**PRG**

# GROUNDCONTROL™
# REMOTE FOLLOWSPOT SYSTEM™

## USER MANUAL

GroundControl™ Remote Followspot System™ User Manual

Version as of: May 9, 2016

PRG part number: 02.9833.0001 A

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# FOREWORD

## Important Safety Instructions

+ Read these instructions.
+ Keep these instructions.
+ Heed all warnings.
+ Follow all instructions.
+ Do not use this apparatus near water.
+ Clean only with dry cloth.
+ Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
+ Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
+ Unplug this apparatus during lightning storms or when unused for long periods of time.
+ Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
+ In Europe: The building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.
+ In Finland: Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan.
+ In Norway: Apparatet må tilkoples jordet stikkontakt.
+ In Sweden: Apparaten skall anslutas till jordat uttag.
+ No naked flame sources should be placed on the apparatus.
+ Apparatus for use in tropical climates.
+ The apparatus shall not be exposed to dripping or splashing. No objects filled with liquids, such as vases, shall be placed on the apparatus.

Safety symbols used throughout this manual are as follows:

| ⚠ | **CAUTION** advising of potential damage to product. |
|---|---|
| ⚡ | **WARNING** advising of potential injury or death to persons. |
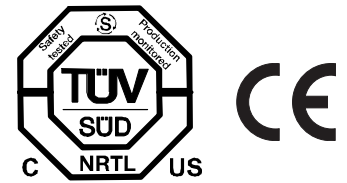
**WARNING!** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

**WARNING!** Power supply plug and/or power switch/circuit breaker shall remain readily operable.

**WARNING!** This CLASS I apparatus shall be connected to a MAINS socket outlet with a protective earthing connection.

**WARNING!** Where the MAINS plug or an appliance coupler is used as the disconnect device, the disconnect device shall remain readily operable.

**WARNING!** For personal safety, this equipment must be properly grounded.

Do not, under any circumstances, cut or remove the ground prong from the power cord.

The power cord of this equipment is provided with a 3-prong grounding plug which mates with a standard 3-prong grounded wall outlet to minimize the possibility of electric shock hazard from this equipment.

Have the wall outlet and electrical circuit checked by a qualified electrician to ensure the outlet is properly grounded. If the outlet is a standard 2-prong outlet, it is your personal responsibility and obligation to have it replaced with a properly grounded 3-prong outlet.

Never unplug the equipment by pulling on the power cord. Always grip the plug firmly and pull it straight out from the outlet. Do not use a cord that shows cracks or damage along its length or at either end. Replacement cords may be ordered from PRG.

## Consignes de Sécurité Importantes

+ Lisez ces instructions.

+ Conservez ces instructions.

+ Respectez tous les avertissements.

+ Suivez toutes les instructions.

+ Ne pas utiliser cet appareil près de l'eau.

+ Nettoyer avec un chiffon sec.

+ Ne pas installer près de sources de chaleur telles que des radiateurs, registres de chaleur, poêles ou autres appareils (incluant les amplificateurs) qui produisent de la chaleur.

+ Protégez le cordon d'alimentation ne soit piétiné ou pincé, particulièrement au niveau des fiches, des prises de courant, et le point où ils sortent de l'appareil.

+ Débranchez cet appareil pendant les orages ou lorsqu'il est inutilisé pendant de longues périodes de temps.

+ Confiez toute réparation à un personnel qualifié. Une réparation est nécessaire lorsque l'appareil a été endommagé de quelque façon que ce cordon d'alimentation ou la fiche est endommagé, du liquide a été renversé ou des objets sont tombés dans l'appareil, l'appareil a été exposé à la pluie ou à l'humidité, ne fonctionne pas normalement , ou est tombé.

+ L'installation du bâtiment doit être considéré comme fournissant une protection conformément à la cote de la prise de courant murale.

+ Aucune source de flamme nue devraient être placés sur l'appareil.

+ Appareil pour une utilisation dans les climats tropicaux.

+ L'appareil ne doit pas être exposé à des éclaboussures. Les objets remplis de liquides, comme des vases, doivent être placés sur l'appareil.

Symboles de sécurité utilisés dans ce manuel sont les suivantes:

| | |
|---|---|
| ⚠ | **MISE EN GARDE** conseillant des dommages potentiels au produit. |
| ⚡ | **ATTENTION** conseillant de préjudice potentiel ou la mort de personnes. |
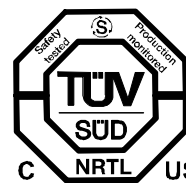
**ATTENTION!** Pour réduire le risque d'incendie ou un choc électrique, ne pas exposer cet appareil à la pluie ou à l'humidité.

**ATTENTION!** Prise d'alimentation et / ou l'interrupteur d'alimentation / disjoncteur doit rester facilement accessible.

**ATTENTION!** Ce appareils de CLASSE I doit être raccordé à une prise secteur dotée d'une connexion à la terre.

**ATTENTION!** Si la fiche d'alimentation ou un coupleur d'appareil est utilisé comme dispositif de déconnexion, le dispositif de déconnexion doit rester facilement accessible.

**ATTENTION!** Pour votre sécurité, cet appareil doit être correctement mis à la terre.

Il ne faut en aucun cas couper ou enlever la broche de terre du cordon d'alimentation.

Le cordon d'alimentation de cet appareil est fourni avec une fiche à 3 broches qui s'accouple avec un standard à 3 broches mise à la terre prise murale afin de minimiser le risque de choc électrique de cet équipement.

Faites vérifier la prise murale et le circuit électrique par un électricien qualifié pour assurer la prise est correctement mise à la terre. Si la prise est un standard 2 broches prise, il est de votre responsabilité et l'obligation de la faire remplacer par une prise à 3 broches prise.

Ne jamais débrancher l'appareil en tirant sur le cordon d'alimentation. Toujours saisir fermement la fiche et tirez-le tout droit hors de la prise. Ne pas utiliser un cordon qui présente des fissures ou des dommages sur toute sa longueur ou aux extrémités. Cordons de rechange peuvent être commandées auprès PRG.

## Revision History

This manual has been revised as follows:

| Version | Release Date | Notes |
|---------|--------------|-------|
| BASIC | January 29, 2016 | Initial release. |
| A | May 9, 2016 | Added 4-Way Switch information. Updated menu screens for latest software version. Added procedures for fiber optic cleaning. Added roadcase packing illustrations. Added specifications for luminaires, fiber cables, and roadcases. |

**Notes**

# TABLE OF CONTENTS

## Software Update

## Troubleshooting

## Maintenance

## Specifications

# INTRODUCTION

## About This Guide

This manual provides necessary information regarding product safety, installation, and operation for the following PRG equipment:

+ GroundControl™ Remote Followspot System™

Familiarizing yourself with this information will help you get the most out of your PRG product.

## Additional Documentation

For more information, refer to the following manuals:

+ Bad Boy® Spot Luminaire User Manual (02.9812.0001)

+ Best Boy® 4000 Spot Luminaire User Manual (02.9816.0001)

## Customer Service

For technical assistance, contact the PRG International Service Center or contact your nearest PRG office. Contact information for all PRG office locations can be found on our website at: www.prg.com

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Service Email: orders@prg.com

For additional resources and documentation, please visit our website at: www.prg.com

# DESCRIPTION

## Overview

The PRG GroundControl™ Remote Followspot System™ allows a technician to remotely operate a high-output, automated luminaire as a followspot from up to 2,000 feet away. The GroundControl (GC) Remote Followspot System (RFS) consists of three parts: a GC Luminaire, a GC Truss Box, and a GC Followspot Controller.

The GC Luminaire is a Bad Boy® or Best Boy® spot luminaire that has been modified and optimized for followspot work. It has a high-definition camera mounted on the fixture which outputs HD-SDI at 1080p enabling the operator on the ground to see the stage from the same point of view as the fixture, thus allowing the operator fast and amazingly accurate pick-ups. The on-board camera has an optical zoom, targeting reticle, and a night-vision mode that enables operators to pick up a performer on a virtually black stage. In addition to CMY color mixing, the GC Luminaire has been further optimized for followspot work by having two dedicated color correction wheels, a CTO, and a CTB Wheel. Both wheels are loaded up with a wide variety of color correction options. Having CMY color mixing along with the CTO and CTB wheels gives designers the ultimate in flexibility to dial in and tune the GC luminaire to their exact needs.

**GC Followspot Controller**

The second component of the GroundControl RFS is the GC Truss Box. DMX, camera control and video are fed to and from the fixture directly to the Truss Box where all data is converted and sent down a robust Neutrik® opticalCON® QUAD armored fiber optic cable to the GC Followspot Controller on the ground. The multi-mode quad fiber allows the Controller to be placed up to 2,000 feet away from the fixture. It also reduces the likelihood of data corruption and/or signal interference due to the proximity of other power and data cables typically found in entertainment venues.

The final component of the GroundControl RFS is the GC Remote Followspot Controller. This device is an intuitive control station that mimics the typical form factor and familiarity of a traditional followspot. The GC RFC has a monitor on a moving yoke whose movements are sent to and mimicked by the GC luminaire. Any way the Controller is moved, the GC luminaire will respond. There are also intuitive controls for Intensity, Iris, Zoom, Frost, and Edge as well as buttons that can be used for color and beam presets. The GC Followspot Controller features an on-board touchscreen for easy addressing, configuring, and diagnostics. The GC Followspot Controller is mounted on a robust, adjustable slider stand and has Neutrik® powerCON® In and Thru connectors for power, XLR 5-pin In and Thru, as well as a BNC connector that outputs HD-SDI video. The video output is a direct feed from the camera on the GC luminaire which can be used for a variety of things, such as routing to an LD Followspot Preview Monitor or to even use the feed for I-Mag use.

The GroundControl 4-Way Switch is an optional component which allows control of up to four different fixtures from the same Control Arm (one at a time).

**Features:**

+ Monitor and high definition camera
+ HD-SDI camera output
+ Local control for Intensity, Iris, Zoom, Edge, and Frost
+ On-board touchscreen for easy addressing, configuring, and diagnostics
+ Wide range of color correction + CMY color mixing
+ Easy grip handles for manual control of Pan and Tilt
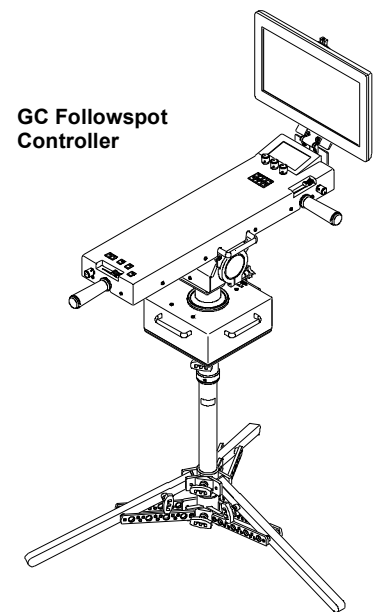
**Requirements:**

In order for the GC Followspot Controller to work with the luminaire, the luminaire must be running the GroundControl Remote Followspot System software. The following versions are required:

+ GroundControl Bad Boy software: v0.03 or greater
+ GroundControl Best Boy software: v0.04 or greater
+ GroundControl software: v0.15 or greater

**Sample Configuration:**

The following illustration shows a typical GroundControl Remote Followspot System configuration.
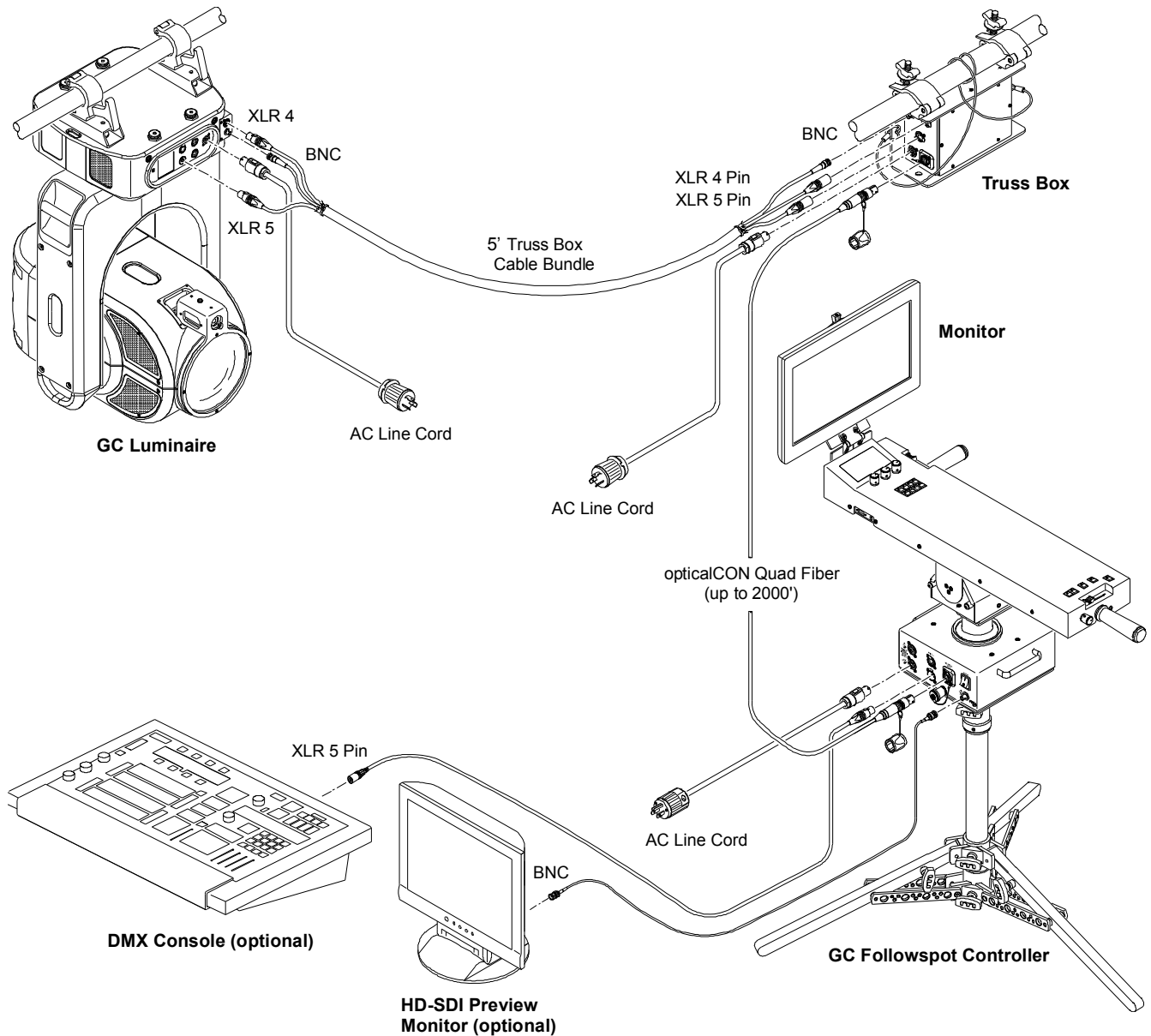


Figure 1:  Sample RFS Configuration

## Included Items

The following illustration shows all items included with the GroundControl Remote Followspot System.
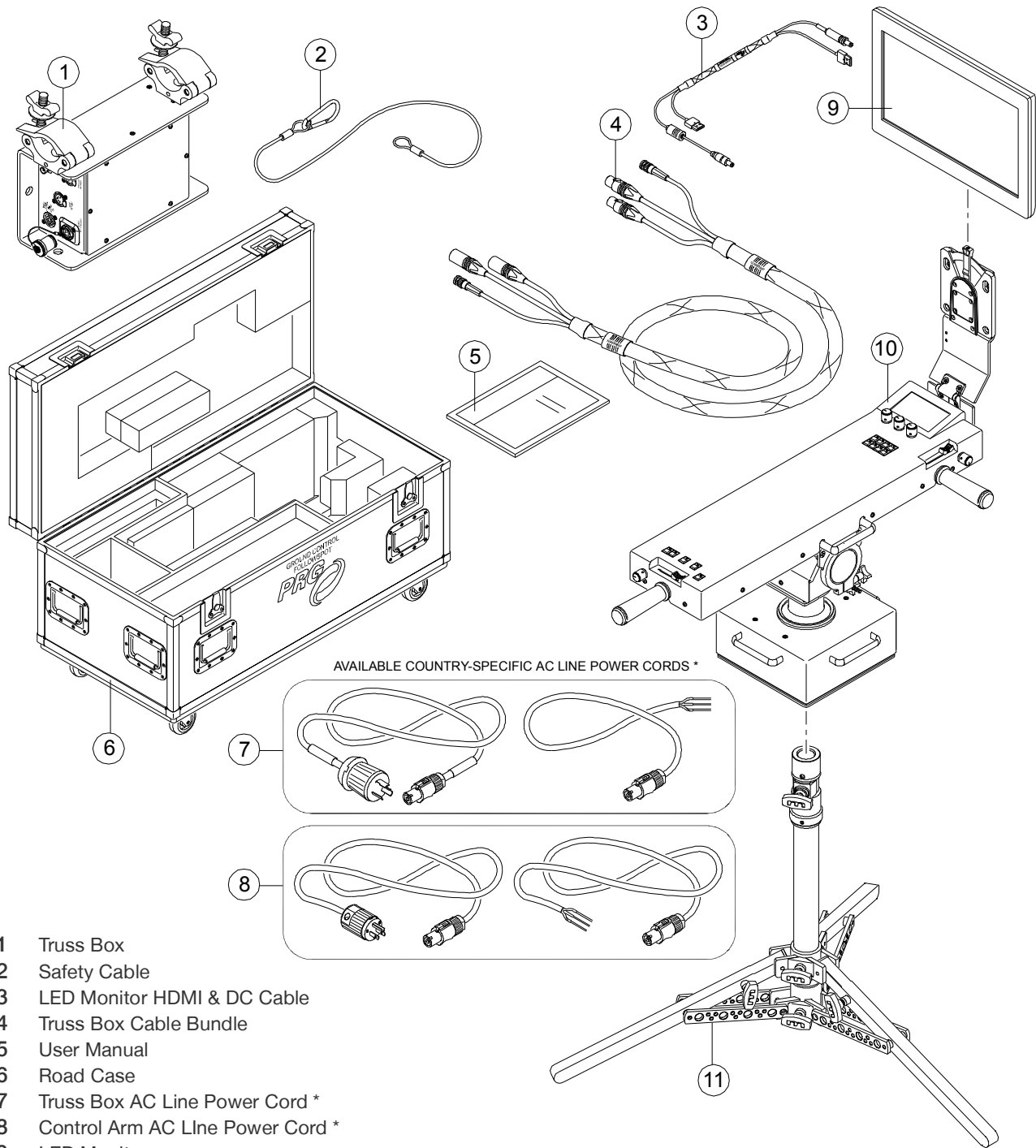


1 Truss Box
2 Safety Cable
3 LED Monitor HDMI & DC Cable
4 Truss Box Cable Bundle
5 User Manual
6 Road Case
7 Truss Box AC Line Power Cord *
8 Control Arm AC LIne Power Cord *
9 LED Monitor
10 RFS Control Arm
11 Floor Stand
(See next page for part numbers and ecodes.)

AVAILABLE COUNTRY-SPECIFIC AC LINE POWER CORDS *

\* The configuration of the supplied AC Line Power Cords will be specific to your order.

