ON" switch is pressed it forces its load(s) to go to the level specified in this box (0-100%). The default value is 100%.

**❼ PRESET NUM**

This box is associated with the Preset Function. Several Preset Switches may be assigned to the same group of loads. The PRESET NUM is used to distinguish the scenes from one another. Valid numbers are from 1 to 254. Presets #251 to 254 are initialized by the PD408 drivers to certain levels that cannot be overwritten by a Store operation. Preset #'s 253 and 254 get initialized to Hi-Trim and Lo-Trim respectively and may be used as permanent "ON" and "OFF" Presets. The ENTER key must be pressed after changing the value in the Preset Num Box.

**❽ LIST OF LOADS**

A Switch can have from 1 to 24 loads. If the Global Option is checked, the Switch operates on all loads present in the system. Up to 24 loads may be excluded from a global operation. To include a load in the Switch Configuration, position the mouse pointer over its corresponding box and click the left mouse button. To remove the load click again. A red square turns on to indicate that a load has been included. In the load list, load ID's are noted with PP-C. PP represents the Dimmer Module address and C represents its channel or Output number.

**Program the remainder of the Station Switches**

Click on every switch in the station and repeat the 8-step procedure until all the station switches are configured. It is advisable to save your work every time you complete a few stations. Refer to the section (H) below for instructions on how to save and read system files.

## F. Programming the remainder of the Stations

Finish configuring every station in the system. You can navigate between stations using the PREVIOUS/NEXT Station Arrows or go directly to any station by typing its address/number in the box above the station navigation arrows.

## G. Saving the Configuration

To save the system configuration file, from the Main form, select File, from the file pull-down menu select Save To Disk. Enter a DOS filename (8 characters or less without extension, the system will add the DAT extension). Click OK. Another file with the same name but with a .TXT extension will be automatically created and saved with the DAT file. The DAT file is a binary system file used by the PROTOCOL. The TXT is a master file that contains the configuration data in text form.

## H. Generating Station and Dimmer Module Files

1- Go to the Main form, select File, from the File pull-down menu select Generate System Files.
2- The file browser is displayed with the current file name selected. Click OK.
3- The Proasm4 system files generator is automatically launched. Click on its box or icon to open it.
4- Answer Y to proceed with current file name.
5- This starts the compilation of the files. The number of station files and the number of dimmer files are displayed when done.
6- Press any key.
7- Close the Proasm4 window.

At this point you have successfully generated station files "filename.S01" through "filename.Sxx" (xx represents the last station number in the system) and dimmer files "filename.D01" through "filename.Dyy" (yy represents the last dimmer module number in the system). You are now ready to send/download these files to the stations and dimmer modules. If you are programming the Protocol system from a remote site (online) proceed to Section J.

## I. Downloading System Files using your PC's COM port

1- Go to the Main form, select File, from the File pull-down menu select Remote System Interface.
2- In the Direct Serial Port Connection box, select the COM port the RAU is connected to.
3- Click on the Connect button.
4- The RAU will display the introductory screen and ask for a Password.
5- [PROCEED TO SECTION K]

## J. Downloading System Files Remotely by Modem

1- Go to the Main form, select File, from the File pull-down menu select Remote System Interface.
2- In the Dial-in Connection box, select the COM port that contains the modem.
3- If the phone number you want to call is displayed in the list, select it and proceed to step 8.
4- In the Name Box, enter a name for the installation you are planning to call.
5- In the Telephone Number box enter 1-area code-number.
6- Click on the ADD button. The name & number are now displayed in the list.
7- Select the name you have just entered from the list of phone numbers.
8- Click the Dial/Connect button. Wait few seconds for the modems to negotiate a connection. Once the connection is properly made the screen displays a CONNECT 9600 message and the RAU sends the introductory message asking for a Password. It may be necessary to press ENTER in order to get the introductory message.
9- [PROCEED TO SECTION K]

## K. Proceeding With File Download

1- Type 1234 followed by the ENTER key in the user's reply box at the bottom of the screen (See Figure 6).
2- The RAU displays the Main Menu Options. (*The mouse cannot be used to select any RAU menu options, you must type in their corresponding number in the user's reply box followed by the "ENTER" key*)
3- Select option [5] File Transfer Utility. A sub menu is displayed.
4- Select option [1] Send File to Device. Another sub menu is displayed.
5- Select option [2] Station.
6- Enter the next Station Number/Address you want to program.
7- Under the File Transfer pull-down menu, select Download to System.
8- In the file browser select the ″ filename.Sxx″, where xx is the number you entered in step 6.
9- The configuration is now being sent to the station.
10- Repeat for all the stations in the system.

**Dimmer modules are normally programmed at the factory and they do not require their configuration files to be sent to them.**
**If it is necessary to send dimmer module files, the same procedure is used with steps 5-8 slightly different:**

5- Select option [1] Dimmer.
6- Enter the next Dimmer Number/Address you want to program.
7- Under the File Transfer pull-down menu, select Download to System.
8- In the file browser select the filename.Dxx, where yy is the number you entered in step 6.

When done Downloading, click on the Disconnect button and exit the PROTOCOL software.

## L. Customer Support

For help with planning, specifications, installation, and troubleshooting, please contact your local factory representative or our technical support department at:

### Tel: 305-264-8391 or Toll free: 1-877-264-8391

We can be reached by e-mail at the following address:     **info@digitallighting.com**
or by filling out the Message Form posted on our web site at:     **www.digitallighting.com**

## IV. RAU INSTRUCTIONS

### A. INTRODUCTION

The RAU (Remote Access Unit) allows the user to communicate with Stations, Dimmer Modules and other Protocol system components. Whether the RAU is directly connected to a Personal Computer or to a telephone line through a modem, it walks the user through all steps necessary to complete a system change and/or perform system diagnostics, using simple menus and sub-menus of choices to select from.

