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## General Information

This document describes the commands available to monitor and operate the GRAFIK Eye system through various GRAFIK Eye RS232 Interfaces: GRX-RS232 or GRX-PRG. The following general information applies to all RS232 Interfaces.

### Communication Settings

To configure your device to talk to the GRAFIK Eye RS232 Interface, use the data conventions listed below.

**9600 BAUD**  
**8 DATA**  
**1 STOP**  
**NO PARITY**

If you wish to send these commands from a PC, run the Microsoft Windows® Hyper Terminal program or an equivalent program. Then, select Local Echo, Line Feed, and Carriage Return inbound and outbound. This allows you to see the characters that you are typing as well as keep the responses from overwriting typed characters.

### Typical Interface Wiring

For connection to any GRAFIK Eye RS232 Interface, use a cable with a DB9 connector and 5-position terminal block (Lutron P/N 234-123). If you do not have this cable, the following Table lists the connections you need to make one.

|   | <b>RS232 I/O Link on<br/>Lutron equipment</b> | <b>Typical PC or A/V<br/>equipment signal</b> | <b>Pin on standard<br/>9 pin connector</b> | <b>Pin on standard<br/>25 pin connector</b> |
|---|---|---|--|---|
| 1 | Common  | COM   | 5  | 7   |
| 2 | Data In                                       | TxD   | 3  | 2   |
| 3 | Data Out                                      | RxD   | 2  | 3   |
| 4 | NC  |   |  |   |
| 5 | NC  |   |  |   |

### GRAFIK EYE Control Units

There are eight addresses (1 to 8) available for Control Units in a GRAFIK Eye System. The following terms are applicable for GRAFIK Eye 3000 and 4000 Series Control Units.

#### Scenes

Each Control Unit has 16 scenes plus OFF. For commands that include a scene parameter, the scene is represented by a single character 0 (zero) to G. Characters 1 to 9 represent scenes 1 to 9, characters A to G represent scenes 10 to 16, and 0 represents the OFF scene.

#### Intensity (int)

Intensity information can range from 0h to 7Fh (**h** indicates a hexadecimal value). For presets, an intensity of D0h assigns a zone to "unaffected." For all load types, a 0h turns it OFF and opens the air-gap relay. A value of 1h closes the relay and sets a minimum light level. A value of 7Fh turns it to maximum light level. If the zone is a non-dim, then 7Fh is required to turn it ON; 0h is required to turn the zone OFF.

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## General Information (continued)

### Temporary Mode

The temporary mode (*override* in early models) determines whether temporary light level changes are normally saved or not. There are five temporary mode settings: Sd, Sb, Sn, 4S, and bd.

- 0 = Sd - Save by default
- 1 = Sb - Save by button
- 2 = Sn - Save never
- 3 = 4S - Scene selects and master raise/lower only
- 4 = bd - buttons disabled

Sd - Save by default. Any changes to the intensities or fade time at the Control Unit are saved automatically. TEMPORARY LED is normally OFF, but can be manually overridden to ON. See GRAFIK Eye Installation Guide for more details.

Sb - Save by button. Any changes to the intensities or fade time will not normally be saved; TEMPORARY LED is normally ON, but can be manually overridden to OFF. See GRAFIK Eye Installation Guide for more details.

Sn - Save never. All changes to the intensities are temporary. TEMPORARY LED is always ON and cannot be overridden.

4S - Scene selects and master raise/lower only. All buttons on the Control Unit are disabled, except the scene select buttons and the master raise/lower buttons.

bd - Buttons disabled. All buttons on the Control Unit are disabled. IR and Accessory Control commands will not be disabled.

### Accessory Controls

There are 16 addresses (1 to 16) available for Accessory Controls and 8 addresses (1 to 8) available for Motorized Window Treatment Controllers in a GRAFIK Eye System. The following terms are applicable for GRAFIK Eye 3000 and 4000 series Accessory Controls. Systems that include a GRX-PRG are limited to 15 addresses (1 to 15) for Accessory Controls; Address 16 is reserved for the GRX-PRG.

#### DIP switch

Most GRAFIK Eye Accessory Controls are addressed using a set of DIP switches on the Accessory Control. The exceptions are the GRX-DACPI, GRX-PRG, and GRX-RS232 (not using fixed address). Addressing information is included with all GRAFIK Eye Accessory Control Installation and Operation Instructions. DIP switches are also used to assign functionality for each Accessory Control. This information can be reported by *Programming Mode: Accessory Control Commands* available through the GRX-PRG. For commands that include an Accessory Control parameter, the Accessory Control address is represented by a single character 1 to G. Characters 1 to 9 represent addresses 1 to 9, characters A to G represent addresses 10 to 16. For commands that include a Motorized Window Treatment parameter, the Motorized Window Treatment Control address is represented by a 2-character absolute address, 11-18. When a Motorized Window Treatment Control responds, it will respond with its relative address, 1-8.

#### LEDs

The status of LEDs on GRAFIK Eye Accessory Controls can be set (ON) and cleared (OFF) using Accessory Control Command **srl** available through the GRX-PRG. However, the LED status cannot be read.

## General Information (continued)

### Format for Commands

All data is in ASCII

COMMAND FORMAT [ : ][ **command** ][ **parameters** ] <cr>

|                   |   |
|-------------------|---|
| :                 | - Clears input buffer   |
| <b>command</b>    | - command as shown  |
| <b>parameters</b> | - GRAFIK Eye Units, Zones, or other parameters specific to each command |
| <cr>              | - carriage return executes command                                      |

*Example:* To select Scene 1 on GRAFIK Eye Control Units 2 and 3, the following would be sent:  
:A123 <cr>

**Note: All commands in this document are presented as ASCII strings. If your equipment does not support transmission of ASCII text, you will need to convert command strings per the requirements of your equipment.**

For example, if you are using a touchscreen to interface with a GRX-RS232 that can only send hex values, you will need to convert the ASCII command string to a hexadecimal equivalent. To do this, you must determine the hexadecimal representation of the ASCII character you want to send (refer to the ASCII Character Lookup Chart in Appendix A). To make the scene select in the previous example (:A123 in ASCII), the hexadecimal equivalent would be:

|             |   |    |    |    |    |       |
|-------------|---|----|----|----|----|-------|
| ASCII       | : | A  | 1  | 2  | 3  | <cr>  |
| hexadecimal |   | 3A | 41 | 31 | 32 | 33 0D |

**Note: THE COMMAND STRING MAY CONTAIN A MAXIMUM OF 30 CHARACTERS.**

### System Responses to Commands

After each command line is entered, the GRX-RS232 or GRX-PRG transmits a response to the command. This response always begins as follows:

|             |                              |            |
|-------------|------------------------------|------------|
| ASCII       | <b>unprintable character</b> | ~          |
| hexadecimal | <b>FFh</b>                   | <b>7Eh</b> |

### Response Strings

The response string will always take one of the following forms:

|                                       |  |
|---------------------------------------|--|
| <b>~(response if applicable) N OK</b> | no errors occurred, N is the number of commands executed |
| <i>Example:</i>                       | ~1 OK  |
| <b>~ERROR #X N OK</b>                 | an error occurred and N number of commands were executed |
| <i>Example:</i>                       | ~ERROR #6 0 OK   |

Refer to the Error Codes in Appendix A for explanations of error codes.

### End of Response

The response string will always end as follows:

|             |            |            |
|-------------|------------|------------|
| ASCII       | <cr>       | <lf>       |
| hexadecimal | <b>0Dh</b> | <b>0Ah</b> |

## RS232 Commands

These commands are for use with the GRX-RS232 or the GRX-PRG Interface Accessory Controls.

### SELECT SCENE

Select any scene on the specified GRAFIK Eye Control Units.

**A[scene][Control Units]**

**scene** - scene to select (0 to G)  
**Control Units** - Control Units to select scene on

*Examples:* :A21 select scene 2 on Control Unit A1  
 :AG78 select scene 16 on Control Units A7 & A8

### SCENE LOCK

Place the specified GRAFIK Eye Control Units in or out of Scene Lock. **Setting Scene Lock from an RS232 Interface can only be cleared by the same RS232 Interface.**

**SL[+ or -][Control Units]**

**+ or -** - add or remove Control Units from scene lock  
**Control Units** - Control Units to scene lock

*Examples:* :SL release all Control Units from scene lock  
 :SL-1 release only Control Unit 1 from scene lock  
 :SL+36 additionally lockout Control Units 3 & 6

### REQUEST SCENE

Report the scene status of all Control Units on the link.