**Figure 2:  Included Items**

**Included Items List:**

| No. | Item | PRG Part Number | Ecode |
|-----|------|-----------------|-------|
| 1 | Truss Box | 20.9833.0040 | 374C7-<br>Includes 2 each 27781- (Chesboro Aluminum 2" Half) |
| 2 | Safety Cable | 55.9802.1000 | 27814- |
| 3 | LED Monitor HDMI & DC Cable | 25.9833.0015 | 374CA- |
| 4 | Truss Box Cable Bundle | 23.9833.0030 | 374C9- |
| 5 | User Manual | 02.9833.0001 | n/a |
| 6 | Road Case | 22.9833.1201 | 374CH- |
| 7 | Truss Box AC Line Power Cord | 25.9812.0902.5 USA<br>25.9830.0160.03 EURO | 64334- USA<br>64333- EURO |
| 8 | Control Arm AC LIne Power Cord | 25.9830.0161.10 USA<br>25.9830.0160.10 EURO | 64330- USA<br>64333- EURO |
| 9 | LED Monitor | 21.9833.0015 | 374CC-<br>Includes 374C5- (Mount Plate) |
| 10 | Remote Followspot Controller | 21.9833.0090 | 374C2- |
| 11 | Junior Slider Control Stand | 76.9833.0001.0 | 8015A- |

## Optional Items

### 4-Way Switch

The GroundControl 4-Way Switch allows control of up to four different fixtures from the same Control Arm (one at a time).

| Item | PRG Part Number | Ecode |
|------|-----------------|-------|
| 4-Way Switch | 20.9833.0200 | 374C6- |
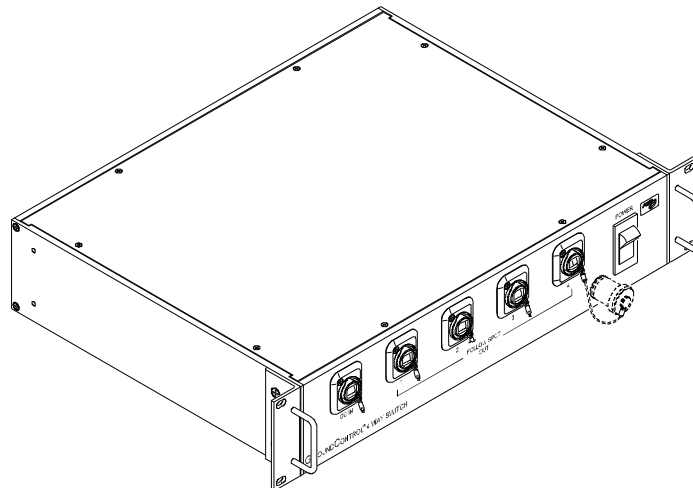


Figure 3:  4-Way Switch

## Fiber Optic Cables

Neutrik® opticalCON ADVANCED Quad Core armored fiber cable should be used with the GroundControl Remote Followspot System. The multi-mode quad fiber allows the GC Followspot Controller to be placed up to 2,000 feet away from the fixture. It also reduces the likelihood of data corruption and/or signal interference due to the proximity of other power and data cables typically found in entertainment venues.
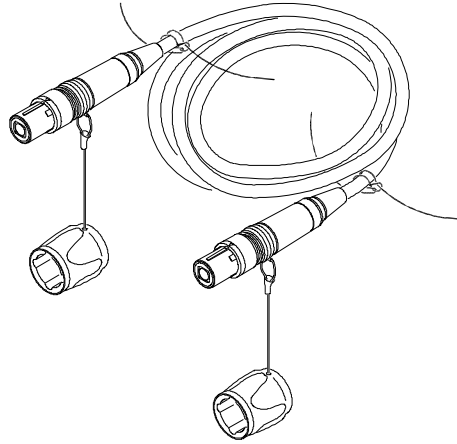


Figure 4: opticalCON Fiber Optic Cable

Terminated, extreme-duty quad cables:

| PRG Part No. | Ecode | Description |
|---|---|---|
| 25.0013.0050 | 394AF- | FIBER MM OPTICALCON QUAD ARMORED 50' 15M |
| 25.0013.0075 | 394AH- | FIBER MM OPTICALCON QUAD ARMORED 75' 23M |
| 25.0013.0100 | 394AJ- | FIBER MM OPTICALCON QUAD ARMORED 100' 30M |
| 25.0013.0125 | 394AK- | FIBER MM OPTICALCON QUAD ARMORED 125' 38M |
| 25.0013.0150 | 394AM- | FIBER MM OPTICALCON QUAD ARMORED 150' 45.5M |
| 25.0013.0175 | 394AN- | FIBER MM OPTICALCON QUAD ARMORED 175' 53M |
| 25.0013.0200 | 394AO- | FIBER MM OPTICALCON QUAD ARMORED 200' 60.5M |
| 25.0013.0250 | 394AR- | FIBER MM OPTICALCON QUAD ARMORED 250' 76M |
| 25.0013.0300 | 394AT- | FIBER MM OPTICALCON QUAD ARMORED 300' 91M |
| 25.0013.0350 | 394AW- | FIBER MM OPTICALCON QUAD ARMORED 350' 106.5M |
| 25.0013.0600 | 394AZ- | FIBER MM OPTICALCON QUAD ARMORED 600' 182.5M |
| 25.0013.1000 | 394BA- | FIBER MM OPTICALCON QUAD ARMORED 1000' 305M |

Quad coupler:

| PRG Part No. | Ecode | Description |
|---|---|---|
| n/a | 39452- | OPTICALCON OM3 QUAD COUPLER MM IP65 BLK |

## Components

### External Controls and Connections

The following illustrations show the external controls and connections for the GroundControl Remote Followspot System components.

MONITOR CONNECTIONS

HDMI

12VDC
1A

HDMI

Power

Monitor

Manual Controls
(see details on the next page)

Menu Touchscreen

Followspot Handle

DMX512      Ethernet

1           2
ACCESS PORT

Followspot Handle

Control Arm

Interface Box
(see details on the
following pages)

ACCESS PORTS
(for software loading only)

Slider Stand
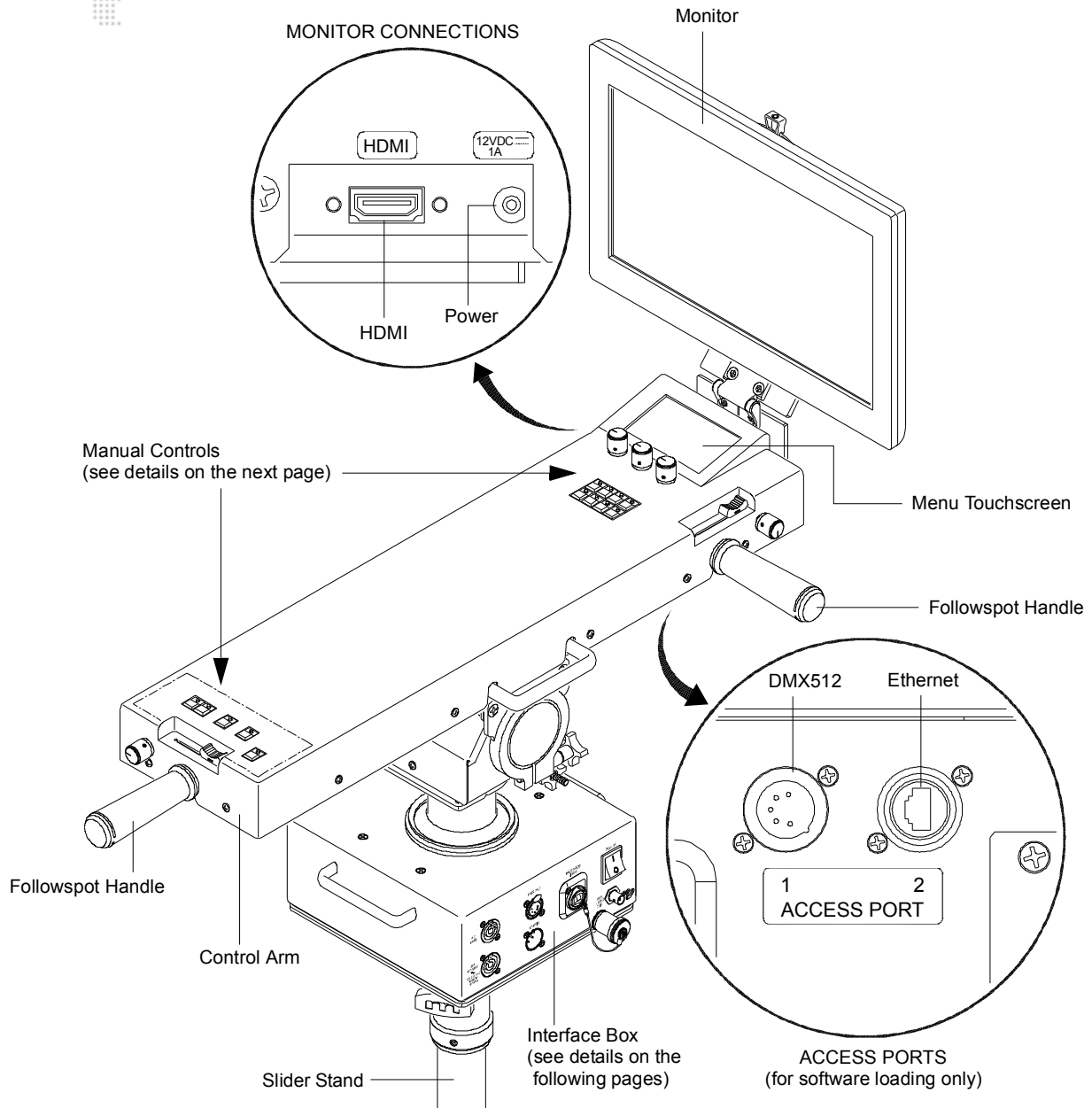
Figure 5:  GC Followspot Controller - Main Components

Menu Touchscreen

Iris Adjustment Knob (luminaire)

Zoom / Intensity
Fader (configurable)

Multi-Function
Adjustment Knobs

Preset Buttons

CAMERA

ZOOM
-    +

DAY/NIGHT

RETICLE

Reticle (Crosshairs) Button

Zoom In / Out Buttons

BLACKOUT

Day / Night Mode Button

Blackout Button

CAMERA
IRIS

Intensity / Zoom Fader
(configurable)

Iris Adjustment
Knob (camera)
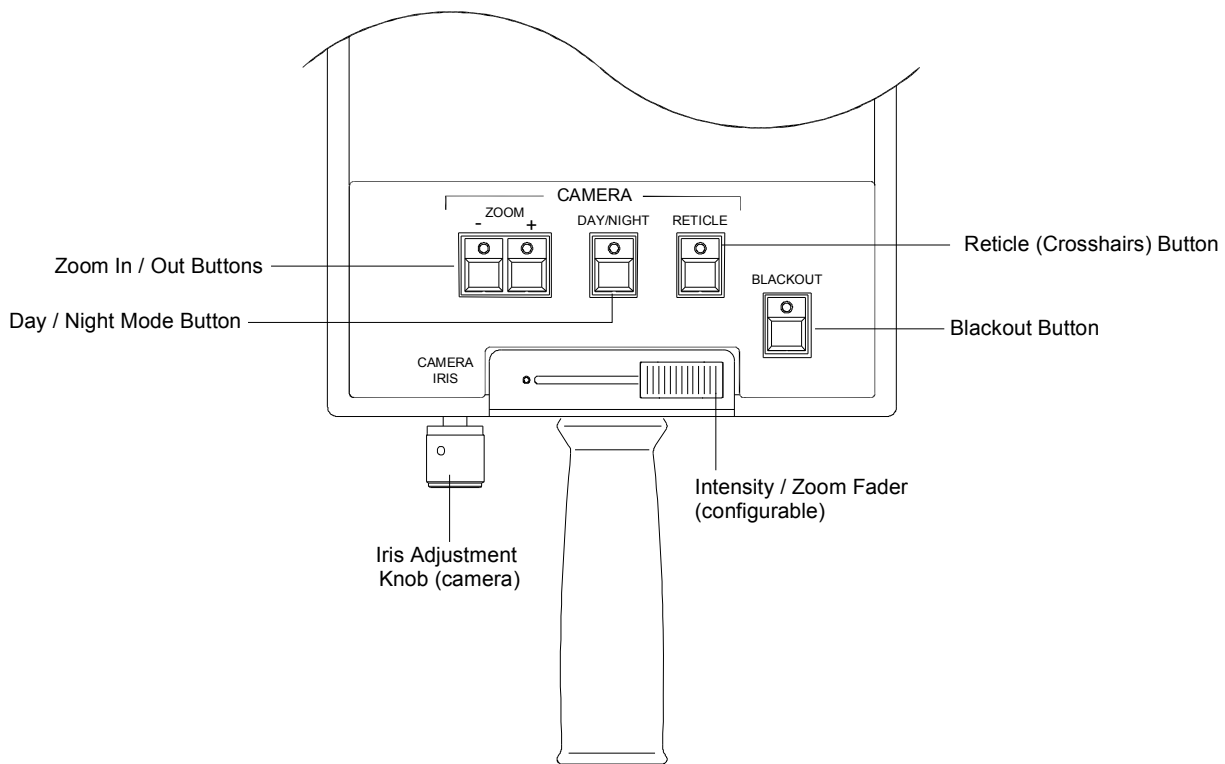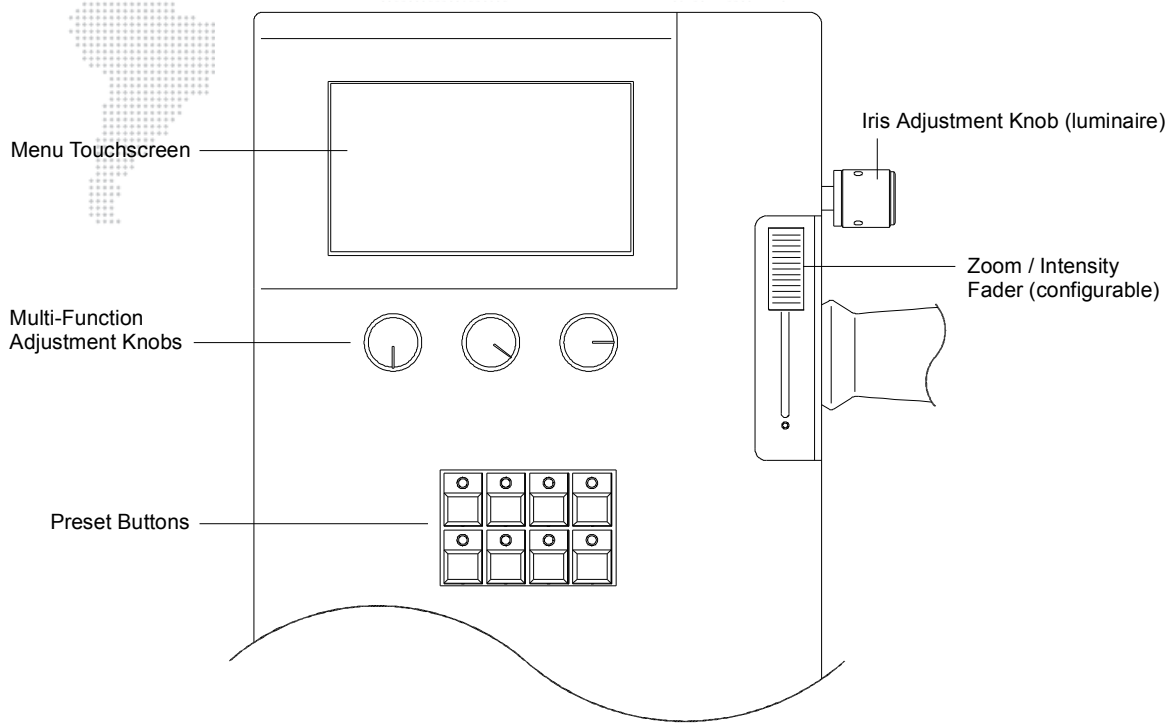
**Figure 6: GC Followspot Controller - Control Arm Details**

AC Power Output  DMX512 Output  Power On/Off Switch

AC
THRU

DMX OUT
PUSH
5 ○ ○ 1
4 ○ ○ 2
○
3

TRUSS BOX
FIBER
B   A

POWER

AC
POWER
~
100-240 VAC
50/60 Hz
1A MAX.

DMX IN
1   5
2   4
3

AUX
VIDEO
OUT

PRG

AC Power Input  DMX512 Input

Fiber Optic
(to Truss Box)

Auxiliary Video Output
(HD-SDI)
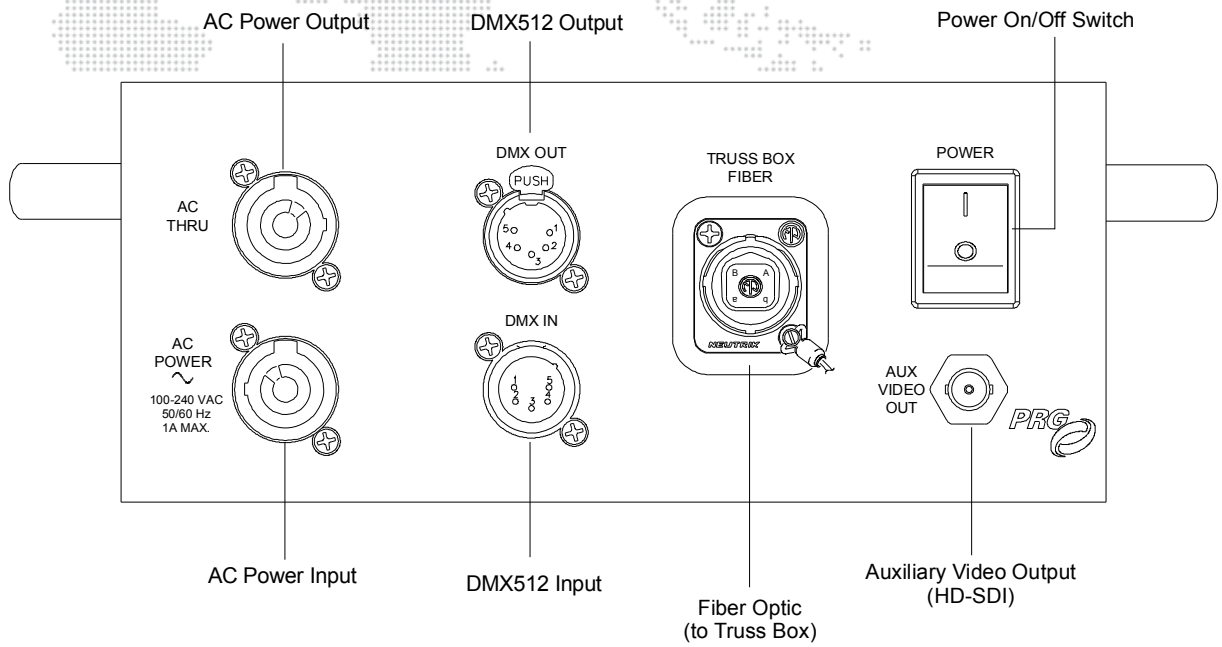
Figure 7: GC Followspot Controller – Interface Panel Detail

Camera Control
DMX512

Fiber Optic
(from Controller)

CAMERA
CONTROL
PUSH
4 ○   ○ 1
3 ○   ○ 2
○

CONTROLLER
FIBER
B   A

FIXTURE
DMX
PUSH
5   1
4   2
3

CAMERA
VIDEO

AC
POWER
~
100-240 VAC
50/60 Hz
1A MAX.

Camera Video Input

DMX512
(to Fixture)

AC Power Input
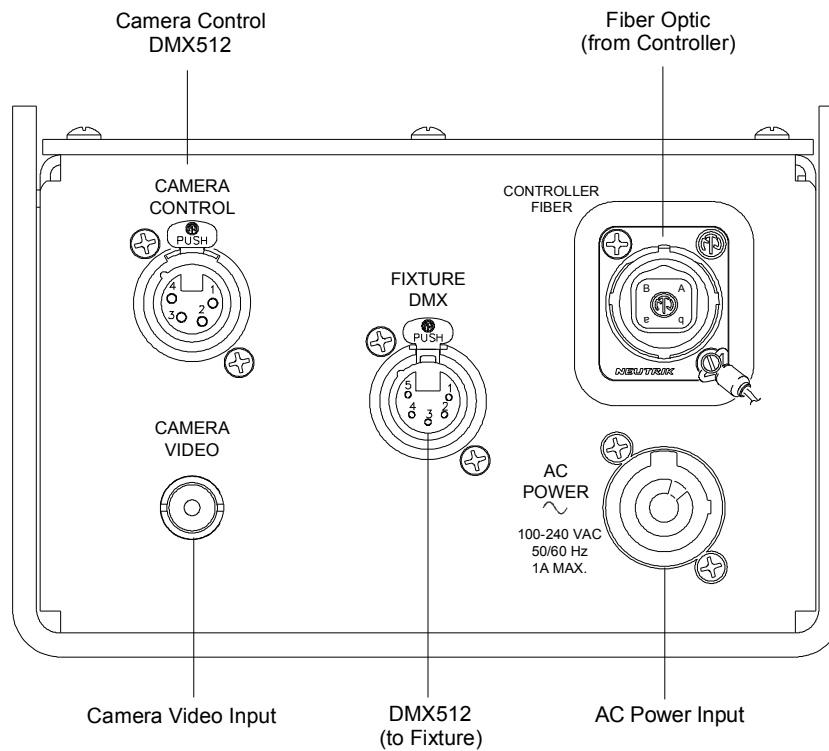
Figure 8: Truss Box Interface Panel
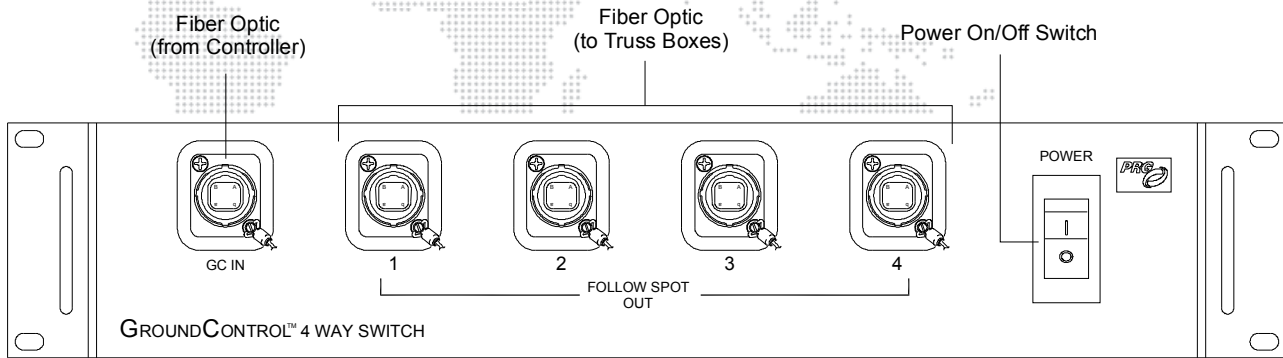
Figure 9:  4-Way Switch (optional)