The RAU is a powerful tool that can be used to:

- **Download configuration files to PROTOCOL devices.**
- **Control any load in the system.**
- **Store and recall presets.**
- **Set various system options.**
- **Monitor the operation of system components.**
- **Perform inquiries on system components.**
- **Run diagnostics and troubleshooting techniques.**

The RAU interface is modeled after a "host main frame - dumb terminal" type of communication. It communicates with the user via simple ASCII strings. This design allows it to work with any operating system platform. Any computer and/or communication software may be used to establish a connection with the RAU, including Windows Terminal and Hyperterminal. The Protocol software integrates a dumb terminal emulator in its "Remote System Interface" module and provides a complete solution for configuring and communicating with the Protocol systems.

The "Remote System Interface" section of the Protocol software provides a large boxed area on the screen where messages from the RAU are displayed. A smaller box below it is provided for user responses. All user responses must be in numeric form and followed by the "ENTER" key. To return to a previous menu and/or abort an operation, the user may simply press "ENTER" without making a selection or supply an invalid selection. The mouse pointer cannot be used to make a selection while in this mode. *( Please refer to Figures 5 & 6 )*

### B. SIGNING ON

You can communicate with the system via a direct connection or remotely by modem. Launch the PROTOCOL software and follow the instructions below to make a connection with the system.

#### B1. If your PC is connected directly to the RAU

1- Go to the Main form, select File, from the File pull-down menu select Remote System Interface.
2- In the Direct Serial Port Connection box, select the COM port the RAU is connected to.
3- Click on the Connect button.
4- The RAU will display the introductory screen and ask for a Password.
5- [PROCEED TO SECTION V]

#### B2. If you are connecting to the RAU remotely  (online via modem)

1- Go to the Main form, select File, from the File pull-down menu select Remote System Interface.
2- In the Dial-in Connection box, select the COM port that contains the modem.
3- If the phone number you want to call is displayed in the list, select it and proceed to step 8.
4- In the Name Box, enter a name for the installation you are planning to call.
5- In the Telephone Number box enter 1-area code-number.
6- Click on the ADD button. The name & number are now displayed in the list.
7- Select the name you have just entered from the list of phone numbers.
8- Click the Dial/Connect button. Wait few seconds for the modems to negotiate a connection. Once the connection is properly made the screen displays a CONNECT 9600 message and the RAU sends the introductory message asking for a Password. It may be necessary to press ENTER in order to get the introductory message. [PROCEED TO SECTION V]

# V. RAU MENUS, PROMPTS AND MESSAGES

The following introductory message is sent by the RAU:

DIGITAL LIGHTING SYSTEMS, INC.
PROTOCOL SERIES DIMMING SYSTEMS.
BY A. M. K.
REMOTE ACCESS UNIT READY.
TYPE Password & HIT [ENTER]:

Unless it had been already changed, the factory default password is 1234. It can be modified at a later point by the user.
Type 1234 followed by the "ENTER" key. The RAU replies by sending the following main menu.

```
********* MAIN MENU **********
[1]          Host RAU Menu.
[2]          Station Module Menu.
[3]          Dimmer Module Menu.
[4]          Patch Panel Menu.
[5]          File Transfer Utility.
[6]          General Diagnostics Menu.

[10]         LOG OFF.
```

TYPE CHOICE & HIT [ENTER]:
The main menu is logically divided into sub-menus, each dealing with a particular system component or main task.  The remainder of this document explores these sub-menus individually.

## A. The Host RAU Menu

```
********* HOST RAU MENU **********
[1]          Modify Site Password.
[2]          View Current System Configuration.
[3]          Modify Current System Configuration.
[4]          Auto Detect Current Active Configuration.
[5]          Copy Auto Detect Results to Current Configuration.
[6]          Save to RAU Memory.
[7]          Send Configuration to Individual Nodes.
[8]          About RAU.
[9]          Default to Factory Settings.
[10]          Go To Command Mode
[11]         Exit to Main Menu
```
TYPE CHOICE & HIT [ENTER]:

## A1. [1] Modify Site Password

The password must be 4 characters long and may be a combination of numeric and alphanumeric characters. The system asks for the new password twice for verification. Make sure you record your password and store it in a safe place.

## A2. [2] View Current System Configuration

This selection displays how many of each type of hardware component there are supposed to be in the system. The information consists of the number of stations, dimmer modules, patchers, telephone interfaces (Optional), and RAU's. It also includes the line frequency at the local installation site. This information is stored in the RAU's nonvolatile memory. If actual values have not been entered at some point, default values are displayed instead.

## A3. [3] Modify Current System Configuration

The RAU needs to know the hardware makeup of the system ( No. of stations, dimmers, etc...). This information may be entered and/or modified at any time. The RAU can automatically retrieve the information from the system (A4). At this point, the user will be prompted to enter the numbers for each type of component. The information supplied by the user remains in temporary memory at this point and will be lost upon a power failure. To store the information in the RAU's nonvolatile memory see (A6).

## A4. [4] Auto-Detect Current Active Configuration

Provided that all components are in working order, the RAU can automatically detect the system configuration by starting at the highest allowable address for each type of component and polling it. When a component replies the RAU stores this number in a scratch pad type location and goes on to polling a different type of components until done with all. To store the information in the RAU's nonvolatile memory see sections (A5 and A6).

## A5. [5] Copy Auto-Detect Results to Current Configuration

Copy the numbers found for each type of component in AUTO DETECT [4] to the configuration temporary memory list.

## A6. [6] Save to RAU Memory

This option directs the RAU to copy the system configuration into its nonvolatile memory. Prior to this point all information would be lost upon a power failure.

## A7. [7] Send Configuration to Individual Nodes

Each type of component in the Protocol system needs to have part or all of the information in the system configuration list. Using this option, the RAU sends the correct information to each node (component on the system) automatically.

## A8. [8] About RAU

This feature is provided and performs a similar function in all sub-menus. Every system component contains program code (software). The "About" feature provides a convenient way to check the device's code version and date without having to read its label.

## A9. [9] Default to Factory Settings

This feature is provided and performs a similar function in all sub-menus. When changes are made to configuration and settings of certain components, it may be desired to revert to the original factory settings before any programming was done to the component. This features returns the component to its default settings. To copy the settings into the nonvolatile memory, the "Save to Memory" option must be invoked.

## A10. [10] Go To Command Mode

The RAU will accept ASCII COMMANDS through the RS232 port. To return to RAU normal operation type *MENU and enter.