**G**

*Example:* :G get scene status

*Response:* ~:ss [S1][S2][S3][S4][S5][S6][S7][S8]

**[Sx]** - scene currently selected on Control Unit at address x

*Response:* ~:ss 1AMMMMMM Control Unit at address 1 is in scene 1, Control Unit at address 2 is in scene 10, Control Units at addresses 3 to 8 are missing (M)

### SEQUENCE

Sequence scenes on the specified GRAFIK Eye Control Units. Range of scenes sequenced (1 to 4, or 5 to 16) is set by DIP switch 4 on the RS232 Interface. **Setting Sequence from an RS232 Interface can only be cleared by the same RS232 Interface.**

**SQ[+ or -][Control Units]**

**+ or -** - add or remove Control Units from sequencing  
**Control Units** - Control Units to sequence

*Examples:* :SQ release all Control Units from sequence mode  
 :SQ-3 release only Control Unit 3 from sequencing  
 :SQ+68 add Control Units 6 & 8 to sequencing

## RS232 Commands (continued)

### ZONE LOCK

Zone lockout the specified GRAFIK Eye Control Units. **Setting Zone Lock from an RS232 Interface can only be cleared by the same RS232 Interface.**

**ZL[+ or -][Control Units]**

**+ or -** - add or remove Control Units from zone lock  
**Control Units** - Control Units to zone lock

*Examples:* :ZL release all Control Units from zone lock  
 :ZL-1 release only Control Unit 1 from lock  
 :ZL+36 additionally lockout Control Units 3 & 6

### ZONE LOWER (This command will not affect shade zones)

Zone lower ramps down specific zones on a single GRAFIK Eye Control Unit.

**D[Control Unit][zones]**

**Control Unit** - Control Unit where zones are to ramp down  
**zones** - zones to ramp down

*Examples:* :D5 stop ramping down all zones on Control Unit 5  
 :D3124 ramp down zones 1, 2, & 4 on Control Unit 3

### ZONE LOWER STOP (This command will not affect shade zones)

This command is a shortcut means of stopping all ramping down on all Control Units.

**E**

*Example:* :E stop ramping down all zones on all Control Units

### ZONE RAISE (This command will not affect shade zones)

Zone raise ramps up specific zones on a single GRAFIK Eye Control Unit.

**B[Control Unit][zones]**

**Control Unit** - Control Unit where zones are to ramp up  
**zones** - zones to ramp up

*Examples:* :B5 stop ramping up all zones on Control Unit 5  
 :B3124 ramp up zones 1, 2, & 4 on Control Unit 3

### ZONE RAISE STOP (This command will not affect shade zones)

This command is a shortcut means of stopping all ramping up on all Control Units.

**C**

*Example:* :C stop ramping up all zones on all Control Units

## PRG Commands

These commands are for use with the GRX-PRG Interface Accessory Controls. In addition, all GRX-RS232 commands can be used with the GRX-PRG.

**Note:** Timeclock and Super Sequence commands can be used with GRAFIK Eye 3100, 3500, 4100, 4500, or Integrale Series Control Units. All other PRG commands require 3500, 4500, or Integrale Series Control Units.

### SET TIME

Set the time in the internal timeclock. Parameters must be separated by a space (20h).

**ST [hr] [min] [mth] [day] [yr] [dayofweek]**

**hr** - hour of time to set (0 to 23)  
**min** - min of time to set (0 to 59)  
**mth** - month of date to set (1 to 12)  
**day** - day of date to set (1 to 31)  
**yr** - year of date to set  
**day of week** - day of week of date (1 to 7, 1 = Sunday)

*Examples:* :ST 1 35 10 26 95 5 set time and date to 1:35am, Thurs, Oct 26, 1995  
 :ST 13 45 10 27 95 6 set time and date to 1:45pm, Fri, Oct 27, 1995

### REPORT TIME

Report the current time and date in the internal timeclock. Parameters will be separated by a space (20h).

**RT**

*Example:* :RT report current time and date of control

*Response:* ~:rt [hr] [min] [month] [day] [yr] [dayofweek]

**hr** - hour of time set (0 to 23)  
**min** - min of time set (0 to 59)  
**mth** - month of date set (1 to 12)  
**day** - day of date set (1 to 31)  
**yr** - year of date set, > 50 will be 1900, < 50 will be 2000  
**day of week** - day of week date (1 to 7, 1 = Sunday)

*Response:* ~:rt 13 45 10 27 95 6 the time and date are 1:45pm, Fri, Oct 27, 1995

### SELECT SCHEDULE

Select the schedule to be run for the current day. This will override the default schedule to run as configured by a download from LIAISON software.

**SS[schedule]**

**schedule** - schedule to run, 0 = suspend schedule  
 1 = weekday schedule  
 2 = weekend schedule

*Example:* :SS1 start the weekday schedule





## PRG Commands (continued)

### REPORT SUPER SEQUENCE STATUS

The status of the super sequence created and downloaded from GRAFIK Eye LIAISON can be reported from the GRX-PRG. Parameters will be separated by a space (20h).

**Q?**

*Example:* :Q? report the status of the super sequence

*Response:* ~:s? [status] [next] [min] [sec]

**status** - R = running, S = stopped  
**next** - next step in super sequence  
**min** - minutes until next step  
**sec** - seconds until next step

*Response:* ~:s? R 5 0 20 the super sequence is running, Step 5 will occur in 20 seconds

### SET TIMECLOCK STATUS

Timeclock events can be enabled and disabled on an individual Control Unit basis. Control Units that have timeclock events disabled will not respond to timeclock events as long as they are disabled. Parameters will be separated by a space (20h).

**ate [bitmap]**

**bitmap** - hex bitmap of what Control Units to enable and disable timeclock events at (bit 0 = Unit 1, bit 7 = Unit 8)

*Bitmap Examples:* 27h = 00100111 = enable timeclock at Control Units 6, 3, 2, 1  
 = disable timeclock at Control Units 8, 7, 4  
 0Ch = 00001100 = enable timeclock at Control Units 4, 3  
 = disable timeclock at Control Units 8, 7, 6, 5, 2, 1

*Example:* :ate FF enable timeclock events on all Control Units

### REPORT TIMECLOCK STATUS

Control Units that have timeclock events disabled will not respond to timeclock events as long as they are disabled. Parameters will be separated by a space (20h).

**at?**

*Example:* :at? report the timeclock enabled status

*Response:* ~:at [bitmap]

**bitmap** - hex bitmap of what Control Units are timeclock enabled (bit 0 = Unit 1, bit 7 = Unit 8)

*Bitmap Examples:* 27h = 00100111 = timeclock enabled at Control Units 6, 3, 2, 1  
 = timeclock disabled at Control Units 8, 7, 4  
 0Ch = 00001100 = timeclock enabled at Control Units 4, 3  
 = timeclock disabled at Control Units 8, 7, 6, 5, 2, 1

*Response:* ~:at 27 timeclock events at Control Units 1, 2, 3, and 6 are enabled



## PRG Commands (continued)

- 4q** - bitmap of 4Q functions now active on this control
  - bit 4 = unit in fade override
  - bit 3 = unit in scene lock
  - bit 2 = unit in zone lock
  - bit 1 = unit in sequence mode
  - bit 0 - set = seq type 5—16, clr = seq type 1—4
- ir\_addr** - IR address variable 0h—FFh

*Response:* ~:mu 1 35 4 51 6 1 1 0 0      address 1 is a GRX-3504, code rev = 5.1, talks to Control Units at address 2 and 3, the temporary mode is Sb, PLL option is on

## READ LOAD TYPES

This command will return the load types assigned to each zone of the Control Unit. Parameters will be separated by a space (20h).

### rlt [Control Unit]

- Control Unit** - Control Unit to get load type data from (1 to 8)

*Example:* :rlt 7      get load types of zones on unit at address 7

*Response:* ~:lt [main\_unit] [lt1] [lt2] [lt3] [lt4] [lt5] [lt6] [lt7] [lt8]

- Control Unit** - Control Unit for which load types are returned
- ltx** - load type returned where **x** is the zone number

- 1 = INC, MLV - incandescent, magnetic low voltage
- 2 = FDB, ELV - fluorescent, electronic low voltage
- 3 = Neon/Cold Cathode
- 4 = ND - Non-dim, Last on, first off
- 5 = ND - Non-dim, First on, first off

*Response:* ~:lt 7 1 1 2 2 1 1 1      the load types for the Control Unit at address 7 are:  
    INC,MLV      Zones 1, 2, 5, 6, 7, 8  
    FDB,ELV      Zones 3, 4

**Note:** The response will always include load types for 8 zones. For Control Units with less than 8 zones, load type 1 will be returned for zones exceeding the number of zones on the Control Unit.

| Load Type                       | GRX3xxx | Integrale | GRX4xxx* |
|---------------------------------|---------|-----------|----------|
| 1 = Incandescent, MLV           | X       | X         | X        |
| 2 = FDB                         | X       | X         | ext      |
| 3 = Neon                        | X       | X         | ext      |
| 4 = Non-dim last on, first off  | X       | X         | X        |
| 5 = Non-dim First ON, First OFF | X       | X         | X        |
| 6 = Tu-Wire                     | 5-5     |           | ext      |
| 7 = ELV Reverse Phase           |         | X         | ext      |
| 8 = Auto select (For/REV)       |         | X         |          |
| 9 = 0-10 Fluorescent            |         | X         | ext      |
| 10 = DSI Fluorescent            |         | X         | ext      |
| 11 = DALI Fluorescent           |         | X         | ext      |
| 12 = PWM Fluorescent            |         | X         | ext      |
| 13 = Unused                     |         |           |          |
| 14 = Unused                     |         |           |          |
| 15 = Unused                     |         |           |          |
| 16 = AC Shade                   | 7-1     |           | 7-1      |
| 17 = Sivoia Shade               | 7-1     |           | 7-1      |

\* GRX4xxx unit should be set to load type 1 for these.