## GroundControl Luminaires

In order to work with the GroundControl Remote Followspot System, the associated Bad Boy / Best Boy luminaire has been modified with a camera.
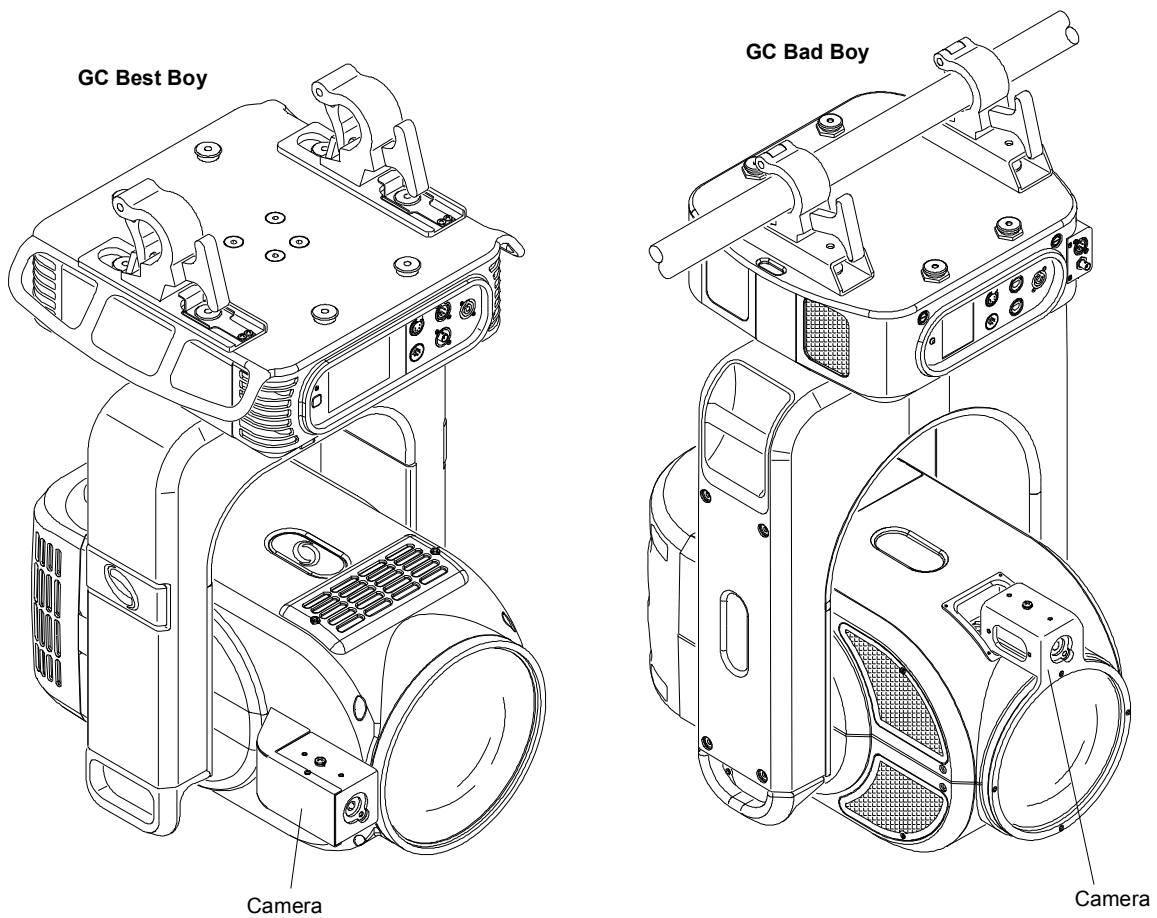


Figure 10:  GroundControl Remote Followspot Luminaires

The GC Bad Boy luminaires also have different color and gobo wheel configurations than standard Bad Boy luminaires. The GC Bad Boy wheel configurations are as follows:

| Ecodes: | Descriptions: |
|---------|---------------|
| 37493-A1 | BADB GOBO - JUST HOLES |
| 37493-A2 | BADB GOBO - PENCIL DUST |
| 37493-A4 | BADB GOBO - LESS SQUARES |
| 37493-A6 | BADB GOBO - CRACKLE LINEAR |
| 37493-A7 | BADB GOBO - CARDBOARD TEXTURE |
| 37493-B1 | BADB GOBO - BRAMBLE BREAKUP |
| 37493-B4 | BADB GOBO - SLOT |

### Gobo Wheel 1

Postion #1
Just Holes
41.9812.0047

Postion #7
Cardboard Texture
41.9812.2000

Postion #2
Pencil Dust
41.9812.0925

Postion #6
Crackle Linear
41.9812.0702

Open

Postion #3
Slot
41.9812.0003

Postion #5
Bramble Breakup
41.9812.0923

Postion #4
Less Squares
41.9812.0074

### CT Gobo Wheel

Position #1
Minus Green
41.9812.0311.44
17.9812.0310.44

Position #7
1/8 CTO
41.9812.0311.47
17.9812.0310.47

Open

Position #2
1/8 CTB
41.9812.0311.48
17.9812.0310.48

Position #6
Full CTB
41.9812.0311.41
17.9812.0310.41

Position #3
1/4 CTB
41.9812.0311.46
17.9812.0310.46

Position #5
3/4 CTB
41.9812.0311.50
17.9812.0310.50

Position #4
1/2 CTB
41.9812.0311.40
17.9812.0310.40

### CT Panel Wheel

Position #1
Minus Green
41.9812.0311.44
22.9812.0317.44

Position #7
1/8 CTB
41.9812.0310.48
22.9812.0317.48

Open

Position #2
1/8 CTO
41.9812.0310.47
22.9812.0317.47

Position #6
Full CTO
41.9812.0310.43
22.9812.0317.43

Position #3
1/4 CTO
41.9812.0310.45
22.9812.0317.45

Position #5
3/4 CTO
41.9812.0310.49
22.9812.0317.49

Position #4
1/2 CTO
41.9812.0310.42
22.9812.0317.42

| Ecodes: | Descriptions: |
|---------|---------------|
| 3749W-105 | BADB COLOR CTO 1/4 |
| 3749W-108 | BADB COLOR CTO 1/2 |
| 3749W-110 | BADB COLOR CTO FULL |
| 3749W-130 | BADB COLOR MINUS GREEN |
| 37499-801 | BADB GOBO MINUS GREEN |
| 3749W-102 | BADB COLOR CTO 1/8 |
| 3749W-109 | BADB COLOR CTO 3/4 |
| 3749W-112 | BADB COLOR CTB 1/8 |
| 37499-822 | BADB GOBO CTB 1/8 |
| 37499-825 | BADB GOBO CTB 1/4 |
| 37499-828 | BADB GOBO CTB 1/2 |
| 37499-829 | BADB GOBO CTB 3/4 |
| 37499-82C | BADB GOBO CTB FULL |
| 37499-832 | BADB GOBO CTO 1/8 |
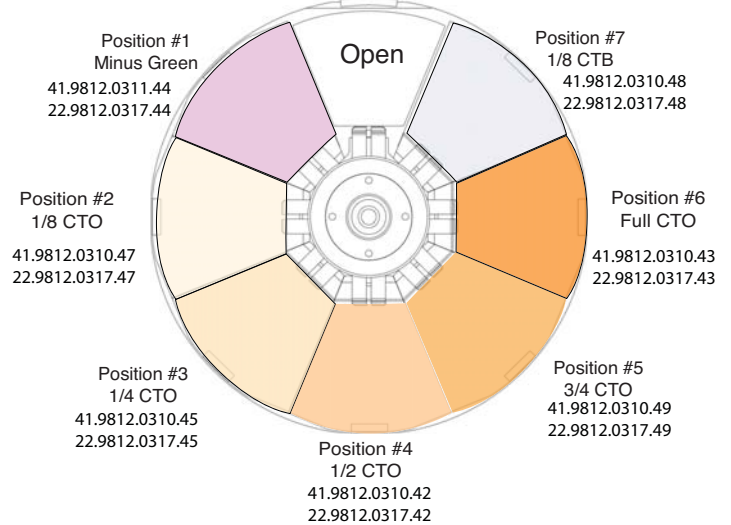
**Figure 11:  GC Bad Boy Wheel Configurations**

# INSTALLATION

## Fixture

Mount or position the GC luminaire as required. Refer to the appropriate Bad Boy or Best Boy luminaire user manual for detailed installation instructions.

## Truss Box

The GC Truss Box can be hung horizontally or vertically from any 2-inch diameter truss. Two Mega-Coupler hooks are provided for this purpose.

⚠ **WARNING:** A safety cable should be used in all mounting configurations.

⚠ **WARNING:** Un câble de sécurité doit être utilisé dans toutes les configurations de montage.

⚠ **CAUTION:** The Truss Box should be powered from an independent circuit separate from the fixture.

⚠ **CAUTION:** La Truss Box devrait être alimenté par un circuit indépendant séparé de l'appareil .

Step 1. Mount Truss Box to pipe using Truss Hooks (**Figure 12**). Tighten wing nuts to secure in place.

Step 2. Attach safety cable and loop around pipe as shown.

**NOTE**: Mega-Coupler Truss Hook is designed to be used only with 2.0" OD round tubing.
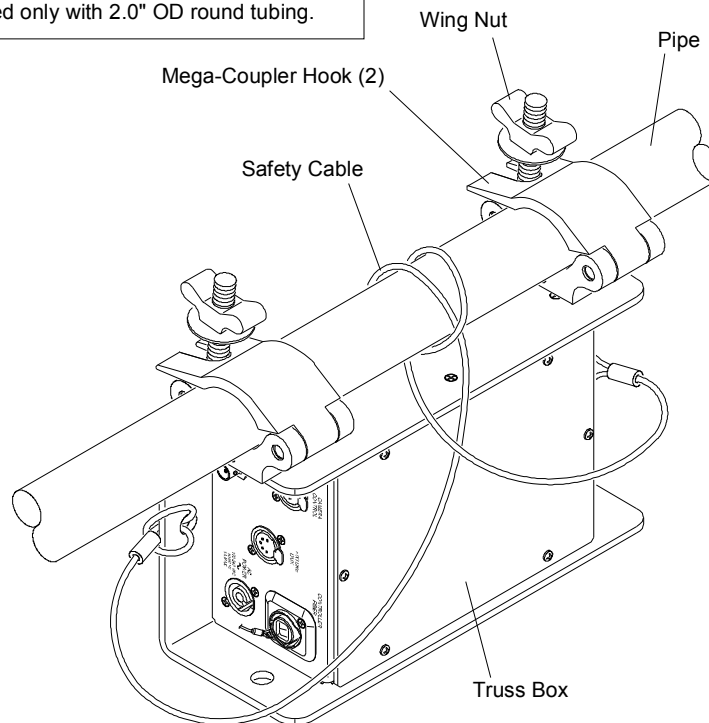


**Figure 12:  Hanging the Truss Box**

# Controller

The GC Followspot Controller should be placed on a sturdy, flat surface large enough to accommodate the stand.

**Note:** The cables should be positioned on the opposite side of the operator.

**To install GC Followspot Controller:**

Step   1.  Extend legs of slider stand and place on floor (**Figure 13**). Lock in place by tightening two bottom locking knobs. *To ensure stability do not allow the center post to come in contact with the floor / ground.*

Step   2.  Adjust stand to desired height and tighten locking knob.

Step   3.  Insert pin of RFS Control Arm Interface Box into the receiver socket of the stand. Tighten top locking knob to prevent rotation of Interface Box.

Step   4.  Attach Monitor to monitor mount.

Step   5.  Connect HDMI Cable from Monitor to Control Arm. (Monitor HDMI Cable is bundled with its Power Cord.)

Step   6.  Connect Monitor Power Cord from Monitor to Control Arm. (Monitor Power Cord is bundled with its HDMI Cable.)
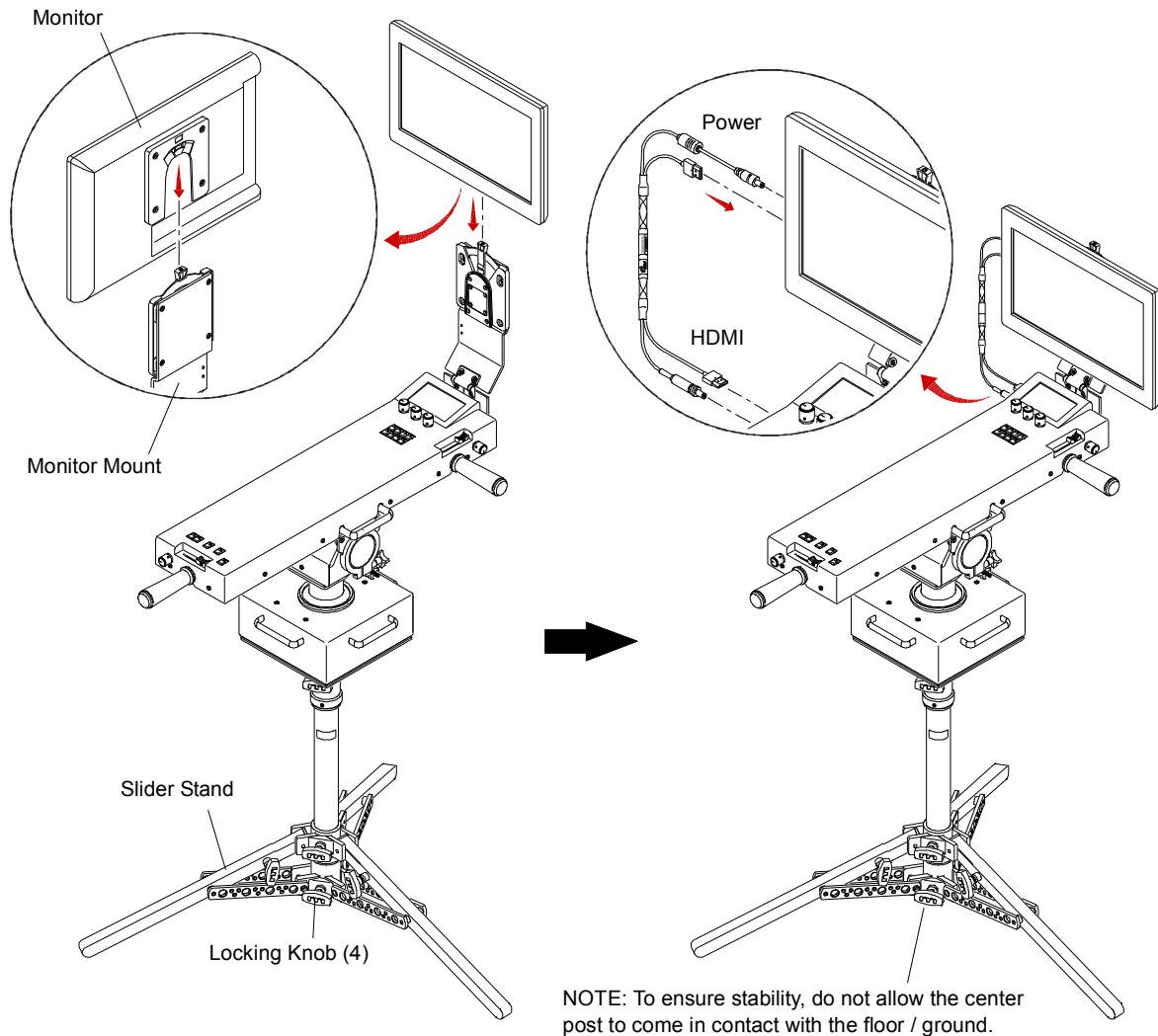


**Figure 13:  Assembling GC Followspot Controller**

## Connecting Power and Data

Refer to **Figure 14** on the following page.

**To connect power and data:**

Step 1. Connect opticalCON Armored Quad Fiber cable (up to 2000 feet) from GC Followspot Controller to Truss Box.

Step 2. Connect 5-pin XLR cable from Truss Box to fixture's DMX Input connector. (Part of Truss Box Cable Bundle.)

Step 3. Connect 4-pin XLR cable from Truss Box to fixture's Camera Control connector. (Part of Truss Box Cable Bundle.)

Step 4. Connect BNC cable from Truss Box to fixture's Video connector. (Part of Truss Box Cable Bundle.)

Step 5. If required, connect DMX Console to GC Followspot Controller.

Step 6. If required, connect HD-SDI LD Preview Monitor to GC Followspot Controller.

⚠️ **WARNING:** Turn off the mains circuit breaker *before* connecting or disconnecting the Neutrik powerCON AC Power Cables to the devices.

⚠️ **WARNING:** Éteignez le disjoncteur du réseau avant de brancher ou de débrancher les câbles Neutrik powerCON AC alimentation aux périphériques.

Step 7. Connect fixture's AC Line Cord from power source to fixture. (Dress and secure all cables so that they will not interfere with fixture head or yoke movement.)

⚠️ **CAUTION:** The Truss Box should be powered from an independent circuit separate from the fixture.

⚠️ **CAUTION:** La Truss Box devrait être alimenté par un circuit indépendant séparé de l'appareil .

Step 8. Connect Truss Box AC Line Power Cord from power source to Truss Box.

Step 9. Connect Controller AC Line Power Cord from power source to GC Followspot Controller .

AC Line Cord *

opticalCON Armored
Quad Fiber

Truss Box Cable Bundle

Truss Box

AC Line
Cord *

GC Luminaire

Up to
2000 ft

GC Followspot
Controller

AC Line Cord *

DMX Console (optional)

HD-SDI Preview
Monitor (optional)

*   The configuration of the supplied AC Line
    Power Cords will be specific to your order.
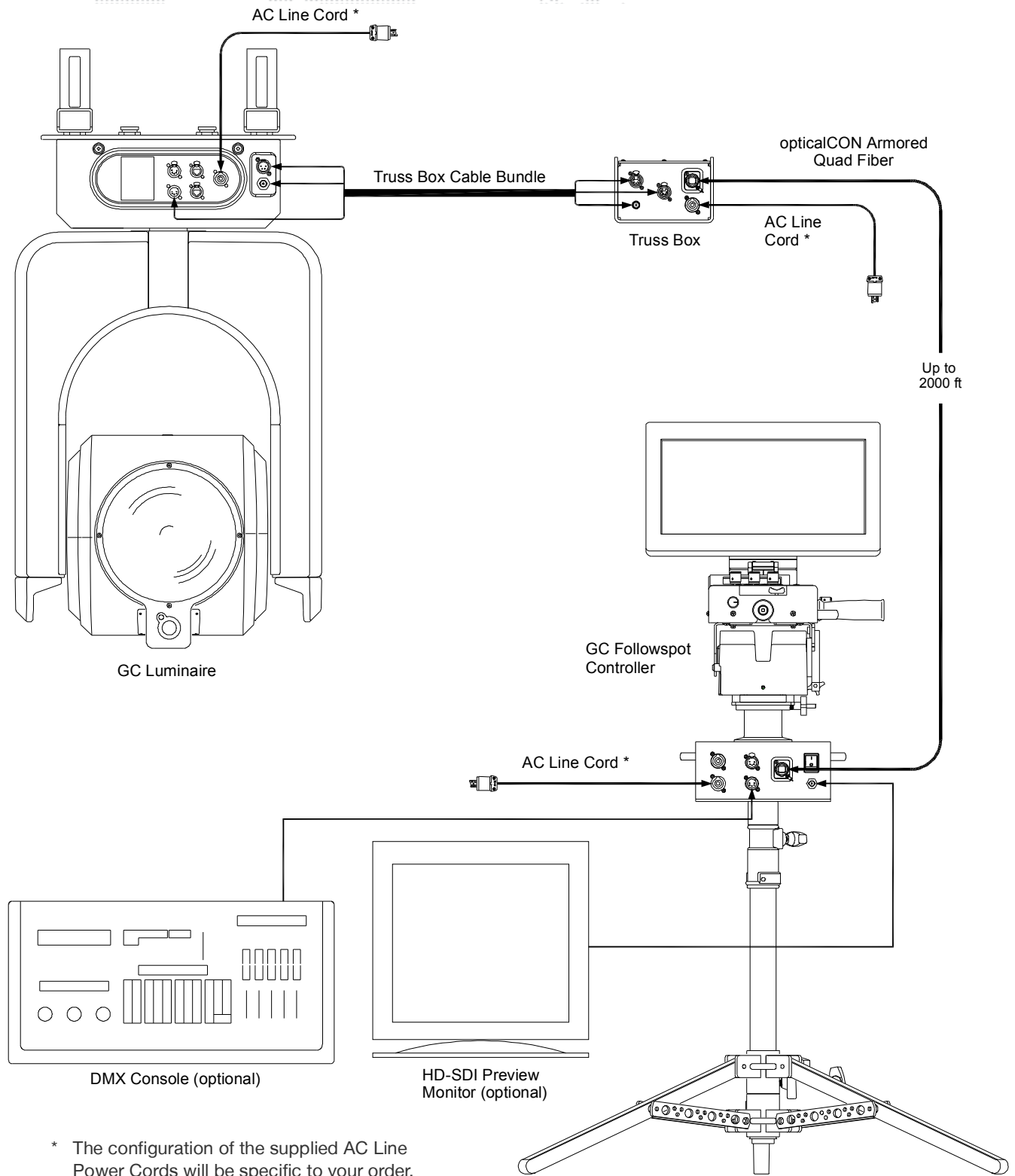
Figure 14:  Connecting Power and Data Cables (Standard System)

## 4-Way Switch System

When using a 4-Way Switch, it will be installed between the GC Followspot Controller and Truss Boxes as shown in **Figure 15** below.



**Location A**

AC Line Cord *

Truss Box

Up to 2000 ft

GC Luminaire

**Location B**

AC Line Cord *

Truss Box

Up to 2000 ft

GC Luminaire

**Location C**

AC Line Cord *

Truss Box

Up to 2000 ft

GC Luminaire

opticalCON Armored
Quad Fiber

AC Line Cord *

4-Way Switch

**Location D**

Up to 2000 ft

AC Line Cord *

Truss Box

GC Luminaire

AC Line Cord *

DMX Console
(optional)

HD-SDI Preview
Monitor (optional)

GC Followspot
Controller

*   The configuration of the supplied AC Line
    Power Cords will be specific to your order.

**Figure 15:  Connecting Power and Data Cables (4-Way System)**

# START-UP

## Power Up

When powering up the GroundControl system, use the following recommended sequence:

1) Fixture
2) Truss Box
3) 4-Way Switch (if used). Allow one minute for the 4-Way Switch to boot up.
4) GC Followspot Controller

There is no power on/off switches for the Truss Box or fixture. (Power is automatically applied once the power source is connected.)