## A11. [11] Exit To Main Menu

Upon selection, the sub-menu is exited and control is given back to the Main menu.

## B. The Station Module Menu

This sub-menu interacts mainly with the Protocol control stations.

```
********* STATION MODULE MENU **********
[1]        Default Switch Configuration Memory.
[2]        Set # of Station Nodes.
[3]        Set # of Dimmer Nodes.
[4]        Save to Memory.
[5]        Buttons Utility.
[6]        Preset Security.
[7]        View System Configuration.
[8]        About Station.
[9]        Default To Factory Settings.
[10]       Exit to Main Menu.
TYPE CHOICE & HIT [ENTER]:
```

## B1. [1]   Default Switch Configuration Memory

This features overwrites the switch configuration of the station and must be used cautiously. The following options are presented:

```
FILL  SWITCH CONFIGURATION MEMORY WITH:
1=CONSTANT VALUE      2=FACTORY CONFIGURATION
ANYTHING ELSE TO ABORT ?:
```

## B1-1.  Selection 1

If desired every location in the switch configuration memory area is replaced with a specific constant value. This is mostly used for hardware testing and has little practical use in the field.

## B1-2.  Selection 2

If desired the station may be forced to revert to its built-in default switch configuration. This is mostly used for hardware testing and has little practical use in the field.

## B2. [2] Set # of Station Nodes

In general, Protocol stations are required to know the total number of stations in the system. This information is included in the configuration file or may be entered or modified at this point. To store this configuration information in nonvolatile memory see section (B4).

## B3. [3] Set # of Dimmer Nodes

In general, Protocol stations are required to know the total number of dimmer modules in the system. This information is included in the configuration file or may be entered or modified at this point. To store this configuration information in nonvolatile memory see section (B4).

## B4. [4] Save to Memory

This option directs the Station to copy the system configuration entered in B23 into its nonvolatile memory. Prior to this point all information would be lost upon a power failure.

## B5. [5] Buttons Utility

This item invokes the following sub-menu:

```
********* STATION BUTTONS MENU **********
[1]      Monitor Buttons.
[2]      Change Button Numbers 1-8 to  9-16.
[3]      Restore Original Button Numbers.
[4]      Exit to Station Menu.
TYPE CHOICE & HIT [ENTER]:
```

## B5-1.  [1] Monitor Buttons

This feature causes the RAU to monitor and display the information that a station sends to the dimmers every time a switch is pressed. This is a powerful troubleshooting tool that can determine the following:

- If the station address is set correctly.  The information displayed begins with the station address followed by a period and the switch number. For example 23.09 indicates switch 9 on station 23.
- If the switch is configured correctly, the displayed information contains all the items in the switch configuration, including function, rate, preset number, etc...
- If the switch is addressing the correct group of loads. Loads are displayed beginning with the dimmer module address followed by a period and the output number. For example 11.2 indicates output 2 of dimmer 11.

## B5-2.  [2] Change Button Numbers 1-8 to  9-16

A station configuration file contains switch definition for 16 switches. By using this feature a station with only 8 physical buttons (1-8) may be made to address switches 9-16 instead.

## B5-3.  [3] Restore Original Button Numbers

This reverses the action in B5-2 and returns the station switch addresses to 1-8. Actions taken in B5-2,3 must be followed by a Save to Memory to save the new status into the nonvolatile memory.

## B5-4.  [4] Exit to Station Menu

Returns control to the main station menu.

## B6. [6] Preset Security

Once scene presets have been programmed, a station may be locked in order to prevent inadvertent changes to the scenes. Whenever the presets on a station have been locked or unlocked, this action must be followed by a Save to Memory action to save the status into the nonvolatile memory. It is advisable to lock the presets on DCI-16 modules after the scenes have been programmed.

## B7. [7] View System Configuration

This causes the station to send the system configuration it contains (No. of stations and No. of dimmers).

## B8. [8] About Station

This feature is provided and performs a similar function in all sub-menus. Every system component contains program code (software). The "About" feature provides a convenient way to check the device's code version and date without having to read its label.

## B9. [9] Default to Factory Settings

This feature is provided and performs a similar function in all sub-menus. When changes are made to configuration and settings of certain components, it may be desired to revert to the original factory settings before any programming was done to the component. This features returns the component to its default settings. To make this change into the nonvolatile memory, the "Save to Memory" option must be invoked.

## B10. [10] Exit To Main Menu

Upon selection, the sub-menu is exited and control is given back to the Main menu.

## C. The Dimmer Module Menu

This sub-menu interacts mainly with the Protocol dimmer modules.

```
********* DIMMER MODULE MENU **********
[1]        Initial/Erase Memory Presets.
[2]        Set Low Trim.
[3]        Set High Trim.
[4]        Set Load Types.
[5]        Save Settings to Memory.
[6]        Control Load.
[7]        View Current Settings & Levels.
[8]        About Dimmer.
[9]        Default To Factory Settings.
[10] Exit to Main Menu.
TYPE CHOICE & HIT [ENTER]:
```

## C1. [1] Initial/Erase Memory Presets

The dimmer modules store the preset levels in nonvolatile memory. When desired all preset levels may be initialized to the same value. A value of 1 initializes all levels to OFF (0%) and a value of 254 initializes all levels ON (100%). Caution must be used in order not to inadvertently erase all dimmer presets.

## C2. [2] Set Low Trim

The low Trim is the lowest dimming level that a dimmer output is allowed to reach during normal operation. A value between 0% & 40% may be directly set here or by a dimmer configuration file (filename.Dxx) that is downloaded to the dimmer. Trims for dimmers can be set individually for each output (1-4) or for all four outputs by entering a 5 for the output number when prompted. A Save Settings to Memory must follow to write the change in nonvolatile memory.

## C3. [3] Set High Trim

The High Trim is the highest dimming level that a dimmer output is allowed to reach during normal operation. A value between 60% &100% may be directly set here or by a dimmer configuration file (filename.Dxx) that is downloaded to the dimmer. Trims for dimmers can be set individually for each output (1-4) or for all four outputs by entering a 5 for the output number when prompted. A Save Settings to Memory must follow to write the change in nonvolatile memory.