**Key:** X = all versions; X-X = all versions of that code rev or higher; ext = set by external module and circuit selector.

## PRG Commands (continued)

### READ LOW ENDS

This command will return the low end values assigned to each zone of the Control Unit. Parameters will be separated by a space (20h).

**rl** [*Control Unit*]

**Control Unit** - Control Unit to get low end data from (1 to 8)

*Example:* :rl 7 get low ends of zones on unit at address 7

*Response:* ~:le [*main\_unit*] [*le1*] [*le2*] [*le3*] [*le4*] [*le5*] [*le6*] [*le7*] [*le8*]

**Control Unit** - Control Unit for which load types are returned

**lex** - low end returned where *x* is the zone number

7Fh = Non-dim (has no low end setting)

*Response:* ~:le 7 4 4 3C 3C 4 4 4 4 the low ends for the Control Unit at address 7 are:

4h Zones 1, 2, 5, 6, 7, 8

3Ch Zones 3, 4

**Note:** The response will always include low ends for 8 zones. For Control Units with less than 8 zones, low end for incandescent will be returned for zones exceeding the number of zones on the unit.

Other values represent the low-end setting that depends on the load type. (1 = lowest light level possible; numbers greater than 1 represent higher low-end light settings). Each load type has a different maximum low-end value (highest low-end light level). Also, each load type has a default low-end value that is set automatically whenever a load type is changed. The lowest low end level (least light) for each load type has a value of 1. Each load type has a different max low end trim value (highest light). There is also a default low end for each type that is set automatically each time a load type is changed. This value is 0.

| <u>GRX3xxx</u>   | <u>LE Range</u><br>(higher number = brighter light) | <u>Default Value</u> |
|------------------|---|----------------------|
| Incandescent     | 1 to 50h  | 3h or 0              |
| FDB              | 1 to 50h  | 39h or 0             |
| Tu-Wire          | 1 to 50h  | 6h or 0              |
| Neon/CC          | 1 to 50h  | 2Ah or 0             |
| <u>Integrale</u> | <u>LE Range</u><br>(higher number = brighter light) | <u>Default Value</u> |
| Auto             | 1 to 5Fh  | Ah or 0              |
| ELV              | 1 to 5Fh  | Ah or 0              |
| MLV              | 1 to 5Ah  | 7h or 0              |
| FDB              | 1 to 5Ah  | 38h or 0             |
| 0-10             | 1 to 38h  | Ah or 0              |
| DSI              | 1 to 38h  | Ah or 0              |
| DALI             | 1 to 38h  | Ah or 0              |
| PWM              | 1 to 38h  | Ah or 0              |
| Neon/CC          | 1 to 6Eh  | 28h or 0             |

Note: Values for shade and non-dim zones are undefined.  
Command not available on GRX4xxx type units.

## PRG Commands (continued)

### READ HIGH ENDS

This command will return the highend values assigned to each zone of the Control Unit. Parameters will be separated by a space (20h). This command is valid only on units with software 7.0 or higher and Integrale.

**rhe** [*Control Unit*]

**Control Unit** - Control Unit to get high end data from (1 to 8)

*Example:* :rhe 7 get high ends of zones on unit at address 7

*Response:* ~:he [*main\_unit*] [*he1*] [*he2*] [*he3*] [*he4*] [*he5*] [*he6*] [*he7*] [*he8*]

**Control Unit** - Control Unit for which load types are returned

**hex** - high end returned where *x* is the zone number

7Fh = Non-dim (has no high end setting)

*Response:* ~:he 7 4 4 3C 3C 4 4 4 4 the high ends for the Control Unit at address 7 are:

4h Zones 1, 2, 5, 6, 7, 8

3Ch Zones 3, 4

**Note:** The response will always include high ends for 8 zones. For Control Units with less than 8 zones, high end for incandescent will be returned for zones exceeding the number of zones on the unit.

The highest high end level (most light) for each load type has a value of 1. Each load type has a different max high end trim value (lowest light). There is also a default high end for each type that is set automatically each time a load type is changed. This value is 0.

| <u>GRX3xxx</u>   | <u>HE Range</u><br>(higher number = brighter light) | <u>Default Value</u> |
|------------------|---|----------------------|
| Incandescent     | 1 to 50h  | 3h or 0              |
| FDB              | 1 to 50h  | 39h or 0             |
| Tu-Wire          | 1 to 50h  | 6h or 0              |
| Neon/CC          | 1 to 50h  | 2Ah or 0             |
| <u>Integrale</u> | <u>HE Range</u><br>(higher number = brighter light) | <u>Default Value</u> |
| Auto             | 1 to 55h  | 2Dh or 0             |
| ELV              | 1 to 55h  | 1Eh or 0             |
| MLV              | 1 to 5Ch  | 9h or 0              |
| FDB              | 1 to 5Ch  | 38h or 0             |
| 0-10             | 1 to 38h  | Ah or 0              |
| DSI              | 1 to 38h  | Ah or 0              |
| DALI             | 1 to 38h  | Ah or 0              |
| PWM              | 1 to 38h  | Ah or 0              |
| Neon/CC          | 1 to 55h  | 45h or 0             |

**Note:** Values for shade and non-dim zones are undefined.  
Command not available on GRX4xxx type units.

## PRG Commands (continued)

### READ PRESET SCENE

This command will return the preset scene data for each zone of the Control Unit. Parameters will be separated by a space (20h).

**rps** [*Control Unit*] [*scene*]

**Control Unit** - Control Unit to read preset  
**scene** - scene number 0h (Off) to 10h (Scene 16)

*Example:* :rps 1 2 return preset for scene 2 on Control Unit at address 1

*Response:* ~:ps [*Control Unit*] [*scene*] [*ft*] [*Int1*] [*Int2*] [*Int3*] [*Int4*] [*Int5*] [*Int6*] [*Int7*] [*Int8*]

**Control Unit** - Control Unit address  
**scene** - scene number 0h (Off) to 10h (Scene 16)

**ft** - fade time

0h—3Bh = seconds (0—59 seconds)

3Ch—78h = subtract 3Bh for minutes (1—60 minutes)

**Intx** - intensity for zone *x* 0h -> 7Fh, D0h is unaffected

**Refer to Control Units, Intensity in the General Information section for details on converting decimal values to hexadecimal values.**

*Response:* ~:ps 1 2 5 20 40 60 7F D0 D0 40 40 sene 2 at address 1 is programmed for:

5 second fade

25% Zone 1

50% Zone 2

75% Zones 3, 7, 8

99% Zone 4

Unaffected Zones 5, 6

**Note:** The response will always return 8 intensities. For Control Units with less than 8 zones, disregard intensities exceeding the number of zones on the unit.

For AC shade zones valid values for intensity are

D0h = unaffected

1 = OPEN

2 = CLOSE

For Sivoia shade zones, valid values are:

D0h = unaffected

1 = OPEN

2 = CLOSED

3 = preset 1

4 = preset 2

5 = preset 3

### STOP COMMUNICATION LINK

This command will stop all link polling and allow the RS-232 unit to communicate with and program the INTEGRATOR boxes in each dimmer panel. This communication is documented in the GRAFIK 6000® product documentation. If valid dimmer panel commands are not present on the link for 5 seconds, the link will resume polling.

**scl**

*Example:* :scl stop the communication link to the dimmer panels

## PRG Commands (continued)

### RESTART COMMUNICATION LINK

This command will allow link polling to resume.

**rcl**

*Example:*   :rcl                   restart link polling with the dimmer panels

### PROGRAM WHO I TALK TO

This command will set the Control Units talked to by the scene select buttons of the Control Unit. Parameters must be separated by a space (20h).