Power up the GC Followspot Controller by switching its power switch to the ON position (**Figure 16**).
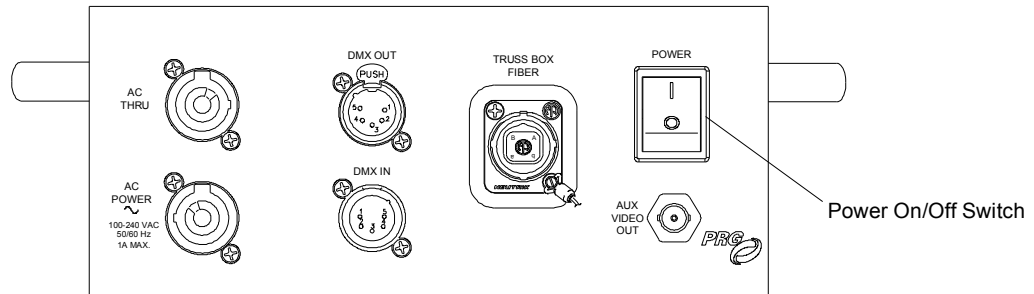


**Figure 16:  GC Controller Power Switch Location**

## Setting Controller and Fixture Home Positions

After power up, the home position of both the Fixture and the Controller needs to be set. The home position is where the fixture will be sent upon power-up of the GC Followspot Controller regardless of the position of the control arm.

**To set home position:**

Step 1. At Controller main menu, press CONFIG panel.

Step 2. At Configuration menu, press SETTINGS panel.

Step 3. At Settings menu, press **Release Pan & Tilt** and use pan/tilt encoders below touchscreen to set home position of fixture. (The camera image orientation may need to be changed as well. See below for details.)

Step 4. Press **Save Pan & Tilt Home Pos** to save current fixture pan and tilt position as "home" position.

Step 5. Move GC Controller to desired home position and then press **Engage Pan & Tilt**.

## Setting Camera Image Orientation

Before operation, the camera image orientation should also be set so that the image on the GC Controller's monitor is upright and mirrored correctly. This can be done using the Camera Image Flip feature.

**To set camera image orientation:**

Step 1. At Controller main menu, press CONFIG panel.

Step 2. At Configuration menu, press SETTINGS panel.

Step 3. At Settings menu, press **Camera Image Flip** until the image in the monitor is correct. Each press of the button will flip the image across one of its axes, either vertically or horizontally, starting at the last set orientation.

For example:

Press 1-> image is upside-down.

Press 2-> image is upside-down and mirrored.

Press 3-> image is right-side-up and mirrored.

Press 4-> image is right-side-up and not mirrored.

**Note:** The camera image setting is persistent. When the GC Controller is powered up, the camera image will be in the same orientation as it was when last powered down.
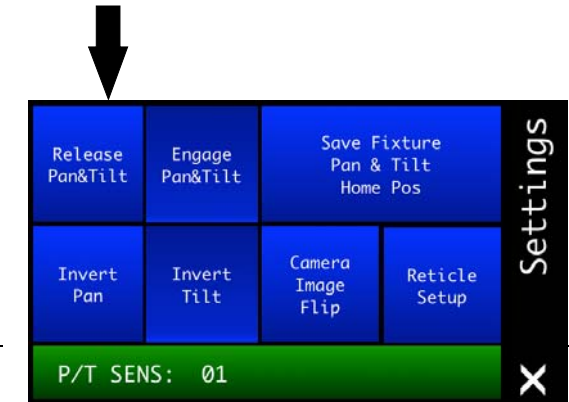
## Configuring the Reticle

Targeting crosshairs, referred to as the "reticle," are available in the the camera view. The position and size of the reticle can be configured using the Settings menu.

**To configure reticle:**

Step 1. At Controller main menu, press CONFIG panel.

Step 2. At Configuration menu, press SETTINGS panel.

Step 3. At Settings menu, press **Reticle Setup** to bring up the reticle on the monitor.

Step 4. Use the three encoders below the touchscreen to adjust the reticle X Position, Y Position, and Size.
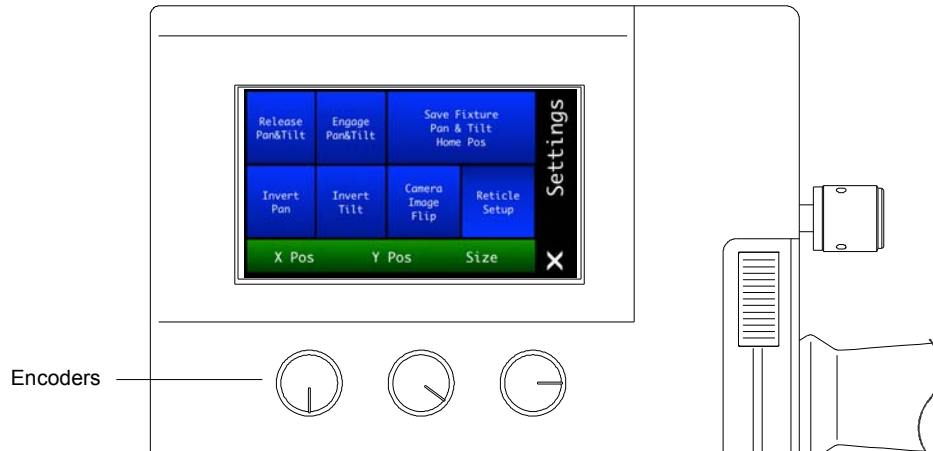


Figure 17: Reticle Adjustment

Step 5. Once the reticle is set as desired, press **Reticle Setup** again to exit the setup mode and save the reticle size and position.

**Note:** The reticle settings are persistent after power down.

# OPERATION

## Using the Menu Touchscreen

The GroundControl software is used to configure and control the system. The software menus are displayed on the GC Followspot Controller's touchscreen.
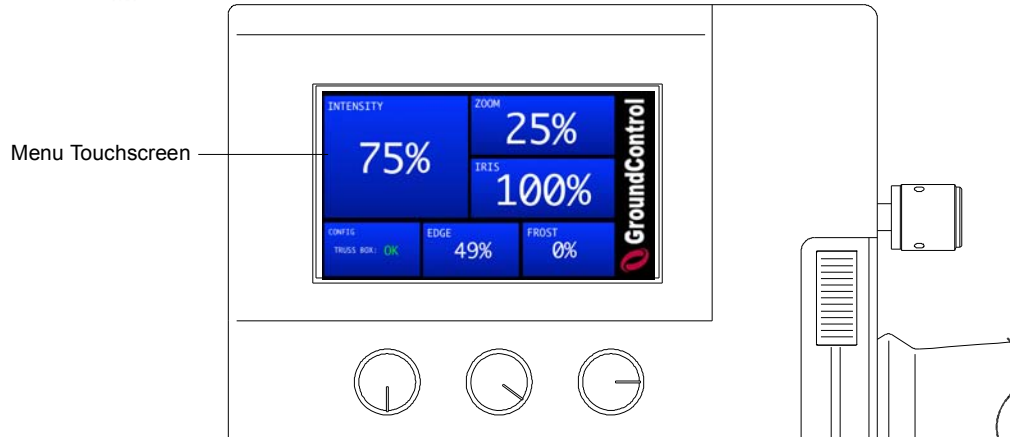
**Color Codes**

The software menus are color coded as follows:

+ **Blue** - function control panels. These are configurable functions which will open a sub-menu when touched.
+ **Green** - informational panels. These display status info and will not open further menus when touched.
+ **Red** - important control panels. These are configurable functions which will open a sub-menu when touched. Activating these functions will affect important settings.

**Navigation**

To navigate the menus, press the blue or red areas of the touchscreen.

The software will automatically return to the Main menu, from a sub-menu, if inactive for 45 seconds.

## Software Menus

The GC Followspot Controller software consists of a hierarchy of menu levels. Sub-menus, options, and alpha/numeric keypads may be accessed by pressing the blue and red areas of these main menus. Pressing the right bar (X) while at a sub-menu will return to the previous menu.

When power is applied, the Main menu will be displayed on the touchscreen.

### Main Menu

The Main menu consists of several sections (referred to as "panels") which provide status and configuration information. Pressing the panels on the touchscreen will open the applicable sub-menus.

GroundControl software: v0.15 or greater

+ **Intensity** - displays current Intensity percentage level. Press panel to enable/disable control of this mechanism.
    - White text = normal fader operation.
    - Red text = intensity is in blackout.
    - When intensity scaling is enabled, the incoming intensity level will be shown.
    - If the fixture douses due to a lamp error, a red lamp icon will appear on the bottom-left corner of the Intensity panel.
+ **Zoom** - displays current zoom level. Press panel to enable/disable control of this mechanism.
    - White text = normal fader operation.
    - Yellow text = level is being determined by a preset. (When a preset which changes the zoom level is recalled, the zoom fader will be captured. This means that moving the fader will not change the zoom level until the fader has been moved to the position specified by the preset. This action will re-enable the zoom fader and clear the yellow text.)
+ **Iris** - displays current iris level. Press panel to enable/disable control of this mechanism.
+ **Config** - displays Truss Box status: OK (green) or XXX (red). Press to open Configuration Menu.
+ **Edge** - displays current edge level. Press panel to enable/disable control of this mechanism.
+ **Frost** - displays current frost level. Press panel to enable/disable control of this mechanism.
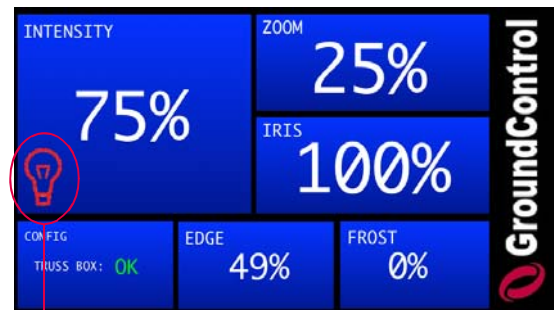
Fixture Lamp Error Indication

Truss Box Error Indication

---

**Note:** When a mechanism is selected/deselected for use by the controller, it immediately snaps to the new position.

## Configuration Menu

+ **DMX Address** - displays current DMX512 address. Press to bring up numeric keypad for inputting the address.
+ **Lamp** - press panel to open Lamp Menu.
+ **Comm** - displays currently active input protocol. Press to open Communication Menu.
+ **Status/Info** - displays Truss Box status: OK (green) or XXX (red). Press to open Status Menu.
+ **Settings** - displays current pan/tilt options. Press to open Settings Menu.
+ **Presets** - displays last recalled preset (green) and stored presets (white) in a grid. (There are 8 possible presets.) Press to open Presets Menu.
+ **Options** - displays current intensity scaling, blackout, fader assignments, and zoom table settings. Press to open Options Menu.

Press (X) to return to Main Menu.

## Lamp Menu

+ **Start/Douse** - provides options to start or douse the lamp.
+ **Power On** - sets option to start lamp automatically upon power up. Press to bring up wait/start options.
+ **Lamp Limit** - sets lamp wattage limit. Press to bring up Low/Medium/High options.
+ **Lamp Status** - displays total lamp hours and current lamp state.

Press (X) to return to Main Menu.
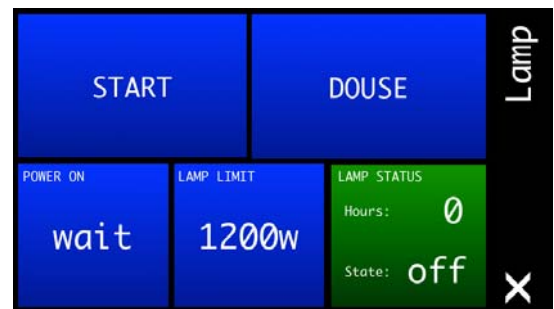
## Communication Menu

+ **Control In** - displays current DMX512 control values coming from the console (if connected). If incoming DMX is absent, "no comm" will be displayed.
+ **Control Out** - displays current DMX512 control values being sent to the fixture.

Values will be displayed in yellow text when being controlled by a knob or fader, and blue text when being controlled by the control arm's pan/tilt action.

Press (X) to return to Main Menu.
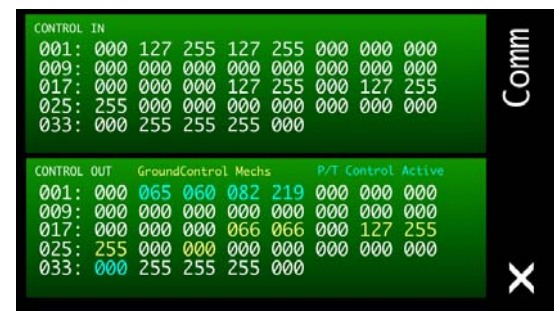
## Status Menu

+ **Log** - displays system status log. The log entries are stored in persistent memory and are retained through power down. Use touchscreen arrows to scroll up or down. Press CLR to bring up Clear Log Yes/No options. Press the LOG panel itself to scroll directly to the bottom, displaying the most recent log entries.

+ **Encoders** - displays current pan and tilt encoder positions.

+ **Reset** - press to reset associated fixture and/or camera. (Refer to "Resetting Fixture or Camera" on page 28.)

+ **Info** - displays current GC Followspot Controller software version. Press to open Information Menu.

Press (X) to return to Main Menu.

## Information Menu

+ **Run Time** - displays current run time in *hours:minutes* format.

+ **Firmware Versions** - displays current firmware versions for the Truss Box and Switch Board. (In a 4-Way Switch system, this panel will be blue. Refer to "4-Way Switch Control" on page 32.)

+ **Software Version** - displays current GroundControl and Fixture software versions, along with the Boot version.

+ **Crossload** - allows the GC Followspot Controller to send its software version via DMX512 to other connected Controllers in a daisy-chain. (Refer to "Software Crossload" on page 56.)

+ **Reset Defaults** - resets software to factory defaults.
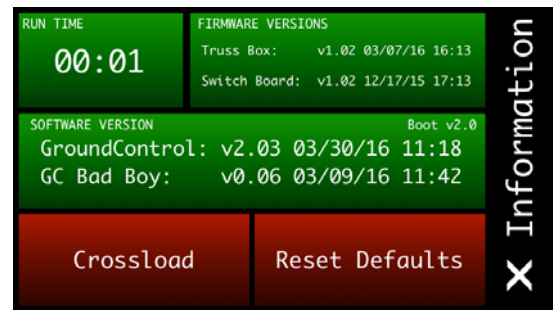
Press (X) to return to Main Menu.

**Note:** If the associated fixture is changed, recycle power to the GC Followspot Controller (power off and on) to reset the connection.

## Options Menu

+ **Intensity Scaling** - press to enable or disable intensity scaling.

+ **Blackout Button** - press to enable or disable the blackout button.

+ **Fader Mech Assignments** - swaps the function of the two faders on the control arm between zoom and intensity. (In the default setting, the front fader controls zoom and the rear fader controls intensity. With the swap enabled, the front fader controls intensity and the rear fader controls zoom.)

+ **Swap Iris & Zoom** - swaps the function of the iris knob and the zoom fader (whichever fader is currently assigned by the Fader Mech Assignment).

+ **Zoom Table** - press to select zoom table setting.

Press (X) to return to Main Menu.

## Settings Menu

+ **Release Pan & Tilt** - press to release control of the fixture's pan and tilt from the movement of the Control Arm. While released, the fixture's pan/tilt functionality can be controlled by the two left-most encoders just below the touchscreen. Use this to align the pan and tilt of the fixture with the orientation of the Control Arm.

+ **Engage Pan & Tilt** - press to restore control of fixture pan and tilt to the Control Arm.

+ **Save Fixture Pan & Tilt Home Position** - press to save the current fixture pan and tilt position as the "home" position, which is where the fixture will be sent upon power-up of the GC Followspot Controller.

+ **Invert Pan / Invert Tilt** - displays current invert settings. When inverted, pan/tilt will move in the opposite direction.

+ **Camera Image Flip** - press to mirror or invert the camera view. Each time the button is pressed, the image from the camera is changed for a total of four possible orientations to allow the image on the monitor to be upright regardless of the position of the camera. (Refer to "Setting Camera Image Orientation" on page 18 for more instructions.)

+ **Reticle Setup** - press to adjust position and size of reticle. (Refer to "Configuring the Reticle" on page 19 for more instructions.)

+ **Pan/Tilt Sensitivity (P/T SENS)** - the left-most encoder adjusts the pan/tilt sensitivity setting. This setting allows adjustment of the ratio between the movement of the control arm and the movement of the fixture. Higher sensitivity numbers cause the fixture to move shorter distances for the same movement of the Control Arm, allowing finer control over pan and tilt in long throw situations.

Press (X) to return to Main Menu.

## Presets Menu

+ **Manual Control** - press to open Manual Control Menu.
+ **Store DMX Snapshot** - press to open Store Preset Menu.
+ **Clear All Presets** - press to clear all presets. (A confirmation menu will open.)
+ **Clear Preset** - press to clear a single preset. (The Clear Preset menu will open in order to specify which preset. Use the control arm's preset button bank to specify.)

Press (X) to return to Main Menu.

## Manual Control Menu

The Manual Control menu allows control of additional fixture mechanisms (color, gobo, etc.) with the three encoders below the touchscreen in order to create a "look" which can then be stored as a preset.

The mechanism group buttons (CYM, Beam, etc.) select which mechanisms are being controlled by the encoders. The encoder functions are labeled in the green panel at the bottom of the menu. For example, when Beam is selected, it will display Strobe, Edge, and Frost. Depending on the type of fixture connected, a different Manual Control menu will be displayed to allow control of that fixture's features. Use the corresponding knobs on the Control Arm to adjust the parameters as shown in **Figure 19**.

+ Store Preset - press this panel to open Store Preset Menu.

Press (X) to return to Main Menu.

**Bad Boy Manual Control**

**Best Boy Manual Control**
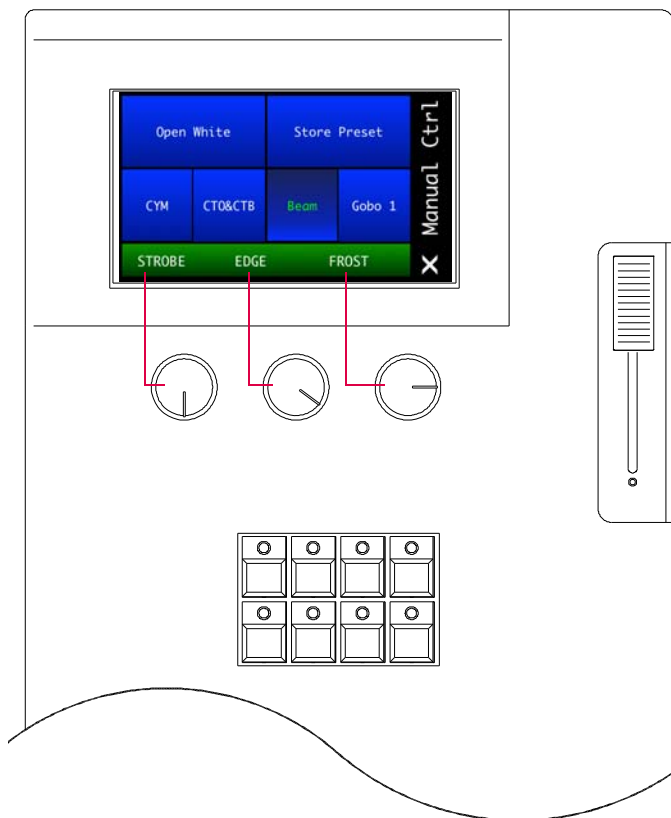
Figure 19:  Mechanism Adjustment Knobs
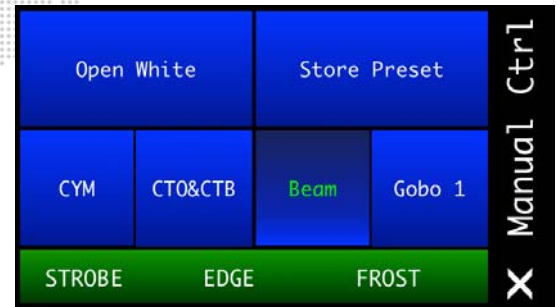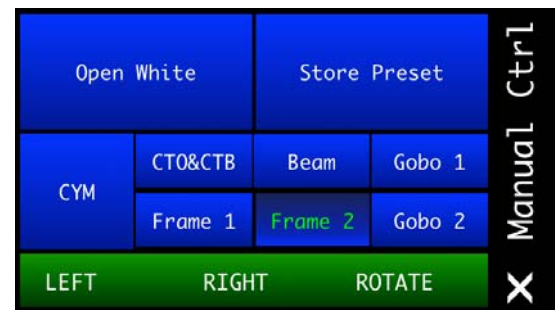
## Store Preset Menu

The Store Preset menu allows specific fixture mechanisms to be selected and stored in a preset in order to create "looks" that can be recalled at any time. (The system allows up to eight presets.)