## C4. [4] Set Load Types

The load type is used to identify the type of load that a dimmer is controlling. A value between 1 & 4 can be directly set here or by a dimmer configuration file (filename.Dxx) that is downloaded to the dimmer. Currently the load types are for documentation purposes only. Load Types can be set individually for each output (1- 4) or for all four outputs by entering a 5 for the output number when prompted. A Save Settings to Memory must follow to write the change in nonvolatile memory.

## C5. [5] Save Settings to Memory

This option directs the dimmer module to copy the High Trims, Low Trims, Load Types and current output levels into its nonvolatile memory. Prior to this point all information would be lost upon a power failure.

## C6. [6] Control Load

The RAU allows direct control over the dimmer outputs and presets. Levels may be set and presets stored or recalled. These control actions can be applied to one load at a time, to an entire module (4 loads) or to every load on the system. To save the changes into nonvolatile memory, the Save Settings to Memory must be invoked.

## C7. [7] View Current Settings & Levels

The High Trims, Low Trims, Load Types and Current Output levels of any dimmer module in the system can be viewed using this option.

## C8. [8] About Dimmer

This feature is provided and performs a similar function in all sub-menus. Every system component contains program code (software). The "About" feature provides a convenient way to check the device's code version and date without having to read its label.

## C9. [9] Default to Factory Settings

This feature is provided and performs a similar function in all sub-menus. When changes are made to configuration and settings of certain components, it may be desired to revert to the original factory settings before any programming was done to the component. This features returns the component to its default settings. To make this change into the nonvolatile memory, the "Save to Memory" option must be invoked.

## C10. [10]  Exit To Main Menu

Upon selection, the sub-menu is exited and control is given back to the Main menu.

## D. Patch Panel Menu

This section specifically pertains to applications in hotel ballrooms where a Patch panel (Patcher) module is used to link/un-link control stations depending on a particular partition.

```
********* PATCH PANEL MENU **********
[1]Set # of Dimmer Nodes.
[2]Set # of Station Nodes.
[3]View System Configuration.
[4]View Current Event Partition.
[5]Save to Memory.
[6]View Current Partition for Individual Station.
[7]Activate/Deactivate Current Partition.
[8]About Patcher.
[9]Default To Factory Settings.
[10]        Exit to Main Menu.
TYPE CHOICE & HIT [ENTER]:
```

## D1. [1] Set # of Dimmer Nodes

In general, Protocol patch panels are required to know the total number of dimmer modules in the system. If not already done at the factory this information may be entered or modified at this point. To store this configuration information in nonvolatile memory see section (D5).

## D2. [2] Set # of Station Nodes

In general, Protocol patch panels are required to know the total number of rooms in the partition. Each room can have one master station and up to three slave stations. If not already done at the factory, the number of rooms (not the total number of stations) may be entered using this feature. To store this configuration information in nonvolatile memory see section (D5).

## D3. [3] View System Configuration

This causes the patch panel to send the system configuration it contains (No. of stations and No. of dimmers).

## D4. [4] View Current Event Partition

The patch panel links the master station in each room with one or more master stations from other rooms. A list kept in the patch panel showing the rooms that are patched together can be viewed by selecting this option.

## D5. [5] Save to Memory

This option directs the Patch panel to copy the system configuration entered in D12 into its nonvolatile memory. Prior to this point all information would be lost upon a power failure.

## D6. [6] View Current Partition for Individual Station

Each master station in a partitioned system receives  a list of the rooms that it is patched with after it has been issued a patch command by the patch panel. The rooms associated with a particular master/slave station may be viewed by selecting this option.

## D7. [7] Activate/Deactivate Current Partition

This selection is used to link or un-link rooms without losing the previous partition information.

## D8. [8] About Patcher

This feature is provided and performs a similar function in all sub-menus. Every system component contains program code (software). The "About" feature provides a convenient way to check the device's code version and date without having to read its label.

## D9. [9] Default to Factory Settings.

This feature is provided and performs a similar function in all sub-menus. When changes are made to configuration and settings of certain components, it may be desired to revert to the original factory settings before any programming was done to the component. This features returns the component to its default settings. To make this change into the nonvolatile memory, the "Save to Memory" option must be invoked. In the case of the patcher the number of rooms and dimmer modules are reset to 12.

## D10. [10] Exit To Main Menu

Upon selection, the sub-menu is exited and control is given back to the Main menu.

## E. File Transfer Utility

This menu is used to transfer configuration files created by "Create System files" option of the Protocol software to individual system components. There are two types of files created, station files and dimmer files. The station files have an extension beginning with .S followed by the station number. For example JOB_XYZ.S023 is a file belonging to station #23. Each of the station files contains definition information for 16 station switches and includes the total number of stations and modules information.  The dimmer module files have an extension beginning with .D followed by the dimmer number. For example JOB_XYZ.D15 belongs to dimmer module #15. Each of the dimmer files contains High Trim, Low Trim and Load Types information for 4 dimmer outputs. There is no need to transfer dimmer files to the dimmers if the dimmer's high and low trims have not been modified from their default 100% and 0% values, during station configuration.

```
*********FILE TRANSFER UTILITY **********
[1]          Send File To Device.
[2]          Exit to Main Menu.
TYPE CHOICE & HIT [ENTER]:
```

## E1. [1] Send File To Device

Selecting option 1 invokes the following sub-menu:

```
WHAT DEVICE TYPE:?
[1] Dimmer   [2] Station  [3] Patcher    [4] PAU Virtual Station        [5] Cancel
TYPE CHOICE & HIT [ENTER]:
```

## E1-1.  Dimmer

Select 1 if file is intended for a dimmer module and give the RAU the dimmer  number you are sending the file to. Skip to Selecting a file to download.

### E1-2.  Station

Select 2 if file is intended for a station or a DCI-16 module and give the RAU the station number you are sending the file to. Skip to Selecting a file to download.

### E1-3.  Patcher

Select 3 if file is intended for a programmable patch panel and give the RAU the station number you are sending the file to. Patch panel files have a (.Snn) extension. Skip to Selecting a file to download.