**ptt [Control Unit] [bitmap]**

- Control Unit** - Control Unit to program
- bitmap** - hex bitmap of which Control Units to talk to (bit 0 = Unit 1, bit 7 = Unit 8)

*Bitmap Examples:*       27h = 00100111     = Control Units 6, 3, 2, 1  
                           0Ch = 00001100     = Control Units 4, 3

*Example:*               :ptt 2 C           program Control Unit at address 2 to talk to addresses 3 and 4

### PROGRAM LOAD TYPES

This command will program the load types assigned to each zone of the Control Unit. Parameters must be separated by a space (20h).

**plt [Control Unit] [lt1] [lt2] [lt3] [lt4] [lt5] [lt6] [lt7] [lt8]**

- Control Unit** - Control Unit to program load types
- ltx** - load type for each zone where **x** is the zone number

| Load Type                       | GRX3xxx | Integrale | GRX4xxx* |
|---------------------------------|---------|-----------|----------|
| 1 = Incandescent, MLV           | X       | X         | X        |
| 2 = FDB                         | X       | X         | ext      |
| 3 = Neon                        | X       | X         | ext      |
| 4 = Non-dim last on, first off  | X       | X         | X        |
| 5 = Non-dim First ON, First OFF | X       | X         | X        |
| 6 = Tu-Wire                     | 5-5 +   |           | ext      |
| 7 = ELV Reverse Phase           |         | X         | ext      |
| 8 = Auto select (For/REV)       |         | X         |          |
| 9 = 0-10 Fluorescent            |         | X         | ext      |
| 10 = DSI Fluorescent            |         | X         | ext      |
| 11 = DALI Fluorescent           |         | X         | ext      |
| 12 = PWM Fluorescent            |         | X         | ext      |
| 13 = Unused                     |         |           |          |
| 14 = Unused                     |         |           |          |
| 15 = Unused                     |         |           |          |
| 16 = AC Shade                   | 7-1 +   |           | 7-1 +    |
| 17 = Sivoia Shade               | 7-1 +   |           | 7-1 +    |

\* Set Load Type to 1.

+Key:X = all versions; X-X = all versions of that code rev or higher; ext = set by external module and circuit selector.

*Example:*   :plt 2 1 1 \* 1     program zones 1, 2, 4 of address 2 to be incandescent

**Note:** It is not necessary to send all 8 values, but placement and order is important. Use \* for zones that are to remain the same. In the example above, zone 3 does not change, but an \* is required as a placeholder to



## PRG Commands (continued)

### PROGRAM LOW ENDS

This command will program the low-end values assigned to each zone of the Control Unit. Parameters must be separated by a space (20h).

**ple** [*Control Unit*] [*le1*] [*le2*] [*le3*] [*le4*] [*le5*] [*le6*] [*le7*] [*le8*]

**Control Unit** - Control Unit to get low end data from (1 to 8)

**lex** - low end hex value for zone **x**

7Fh = Non-dim (has no low-end setting)

*Example:* :ple 2 10 10 \* 10 program low ends of zones 1, 2, and 4 at address 2 to 10h (16 decimal)

**Note:** It is not necessary to send all 8 values, but placement and order is important. Use \* for zones that are to remain the same. In the example above, zone 3 does not change, but an \* is required as a placeholder to send values for zone 4.

Other values represent the low-end setting that depends on the load type. (1 = lowest light level possible; numbers greater than 1 represent higher low-end light settings). Each load type has a different maximum low-end value (highest low-end light level). Also, each load type has a default low-end value that is set automatically whenever a load type is changed. The lowest low end level (least light) for each load type has a value of 1. Each load type has a different max low end trim value (highest light). There is also a default lowend for each type that is set automatically each time a load type is changed. This value is 0.

| <u>GRX3xxx</u>   | <u>LE Range</u><br>(higher number = brighter light) | <u>Default Value</u> |
|------------------|---|----------------------|
| Incandescent     | 1 to 50h  | 3h or 0              |
| FDB              | 1 to 50h  | 39h or 0             |
| Tu-Wire          | 1 to 50h  | 6h or 0              |
| Neon/CC          | 1 to 50h  | 2Ah or 0             |
| <u>Integrale</u> | <u>LE Range</u><br>(higher number = brighter light) | <u>Default Value</u> |
| Auto             | 1 to 5Fh  | Ah or 0              |
| ELV              | 1 to 5Fh  | Ah or 0              |
| MLV              | 1 to 5Ah  | 7h or 0              |
| FDB              | 1 to 5Ah  | 38h or 0             |
| 0-10             | 1 to 38h  | Ah or 0              |
| DSI              | 1 to 38h  | Ah or 0              |
| DALI             | 1 to 38h  | Ah or 0              |
| PWM              | 1 to 38h  | Ah or 0              |
| Neon/CC          | 1 to 6Eh  | 28h or 0             |

Note: Values for shade and non-dim zones are undefined.  
Command not available on GRX4xxx type units.

## PRG Commands (continued)

### PROGRAM HIGH ENDS

This command will program the high-end values assigned to each zone of the Control Unit. Parameters must be separated by a space (20h). This command is valid only on units with software version 7.0 or higher and Integrale.

**phe** [*Control Unit*] [*he1*] [*he2*] [*he3*] [*he4*] [*he5*] [*he6*] [*he7*] [*he8*]

**Control Unit** - Control Unit to get low end data from (1 to 8)

**hex** - high end hex value for zone *x*

7Fh = Non-dim (has no low-end setting)

*Example:* :phe 2 10 10 \* 10 program high ends of zones 1, 2, and 4 at address 2 to 10h (16 decimal)

**Note:** It is not necessary to send all 8 values, but placement and order is important. Use \* for zones that are to remain the same. In the example above, zone 3 does not change, but an \* is required as a placeholder to send values for zone 4.

Other values represent the high-end setting that depends on the load type. (1 = highest light level possible; numbers greater than 1 represent lower high-end light settings). Each load type has a different maximum high-end value (lowest high-end light level). Also, each load type has a default high-end value that is set automatically whenever a load type is changed. The highest high end level (most light) for each load type has a value of 1. Each load type has a different max highend trim value (lowest light). There is also a default high end for each type that is set automatically each time a load type is changed. This value is 0.

**Note:** Values for Window Treatment and Non-Dim Zones are undefined. Command is not available on GRX-4XXX units.

| <u>GRX3xxx</u>   | <u>HE Range</u><br>(higher number = brighter light) | <u>Default Value</u> |
|------------------|---|----------------------|
| Incandescent     | 1 to 50h  | 3h or 0              |
| FDB              | 1 to 50h  | 39h or 0             |
| Tu-Wire          | 1 to 50h  | 6h or 0              |
| Neon/CC          | 1 to 50h  | 2Ah or 0             |
| <u>Integrale</u> | <u>HE Range</u><br>(higher number = brighter light) | <u>Default Value</u> |
| Auto             | 1 to 55h  | 2Dh or 0             |
| ELV              | 1 to 55h  | 1Eh or 0             |
| MLV              | 1 to 5Ch  | 9h or 0              |
| FDB              | 1 to 5Ch  | 38h or 0             |
| 0-10             | 1 to 38h  | Ah or 0              |
| DSI              | 1 to 38h  | Ah or 0              |
| DALI             | 1 to 38h  | Ah or 0              |
| PWM              | 1 to 38h  | Ah or 0              |
| Neon/CC          | 1 to 55h  | 45h or 0             |

**Note:** Values for shade and non-dim zones are undefined.  
Command not available on GRX4xxx type units.



## PRG Commands (continued)

### Programming Mode: Accessory Control Commands

All Programming Mode Commands require that the GRX-PRG RS232 Interface be in programming mode. To start programming mode, see the **START PROGRAMMING MODE (spm)** command.

### READ ACCESSORY CONTROL INFO

This command will return the type of Accessory Control, code revision level, function, and other information about the Accessory Control. Parameters will be separated by a space (20h).

**rru [Acc Control]**

**Acc Control** - address of Accessory Control 1h to Fh (1 to 15)

*Example:* :rru A get details of Accessory Control at address 10

*Response:* ~:ru [Acc Control] [type] [code\_rev] [(...other Acc Control data...)]