+ Press panels to selected one or more mechanisms, then press the desired preset button on the Control Arm as shown in **Figure 20**.
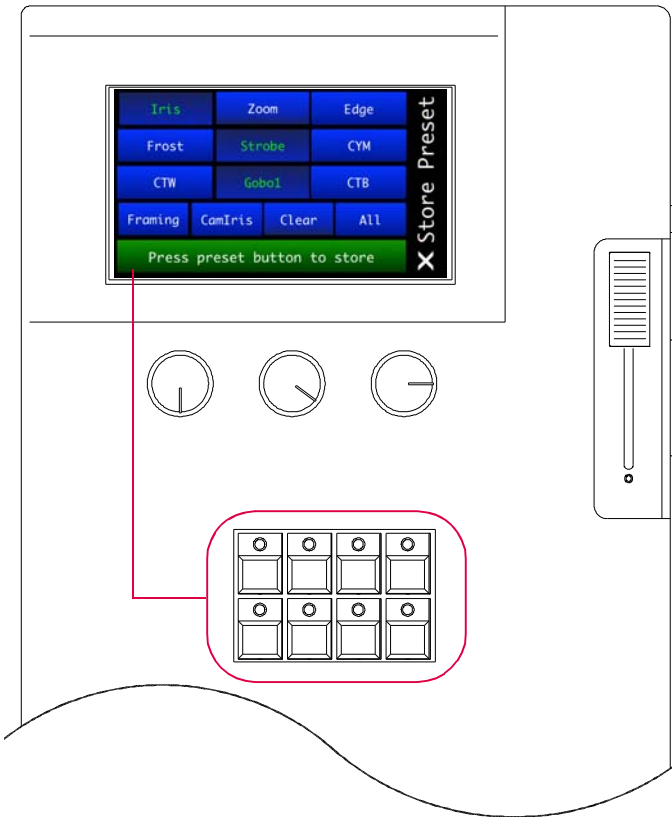




Figure 20:  Preset Store Bank

**Note:**  Clear presets by using the Presets Menu.

## Screen Lock

The Screen Lock feature allows the touchscreen to be locked in order to prevent changes. When Screen Lock is enabled, the menu will default to the main screen and turn gray. During this time, the touchscreen will be inactive, but all GC Controller buttons will remain functional.



**To turn Screen Lock on or off:**

+ Hold down the Reticle button and the upper-left Preset button for three seconds.
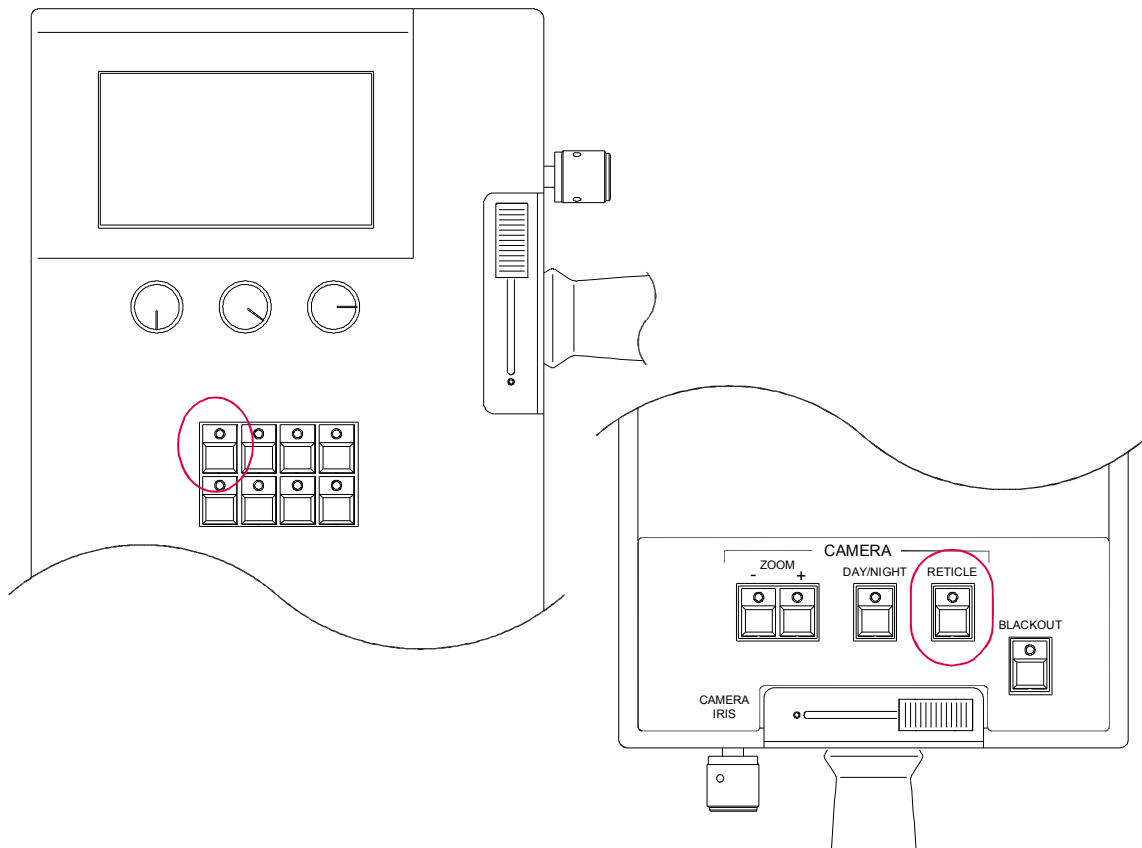


**Figure 21: GC Followspot Controller**

## Resetting Fixture or Camera

The associated fixture and/or its camera can be reset from the GC Followspot Controller using the Reset feature.

**To reset fixture/camera:**

Step 1. At main menu, press CONFIG panel.

Step 2. At Configuration menu, press STATUS panel.

Step 3. At Status menu, press Reset panel.

Step 4. Select **Fixture** or **Camera** and then press **Perform Reset**. (Selecting **No** will abort the reset operation.)
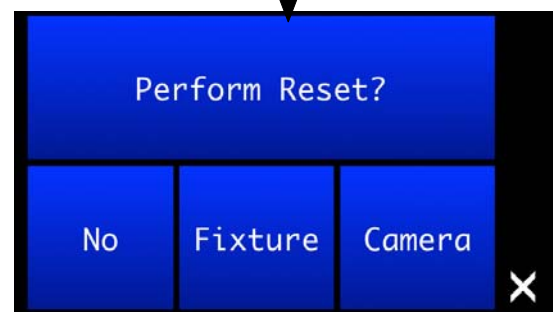
## Manual Control

The Control Arm of the GC Followspot Controller provides handles, knobs, faders, and buttons for manual control of the associated fixture.

### Pan and Tilt

The Control Arm can be swiveled up/down and right/left using the two followspot handles. As the unit is turned, the associated fixture will pan and tilt accordingly. The corresponding camera view from the fixture will be displayed in the monitor.

**Note:** The fixture camera view can be flipped using the Settings menu. Refer to "Settings Menu" on page 24.
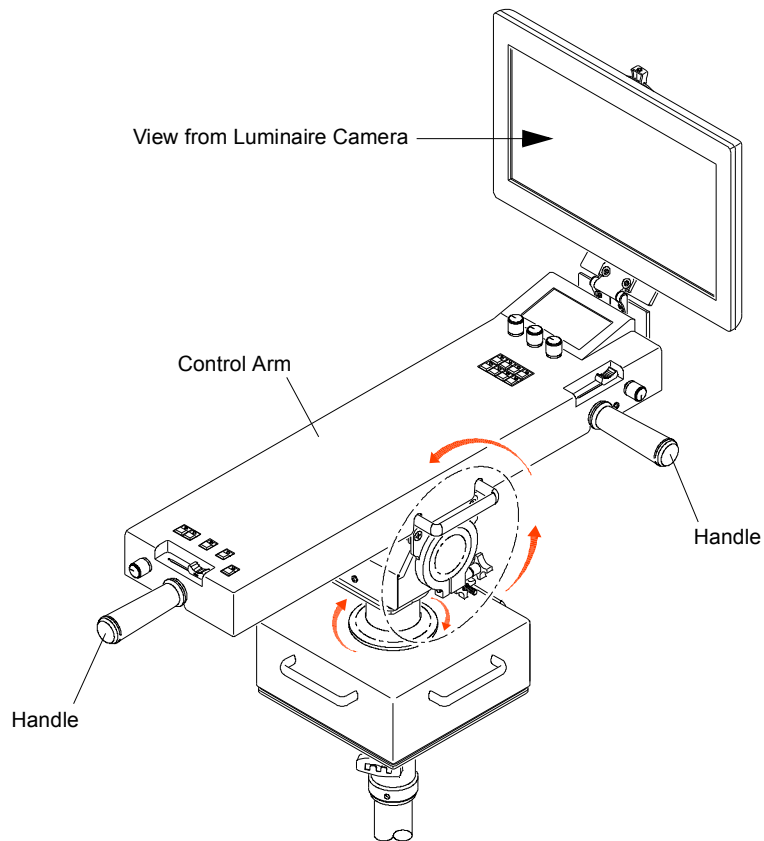


**Figure 22: Pan/Tilt Control**

**Note:** If incoming comm is removed when pan/tilt are under console control, pan/tilt control will be regained at the control arm.

### Edge/Frost

Edge and Frost can be adjusted using the EDGE and FROST knobs on the Control Arm (**Figure 23**). The knobs will control Edge and Frost respectively, unless the Manual Control software menu is selected, in which case the three knobs will control parameters of the selected mechanism. (Refer to "Manual Control Menu" on page 25 for more information.)

### Beam Iris

The Beam Iris can be adjusted using the IRIS knob on the Control Arm (**Figure 23**).

The knob's Iris function can also be swapped with the currently assigned Zoom fader (see below) using the "Swap Iris & Zoom" option available in the Options software menu. (Refer to "Options Menu" on page 23.)
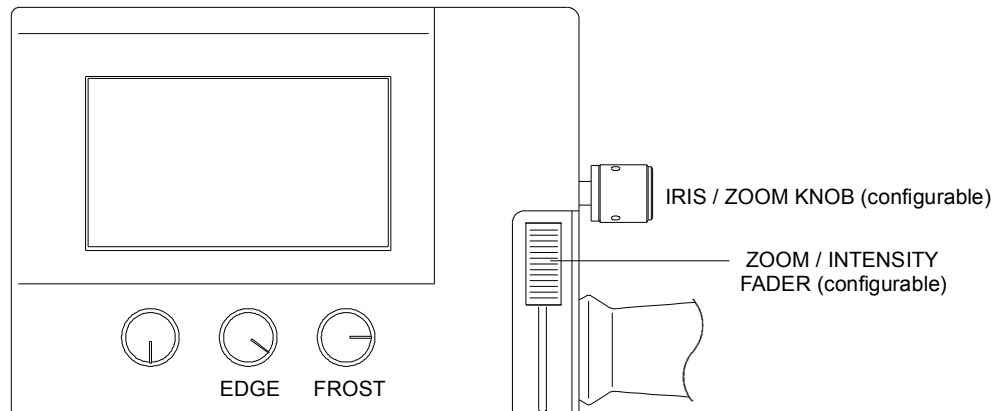


**Figure 23: Front Controls**

### Zoom/Intensity

Zoom and Intensity can be scaled using their respective faders on the Control Arm. In default mode, Zoom is controlled by the front fader (**Figure 23**), and Intensity by the rear fader (**Figure 24**). To swap the fader functions, change the "Fader Mech Assignment" in the Options software menu. (Refer to "Options Menu" on page 23.)
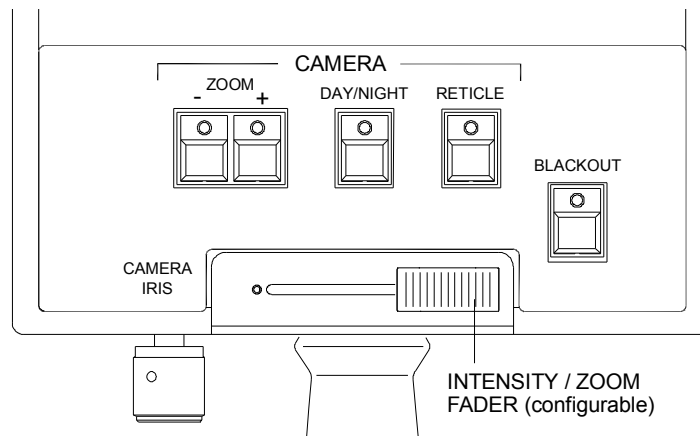


**Figure 24: Rear Controls**

### Zoom In/Out

The camera view can be zoomed in and out by pressing the ZOOM buttons on the Control Arm (**Figure 24**).

The [+] knob zooms in, while the [-] knob zooms out.

## Day/Night Modes

The Night mode feature allows a performer to be seen on a virtually black stage.

Day / Night modes can be toggled using the DAY/NIGHT button on the Control Arm (**Figure 24**). The button's LED will be lit when the Controller is in Night mode. While in Night mode, the camera and the image displayed will be in high contract black and white.

**Note:** Add an IR Illuminator(s) if a total blackout is expected. This will aid in viewing the performers in extremely low or no light situations.

## Reticle

The Reticle feature adds targeting crosshairs to the camera view.

Reticle can be toggled on and off using the RETICLE button on the Control Arm (**Figure 24**). The button's LED will be lit when Reticle is turned on.

The position and size of the reticle can be configured using the Settings menu. (Refer to "Settings Menu" on page 24.)

## Blackout

The Blackout feature sets the intensity level to zero (no output). Blackout can be turned on by pressing the BLACKOUT button on the Control Arm (**Figure 24**). The button's LED will be lit when Blackout is active.

The Blackout button can be enabled/disabled in the Options software menu. (Refer to "Options Menu" on page 23.)

## Camera Iris

The camera's iris can be adjusted using the CAMERA IRIS knob on the Control Arm (**Figure 24**).

## Presets

A bank of eight Preset buttons available on the Control Arm allows for quick recall of stored presets (i.e., looks). Press the appropriate button to store or recall a preset (**Figure 25**). Refer to "Store Preset Menu" on page 26 for more information on the Preset function.

The Preset button's LED will be lit when the preset is recalled.
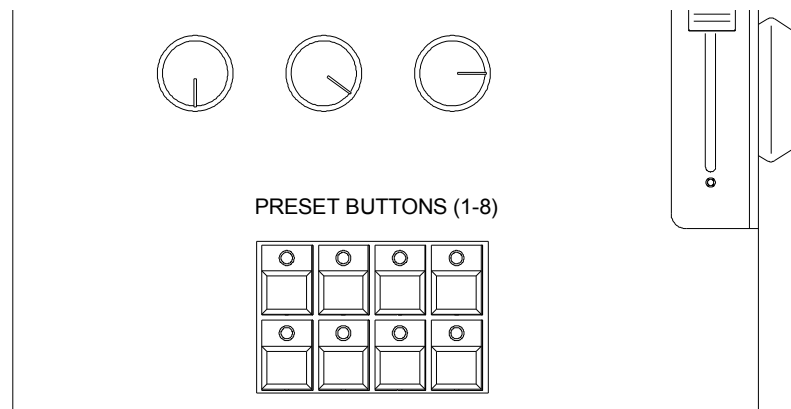


PRESET BUTTONS (1-8)

**Figure 25: Preset Buttons**

## 4-Way Switch Control

The optional 4-Way Switch allows control of up to four different fixtures from the same Control Arm, but only one at a time. (See "4-Way Switch System" on page 16 for a diagram.) All fixtures being controlled by the same control arm must be on the same universe.

The fixtures are lettered A-D with the selected fixture shown on both the Main menu and the Config menu:
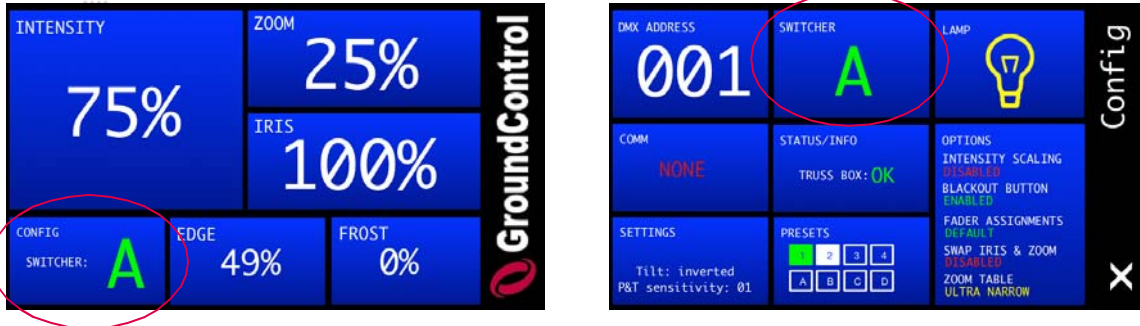


The fixture being controlled by the arm can be changed in three different ways:

+ Using the Switcher menu.
+ Using the bottom four Preset buttons.
+ Using the DMX control channel, values 171-174 selecting A-D.

Any fixture connected to the 4-Way Switch that is not presently being controlled by the Control Arm can instead be used by the console as a normal fixture. Once the fixture is selected by the Control Arm, however, the GC Followspot Controller takes control of the fixture (and releases control of the previously selected fixture).

**Using the Switcher menu:**

Step   1.  At Main menu, press CONFIG panel.

Step   2.  At Config menu, press SWITCHER panel.

Step   3.  At Switcher menu, select fixture to be controlled.
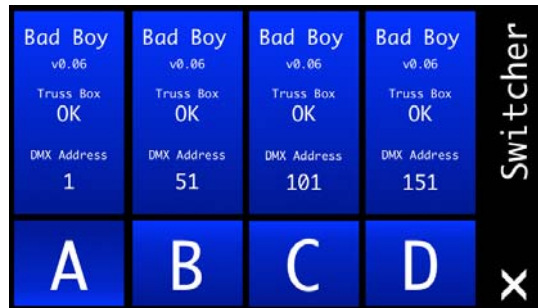


**Using the Preset buttons:**

+ At Preset button bank, press one of four bottom buttons. These correspond to fixtures A-D.
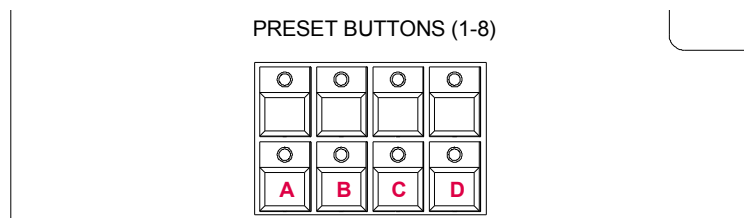


**Figure 26: Preset Buttons**

When a 4-Way Switch is connected, the FIRMWARE VERSIONS panel of the Information menu will be blue to indicate it can be pressed. Pressing the panel brings up a Versions menu showing all connected truss box and fixture software versions.
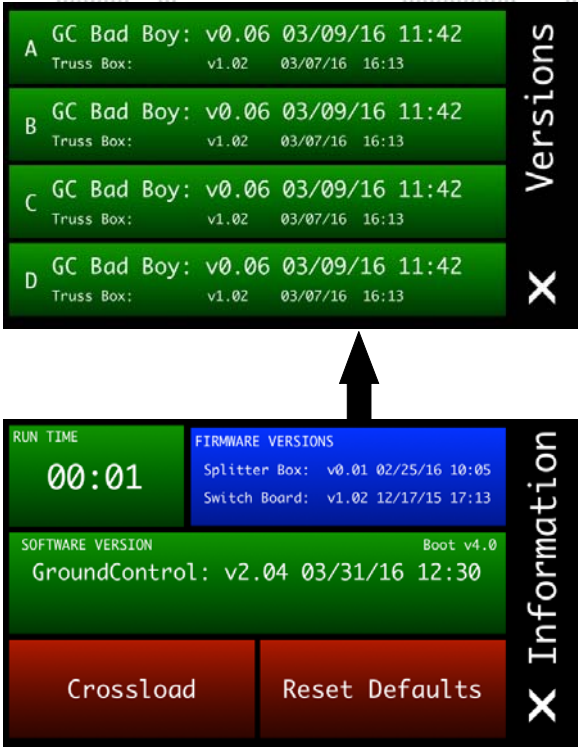
## DMX Control Channels

The DMX control channel maps include commands for GroundControl Remote Followspot System functionality as shown in the tables below.