### E1-4.  PAU Virtual Station

The PAU (PhoneAccess Unit) acts like a virtual station (for more information about availability, contact Digital Lighting Systems). It uses a standard station configuration file. Select 4 if the file is intended for it and give the RAU the PAU number you are sending the file to.

### Selecting a file to download

When the RAU gets the device number it displays the following message:

PLEASE SEND HEX FILE FROM FILE TRANSFER MENU .
STATION FILE NAME EXTENSION= (.Snn)
DIMMER FILE NAME EXTENSION= (.Dnn)
TO ABORT DOWNLOAD PRESS [ENTER]

At this point, using the mouse, Click on File_Transfer from the File Menu, select Download to System. Select the appropriate file filter in the file browser window. All files of the type selected will be displayed. Scroll to the appropriate file (extension=device number) and press OK. The RAU will do the rest. If no error messages are displayed, the operation is successful.

### E1-5.  [5] Cancel

Select 5 to cancel the download process.

### E2. [2] Exit to Main Menu

Returns control to the main menu.

### F. General Diagnostics

The majority of system diagnostics and troubleshooting can be done from this menu. There are three similar sections relating to station, dimmer and Patcher modules.

```
*********GENERAL DIAGNOSTICS **********
STATION   [1] Check  [2] Flash  [3] Reset
DIMMER    [4] Check  [5] Flash  [6] Reset
PATCHER  [7] Check  [8] Flash  [9] Reset
[10] Hold Net.  [11] Release Net.  [12] Exit to Main
TYPE CHOICE & HIT [ENTER]:
```

### F1.  [1] Check Station

The RAU prompts the user for a station number. Then it begins checking stations in descending order starting with the number supplied by the user. If a station fails to respond for any reason, the RAU displays its number with an ERR (error) next to it. When done the RAU displays SYSTEM CHECK DONE, CONTINUE [ENTER].

Check the stations that failed (if any) for proper connections or ID settings. Reset the stations and repeat the check until all stations pass this test. Press "ENTER" key to continue.

### F2.  [2] Flash Station

Upon giving the RAU a station number, the station having this address will start pulsing its LED's. This is a good tool to check if a station has been assigned the correct address and installed in the right location. This option also provides a convenient way to check if the same address has been assigned to more than one station. To stop the flashing reset the station (see F3).

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Rev. B-05/01

## F3. [3] Reset Station

If a particular station failed during a check, this operation performs a software reset on the station. Just respond to the RAU with the station number. In most instances this will solve the problem. If it does not, a hardware reset may be necessary. The hardware reset may be implemented by turning power off to the station for few seconds or by pressing the station's reset button. The reset button is located between switches 1 & 5, behind the front cover. Use a nonconducting object such as the tip of a pencil to push the reset button.

## F4. [4] Check Dimmer

The RAU prompts the user for a dimmer module number. Then it begins checking dimmer modules in descending order starting with the number supplied by the user. If a dimmer module fails to respond for any reason, the RAU displays its number with an ERR (error) next to it. When done the RAU displays
SYSTEM CHECK DONE, CONTINUE [ENTER].

Check the dimmer modules that failed (if any) for proper connections or ID settings. Reset the dimmer modules and repeat the check until all dimmer modules pass this test. Press "ENTER" key to continue.

## F5. [5] Flash Dimmer

Upon giving the RAU a dimmer module number and an output number, the output of the dimmer module having this address will start flashing. This is a good tool to check if a dimmer has been assigned the right address and/or if the right loads have been connected to its outputs. This option also provides a convenient way to check if the same address has been assigned to more than one dimmer. To stop the flashing reset the dimmer module (see F6).

## F6. [6] Reset Dimmer

If a particular dimmer module failed during a check, this operation performs a software reset on the dimmer module. Just respond to the RAU with the dimmer module number. In most instances this will solve the problem. If it does not, a hardware reset may be necessary. The hardware reset may be implemented by turning power the dimmer module's power off and back on, using its circuit breakers.

## F7. [7] Check Patch panel

The RAU prompts the user for a patch panel number. Then it begins checking patch panels in descending order starting with the number supplied by the user. If a patch panel fails to respond for any reason, the RAU displays its number with an ERR (error) next to it. When done the RAU displays
SYSTEM CHECK DONE, CONTINUE [ENTER].

Check the patch panels that failed (if any) for proper connections or ID settings. Reset the patch panels and repeat the check until all patch panels pass this test. Press "ENTER" key to continue.

## F8. [8] Flash Patch panel

Upon giving the RAU a patch panel number, the patch panel having this address will start pulsing its LED's. This is a good tool to check if a patch panel has been assigned the right address and installed in the right location. This option also provides a convenient way to check if the same address has been assigned to more than one panel. To stop the flashing reset the patch panel (see F13).

## F9. [9] Reset Patch panel

If a particular patch panel failed during a check, this operation performs a software reset on the patch panel. Just respond to the RAU with the patch panel number. In most instances this will solve the problem. If it does not, a hardware reset may be necessary. The hardware reset may be implemented by turning power off to the patch panel for few seconds or by pressing the patch panel's reset button. The reset button is located between switches 1 & 5, behind the front cover. Use a nonconducting object such as the tip of a pencil to push the reset button.

## F10. [10] Hold Net

This function is used to disable network communications. When invoked all stations and other host devices will stop sending switch activations to the network until the "Release Net" function is received (see F11).

## F11. [11] Release Net

This function is used to re-enable network communications. It can be used in conjunction with "F10" to reset the software communications drivers of all Protocol devices connected to the network.

## F12. [12] Exit to Main

Returns control to the main menu.

## G. Logging Off

To log off the system, select 10 from the main menu. Wait for RAU to respond with the "GOOD BYE" message. Press the Disconnect button and exit Protocol.

## H. RAU Error Messages

### H1- INVALID CHOICE

Data entered in response to a prompt is not within valid limits.

### H2- INVALID PASSWORD

The password entered is either invalid or has the wrong format.