**Acc Control** - address for which details are returned

**type** - see chart below

**code\_rev** - revision level 00h -> 7Fh

**other data** - see below

*Response:* ~:ru A 0 20 3 2      Accessory Control at address 10 is an NTGRX-4S with code revision level 2-0, programmed to "talk to" Control Units 1 and 2 and select scenes 5—8

The Accessory Control data returned will be different for each Accessory Control, depending on its type. Refer to the following table:

**READ ACCESSORY CONTROL Response Table**

| <u>Type</u> | <u>Type Description</u> | <u>Other Accessory Control Data</u>  |
|-------------|-------------------------|--|
| 0           | 4S                      | a) Bitmap Control Units talked to (bit 0 = addr 1)<br>b) setting of DIP switches 5 and 6<br>(3 = scenes 1—4)<br>(2 = scenes 5—8)<br>(1 = scenes 9—12)<br>(0 = scenes 13—16)  |
| 1           | 4Q                      | a) Bitmap Control Units talked to (bit 0 = addr 1)<br>b) Bitmap of DIP switches 5 and 6<br>(3, 2 = seq 1—4)<br>(1, 0 = seq 5—16)   |
| 2           | 4PS                     | a) Bitmap Control Units button 1 (bit 0 = addr 1)<br>b) Bitmap Control Units button 2 (bit 0 = addr 1)<br>c) Bitmap Control Units button 3 (bit 0 = addr 1)<br>d) Bitmap Control Units button 4 (bit 0 = addr 1)   |
| 3           | 4M                      | a) Bitmap Control Units button 1 (bit 0 = addr 1)<br>b) Bitmap Control Units button 2 (bit 0 = addr 1)<br>c) Bitmap Control Units button 3 (bit 0 = addr 1)<br>d) Bitmap Control Units button 4 (bit 0 = addr 1)<br>e) Bitmap Control Units button 5 (bit 0 = addr 1)<br>f) setting of DIP switches 5 and 6<br>(3, 2 = button 5 turns ON)<br>(1, 0 = button 5 turns OFF) |

**PRG Commands** (continued)

| <u>Type</u> | <u>Type Description</u>     | <u>Other Accessory Control Data</u>   |
|-------------|-----------------------------|---|
| 5           | CIR                         | a) Bitmap Control Units talked to (bit 0 = addr 1)<br>b) variable IR address value<br>c) setting of DIP switches 5 and 6<br>- starting scene of unit<br>(3 = scene 1)<br>(2 = scene 5)<br>(1 = scene 9)<br>(0 = scene 13)                                       |
| 7           | 4S IR                       | a) Bitmap Control Units talked to (bit 0 = addr 1)<br>b) variable IR address value<br>c) setting of DIP switches 5 and 6<br>- starting scene of unit<br>(3 = scene 1)<br>(2 = scene 5)<br>(1 = scene 9)<br>(0 = scene 13)                                       |
| 8           | FINETUNE                    | a) Control Unit number (1—8)<br>b) Bitmap of zones on unit above that i talk to<br>c) . . . up to 7 more Control Units and zone bitmaps can follow . . .  |
| 9           | 2B Scene                    | a) Bitmap Control Units talked to (bit 0 = addr 1)<br>b) setting of DIP switches 5 and 6<br>(3 = scenes 9—10)<br>(2 = scenes 13—14)   |
| A           | 2B Panic                    | a) Bitmap Control Units talked to (bit 0 = addr 1)  |
| B           | 2B Part                     | a) Bitmap Control Units talked to (bit 0 = addr 1)  |
| C           | 2B 4Q                       | a) Bitmap Control Units talked to (bit 0 = addr 1)<br>b) setting of DIP switch 7<br>(1 = sequence scenes 5—16)<br>(0 = zone lockout)  |
| D           | 2B 1S                       | a) Bitmap Control Units talked to (bit 0 = addr 1)  |
| F           | DACPI                       | a) Bitmap Control Units talked to (bit 0 = addr 1)<br>b) photocell calibration value high byte<br>c) photocell calibration value low byte   |
| 20          | A/V 4S<br>Maintained Output | a) Bitmap Control Units talked to (bit 0 = addr 1)<br>b) setting of DIP switches 5 and 6<br>(3 = scenes 1—4)<br>(2 = scenes 5—8)<br>(1 = scenes 9—12)<br>(0 = scenes 13—16)<br>c) Bitmap of current states of inputs 1—5<br>(bit 0 = input 1, set (1) = closed) |

**PRG Commands** (continued)

| <u>Type</u> | <u>Type Description</u>     | <u>Other Accessory Control Data</u>   |
|-------------|-----------------------------|---|
| 21          | A/V 4Q                      | a) Bitmap Control Units talked to (bit 0 = addr 1)<br>b) setting of DIP switches 5 and 6<br>(bit 1 on = momentary inputs)<br>(bit 1 off = maintained inputs)<br>(bit 2 on = seq 1—4)<br>(bit 2 off = seq 5—16)<br>c) Bitmap of current states of inputs 1—5<br>(bit 0 = input 1, set (1) = closed)  |
| 22          | A/V 4PS                     | a) Bitmap Control Units button 1 (bit 0 = addr 1)<br>b) Bitmap Control Units button 2 (bit 0 = addr 1)<br>c) Bitmap Control Units button 3 (bit 0 = addr 1)<br>d) Bitmap Control Units button 4 (bit 0 = addr 1)<br>e) Bitmap Control Units button 5 (bit 0 = addr 1)<br>f) setting of DIP switches 5 and 6<br>(3 = momentary inputs)<br>(2 = maintained inputs)<br>g) Bitmap of current states of inputs 1—5<br>(bit 0 = input 1, set(1) = closed) |
| 24          | A/V OCC                     | a) Bitmap Control Units button 1 (bit 0 = addr 1)<br>b) Bitmap Control Units button 2 (bit 0 = addr 1)<br>c) Bitmap Control Units button 3 (bit 0 = addr 1)<br>d) Bitmap Control Units button 4 (bit 0 = addr 1)<br>e) Bitmap Control Units button 5 (bit 0 = addr 1)<br>f) setting of DIP switch 5<br>(0 = 0 off scene only)<br>(1 = 1 on and off function)<br>g) Bitmap of current states of inputs 1-5<br>(bit 0 = input 1, set(1) = closed)     |
| 25          | A/V 4S<br>Momentary Output  | a) Bitmap Control Units talked to<br>(bit 0 = addr 1)<br>b) setting of DIP switches 5 and 6<br>(3 = scenes 1—4)<br>(2 = scenes 5—8)<br>(1 = scenes 9—12)<br>(0 = scenes 13—16)<br>c) Bitmap of current states of inputs 1—5<br>(bit 0 = input 1, set (1) = closed)  |
| 28          | RS232<br>Fixed Address      | a) Bitmap of DIP switches 6,7and 8<br>(bit 1 on = momentary inputs)<br>(bit 1 off = maintained inputs)<br>(bit 2 on = seq 1—4)<br>(bit 2 off = seq 5—16)  |
| 42          | Shade Control<br>3W or 3WRL | a) Control Unit Number 1—8<br>b) Bitmap of zones on unit above that I talk to<br>c) . . . up to 7 more Control Units and zone bitmaps<br>can follow . . .   |

**PRG Commands** (continued)

|    |                        |   |
|----|------------------------|---|
| 43 | Shade Control<br>2W    | <ul style="list-style-type: none"> <li>a) Control Unit Number 1—8</li> <li>b) Bitmap of zones on unit above that I talk to</li> <li>c) . . . up to 7 more Control Units and zone bitmaps can follow . . .</li> </ul>  |
| 60 | CCO in Scene Control   | <ul style="list-style-type: none"> <li>a) Bitmap of Control Units I listen to</li> <li>b) Bitmap of Switch Settings <ul style="list-style-type: none"> <li>bits 0-2 indicate scene selections</li> <li>bit 3 indicates scene match status</li> <li>bit 4 indicates momentary or maintained outputs</li> <li>0 → ON</li> <li>1 → OFF</li> </ul> </li> </ul> <p>Refer to GRX-CCO installer's guide for more information.</p>  |
| 61 | Shade Control<br>3WD   | <p>Top half of control</p> <ul style="list-style-type: none"> <li>a) Control Unit Number 1—8</li> <li>b) bitmap of zones on unit above that I talk to</li> <li>c) . . . up to 7 more Control Units and zone bitmaps can follow . . .</li> </ul> <p>Bottom half of control</p> <p>Read with :rrs command format</p> <p>rrs [Acc Control] [bank to read]</p> <p>Response</p> <p>rrs [Acc Control] [type][code rev][data packet]</p> <p>data packet</p> <ul style="list-style-type: none"> <li>a)Control Unit Number 1—8</li> <li>b)bitmap of zones on unit above that I talk to</li> <li>c) . . . up to 7 more Control Units and zone bitmaps can follow . . .</li> </ul> |
| 70 | Group Controller       | <ul style="list-style-type: none"> <li>a) Control Unit for channel 1</li> <li>b) bitmap of zones that I listen to</li> <li>c) 3 more Control Units and zone bitmaps can follow</li> </ul>   |
| 71 | CCO in<br>Zone Control | <ul style="list-style-type: none"> <li>a) Control Unit for channel 1</li> <li>b) bitmap of zones that I listen to</li> <li>c) Up to 7 more Control Units and zone bitmaps can follow</li> </ul>   |
| 72 | Sivoia Interface       | <ul style="list-style-type: none"> <li>a) Control Unit Number 1—8</li> <li>b) bitmap of zones that I listen to</li> </ul>   |

## PRG Commands (continued)

|                          |                              |  |
|--------------------------|------------------------------|--|
| 80                       | Preset Shade Control<br>5WRL | a) Control Unit Number 1—8<br>b) Bitmap of zones on unit above that I talk to<br>c) . . . up to 7 more Control Units and zone bitmaps can follow . . . |
| 31-36, 41,<br>51, 52, 62 | Custom<br>Shade Control      | a) Control Unit Number 1—8<br>b) Bitmap of zones on unit above that I talk to<br>c) . . . up to 7 more Control Units and zone bitmaps can follow . . . |

## READ ACCESSORY CONTROL SPECIFIC DATA

This command is used to get data from the Accessory Control that is not contained in the **rru** response. Parameters will be separated by a space (20h).