### GC Bad Boy Spot Luminaire

**Table 1: DMX Mapping for GC Bad Boy**

| Chan | Function | | Description | 8-Bit Value | 16-Bit Value | DMX Percent |
|---|---|---|---|---|---|---|
| 1 | INTENSITY | | Intensity adjustment | home: 0 | | 0% |
| | | | Out | 0 | | 0% |
| | | | Full | 255 | | 100% |
| 2 | PAN | | Pan linear coarse adjustment | home: 127 | 32768 | 50% |
| | | | 0° | 0 | | 0% |
| | | | 540° | 255 | | 100% |
| 3 | Pan Fine | | Pan fine adjustment | home: 0 | | 0% |
| 4 | TILT | | Tilt linear coarse adjustment | home: 127 | 32768 | 50% |
| | | | 0° | 0 | | 0% |
| | | | 270° | 255 | | 100% |
| 5 | Tilt Fine | | Tilt fine adjustment | home: 0 | | 0% |
| 6 | CYAN | | Cyan Color Mix | home: 0 | | 0% |
| | | Mix | [Mode: Continuous] | 0-255 | | 0-100% |
| | | | Open | 0 | | 0% |
| | | | Full | 255 | | 100% |
| | | Wheel Spin | [Mode: Spin] | 0-255 | | 0-100% |
| | | | *Clockwise* | 0-126 | | 0-49% |
| | | | Fast | 0 | | 0% |
| | | | Slow | 126 | | 49% |
| | | | Stop | 127-128 | | 49-50% |
| | | | *Counter-Clockwise* | 129-255 | | 50-100% |
| | | | Slow | 129 | | 50% |
| | | | Fast | 255 | | 100% |
| 7 | YELLOW | | Yellow Color Mix | home: 0 | | 0% |
| | | Mix | [Mode: Continuous] | 0-255 | | 0-100% |
| | | | Open | 0 | | 0% |
| | | | Full | 255 | | 100% |
| | | Wheel Spin | [Mode: Spin] | 0-255 | | 0-100% |
| | | | *Clockwise* | 0-126 | | 0-49% |
| | | | Fast | 0 | | 0% |
| | | | Slow | 126 | | 49% |
| | | | Stop | 127-128 | | 49-50% |
| | | | *Counter-Clockwise* | 129-255 | | 50-100% |
| | | | Slow | 129 | | 50% |
| | | | Fast | 255 | | 100% |
| 8 | MAGENTA | | Magenta Color Mix | home: 0 | | 0% |
| | | Mix | [Mode: Continuous] | 0-255 | | 0-100% |
| | | | Open | 0 | | 0% |
| | | | Full | 255 | | 100% |
| | | Wheel Spin | [Mode: Spin] | 0-255 | | 0-100% |
| | | | *Clockwise* | 0-126 | | 0-49% |
| | | | Fast | 0 | | 0% |
| | | | Slow | 126 | | 49% |

**Table 1: DMX Mapping for GC Bad Boy**

| Chan | Function | Description | 8-Bit Value | 16-Bit Value | DMX Percent |
|------|----------|-------------|-------------|--------------|-------------|
| | | Stop | 127-128 | | 49-50% |
| | | *Counter-Clockwise* | 129-255 | | 50-100% |
| | | Slow | 129 | | 50% |
| | | Fast | 255 | | 100% |
| 9 | COLOR MIX CONTROL | Sets color mix control mode | home: 0 | | 0% |
| | | Continuous | 0-9 | | 0-3% |
| | | Spin Cyan | 10-19 | | 3-7% |
| | | Spin Yellow | 20-29 | | 7-11% |
| | | Spin Magenta | 30-39 | | 11-15% |
| | | Spin ALL mixers | 40-49 | | 15-19% |
| | | Reserved | 50-255 | | 19-100% |
| 10 | CTO | CTO Wheel Choice | home: 0 | | 0% |
| | Color Choice | [Mode: Continuous, Discrete, Strobe] | 0-255 | | 0-100% |
| | | Open | 0 | | 0% |
| | | Open / Color 1 | 26 | | 10% |
| | | Color 1 | 32 | | 12% |
| | | Color 1 / Color 2 | 42 | | 16% |
| | | Color 2 | 64 | | 25% |
| | | Color 2 / Color 3 | 79 | | 30% |
| | | Color 3 | 96 | | 37% |
| | | Color 3 / Color 4 | 114 | | 44% |
| | | Color 4 | 128 | | 50% |
| | | Color 4 / Color 5 | 145 | | 56% |
| | | Color 5 | 160 | | 62% |
| | | Color 5 / Color 6 | 175 | | 68% |
| | | Color 6 | 192 | | 75% |
| | | Color 6 / Color 7 | 208 | | 81% |
| | | Color 7 | 224 | | 87% |
| | | Color 7 / Open | 232 | | 90% |
| | | Open | 255 | | 100% |
| | Wheel Spin | [Mode: Spin] | 0-255 | | 0-100% |
| | | *Clockwise* | 0-126 | | 0-49% |
| | | Fast | 0 | | 0% |
| | | Slow | 126 | | 49% |
| | | Stop | 127-128 | | 49-50% |
| | | *Counter-Clockwise* | 129-255 | | 50-100% |
| | | Slow | 129 | | 50% |
| | | Fast | 255 | | 100% |
| 11 | CTO CONTROL | Sets CTO Wheel control mode | home: 0 | | 0% |
| | | Continuous | 0-9 | | 0-3% |
| | | Discrete | 10-19 | | 3-7% |
| | | Spin | 20-39 | | 7-15% |
| | | Strobe Random - Slow | 40-43 | | 15-16% |
| | | Strobe Random - Medium | 44-46 | | 17-18% |
| | | Strobe Random - Fast | 47-49 | | 18-19% |
| | | Variable Strobe Rate | 50-255 | | 19-100% |
| | | Slow | 50 | | 19% |
| | | Fast | 255 | | 100% |

**Table 1: DMX Mapping for GC Bad Boy**

| Chan | Function | Description | 8-Bit Value | 16-Bit Value | DMX Percent |
|---|---|---|---|---|---|
| 12 | GOBO 1 | Rotating Gobo 1 Choice / Modifier | home: 0 | 0 | 0% |
| | | *Discrete Choice* | 0-64 | 0-16383 | 0-25% |
| | | Open | 0-7 | 0-1910 | 1% |
| | | Gobo 1 | 8-16 | 1911-4005 | 4% |
| | | Gobo 2 | 17-24 | 4006-6099 | 7% |
| | | Gobo 3 | 25-32 | 6100-8191 | 10% |
| | | Gobo 4 | 33-40 | 8192-10285 | 13% |
| | | Gobo 5 | 41-48 | 10286-12377 | 16% |
| | | Gobo 6 | 49-57 | 12378-14473 | 19% |
| | | Gobo 7 | 58-64 | 14474-16383 | 22% |
| | | *Continuous Choice* | 64-191 | 16384-49151 | 25% |
| | | Open | 64 | 16384 | 25% |
| | | Open / Gobo 1 | 72 | 18432 | 28% |
| | | Gobo 1 | 80 | 20480 | 31% |
| | | Gobo 1 / Gobo 2 | 89 | 22784 | 35% |
| | | Gobo 2 | 97 | 24832 | 38% |
| | | Gobo 2 / Gobo 3 | 105 | 26880 | 41% |
| | | Gobo 3 | 113 | 28928 | 44% |
| | | Gobo 3 / Gobo 4 | 121 | 30976 | 47% |
| | | Gobo 4 | 129 | 33024 | 50% |
| | | Gobo 4 / Gobo 5 | 138 | 35328 | 54% |
| | | Gobo 5 | 146 | 37376 | 57% |
| | | Gobo 5 / Gobo 6 | 154 | 39424 | 60% |
| | | Gobo 6 | 162 | 41472 | 63% |
| | | Gobo 6 / Gobo 7 | 170 | 43520 | 66% |
| | | Gobo 7 | 178 | 45568 | 70% |
| | | Gobo 7 / Open | 185 | 47360 | 72% |
| | | *Wheel Spin* | 192-255 | 49152-65535 | 75-100% |
| | | *Clockwise* | 192-222 | 49152-57087 | 75-87% |
| | | Fast | 192 | 49152 | 75% |
| | | Slow | 222 | 57087 | 87% |
| | | Stop | 223-224 | 57088-57599 | 87% |
| | | *Counter-Clockwise* | 225-255 | 57600-65535 | 88-100% |
| | | Slow | 225 | 57600 | 88% |
| | | Fast | 255 | 65535 | 100% |
| 13 | Gobo 1 Fine | Gobo 1 fine adjustment | home: 0 | | 0% |
| 14 | GOBO 1 INDEX | Rotating Gobo 1 Wheel Index Modifier | home: 96 | 24575 | 37% |
| | | *Index Position* | 0-191 | 0-49151 | 0-74% |
| | | 0° | 0 | 0 | 0% |
| | | 180° | 96 | 24575 | 37% |
| | | 360° | 191 | 49151 | 74% |
| | | *Index Rotation* | 192-255 | 49152-65535 | 75-100% |
| | | *Spin Negative* | 192-222 | 49152-57087 | 75-87% |
| | | Fast | 192 | 49152 | 75% |
| | | Slow | 222 | 57087 | 87% |
| | | Stop | 223-224 | 57088-57599 | 87% |
| | | *Spin Positive* | 225-255 | 57600-65535 | 88-100% |
| | | Slow | 225 | 57600 | 88% |
| | | Fast | 255 | 65535 | 100% |

| Chan | Function | Description | 8-Bit Value | 16-Bit Value | DMX Percent |
|------|----------|-------------|-------------|--------------|-------------|
| 15 | Gobo 1 Index Fine | Gobo 1 Index fine adjustment | home: 0 | | 0% |
| 16 | CTB | Rotating CTB Wheel Choice / Modifier | home: 0 | 0 | 0% |
| | | *Discrete Choice* | 0-64 | 0-16383 | 0-25% |
| | | Open | 0-7 | 0-1910 | 1% |
| | | Gobo 1 | 8-16 | 1911-4005 | 4% |
| | | Gobo 2 | 17-24 | 4006-6099 | 7% |
| | | Gobo 3 | 25-32 | 6100-8191 | 10% |
| | | Gobo 4 | 33-40 | 8192-10285 | 13% |
| | | Gobo 5 | 41-48 | 10286-12377 | 16% |
| | | Gobo 6 | 49-57 | 12378-14473 | 19% |
| | | Gobo 7 | 58-64 | 14474-16383 | 22% |
| | | *Continuous Choice* | 64-191 | 16384-49151 | 25% |
| | | Open | 64 | 16384 | 25% |
| | | Open / Gobo 1 | 72 | 18432 | 28% |
| | | Gobo 1 | 80 | 20480 | 31% |
| | | Gobo 1 / Gobo 2 | 89 | 22784 | 35% |
| | | Gobo 2 | 97 | 24832 | 38% |
| | | Gobo 2 / Gobo 3 | 105 | 26880 | 41% |
| | | Gobo 3 | 113 | 28928 | 44% |
| | | Gobo 3 / Gobo 4 | 121 | 30976 | 47% |
| | | Gobo 4 | 129 | 33024 | 50% |
| | | Gobo 4 / Gobo 5 | 138 | 35328 | 54% |
| | | Gobo 5 | 146 | 37376 | 57% |
| | | Gobo 5 / Gobo 6 | 154 | 39424 | 60% |
| | | Gobo 6 | 162 | 41472 | 63% |
| | | Gobo 6 / Gobo 7 | 170 | 43520 | 66% |
| | | Gobo 7 | 178 | 45568 | 70% |
| | | Gobo 7 / Open | 185 | 47360 | 72% |
| | | *Wheel Spin* | 192-255 | 49152-65535 | 75-100% |
| | | *Clockwise* | 192-222 | 49152-57087 | 75-87% |
| | | Fast | 192 | 49152 | 75% |
| | | Slow | 222 | 57087 | 87% |
| | | Stop | 223-224 | 57088-57599 | 87% |
| | | *Counter-Clockwise* | 225-255 | 57600-65535 | 88-100% |
| | | Slow | 225 | 57600 | 88% |
| | | Fast | 255 | 65535 | 100% |
| 17 | CTB Fine | CTB fine adjustment | home: 0 | | 0% |
| 18 | CTB INDEX | Rotating CTB Wheel Index Modifier | home: 96 | 24575 | 37% |
| | | *Index Position* | 0-191 | 0-49151 | 0-74% |
| | | 0° | 0 | 0 | 0% |
| | | 180° | 96 | 24575 | 37% |
| | | 360° | 191 | 49151 | 74% |
| | | *Index Rotation* | 192-255 | 49152-65535 | 75-100% |
| | | *Spin Negative* | 192-222 | 49152-57087 | 75-87% |
| | | Fast | 192 | 49152 | 75% |
| | | Slow | 222 | 57087 | 87% |
| | | Stop | 223-224 | 57088-57599 | 87% |
| | | *Spin Positive* | 225-255 | 57600-65535 | 88-100% |
| | | Slow | 225 | 57600 | 88% |

## Table 1: DMX Mapping for GC Bad Boy

| Chan | Function | Description | 8-Bit Value | 16-Bit Value | DMX Percent |
|---|---|---|---|---|---|
| | | Fast | 255 | 65535 | 100% |
| 19 | CTB Index Fine | CTB Index fine adjustment | home: 0 | | 0% |
| 20 | **ZOOM** | Zoom coarse adjustment | home: 94 | home: 24064 | 36% |
| | | 7° (narrow) | 0 | 0 | 0% |
| | | 56° (wide) | 255 | 65535 | 100% |
| 21 | Zoom Fine | Zoom fine adjustment | home: 0 | | 0% |
| 22 | **DISTANCE** | Throw distance control | home: 42 | | 16% |
| | | *Zoom Table* | 0-245 | | 0-96% |
| | | 15-ft zoom | 0-35 | | 0-13% |
| | | 30-ft zoom | 36-70 | | 14-27% |
| | | 50-ft zoom | 71-105 | | 28-41% |
| | | 75-ft zoom | 106-140 | | 42-54% |
| | | 100-ft zoom | 141-175 | | 55-68% |
| | | 300-ft zoom | 176-210 | | 69-82% |
| | | Narrow zoom | 211-245 | | 83-96% |
| 23 | **EDGE** | Edge coarse adjustment | home: 255 | home: 65535 | 100% |
| | | Near | 0 | 0 | 0% |
| | | Far | 255 | 65535 | 100% |
| 24 | Edge Fine | Edge fine adjustment | home: 255 | | 100% |
| 25 | **BEAM IRIS** | Iris control | home: 255 | | 100% |
| | | Small | 0 | | 0% |
| | | Large | 255 | | 100% |
| 26 | **STROBE** | Strobe adjustment | home: 0 | | 0% |
| | | Open | 0-9 | | 0-3% |
| | | Closed | 10-19 | | 3-7% |
| | | *Pulse Clockwise* | 20-39 | | 7-15% |
| | | Fast | 20 | | 7% |
| | | Slow | 39 | | 15% |
| | | *Pulse Counter-Clockwise* | 40-59 | | 15-23% |
| | | Slow | 40 | | 15% |
| | | Fast | 59 | | 23% |
| | | *Ceiling Fan Clockwise* | 60-79 | | 23-30% |
| | | Fast | 60 | | 23% |
| | | Slow | 79 | | 30% |
| | | *Ceiling Fan Counter-Clockwise* | 80-99 | | 31-38% |
| | | Slow | 80 | | 31% |
| | | Fast | 99 | | 38% |
| | | Slow Random | 100-102 | | 39-40% |
| | | Medium Random | 103-106 | | 40-41% |
| | | Fast Random | 107-109 | | 41-42% |
| | | *Speed* | 110-255 | | 43-100% |
| | | Slow | 110 | | 43% |
| | | Fast | 255 | | 100% |
| 27 | **FROST** | Frost control | home: 0 | | 0% |
| 28 | **CONTROLLER** | Controller mechanism selection | home: 0 | | |
| | | Refer to "Followspot Controller Mechanism Selection (Bad Boy / Best Boy)" on page 49 | 0-255 | | |

# Table 1: DMX Mapping for GC Bad Boy

| Chan | Function | Description | 8-Bit Value | 16-Bit Value | DMX Percent |
|---|---|---|---|---|---|
| 29 | CAMERA RETICLE | Camera reticle on/off | home: 0 | | 0% |
| | | No change | 0 | | 0% |
| | | Reticle Off | 1 | | 1% |
| | | Reticle On | 255 | | 100% |
| 30 | CAMERA EXPOSURE | Camera exposure control | home: 0 | | 0% |
| | | No change | 0 | | 0% |
| 31 | CAMERA ZOOM | Camera zoom control | home: 0 | | 0% |
| | | No change | 0 | | 0% |
| | | Wide | 1 | | 1% |
| | | Narrow | 255 | | 100% |
| 32 | CAMERA WB | Camera white balance | home: 0 | | 0% |
| | | No change | 0 | | 0% |
| | | Automatic | 1-60 | | 1-23% |
| | | 3200K | 61-120 | | 24-47% |
| | | 5800K | 121-180 | | 48-70% |
| | | ATW | 181-240 | | 71-94% |
| 33 | FOCUS TIME | Refer to "Timing Channels" on page 50 | home: 255 | | 100% |
| 34 | COLOR TIME | | home: 255 | | 100% |
| 35 | IMAGE TIME | | home: 255 | | 100% |
| 36 | BEAM TIME | | home: 255 | | 100% |
| 37 | CONTROL | Control Channels | home: 0 | | 0% |
| | | Idle | 0 | | 0% |
| | All values must be held for a minimum of 3 seconds to take effect. | Recalibrate: All | 10 | | 3% |
| | | Recalibrate: Erred Mechanisms | 11 | | 4% |
| | | Recalibrate: Zoom/Edge | 12 | | 4% |
| | | Recalibrate: Color | 14 | | 5% |
| | * default setting | Recalibrate: Gobos | 16 | | 6% |
| | | Recalibrate: Dimmer/Strobe/Iris | 18 | | 7% |
| | | Recalibrate: Pan/Tilt | 19 | | 7% |
| | | Lamp: Douse | 20 | | 7% |
| | | Lamp: Wait on Power-Up * | 21 | | 8% |
| | | Lamp: Strike on Power-Up | 22 | | 9% |
| | | Lamp: Start | 30 | | 11% |
| | | Lamp Power Limit Select: 1400W * | 40 | | 15% |
| | | Lamp Power Limit Select: 1200W | 45 | | 17% |
| | | Lamp Power Limit Select: 900W | 50 | | 19% |
| | | Lamp: Override Start-Up Power Limit | 55 | | 21% |
| | | Zoom Speed Select: Maintain Focus | 75 | | 29% |
| | | Zoom Speed Select: Move Fast * | 77 | | 30% |
| | | Gobo: Set Zero Position | 80 | | 32% |
| | | Fixture Display: Turn Backlight On * | 90 | | 35% |
| | | Fixture Display: Turn Backlight Off | 95 | | 37% |
| | | Pan: Lock | 100 | | 39% |
| | | Pan: Unlock * | 102 | | 40% |
| | | Tilt: Lock | 104 | | 40% |
| | | Tilt: Unlock * | 106 | | 41% |
| | | Pan/Tilt: Free Motion | 108 | | 42% |
| | | Pan/Tilt: Free Lock | 110 | | 43% |
| | | Pan/Tilt: End Free Motion * | 112 | | 43% |

**Table 1: DMX Mapping for GC Bad Boy**

| Chan | Function | Description | 8-Bit Value | 16-Bit Value | DMX Percent |
|------|----------|-------------|-------------|--------------|-------------|
| | | No Fade Out * | 114 | | 44% |
| | | Fade Out After 30s | 116 | | 45% |
| | | Fade Out After 60s | 118 | | 46% |
| | | Clear Logs | 120 | | 47% |
| | | Invert Pan | 122 | | 47% |
| | | Don't Invert Pan * | 124 | | 48% |
| | | Invert Tilt | 126 | | 49% |
| | | Don't Invert Tilt * | 128 | | 50% |
| | | Swap Pan/Tilt | 130 | | 50% |
| | | Don't Swap Pan/Tilt * | 132 | | 51% |
| | | FSC: Intensity Scaling On | 150 | | 58% |
| | | FSC: Intensity Scaling Off * | 152 | | 59% |
| | | FSC: Reset Mechanisms to Default Positions | 153 | | 60% |
| | | Followspot: Reinitialize Camera | 155 | | 61% |
| | | 4-Way Switch Fixture Selection (A-D) | 171-174 | | 67-68% |

**GC Best Boy Spot Luminaire**

## Table 2: DMX Channel Mapping for GC Best Boy

| Chan | Function | | Description | 8-Bit Value | 16-Bit Value | DMX Percent |
|---|---|---|---|---|---|---|
| 1 | INTENSITY | | Intensity Adjustment | home: 0 | | 0% |
| | | | Out | 0 | | 0% |
| | | | Full | 255 | | 100% |
| 2 | PAN | | Pan linear coarse adjustment | home: 127 | 32768 | 50% |
| | | | 0° | 0 | | 0% |
| | | | 615° | 255 | | 100% |
| 3 | Pan Fine | | Pan fine adjustment | home: 0 | | 0% |
| 4 | TILT | | Tilt linear coarse adjustment | home: 127 | 32768 | 50% |
| | | | 0° | 0 | | 0% |
| | | | 260° | 255 | | 100% |
| 5 | Tilt Fine | | Tilt fine adjustment | home: 0 | | 0% |
| 6 | CYAN | | Cyan Color Mix | home: 0 | | 0% |
| | | Mix | [Mode: Continuous] | 0-255 | | 0-100% |
| | | | Open | 0 | | 0% |
| | | | Full | 255 | | 100% |
| | | Wheel Spin | [Mode: Spin] | 0-255 | | 0-100% |
| | | | *Clockwise* | 0-126 | | 0-49% |
| | | | Fast | 0 | | 0% |
| | | | Slow | 126 | | 49% |
| | | | Stop | 127-128 | | 50% |
| | | | *Counter-Clockwise* | 129-255 | | 51-100% |
| | | | Slow | 129 | | 51% |
| | | | Fast | 255 | | 100% |
| 7 | YELLOW | | Yellow Color Mix | home: 0 | | 0% |
| | | Mix | [Mode: Continuous] | 0-255 | | 0-100% |
| | | | Open | 0 | | 0% |
| | | | Full | 255 | | 100% |
| | | Wheel Spin | [Mode: Spin] | 0-255 | | 0-100% |
| | | | *Clockwise* | 0-126 | | 0-49% |
| | | | Fast | 0 | | 0% |
| | | | Slow | 126 | | 49% |
| | | | Stop | 127-128 | | 50% |
| | | | *Counter-Clockwise* | 129-255 | | 51-100% |
| | | | Slow | 129 | | 51% |
| | | | Fast | 255 | | 100% |
| 8 | MAGENTA | | Magenta Color Mix | home: 0 | | 0% |
| | | Mix | [Mode: Continuous] | 0-255 | | 0-100% |
| | | | Open | 0 | | 0% |
| | | | Full | 255 | | 100% |
| | | Wheel Spin | [Mode: Spin] | 0-255 | | 0-100% |
| | | | *Clockwise* | 0-126 | | 0-49% |
| | | | Fast | 0 | | 0% |
| | | | Slow | 126 | | 49% |
| | | | Stop | 127-128 | | 50% |
| | | | *Counter-Clockwise* | 129-255 | | 51-100% |
| | | | Slow | 129 | | 51% |
| | | | Fast | 255 | | 100% |

| Chan | Function | Description | 8-Bit Value | 16-Bit Value | DMX Percent |
|------|----------|-------------|-------------|--------------|-------------|
| 9 | COLOR MIX CONTROL | Sets color mix control mode | home: 0 | | 0% |
| | | Continuous | 0-9 | | 1% |
| | | Spin Cyan | 10-19 | | 5% |
| | | Spin Yellow | 20-29 | | 9% |
| | | Spin Magenta | 30-39 | | 13% |
| | | Spin ALL mixers | 40-49 | | 17% |
| | | Reserved | 50-255 | | 19-100% |
| 10 | COLOR TEMPERATURE | Linear color temperature adjustment | home: 50 | | 19% |
| | | 7500k | 0 | | 0% |
| | | Open | 50 | | 19% |
| | | 3000k | 255 | | 100% |
| 11 | DESIGNER COLOR | Color Wheel Choice | home: 0 | | 0% |
| | Color Choice | [Mode: Continuous, Discrete, Strobe] | 0-255 | | 0-100% |
| | | Open | 0 | | 0% |
| | | Open / Color 1 | 26 | | 10% |
| | | Color 1 | 32 | | 12% |
| | | Color 1 / Color 2 | 42 | | 16% |
| | | Color 2 | 64 | | 25% |
| | | Color 2 / Color 3 | 79 | | 30% |
| | | Color 3 | 96 | | 37% |
| | | Color 3 / Color 4 | 114 | | 44% |
| | | Color 4 | 128 | | 50% |
| | | Color 4 / Color 5 | 145 | | 56% |
| | | Color 5 | 160 | | 62% |
| | | Color 5 / Color 6 | 175 | | 68% |
| | | Color 6 | 192 | | 75% |
| | | Color 6 / Color 7 | 208 | | 81% |
| | | Color 7 | 224 | | 87% |
| | | Color 7 / Open | 232 | | 90% |
| | | Open | 255 | | 100% |
| | Wheel Spin | [Mode: Spin] | 0-255 | | 0-100% |
| | | *Clockwise* | 0-126 | | 0-49% |
| | | Fast | 0 | | 0% |
| | | Slow | 126 | | 49% |
| | | Stop | 127-128 | | 50% |
| | | *Counter-Clockwise* | 129-255 | | 51-100% |
| | | Slow | 129 | | 51% |
| | | Fast | 255 | | 100% |
| 12 | DESIGNER CONTROL | Sets Designer Wheel control mode | home: 0 | | 0% |
| | | Continuous | 0-9 | | 1% |
| | | Discrete | 10-19 | | 5% |
| | | Spin | 20-39 | | 11% |
| | | Strobe Random - Slow | 40-43 | | 16% |
| | | Strobe Random - Medium | 44-46 | | 17% |
| | | Strobe Random - Fast | 47-49 | | 18% |
| | | Linear Strobe Rate | 50-255 | | 19-100% |
| | | Slow | 50 | | 19% |
| | | Fast | 255 | | 100% |