### H3- DATA FILE ERROR DETECTED, PLEASE CHECK FILE !!!!
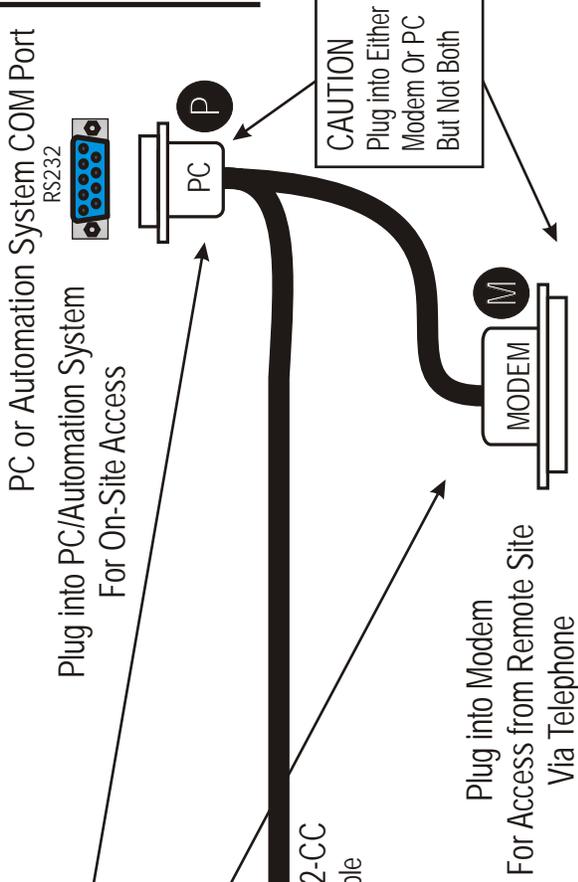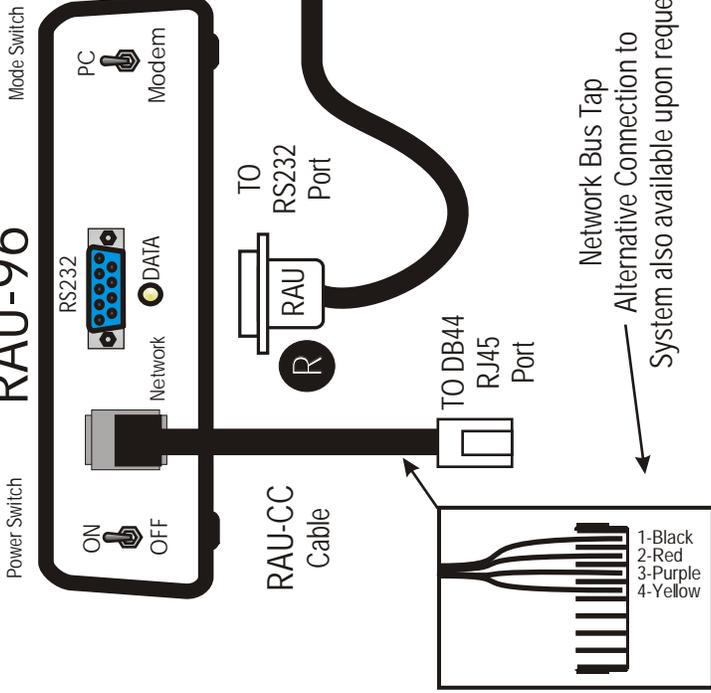
Press [ENTER] to Continue...
Information contained in a configuration file contains errors. Check the configuration and generate system files again.

### H4- DEVICE ERROR DETECTED, PLEASE CHECK DEVICE !!!!

Press [ENTER] to Continue...
The device receiving this file did not respond properly. Reset the device and try again.

RAU-96

Power Switch

Mode Switch

PC
Modem

ON
OFF

RS232
● DATA

Network

TO DB44
RJ45
Port

RAU-CC
Cable

TO
RS232
Port

RAU

R

RS232

PC or Automation System COM Port

RS232

P

PC

Plug into PC/Automation System
For On-Site Access

CAUTION
Plug into Either
Modem Or PC
But Not Both

M

MODEM

RS232-CC
Cable

Plug into Modem
For Access from Remote Site
Via Telephone

External Modem

Line In

TEL-CC
Standard
RJ11
Cable

Plug into
Phone Line

DB-25 Female

Power In

MODEM
POWER
ADAPTER

Provide a
Switched
Power
Receptacle

Network Bus Tap
Alternative Connection to
System also available upon request

1-Black
2-Red
3-Purple
4-Yellow

## Installation and Operating Instructions

* Install a Switched Wall Receptacle for the Modem Wall Adapter.
* With receptacle de-energized plug the modem Wall Adapter into the outlet.
* Connect the modem Wall Adaptor cable to the Modem.
* Connect the modem to a fax or PC phone line.
* Make sure the RAU Power Switch is in the OFF position.
* Install the RAU-CC cable between the DB44 box and the RAU.
* Plug connector (R) from the RS232-CC cable into the RAU.

To Access the system using a PC or Automation System:
* Plug connector (P) into your PC or Automation System's COM Port and leave connector (M) unplugged
* Flip the RAU's MODE SWITCH to PC and turn the RAU Off then On.
* System is ready to be accessed by the PROTOCOL or other software.