**rrs [Acc Control] [packet]**

**Acc Control** - address of Accessory Control  
**packet** - data packet number to return data from

The Accessory Control data returned will be different for each Accessory Control, depending on its type.

### DACPI

*Example:* :rrs A 1

*Response:* ~:rs [Acc Control] [packet] [(...Acc Control specific packet data...)]

**Acc Control** - address for which details are returned  
**packet** - see chart below  
**specific data** - see chart below

| <u>Accessory Control</u> | <u>Packet#</u> | <u>Accessory Control Specific Packet Data</u>   |
|--------------------------|----------------|---|
| 1h – Fh (1 to 15)        | 1 – 4 (Bank #) | a) Threshold 1 (0h – 63h) (1 to 99)<br>b) Threshold 2 (0h – 63h) (1 to 99)<br>c) Threshold 3 (0h – 63h) (1 to 99)<br>d) Enforce Option 0h = Not Enforced<br>1h – 7Fh = Enforced |

*Response:* ~:rs A 1 19 32 4B the thresholds for Bank 1 of DACPI Accessory Control at address 10 are:  
25%- Threshold 1  
50%- Threshold 2  
75%- Threshold 3

### CCO in Zone Control

*Example:* :rrs 11 1

*Response:* ~:rs [Acc Control] [packet] [(...Acc Control specific packet data...)]

**Acc Control** - address for which details are returned  
**packet** - see chart below  
**specific data** - see chart below

| <u>Accessory Control</u> | <u>Packet#</u> | <u>Accessory Control Specific Packet Data</u>  |
|--------------------------|----------------|--|
| 11h – 18h                | 1              | Bitmap of OPTIONS switch settings<br>Switches 1 – 5 correspond to bits 0 – 4, respectively.<br>0 = ON, 1 = OFF |



## PRG Commands (continued)

*Response:* ~:rs 1 1 1      the OPTIONS switch is set as follows:  
 Switch 1- ON  
 Switch 2- ON  
 Switch 3- ON  
 Switch 4- ON  
 Switch 5- OFF

### 3WD

*Example:* :rrs 1 1

*Response:* ~:rs [Acc Control] [type] [code rev] [packet] [(...Acc Control specific packet data...)]

**Acc Control** - address for which details are returned  
**type** - 61 (indicates accessory control type)  
**code rev** - software revision  
**packet** - see chart below  
**specific data** - see chart below

| <u>Accessory Control</u> | <u>Packet#</u>        | <u>Accessory Control Specific Packet Data</u>   |
|--------------------------|-----------------------|---|
| 1h – Fh                  | 0 – Top<br>1 – Bottom | a) Control Unit<br>b) bitmap of zones that I talk to<br>c) ...up to 7 more Control Units and zone bitmaps can follow. |

*Response:* ~:rs 1 1 7 3 8 1      the 3WD talks to zones 1 and 2 on Control Unit 7 and zone 1 on Control Unit 8

## PROGRAM ACCESSORY CONTROL

This command will program the Accessory Control. The data format will be different, depending on the type of Accessory Control. Parameters must be separated by a space (20h).

**pru [Acc Control] [type] [specific data]**

**Acc Control** - address of Accessory Control 1h to Fh (1 to 15)  
**type** - see chart below  
**specific data** - see below

*Example:* :pru A 0 3      program NTGRX-4S Accessory Control at address 10 to "talk to" Control Units at address 1 and 2

## PRG Commands (continued)

The Accessory Control data sent will be different for each Accessory Control, depending on its type. Refer to the following table:

**PROGRAM ACCESSORY CONTROL Data Table**

| <u>Type</u> | <u>Type Description</u>     | <u>Other Accessory Control Data</u>   |
|-------------|-----------------------------|---|
| 0           | 4S                          | a) Bitmap Control Units talked to (bit 0 = addr 1)  |
| 1           | 4Q                          | a) Bitmap Control Units talked to (bit 0 = addr 1)  |
| 2           | 4PS                         | a) Bitmap Control Units button 1 (bit 0 = addr 1)<br>b) Bitmap Control Units button 2 (bit 0 = addr 1)<br>c) Bitmap Control Units button 3 (bit 0 = addr 1)<br>d) Bitmap Control Units button 4 (bit 0 = addr 1)  |
| 3           | 4M                          | a) Bitmap Control Units button 1 (bit 0 = addr 1)<br>b) Bitmap Control Units button 2 (bit 0 = addr 1)<br>c) Bitmap Control Units button 3 (bit 0 = addr 1)<br>d) Bitmap Control Units button 4 (bit 0 = addr 1)<br>e) Bitmap Control Units button 5 (bit 0 = addr 1) |
| 5           | CIR                         | a) Bitmap Control Units talked to (bit 0 = addr 1)<br>b) variable IR address value  |
| 7           | 4S IR                       | a) Bitmap Control Units talked to (bit 0 = addr 1)<br>b) variable IR address value  |
| 8           | FINETUNE                    | a) Control Unit number (1—8)<br>b) Bitmap of zones on unit above that i talk to<br>c) . . . up to 7 more Control Units and zone bitmaps can follow . . .  |
|             | 9                           | 2B Scene<br>a) Bitmap Control Units talked to (bit 0 = addr 1)  |
| A           | 2B Panic                    | a) Bitmap Control Units talked to (bit 0 = addr 1)  |
| B           | 2B Part                     | a) Bitmap Control Units talked to (bit 0 = addr 1)  |
| C           | 2B 4Q                       | a) Bitmap Control Units talked to (bit 0 = addr 1)  |
| D           | 2B 1S                       | a) Bitmap Control Units talked to (bit 0 = addr 1)  |
| F           | DACPI                       | a) Bitmap Control Units talked to (bit 0 = addr 1)<br>b) photocell calibration value high byte<br>c) photocell calibration value low byte   |
| 20          | A/V 4S<br>Maintained Output | a) Bitmap Control Units talked to (bit 0 = addr 1)  |
| 21          | A/V 4Q                      | a) Bitmap Control Units talked to (bit 0 = addr 1)  |