**Table 2: DMX Channel Mapping (Continued) for GC Best Boy**

| Chan | Function | Description | 8-Bit Value | 16-Bit Value | DMX Percent |
|---|---|---|---|---|---|
| **13** | **GOBO 1** | Rotating Gobo 1 Choice / Modifier | home: 0 | 0 | 0% |
| | | *Discrete Choice* | 0-64 | 0-16383 | 0-25% |
| | | Open | 0-9 | 0-2339 | 1% |
| | | Gobo 1 | 10-18 | 2340-4679 | 5% |
| | | Gobo 2 | 19-27 | 4680-7019 | 9% |
| | | Gobo 3 | 28-35 | 7020-9359 | 12% |
| | | Gobo 4 | 36-45 | 9360-11699 | 15% |
| | | Gobo 5 | 46-54 | 11700-14039 | 19% |
| | | Gobo 6 | 55-63 | 14040-16383 | 22% |
| | | *Continuous Choice* | 64-191 | 16384-49150 | 25-74% |
| | | Open | 64 | 16384 | 25% |
| | | Open / Gobo 1 | 74 | 18850 | 29% |
| | | Gobo 1 | 82 | 21014 | 32% |
| | | Gobo 1 / Gobo 2 | 91 | 23400 | 35% |
| | | Gobo 2 | 100 | 25661 | 39% |
| | | Gobo 2 / Gobo 3 | 109 | 27980 | 42% |
| | | Gobo 3 | 118 | 30284 | 46% |
| | | Gobo 3 / Gobo 4 | 128 | 32760 | 50% |
| | | Gobo 4 | 137 | 34966 | 53% |
| | | Gobo 4 / Gobo 5 | 147 | 37543 | 57% |
| | | Gobo 5 | 155 | 39642 | 60% |
| | | Gobo 5 / Gobo 6 | 163 | 41833 | 63% |
| | | Gobo 6 | 173 | 44288 | 67% |
| | | Gobo 6 / Open | 182 | 46513 | 71% |
| | | Open | 191 | 49150 | 74% |
| | | *Wheel Spin* | 192-255 | 49152-65535 | 75-100% |
| | | *Clockwise* | 192-223 | 49152-57343 | 75-86% |
| | | Fast | 192 | 49152 | 75% |
| | | Slow | 222 | 57087 | 86% |
| | | Stop | 223-224 | 57088-57599 | 87% |
| | | *Counter-Clockwise* | 225-255 | 57600-65535 | 88-100% |
| | | Slow | 225 | 57600 | 88% |
| | | Fast | 255 | 65535 | 100% |
| **14** | Gobo 1 Fine | Gobo 1 fine adjustment | home: 0 | | 0% |
| **15** | **GOBO 1 INDEX** | Rotating Gobo 1 Index Modifier | home: 96 | 24575 | 37% |
| | | *Index Position* | 0-191 | 0-49151 | 0-74% |
| | | 0° | 0 | 0 | 0% |
| | | 180° | 96 | 24575 | 37% |
| | | 360° | 191 | 49151 | 74% |
| | | *Index Rotation* | 192-255 | 49152-65535 | 75-100% |
| | | *Clockwise* | 192-223 | 49152-57343 | 75-86% |
| | | Fast | 192 | 49152 | 75% |
| | | Slow | 222 | 57087 | 86% |
| | | Stop | 223-224 | 57088-57599 | 87% |
| | | *Counter-Clockwise* | 225-255 | 57600-65535 | 88-100% |
| | | Slow | 225 | 57600 | 88% |
| | | Fast | 255 | 65535 | 100% |
| **16** | Gobo 1 Index Fine | Gobo 1 Index fine adjustment | home: 0 | | 0% |

| Chan | Function | Description | 8-Bit Value | 16-Bit Value | DMX Percent |
|---|---|---|---|---|---|
| 17 | GOBO 2 | Rotating Gobo 2 Choice / Modifier | home: 0 | 0 | 0% |
| | | *Discrete Choice* | 0-63 | 0-16383 | 0-24% |
| | | Open | 0-9 | 0-2339 | 1% |
| | | Gobo 1 | 10-18 | 2340-4679 | 5% |
| | | Gobo 2 | 19-27 | 4680-7019 | 9% |
| | | Gobo 3 | 28-36 | 7020-9359 | 12% |
| | | Gobo 4 | 37-45 | 9360-11699 | 15% |
| | | Gobo 5 | 46-54 | 11700-14039 | 19% |
| | | Gobo 6 | 55-63 | 14040-16383 | 22% |
| | | *Continuous Choice* | 64-191 | 16384-49150 | 25-74% |
| | | Open | 64 | 16384 | 25% |
| | | Open / Gobo 1 | 74 | 18850 | 29% |
| | | Gobo 1 | 82 | 21014 | 32% |
| | | Gobo 1 / Gobo 2 | 91 | 23400 | 35% |
| | | Gobo 2 | 100 | 25661 | 39% |
| | | Gobo 2 / Gobo 3 | 109 | 27980 | 42% |
| | | Gobo 3 | 118 | 30284 | 46% |
| | | Gobo 3 / Gobo 4 | 128 | 32760 | 50% |
| | | Gobo 4 | 137 | 34966 | 53% |
| | | Gobo 4 / Gobo 5 | 147 | 37543 | 57% |
| | | Gobo 5 | 155 | 39642 | 60% |
| | | Gobo 5 / Gobo 6 | 163 | 41833 | 63% |
| | | Gobo 6 | 173 | 44288 | 67% |
| | | Gobo 6 / Open | 182 | 46513 | 71% |
| | | Open | 191 | 49150 | 74% |
| | | *Wheel Spin* | 192-255 | 49152-65535 | 75-100% |
| | | *Clockwise* | 192-223 | 49152-57343 | 75-86% |
| | | Fast | 192 | 49152 | 75% |
| | | Slow | 222 | 57087 | 86% |
| | | Stop | 223-224 | 57088-57599 | 87% |
| | | *Counter-Clockwise* | 225-255 | 57600-65535 | 88-100% |
| | | Slow | 225 | 57600 | 88% |
| | | Fast | 255 | 65535 | 100% |
| 18 | Gobo 2 Fine | Gobo 2 fine adjustment | home: 0 | | 0% |
| 19 | GOBO 2 INDEX | Rotating Gobo 2 Index Modifier | home: 96 | 24575 | 37% |
| | | *Index Position* | 0-191 | 0-49151 | 0-74% |
| | | 0° | 0 | 0 | 0% |
| | | 180° | 96 | 24575 | 37% |
| | | 360° | 191 | 49151 | 74% |
| | | *Index Rotation* | 192-255 | 49152-65535 | 75-100% |
| | | *Clockwise* | 192-223 | 49152-57343 | 75-86% |
| | | Fast | 192 | 49152 | 75% |
| | | Slow | 222 | 57087 | 86% |
| | | Stop | 223-224 | 57088-57599 | 87% |
| | | *Counter-Clockwise* | 225-255 | 57600-65535 | 88-100% |
| | | Slow | 225 | 57600 | 88% |
| | | Fast | 255 | 65535 | 100% |
| 20 | Gobo 2 Index Fine | Gobo 2 Index fine adjustment | home: 0 | | 0% |

| Chan | Function | Description | 8-Bit Value | 16-Bit Value | DMX Percent |
|---|---|---|---|---|---|
| 21 | EFFECT | Effect control | home: 146 | | 57% |
| | | *Discrete Choice* | 0-146 | | 0-57% |
| | | Gag 3 (Oblong) | 0-35 | | 0-13% |
| | | Gag 2 (Extruder) | 36-71 | | 14-27% |
| | | Gag 1 (4-Facet Prism) | 72-107 | | 28-41% |
| | | Open | 108-146 | | 42-57% |
| | | *Variable Frost* | 147-255 | | 57-100% |
| | | Open | 147 | | 57% |
| | | Full | 255 | | 100% |
| 22 | EFFECT INDEX | Effect Index control | home: 96 | home: 24575 | 37% |
| | | *Index Position* | 0-191 | 0-49151 | 0-74% |
| | | 0° | 0 | 0 | 0% |
| | | 360° | 191 | 49151 | 74% |
| | | *Index Rotation* | 192-255 | 49152-65535 | 75-100% |
| | | *Clockwise* | 192-223 | 49152-57087 | 75-86% |
| | | Fast | 192 | 49152 | 75% |
| | | Slow | 222 | 57087 | 86% |
| | | Stop | 223-224 | 57088-57599 | 87% |
| | | *Counter-Clockwise* | 225-255 | 57600-65535 | 88-100% |
| | | Slow | 225 | 57600 | 88% |
| | | Fast | 255 | 65535 | 100% |
| 23 | Effect Fine | Effect fine adjustment | home: 0 | | 0% |
| 24 | ZOOM | Zoom coarse adjustment | home: 94 | home: 24064 | 36% |
| | | 8° (narrow) | 0 | 0 | 0% |
| | | 64° (wide) | 255 | 65535 | 100% |
| 25 | Zoom Fine | Zoom fine adjustment | home: 0 | | 0% |
| 26 | DISTANCE | Throw distance control | home: 42 | | 16% |
| | | *Zoom Table* | 0-99 | | 1-37% |
| | | 15-ft zoom | 0-9 | | 1% |
| | | 25-ft zoom | 10-19 | | 5% |
| | | 30-ft zoom | 20-29 | | 10% |
| | | 42-ft zoom | 30-39 | | 13% |
| | | 58-ft zoom | 40-49 | | 17% |
| | | 80-ft zoom | 50-59 | | 21% |
| | | 112-ft zoom | 60-69 | | 25% |
| | | 155-ft zoom | 70-79 | | 29% |
| | | 215-ft zoom | 80-89 | | 33% |
| | | 300-ft zoom | 90-99 | | 37% |
| 27 | EDGE | Edge coarse adjustment | home: 255 | home: 65535 | 100% |
| | | Near | 0 | 0 | 0% |
| | | Far | 255 | 65535 | 100% |
| 28 | Edge Fine | Edge fine adjustment | home: 255 | | 100% |
| 29 | BEAM IRIS | Iris control | home: 255 | | 100% |
| | | Small | 0 | | 0% |
| | | Large | 255 | | 100% |
| 30 | STROBE | Strobe adjustment | home: 0 | | 0% |
| | | Open | 0-9 | | 1% |
| | | Closed | 10-19 | | 5% |
| | | *Pulse Clockwise* | 20-39 | | 7-15% |

| Chan | Function | Description | 8-Bit Value | 16-Bit Value | DMX Percent |
|------|----------|-------------|-------------|--------------|-------------|
|  |  | Fast | 20 |  | 7% |
|  |  | Slow | 39 |  | 15% |
|  |  | *Pulse Counter-Clockwise* | 40-59 |  | 15-23% |
|  |  | Slow | 40 |  | 15% |
|  |  | Fast | 59 |  | 23% |
|  |  | *Ceiling Fan Clockwise* | 60-79 |  | 23-30% |
|  |  | Fast | 60 |  | 23% |
|  |  | Slow | 79 |  | 30% |
|  |  | *Ceiling Fan Counter-Clockwise* | 80-99 |  | 31-38% |
|  |  | Slow | 80 |  | 31% |
|  |  | Fast | 99 |  | 38% |
|  |  | Slow Random | 100-102 |  | 40% |
|  |  | Medium Random | 103-106 |  | 41% |
|  |  | Fast Random | 107-109 |  | 42% |
|  |  | *Speed* | 110-255 |  | 43-100% |
|  |  | Slow | 110 |  | 43% |
|  |  | Fast | 255 |  | 100% |
| 31 | CONTROLLER | Controller mechanism selection | home: 0 |  |  |
|  |  | Refer to "Followspot Controller Mechanism Selection (Bad Boy / Best Boy)" on page 49 | 0-255 |  |  |
| 32 | CAMERA RETICLE | Camera reticle on/off | home: 0 |  | 0% |
|  |  | No change | 0 |  | 0% |
|  |  | Reticle Off | 1 |  | 1% |
|  |  | Reticle On | 255 |  | 100% |
| 33 | CAMERA EXPOSURE | Camera exposure control | home: 0 |  | 0% |
|  |  | No change | 0 |  | 0% |
| 34 | CAMERA ZOOM | Camera zoom control | home: 0 |  | 0% |
|  |  | No change | 0 |  | 0% |
|  |  | Wide | 1 |  | 1% |
|  |  | Narrow | 255 |  | 100% |
| 35 | CAMERA WB | Camera white balance | home: 0 |  | 0% |
|  |  | No change | 0 |  | 0% |
|  |  | Automatic | 1-60 |  | 1-23% |
|  |  | 3200K | 61-120 |  | 24-47% |
|  |  | 5800K | 121-180 |  | 48-70% |
|  |  | ATW | 181-240 |  | 71-94% |
| 36 | FOCUS TIME |  | home: 255 |  | 100% |
| 37 | COLOR TIME | Refer to "Timing Channels" on page 50 | home: 255 |  | 100% |
| 38 | IMAGE TIME |  | home: 255 |  | 100% |
| 39 | BEAM TIME |  | home: 255 |  | 100% |
| 40 | CONTROL | Control Channels | home: 0 |  | 0% |
|  |  | Idle | 0 |  | 0% |
|  | All values must be held for a minimum of 3 seconds to take effect.<br><br>* default setting | Recalibrate: All | 10 |  | 3% |
|  |  | Recalibrate: Erred Mechanisms | 11 |  | 4% |
|  |  | Recalibrate: Zoom/Edge | 12 |  | 4% |
|  |  | Recalibrate: Color | 14 |  | 5% |
|  |  | Recalibrate: Gobos | 16 |  | 6% |
|  |  | Recalibrate: Dimmer/Strobe/Iris | 18 |  | 7% |
|  |  | Recalibrate: Pan/Tilt | 19 |  | 7% |

**Table 2: DMX Channel Mapping (Continued) for GC Best Boy**

| Chan | Function | Description | 8-Bit Value | 16-Bit Value | DMX Percent |
|------|----------|-------------|-------------|--------------|-------------|
| | | Lamp: Douse | 20 | | 7% |
| | | Lamp: Wait on Power-Up * | 21 | | 8% |
| | | Lamp: Strike on Power-Up | 22 | | 9% |
| | | Lamp: Start | 30 | | 11% |
| | | Zoom Speed Select: Maintain Focus | 75 | | 29% |
| | | Zoom Speed Select: Move Fast * | 77 | | 30% |
| | | Gobo: Set Zero Position | 80 | | 32% |
| | | Display: Turn Backlight ON * | 90 | | 35% |
| | | Display: Turn Backlight OFF | 95 | | 37% |
| | | Pan: Lock | 100 | | 39% |
| | | Pan: Unlock * | 102 | | 40% |
| | | Tilt: Lock | 104 | | 40% |
| | | Tilt: Unlock * | 106 | | 41% |
| | | Pan/Tilt: Free Motion | 108 | | 42% |
| | | Pan/Tilt: Free Lock | 110 | | 43% |
| | | Pan/Tilt: End Free Motion * | 112 | | 43% |
| | | No Fade Out * | 114 | | 44% |
| | | Fade Out After 30s | 116 | | 45% |
| | | Fade Out After 60s | 118 | | 46% |
| | | Clear Logs | 120 | | 47% |
| | | Invert Pan | 122 | | 47% |
| | | Don't Invert Pan * | 124 | | 48% |
| | | Invert Tilt | 126 | | 49% |
| | | Don't Invert Tilt * | 128 | | 50% |
| | | Swap Pan/Tilt | 130 | | 50% |
| | | Don't Swap Pan/Tilt * | 132 | | 51% |
| | | Followspot: Intensity Scaling ON | 150 | | 58% |
| | | Followspot: Intensity Scaling OFF * | 152 | | 59% |
| | | Followspot: Reset Mechs to Default Positions | 153 | | 60% |
| | | Followspot: Reinitialize Camera | 155 | | 61% |
| | | 4-Way Switch Fixture Selection (A-D) | 171-174 | | 67-68% |

**Table 2: DMX Channel Mapping (Continued) for GC Best Boy**

| Chan | Function | Description | 8-Bit Value | 16-Bit Value | DMX Percent |
|------|----------|-------------|-------------|--------------|-------------|
| 41 | FRAMING 1 | Blade 1A Position | home: 0 | | 0% |
| | | Open | 0 | | 0% |
| | | Inserted | 255 | | 100% |
| 42 | FRAMING 2 | Blade 1B Position | home: 0 | | 0% |
| | | Open | 0 | | 0% |
| | | Inserted | 255 | | 100% |
| 43 | FRAMING 3 | Blade 2A Position | home: 0 | | 0% |
| | | Open | 0 | | 0% |
| | | Inserted | 255 | | 100% |
| 44 | FRAMING 4 | Blade 2B Position | home: 0 | | 0% |
| | | Open | 0 | | 0% |
| | | Inserted | 255 | | 100% |
| 45 | FRAMING 5 | Blade 3A Position | home: 0 | | 0% |
| | | Open | 0 | | 0% |
| | | Inserted | 255 | | 100% |
| 46 | FRAMING 6 | Blade 3B Position | home: 0 | | 0% |
| | | Open | 0 | | 0% |
| | | Inserted | 255 | | 100% |
| 47 | FRAMING 7 | Blade 4A Position | home: 0 | | 0% |
| | | Open | 0 | | 0% |
| | | Inserted | 255 | | 100% |
| 48 | FRAMING 8 | Blade 4B Position | home: 0 | | 0% |
| | | Open | 0 | | 0% |
| | | Inserted | 255 | | 100% |
| 49 | FRAMING ROTATE | Blade rotation control | home: 128 | | 50% |
| | | (-) Angle | 0 | | 0% |
| | | Center | 128 | | 50% |
| | | (+) Angle | 255 | | 100% |

## Followspot Controller Mechanism Selection (Bad Boy / Best Boy)

The "Controller Mechanism Select" channel (28 for Bad Boy / 31 for Best Boy) allows Remote Followspot Controller mechanisms to be selected as follows:

| DMX Range | Mech 1 | Mech 2 | Mech 3 | Mech4 | Mech 5 |
|---|---|---|---|---|---|
| 0 | No Change (leave mechanisms set as they are) | | | | |
| 1-5 (default) | Intensity | Iris | Edge | Zoom | Frost |
| 6-10 | Intensity | Iris | Edge | Zoom | |
| 11-15 | Intensity | Iris | Edge | | |
| 16-20 | Intensity | Iris | | Zoom | Frost |
| 21-25 | Intensity | Iris | | Zoom | |
| 26-30 | Intensity | Iris | | | Frost |
| 31-35 | Intensity | Iris | | | |
| 36-40 | Intensity | | | | |
| 41-45 | Intensity | | Edge | Zoom | Frost |
| 46-50 | Intensity | | Edge | Zoom | |
| 51-55 | Intensity | | Edge | | |
| 56-60 | Intensity | | | Zoom | Frost |
| 61-65 | Intensity | | | Zoom | |
| 66-70 | Intensity | | | | Frost |
| 71-75 | | Iris | Edge | Zoom | Frost |
| 76-80 | | Iris | Edge | Zoom | |
| 81-85 | | Iris | Edge | | |
| 86-90 | | Iris | | Zoom | Frost |
| 91-95 | | Iris | | Zoom | |
| 96-100 | | Iris | | | Frost |
| 101-105 | | Iris | | | |
| 106-110 | | | Edge | Zoom | Frost |
| 111-115 | | | Edge | Zoom | |
| 116-120 | | | Edge | | |
| 121-125 | | | | Zoom | Frost |
| 126-130 | | | | Zoom | |
| 131-135 | | | | | Frost |
| 136-140 | console controls all FSC mechanisms | | | | |
| 255 | console controls ALL FSC mechanisms AND pan & tilt | | | | |

# Timing Channels

## Channel Functions

Timing channel control improves the timed moves of certain groups of parameters. Timing channels support time values of up to six minutes.