To Access the system via Modem:
* Plug connector (M) at the modem. Leave connector (P) unplugged.
* Flip the RAU's MODE SWITCH to MODEM.
* First, energize the modem's wall receptacle. Second, turn the RAU Off then On.
(Above Power-Up sequence must be observed for proper operation).
System is ready for a call from a remote PC.
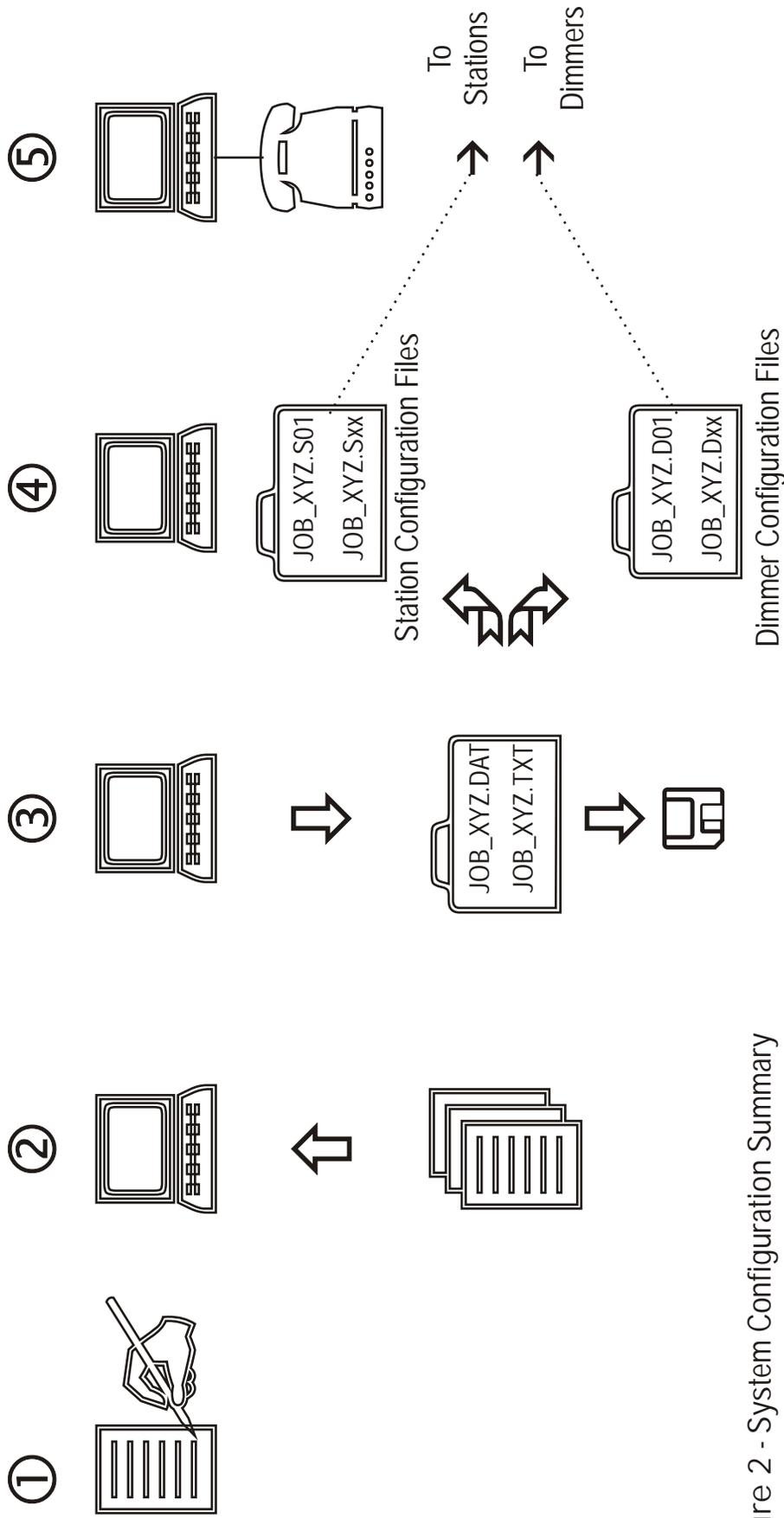
**Figure 1** - RAU Installation          FIGURE 1

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Figure 2 - System Configuration Summary

| ① | ② | ③ | ④ | ⑤ |

Station Configuration Files
JOB_XYZ.S01
JOB_XYZ.Sxx

Dimmer Configuration Files
JOB_XYZ.D01
JOB_XYZ.Dxx

JOB_XYZ.DAT
JOB_XYZ.TXT

To Stations
To Dimmers

Figure 3 - Switch Definition Procedure

| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
|---|---|---|---|---|---|---|---|
| Switch Function | Soft Switch | Dim-able Load | Global Switch | Dimming Rate | External Level | Preset Num | List of Loads Controlled by Switch |