**PRG Commands** (continued)

|    |                            |   |
|----|----------------------------|---|
| 22 | A/V 4PS                    | <ul style="list-style-type: none"> <li>a) Bitmap Control Units button 1 (bit 0 = addr 1)</li> <li>b) Bitmap Control Units button 2 (bit 0 = addr 1)</li> <li>c) Bitmap Control Units button 3 (bit 0 = addr 1)</li> <li>d) Bitmap Control Units button 4 (bit 0 = addr 1)</li> </ul>  |
| 24 | A/V OCC                    | <ul style="list-style-type: none"> <li>a) Bitmap Control Units button 1 (bit 0 = addr 1)</li> <li>b) Bitmap Control Units button 2 (bit 0 = addr 1)</li> <li>c) Bitmap Control Units button 3 (bit 0 = addr 1)</li> <li>d) Bitmap Control Units button 4 (bit 0 = addr 1)</li> <li>e) Bitmap Control Units button 5 (bit 0 = addr 1)</li> </ul>   |
| 25 | A/V 4S<br>Momentary Output | <ul style="list-style-type: none"> <li>a) Bitmap Control Units talked to (bit 0 = addr 1)</li> </ul>  |
| 42 | Shade Control<br>3W or 3WJ | <ul style="list-style-type: none"> <li>a) Control Unit Number 1—8</li> <li>b) Bitmap of zones on unit above that I talk to</li> <li>c) . . . up to 7 more Control Units and zone bitmaps can follow. .</li> </ul>   |
| 43 | Shade Control<br>2W        | <ul style="list-style-type: none"> <li>a) Control Unit Number 1—8</li> <li>b) Bitmap of zones on unit above that I talk to</li> <li>c) . . . up to 7 more Control Units and zone bitmaps can follow. .</li> </ul>   |
| 60 | CCO in Scene Mode          | <ul style="list-style-type: none"> <li>a) bitmap of Control Units I listen to</li> </ul>  |
| 61 | Shade Control<br>3WD       | <p>Top half of control</p> <ul style="list-style-type: none"> <li>a) Control Unit Number 1—8</li> <li>b) Bitmap of zones on unit above that I talk to</li> <li>c) . . . up to 7 more Control Units and zone bitmaps can follow . . .</li> </ul> <p>Bottom half of control</p> <p>Read with :rrs command format</p> <p>rrs [Acc Control] [bank to read]</p> <p>Response</p> <p>rrs [Acc Control] [type][code rev][data packet]</p> <p>data packet</p> <ul style="list-style-type: none"> <li>a)Control Unit Number 1—8</li> <li>b)Bitmap of zones on unit above that I talk to</li> <li>c) . . . up to 7 more Control Units and zone bitmaps can follow . . .</li> </ul> |
| 70 | Group Controller           | <ul style="list-style-type: none"> <li>a) Control Unit for channel 1</li> <li>b) bitmap of zones for channel 1</li> <li>Only one bit may be set except: 0 indicates no Control Unit Controls Channel, 55h will leave programming unaffected</li> <li>c) Repeat for Channels 2-4</li> </ul>  |

## PRG Commands (continued)

|                          |                              |   |
|--------------------------|------------------------------|---|
| 71                       | CCO in Zone Control          | <ul style="list-style-type: none"> <li>a) Control Unit for channel 1</li> <li>b) Bitmap of zones for channel<br/>Only one bit may be set except; 0 indicates no Control Unit controls Channel, 55h will leave programming unaffected</li> <li>c) . . . up to 7 more Control Units and zone bitmaps can follow...</li> </ul> |
| 72                       | Sivoia Interface             | <ul style="list-style-type: none"> <li>a) Control Unit</li> <li>b) bitmap of zones listened to. Bitmap must have only 1 bit set</li> </ul>  |
| 80                       | Preset Shade Control<br>5WRL | <ul style="list-style-type: none"> <li>a) Control Unit Number 1—8</li> <li>b) bitmap of zones on unit above that I talk to</li> <li>c) . . . up to 7 more Control Units and zone bitmaps can follow...</li> </ul>   |
| 31-36, 41,<br>51, 52, 62 | Custom<br>Shade Control      | <ul style="list-style-type: none"> <li>a) Control Unit Number 1—8</li> <li>b) bitmap of zones on unit above that I talk to</li> <li>c) . . . up to 7 more Control Units and zone bitmaps can follow . . .</li> </ul>  |

## PROGRAM ACCESSORY CONTROL SPECIFIC DATA

This command is used to program Accessory Controls with data values that are not contained in the **pru** command. Parameters must be separated by a space (20h). The command will have a format that is dependent on the type of Accessory Control.

### DACPI

**prs [Acc Control] [packet] [type] [specific data]**

- Acc Control** - address of Accessory Control
- packet** - data packet number to return data from
- specific data** - see chart below

**Accessory Control**

1h—Fh (1 to 15)

**Packet#**

1—4 (Bank#)

**Accessory Control Specific**

**Data packet Details**

- a) Threshold 1 (0h—63h) (1 to 99)
- b) Threshold 2 (0h—63h) (1 to 99)
- c) Threshold 3 (0h—63h) (1 to 99)
- d) Enforce Option 0h = Not Enforced  
1h—7Fh = Enforced

### 3WD

**prs [Acc Control] [packet] [type][specific data]**

- Acc Control** - address of Accessory Control
- packet** - data packet number to return data from
- type** - 61 (type of Accessory Control)
- specific data** - see chart below

**Accessory Control**

1h – Fh

**Packet#**

0 – Top  
1 – Bottom

**Accessory Control Specific**

**Data packet Details**

- a) Control Unit
- b) bitmap of zones that I talk to
- c) ...up to 7 more Control Units and zone bitmaps

## PRG Commands (continued)

### Non-Programming Mode Commands

#### SET CONTROL UNIT ZONE INTENSITIES

This command changes the intensity of the given zones to the new values in the given fade time. The scene number selected will change to 17 (H from an :A command), but preset data will not be changed. Parameters must be separated by a space (20h).

**szi** [*Control Unit*] [*ft*] [*Int1*] [*Int2*] [*Int3*] [*Int4*] [*Int5*] [*Int6*] [*Int7*] [*Int8*]

**Control Unit** - Control Unit to set zone intensities

**ft** - fade time

0h—3Bh = seconds (0—59 seconds)

3Ch—78h = subtract 3Bh for minutes (1—60 minutes)

**Intx** - intensity for zone *x* 0h -> 7Fh, \* is don't change

**Refer to Control Units, Intensity in the General Information section for details on converting decimal values to hexadecimal values.**

*Example:* :szi 5 A 20 20 \* 20 20 20      set zones 1, 2, 4, 5, and 6 on unit at address 5 to 25%  
with a 10 second fade, don't change zone 3

**Note:** It is not necessary to send all 8 values, but placement and order is important. Use \* for zones that are to remain the same. In the example above, zone 3 does not change, but an \* is required as a placeholder to send values for zones 4 and above.

**Note:** For non-Dim zones, 0 = zone off, 1 to 7F = zone on.

For shade zones 0 = STOP

1 = OPEN

2 = Close

3 = Preset 1 (Sivoia only)

4 = Preset 2 (Sivoia only)

5 = Preset 3 (Sivoia only)

## PRG Commands (continued)

### READ CONTROL UNIT ZONE INTENSITIES

This command returns the zone intensities on a specified Control Unit. Parameters will be separated by a space (20h).

**rzi** [*Control Unit*]

**Control Unit** - Control Unit to return zone intensities  
**Intx** - intensity for zone *x* 0h -> 7Fh

**Refer to Control Units, Intensity in the General Information section for details on converting decimal values to hexadecimal values.**

*Example:* :rzi 5 return zone intensities for Control Unit at address 5

*Response:* ~:zi [*Control Unit*] [*Int1*] [*Int2*] [*Int3*] [*Int4*] [*Int5*] [*Int6*] [*Int7*] [*Int8*]

**Control Unit** - Control Unit address  
**Intx** - intensity for zone *x* 0h -> 7Fh

**Refer to Control Units, Intensity in the General Information section for details on converting decimal values to hexadecimal values.**

*Response:* ~:zi 1 20 40 60 7F 4 5 6 7 current intensities for zones at address 1 are:

|             |           |
|-------------|-----------|
| 25%         | Zone 1    |
| 50%         | Zone 2    |
| 75%         | Zone 3    |
| 99%         | Zone 4    |
| not present | Zones 5—8 |

**Note:** Eight zone intensities will always be returned. **Intx** will equal *x* – 1 for *x* greater than the number of zones on the Control Unit.

**Note:** For non-Dim zones, 0 = zone off, 1 to 7F = zone on.

If Motorized Window Treatments are moving, the following zone intensities are valid.

5Eh = STOP  
 15h = OPEN  
 2Dh = Close  
 71h = Preset 1 (*Sivoia* Shades only)  
 72h = Preset 2 (*Sivoia* Shades only)  
 73h = Preset 3 (*Sivoia* Shades only)

If Motorized Window Treatments are stopped, the following zone intensities are valid.

5Eh = STOP  
 5Fh = OPEN  
 60h = Close  
 61h = Preset 1 (*Sivoia* Shades only)  
 62h = Preset 2 (*Sivoia* Shades only)  
 63h = Preset 3 (*Sivoia* Shades only)

**Note:** The system assumes that the Motorized Window Treatments are moving for 2 minutes. These values are valid 2 minutes after the last command.

**Note:** There are other zone intensities that exist for internal use. These values are transient and should be ignored.

## PRG Commands (continued)

### SET REMOTE LEDs

This command will turn on the given LEDs in the Accessory Control. The LEDs will override the normal LED functionality of the control. Parameters must be separated by a space (20h).