FIGURES 2,3

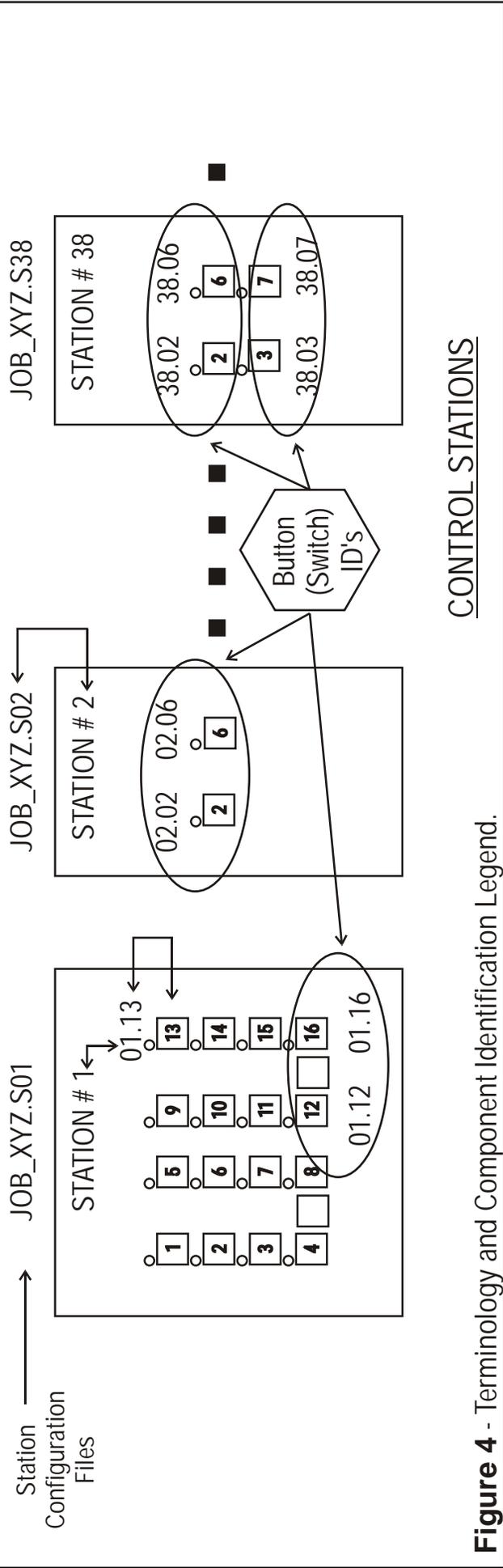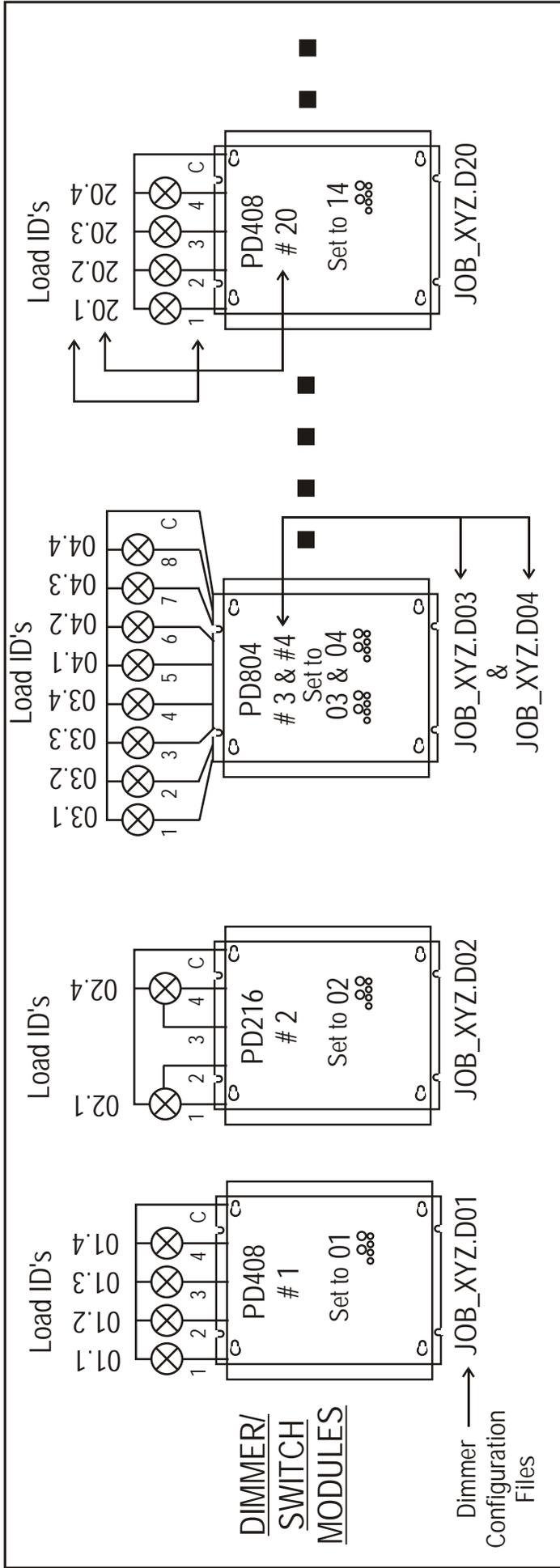PROTOCOL SOFTWARE MANUAL, by DIGITAL LIGHTING SYSTEMS, INC.

**Figure 4** - Terminology and Component Identification Legend.

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FIGURE 4

Station Configuration Form Detail



Station Title
Location or other
useful info.

Load ID
Dimmer Mod #9
Output #1

Station Num

Previous/Next
Station Arrows

Add Station
Delete Station

Multi Column
Single Column

Load Trim's

Max. Level
Min. Level
Trim Values

Station Size
No. of Switches

Figure 5
Station Configuration Form Legend.

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FIGURE 5

**Remote System Interface**

File_Transfer Window Communications

**Direct Serial Port Connection**

Comm Port
- ● COM1
- ○ COM2
- ○ COM3
- ○ COM4

Connect

**Modem Settings**

Comm Port
- ○ COM1
- ● COM2
- ○ COM3
- ○ COM4

Dial/Connect

Save Settings

**Telephone Numbers**

ACME XYZ Site @1-222-333-4444

Add...

Delete

Name

Number

DIGITAL LIGHTING SYSTEMS, INC..
PROTOCOL SERIES DIMMING SYSTEMS.
BY A. M. K.
REMOTE ACCESS UNIT READY.
TYPE Password & HIT [ENTER]:

1234

RAU'S MESSAGE BOX

RAU Menus
And Prompts
Are Displayed Here

USER'S REPLY BOX

RAU Menu Selections
And Replies to Prompts
Using Keyboard

Selections Cannot
Be Made with Mouse

Figure 6
Remote System Interface Screen Legend.

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FIGURE 6

## LIMITED WARRANTY

Digital Lighting Systems, warrants to the purchaser that its products have been carefully manufactured and inspected and are warranted to be free from defects of workmanship and materials when used as intended. Any abuse or misuse contrary to normal operation shall void this warranty.

Digital Lighting Systems' obligation under this warranty shall be limited to replacement or repair of any units as shall within two years of date of invoice from Digital Lighting Systems, prove defective; and Digital Lighting Systems shall not be liable for any other damages, whether direct or consequential. The implied warranties of merchantability and fitness for a particular purpose are limited to the duration of the expressed warranty. Some states do not allow the exclusion of the limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, you may also have other legal rights which vary from state to state.

Defective merchandise may be returned to Digital Lighting Systems, prepaid, after prior notification has been given and approval obtained for the return. To obtain prior approval for the return of the defective items, contact your local Digital Lighting Systems distributor, representative, or:

Digital Lighting Systems, Inc.
Attn: Customer Service Department
7588 NW 8th Street
Miami, FL 33126
(305) 264-8391

Upon request, replacement unit(s) will be shipped as soon as available. Unless immediate shipment of replacement merchandise is requested, Digital Lighting Systems will not ship replacement merchandise until defective merchandise is received, inspected, and determined to be defective.

No labor charges in connection with warranty problems will be reimbursed by Digital Lighting Systems without prior written approval from the factory.

Digital Lighting Systems distributors and representatives have no authority to change this warranty without written permission.

Digital Lighting Systems reserves the right to determine the best method of correcting warranty problems.