**srl [Acc Control] [bitmap]**

**Acc Control** - address of Accessory Control 1h -> Fh (1 to 15)

**bitmap** - hex bitmap 0h to 7Fh (lsb = LED 1 of control)

**bitmap value of FFh will result in the**

**Accessory Control reverting back to it's normal**

**LED functionality** (7 LEDs maximum per Accessory Control)

*Bitmap Examples:* 7h = 00000111 = turn on LEDs 3, 2, 1

= turn off LEDs 7, 6, 5, 4

1Ch = 00011100 = turn on LEDs 5, 4, 3

= turn off LEDs 7, 6, 2, 1

*Example:* :srl 2 8 turn on LED 4 of Accessory Control at address 2  
turn off LEDs 1, 2, 3, 5, 6, 7

Prior to receiving any **srl** command, Accessory Control LEDs will reflect the status defined by DIP switch settings. Any **srl** command will override the status LEDs. An **srl** command with a bitmap value of FFh will cause the Accessory Control's LEDs to revert back to reflecting the status defined by the DIP switch settings.

### DACPI Accessory Control Commands

#### DACPI ON

This command will turn ON the DACPI photocell control at the address specified. The control will become active and transmit scene selections based upon its programmed thresholds and the available natural lighting (normal DACPI function).

**P+ [Acc Control]**

**Acc Control** - address of DACPI Accessory Control 1h to Fh (1 to 15)

*Example:* :P+ A turn on DACPI Accessory Control at address 10

#### DACPI OFF

This command will turn OFF the DACPI photocell control at the address specified. Only the Bank switch and the four Manual Scene Select Switches will be active. No automatic Scene Selections will occur. Manually selected Scenes will be within the currently active Bank.

**P- [Acc Control]**

**Acc Control** - address of DACPI Accessory Control 1h to Fh (1 to 15)

*Example:* :P-B turn off DACPI Accessory Control at address 11

## PRG Commands (continued)

### Miscellaneous Commands

These commands are for use on all GRAFIK Eye RS232 Interfaces: GRX-RS232, GRX-ATC, and GRX-PRG.

#### CODE REV LEVEL

This command requests the revision level of the embedded system's software. It is used for diagnostic purposes and may be needed if you ever contact the Lutron Technical Assistance Hotline for assistance. Parameters will be separated by a space (20h).

**V**

*Example:* :V report the software revision level of the RS232 Interface

*Response:* ~:v hi\_rev lo\_rev model



## Appendix A

### ASCII Character Lookup Chart

| ASCII | Hex Value | Decimal Value | ASCII | Hex Value | Decimal Value |
|-------|-----------|---------------|-------|-----------|---------------|
| :     | 3A        | 58            | S     | 53        | 83            |
| space | 20        | 32            | T     | 54        | 84            |
| +     | 2B        | 43            | U     | 55        | 85            |
| -     | 2D        | 45            | V     | 56        | 86            |
| ~     | 7E        | 126           | W     | 57        | 87            |
| <cr>  | 0D        | 13            | X     | 58        | 88            |
| <lf>  | 0A        | 10            | Y     | 59        | 89            |
| 0     | 30        | 48            | Z     | 5A        | 90            |
| 1     | 31        | 49            | a     | 61        | 97            |
| 2     | 32        | 50            | b     | 62        | 98            |
| 3     | 33        | 51            | c     | 63        | 99            |
| 4     | 34        | 52            | d     | 64        | 100           |
| 5     | 35        | 53            | e     | 65        | 101           |
| 6     | 36        | 54            | f     | 66        | 102           |
| 7     | 37        | 55            | g     | 67        | 103           |
| 8     | 38        | 56            | h     | 68        | 104           |
| 9     | 39        | 57            | i     | 69        | 105           |
| A     | 41        | 65            | j     | 6A        | 106           |
| B     | 42        | 66            | k     | 6B        | 107           |
| C     | 43        | 67            | l     | 6C        | 108           |
| D     | 44        | 68            | m     | 6D        | 109           |
| E     | 45        | 69            | n     | 6E        | 110           |
| F     | 46        | 70            | o     | 6F        | 111           |
| G     | 47        | 71            | p     | 70        | 112           |
| H     | 48        | 72            | q     | 71        | 113           |
| I     | 49        | 73            | r     | 72        | 114           |
| J     | 4A        | 74            | s     | 73        | 115           |
| K     | 4B        | 75            | t     | 74        | 116           |
| L     | 4C        | 76            | u     | 75        | 117           |
| M     | 4D        | 77            | v     | 76        | 118           |
| N     | 4E        | 78            | w     | 77        | 119           |
| O     | 4F        | 79            | x     | 78        | 120           |
| P     | 50        | 80            | y     | 79        | 121           |
| Q     | 51        | 81            | z     | 7A        | 122           |
| R     | 52        | 82            |       |           |               |

### Error Codes

| Error | Description   |
|-------|---|
| 1     | Control Unit Raise/Lower error                            |
| 2     | Invalid scene selected                                    |
| 6     | Bad command was sent                                      |
| 13    | Not a timeclock unit (GRX-ATC or GRX-PRG)                 |
| 14    | Illegal time was entered                                  |
| 15    | Invalid schedule  |
| 16    | No Super Sequence has been loaded                         |
| 20    | Command was missing Control Units                         |
| 21    | Command was missing data                                  |
| 24    | Invalid Control Unit                                      |
| 25    | Invalid value, outside range of acceptable values         |
| 26    | Invalid Accessory Control                                 |
| 80    | Time-out error, no response received                      |
| 255   | GRX-PRG must be in programming mode for specific commands |

## Appendix A (continued)

### Control Unit and Accessory Raw Feedback

Setting DIP switch 6 of any RS232 Interface in the ON position will report when a button has been pushed or released on a GRAFIK Eye Control Unit or Accessory Control. The response will be formatted as follows:

**[address][button data]**

**address** - address of Control Unit or Accessory Control where button was pressed or released

**button data** - what action was taken as a result of the button press or release

The first parameter is the address of the Control Unit or Accessory Control where a button was pushed or released. A capital letter indicates a button was pushed, and a lowercase letter indicates a button was released. The Table that follows is a list of how addresses will be reported by raw feedback.

| Unit Type:        | Addressed as: | Address reported: | Unit Type:        | Addressed as: | Address reported: |
|-------------------|---------------|-------------------|-------------------|---------------|-------------------|
| Control Unit      | A1            | A or a            | Accessory Control | 5             | M or m            |
|                   | A2            | B or b            |                   | 6             | N or n            |
|                   | A3            | C or c            |                   | 7             | O or o            |
|                   | A4            | D or d            |                   | 8             | P or p            |
|                   | A5            | E or e            |                   | 9             | Q or q            |
|                   | A6            | F or f            |                   | 10            | R or r            |
|                   | A7            | G or g            |                   | 11            | S or s            |
|                   | A8            | H or h            |                   | 12            | T or t            |
| Accessory Control | 1             | I or i            | 13                | U or u        |                   |
|                   | 2             | J or j            | 14                | V or v        |                   |
|                   | 3             | K or k            | 15                | W or w        |                   |
|                   | 4             | L or l            | 16                | X or x        |                   |

The second parameter, **button data**, varies based on the function of the Control Unit or Accessory Control. Functions can be separated into four major categories: scene selection/fine tuning, Special Functions (4Q), partitioning, and mastering.

#### Scene Selection/Fine Tuning (GRX-3100, 3500, 4100, and 4500, NTGRX-4S, 4S-IR, and 2B-SL, GRX-4S-DW, & GRX-CIR)

**button data** represents the scene that was selected by the pressed or released button. Characters 1 to 9 represent scenes 1 to 9; characters A to G represent scenes 10 to 16, and 0 represents the OFF scene. For a Control Unit, a Master Raise is indicated by a 17, while a Master Lower is indicated by an 18. For a fine tuning control, such as NTGRX-2B-SL, a 1 indicates that the Raise or top button has been pushed, and a 0 indicates that the Lower or bottom button has been pushed.

*Example of raw feedback:*

|    |   |
|----|---|
| D3 | button press selecting scene 3 on GRAFIK Eye Control Unit addressed as A4         |
| d3 | button release after selecting scene 3 on GRAFIK Eye Control Unit addressed as A4 |

#### Special Functions (NTGRX-4Q, & GRX-AV)

The second parameter will be a value representing which functions are active. If the address parameter is a lowercase letter, no functions are active. The functions available and their values are: Sequence = 1, Zone Lock = 2, Scene Lock = 4, Fade Override (NTGRX-4Q) = 8, Panic (GRX-AV) = 16. Values are added if more than one function is active.

*Example of raw feedback:*

|    |  |
|----|--|
| J6 | zone lock and scene lock are active on the Accessory Control addressed as 12 |
| j1 | no functions are active on the Accessory Control addressed as 12             |

#### Partitioning and Mastering (NTGRX-4M, NTGRX-4PS, & GRX-AV)

The status of these functions cannot be decoded by the RS232 Interface.



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