### Bad Boy Timing Channel Allocations

| Channel Function | Timing Channel |
|---|---|
| Pan | Focus |
| Tilt | |
| Cyan | Color |
| Yellow | |
| Magenta | |
| Color Wheel | |
| CTB Wheel / CTB Index | |
| Gobo Wheel 1 / Gobo Index 1 | Beam |
| Beam | |
| Frost | |

### Best Boy Timing Channel Allocations

| Channel Function | Timing Channel |
|---|---|
| Pan | Focus |
| Tilt | |
| Cyan | Color |
| Yellow | |
| Magenta | |
| Color Wheel | |
| Zoom | Beam |
| Edge | |
| Iris | |
| Framing | |
| Rotating Gobo Wheels 1 & 2 | Image |
| Gobo Index 1 & 2 | |
| Effects Wheel | |
| Effects Index | |

## Timing Channel Mapping

Refer to the **Timing Channels Table** starting on the next page. The following guidelines apply:

+ A timing value of zero is full speed.
+ A time value of 100% (or 255 in DMX) causes the associated parameter(s) to follow cue fade time (console time) rather than the timing channel.
+ Timing channels can be set in either % or 0-255 (DMX) modes, with the values assigned - as shown in the tables.

## Timing Channels

| % Value | DMX | = Seconds |
|---|---|---|
| | 0 | Full Speed |
| | 1 | 0.2 |
| | 2 | 0.4 |
| 1 | 3 | 0.6 |
| | 4 | 0.8 |
| 2 | 5 | 1 |
| | 6 | 1.2 |
| | 7 | 1.4 |
| 3 | 8 | 1.6 |
| | 9 | 1.8 |
| 4 | 10 | 2 |
| | 11 | 2.2 |
| | 12 | 2.4 |
| 5 | 13 | 2.6 |
| | 14 | 2.8 |
| 6 | 15 | 3 |
| | 16 | 3.2 |
| | 17 | 3.4 |
| 7 | 18 | 3.6 |
| | 19 | 3.8 |
| 8 | 20 | 4 |
| | 21 | 4.2 |
| | 22 | 4.4 |
| 9 | 23 | 4.6 |
| | 24 | 4.8 |
| 10 | 25 | 5 |
| | 26 | 5.2 |
| | 27 | 5.4 |
| 11 | 28 | 5.6 |
| | 29 | 5.8 |
| | 30 | 6 |
| 12 | 31 | 6.2 |
| | 32 | 6.4 |
| 13 | 33 | 6.6 |
| | 34 | 6.8 |
| | 35 | 7.0 |
| 14 | 36 | 7.2 |
| | 37 | 7.4 |
| 15 | 38 | 7.6 |
| | 39 | 7.8 |
| | 40 | 8 |
| 16 | 41 | 8.2 |
| | 42 | 8.4 |
| 17 | 43 | 8.6 |
| | 44 | 8.8 |
| | 45 | 9 |
| 18 | 46 | 9.2 |
| | 47 | 9.4 |
| 19 | 48 | 9.6 |
| | 49 | 9.8 |
| | 50 | 10 |
| 20 | 51 | 10.2 |

## Timing Channels  (Continued)

| % Value | DMX | = Seconds |
|---|---|---|
| | 52 | 10.4 |
| | 53 | 10.6 |
| 21 | 54 | 11 |
| | 55 | 11 |
| 22 | 56 | 12 |
| | 57 | 12 |
| | 58 | 13 |
| 23 | 59 | 13 |
| | 60 | 14 |
| 24 | 61 | 14 |
| | 62 | 14 |
| | 63 | 15 |
| 25 | 64 | 15 |
| | 65 | 16 |
| 26 | 66 | 16 |
| | 67 | 16 |
| | 68 | 17 |
| 27 | 69 | 17 |
| | 70 | 18 |
| 28 | 71 | 18 |
| | 72 | 18 |
| | 73 | 19 |
| 29 | 74 | 19 |
| | 75 | 20 |
| 30 | 76 | 20 |
| | 77 | 20 |
| | 78 | 21 |
| 31 | 79 | 21 |
| | 80 | 21 |
| | 81 | 22 |
| 32 | 82 | 22 |
| | 83 | 23 |
| 33 | 84 | 23 |
| | 85 | 23 |
| | 86 | 24 |
| 34 | 87 | 24 |
| | 88 | 25 |
| 35 | 89 | 25 |
| | 90 | 25 |
| | 91 | 26 |
| 36 | 92 | 26 |
| | 93 | 27 |
| 37 | 94 | 27 |
| | 95 | 27 |
| | 96 | 28 |
| 38 | 97 | 28 |
| | 98 | 29 |
| 39 | 99 | 29 |
| | 100 | 29 |
| | 101 | 30 |
| 40 | 102 | 30 |
| | 103 | 30 |
| | 104 | 31 |

## Timing Channels  (Continued)

| % Value | DMX | = Seconds |
|---|---|---|
| 41 | 105 | 31 |
|  | 106 | 32 |
| 42 | 107 | 32 |
|  | 108 | 32 |
|  | 109 | 33 |
| 43 | 110 | 33 |
|  | 111 | 34 |
| 44 | 112 | 34 |
|  | 113 | 34 |
|  | 114 | 35 |
| 45 | 115 | 35 |
|  | 116 | 36 |
| 46 | 117 | 36 |
|  | 118 | 36 |
|  | 119 | 37 |
| 47 | 120 | 37 |
|  | 121 | 38 |
| 48 | 122 | 38 |
|  | 123 | 38 |
|  | 124 | 39 |
| 49 | 125 | 39 |
|  | 126 | 39 |
|  | 127 | 40 |
| 50 | 128 | 40 |
|  | 129 | 41 |
| 51 | 130 | 41 |
|  | 131 | 41 |
|  | 132 | 42 |
| 52 | 133 | 42 |
|  | 134 | 43 |
| 53 | 135 | 43 |
|  | 136 | 43 |
|  | 137 | 44 |
| 54 | 138 | 44 |
|  | 139 | 45 |
| 55 | 140 | 45 |
|  | 141 | 45 |
|  | 142 | 46 |
| 56 | 143 | 46 |
|  | 144 | 47 |
| 57 | 145 | 47 |
|  | 146 | 47 |
|  | 147 | 48 |
| 58 | 148 | 48 |
|  | 149 | 49 |
| 59 | 150 | 49 |
|  | 151 | 49 |
|  | 152 | 50 |
| 60 | 153 | 50 |
|  | 154 | 50 |
|  | 155 | 51 |
| 61 | 156 | 51 |
|  | 157 | 52 |

## Timing Channels  (Continued)

| % Value | DMX | = Seconds |
|---|---|---|
| 62 | 158 | 52 |
|  | 159 | 52 |
|  | 160 | 53 |
| 63 | 161 | 53 |
|  | 162 | 54 |
| 64 | 163 | 54 |
|  | 164 | 54 |
|  | 165 | 55 |
| 65 | 166 | 55 |
|  | 167 | 56 |
| 66 | 168 | 56 |
|  | 169 | 56 |
|  | 170 | 57 |
| 67 | 171 | 57 |
|  | 172 | 58 |
| 68 | 173 | 58 |
|  | 174 | 58 |
|  | 175 | 59 |
| 69 | 176 | 59 |
|  | 177 | 59 |
|  | 178 | 60 |
| 70 | 179 | 60 |
|  | 180 | 65 |
| 71 | 181 | 65 |
|  | 182 | 65 |
|  | 183 | 70 |
| 72 | 184 | 70 |
|  | 185 | 75 |
| 73 | 186 | 75 |
|  | 187 | 75 |
|  | 188 | 80 |
| 74 | 189 | 80 |
|  | 190 | 85 |
| 75 | 191 | 85 |
|  | 192 | 85 |
|  | 193 | 90 |
| 76 | 194 | 90 |
|  | 195 | 95 |
| 77 | 196 | 95 |
|  | 197 | 95 |
|  | 198 | 100 |
| 78 | 199 | 100 |
|  | 200 | 110 |
| 79 | 201 | 110 |
|  | 202 | 110 |
|  | 203 | 120 |
| 80 | 204 | 120 |
|  | 205 | 120 |
| 81 | 206 | 130 |
|  | 207 | 130 |
|  | 208 | 140 |
| 82 | 209 | 140 |
|  | 210 | 140 |

**Timing Channels  (Continued)**

| % Value | DMX | = Seconds |
|---|---|---|
| | 211 | 150 |
| 83 | 212 | 150 |
| | 213 | 160 |
| 84 | 214 | 160 |
| | 215 | 160 |
| | 216 | 170 |
| 85 | 217 | 170 |
| | 218 | 180 |
| 86 | 219 | 180 |
| | 220 | 180 |
| | 221 | 190 |
| 87 | 222 | 190 |
| | 223 | 200 |
| 88 | 224 | 200 |
| | 225 | 200 |
| | 226 | 210 |
| 89 | 227 | 210 |
| | 228 | 210 |
| | 229 | 220 |
| 90 | 230 | 220 |
| | 231 | 230 |
| 91 | 232 | 230 |
| | 233 | 230 |
| | 234 | 240 |
| 92 | 235 | 240 |
| | 236 | 250 |
| 93 | 237 | 250 |
| | 238 | 250 |
| | 239 | 260 |
| 94 | 240 | 260 |
| | 241 | 270 |
| 95 | 242 | 270 |
| | 243 | 270 |
| | 244 | 280 |
| 96 | 245 | 280 |
| | 246 | 290 |
| 97 | 247 | 290 |
| | 248 | 290 |
| | 249 | 300 |
| 98 | 250 | 300 |
| | 251 | 310 |
| 99 | 252 | 310 |
| | 253 | 310 |
| | 254 | 310 |
| 100 | 255 | Follows Cue Data |

# SOFTWARE UPDATE

## Updating GroundControl Software

GroundControl software is updated using the two access ports (**Figure 27**) available on the underside of the Control Arm:

+ **Port 1 (DMX)** - used to load firmware into the Control Arm's Switch Board.
+ **Port 2 (Ethernet)** - used to load firmware into the Control Arm's main board, the GC Truss Box, and the GC luminaire (connected to the arm).
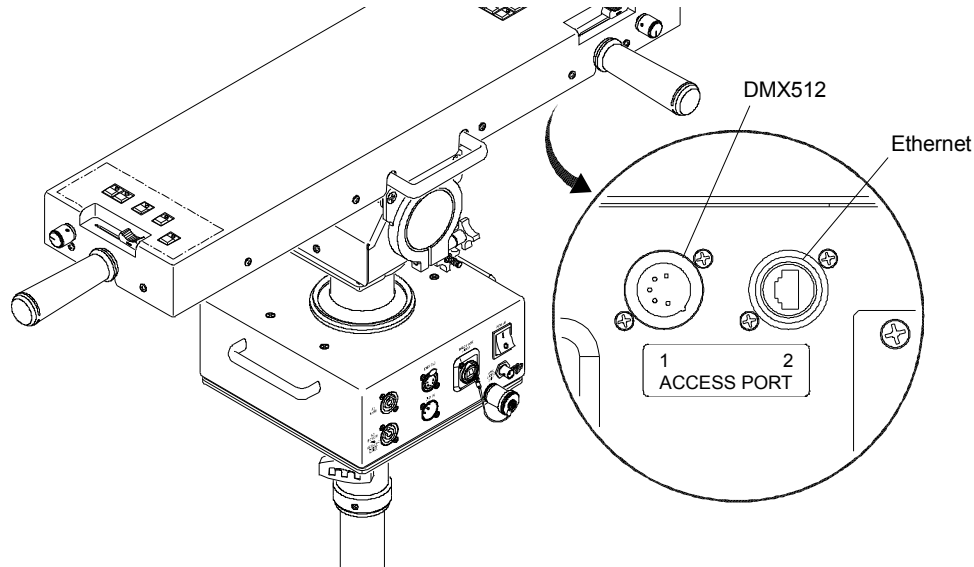


**Figure 27: Access Ports**

**To update main board, truss box, or luminaire:**

Step 1. Connect Truss Box and Luminaire to GC Controller as normal.

Step 2. Connect Ethernet cable between computer and Control Arm Access Port 2 (**Figure 27**).

Step 3. Open required .jar file.

Step 4. If computer has more than one Ethernet interface available, select appropriate network interface from drop-down menu.

Step 5. Click **Start Download** button. Touchscreen display will change to bootloader screen and show load progress.

Step 6. Wait for download to complete.

Step 7. After download, the updated version can be verified in the Information menu:
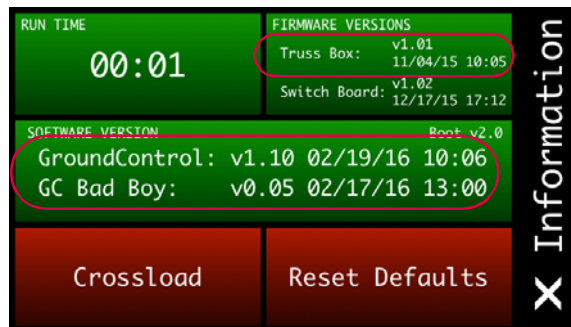
**To update switch board:**

Step   1.  Connect XLR cable between computer and PRG Node device or S400 System.

Step   2.  Connect XLR cable between Node / S400 and Control Arm Access Port 1 (**Figure 27**).

Step   3.  Open required .jar file.

Step   4.  Click **Start Download** button. Touchscreen display will change to bootloader screen and show load progress.

Step   5.  Wait for download to complete.

Step   6.  After download, the updated version can be verified in the Information menu:
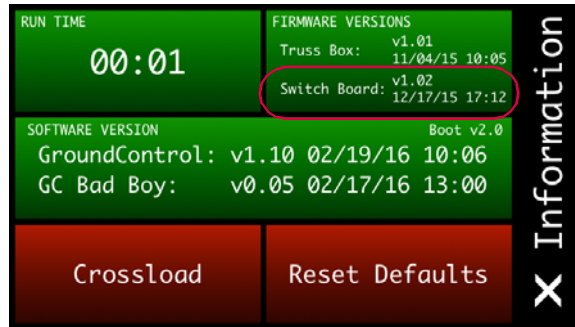
## Software Crossload

The Information menu provides a method for sending the current GC Followspot Controller software to any connected Controllers. Controllers can be daisy-chained using the DMX512 ports located on the Control Arm interface panel.

**Note:** At the last Controller in the chain, install a male termination connector at the DMX OUT connector.
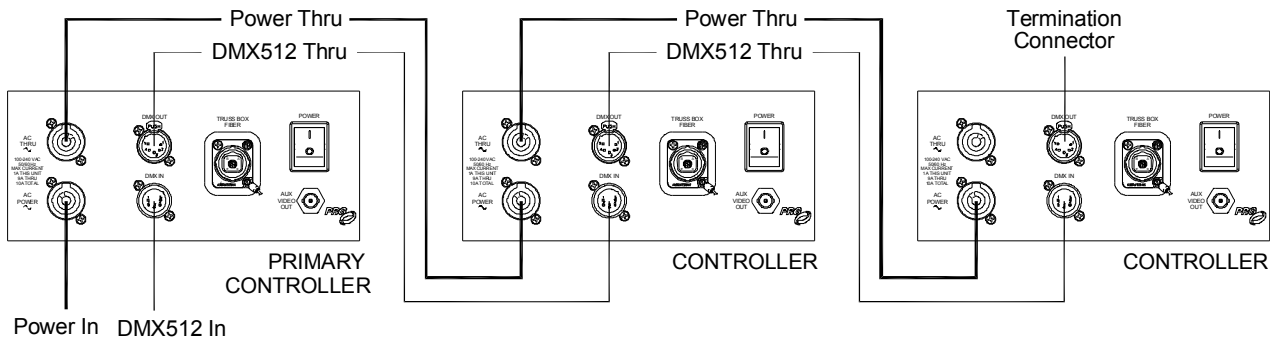


**Figure 28: Example Daisy-Chain Configuration**

To initiate the software crossload, press **Crossload Software** at the Information menu. At confirmation menu, press "Yes." If a connected Controller already has that software version, it will do nothing. If it does not have the same version, it will go into the boot screen and start updating.
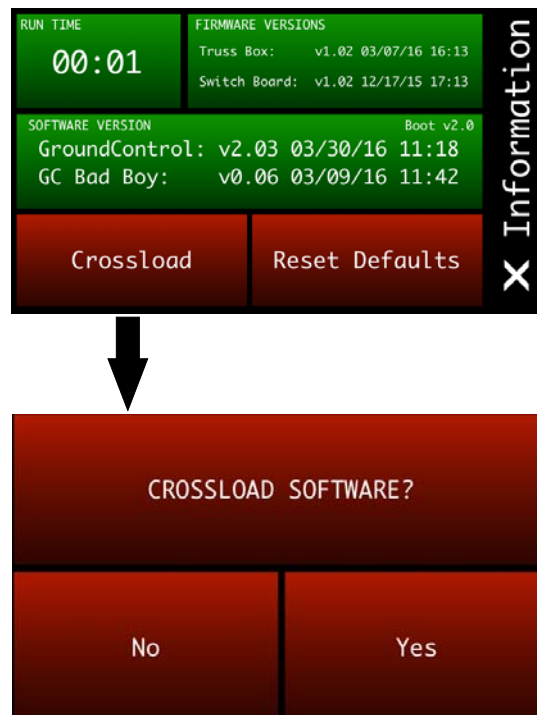


**Note:** There should be no active control during the update process.

# TROUBLESHOOTING

## Troubleshooting Guide

The following table provides a list of common problems and possible solutions.

| Symptom | Solution(s) | Refer to... |
|---|---|---|
| No power to Controller | Ensure power cable is properly connected to Neutrik input connector | page 14 |
| | Ensure power is switched on at source (mains, disconnect box, etc.) | n/a |
| | Ensure power on/off switch is ON | page 20 |
| No power to Truss Box | Ensure power cable is properly connected to Neutrik input connector | page 14 |
| | Ensure power is switched on at source (mains, disconnect box, etc.) | n/a |
| No power to luminaire | Ensure power cable is properly connected to Neutrik input connector | page 14 |
| | Ensure power is switched on at source (mains, disconnect box, etc.) | n/a |
| No console control | Ensure data cable is properly connected to Controller | page 14 |
| | Ensure DMX512 address setting is correct | page 22 |
| | Ensure correct luminaire is selected in the console profile (Bad Boy/Best Boy) | n/a |
| Lamp does not strike at power-up | Configure lamp to start at power-up | page 22 |
| No intensity fader control | Enable intensity scaling | page 23 |
| | If intensity scaling is already enabled, deselect the Blackout button to ensure the console is not limiting the output. | page 31 |
| No blackout button control | Enable blackout | page 23 |
| No beam output | Check intensity setting | page 30 |
| | Check beam iris setting | page 30 |
| | Ensure Blackout button is not engaged | page 31 |
| | Check intensity scaling setting | page 21 |
| | Ensure luminaire lamp is lit | n/a |
| Reticle appears as a black box | Reset GC Controller | page 20 |
| | Reset Truss Box | page 20 |
| | Reset Camera | page 28 |

| Symptom | Solution(s) | Refer to... |
|---|---|---|
| No camera iris | Reset GC Controller | page 20 |
| | Reset Truss Box | page 20 |
| | Reset Camera | page 28 |
| GC Controller pan/tilt is very slow | Reset GC Controller | page 20 |
| Pan/Tilt is very fast | Check and adjust Pan/Tilt sensitivity | page 24 |
| Main menu displays Truss Box status as XXX | Verify Truss Box has power | page 14 |
| | Check fiber optic connection | page 14 |

# MAINTENANCE

## Quad Chassis Connector Cleaning

To clean the fiber ends of panel-mount opticalCON Quad connectors, the individual LC connectors must be carefully removed from the rear of the connector.

⚠️ **WARNING:** Laser radiation. Do not look directly into fiber optic cable connectors without eye protection! Turn off source or disconnect both ends of cable before performing maintenance.

**To clean quad chassis connector:**

Step 1. Remove individual LC connectors from rear of chassis panel.

Step 2. Open cover of Guide Cap (**Figure 29**).

Step 3. Insert LC connector into Guide Cap while observing cautions as shown in **Figure 29**.

Step 4. Push outer shell to start cleaning LC connector end face. A "click" sound indicates the end of the cleaning process.

Step 5. Close Guide Cap cover.

Step 6. Re-install LC connector into chassis panel.

CAUTION: Be careful not to slant LC connector while inserting into the Guide Cap.

CAUTION: Do not overly exert force during insertion as this may cause damage to both the LC connector and Guide Cap.



LC Connector (removed from rear of opticalCON Quad)

PRO TIP! To prevent cross contamination clean the cable ends and the mating connectors at the same time.

Cover

Guide Cap

Dry Cleaning Tool
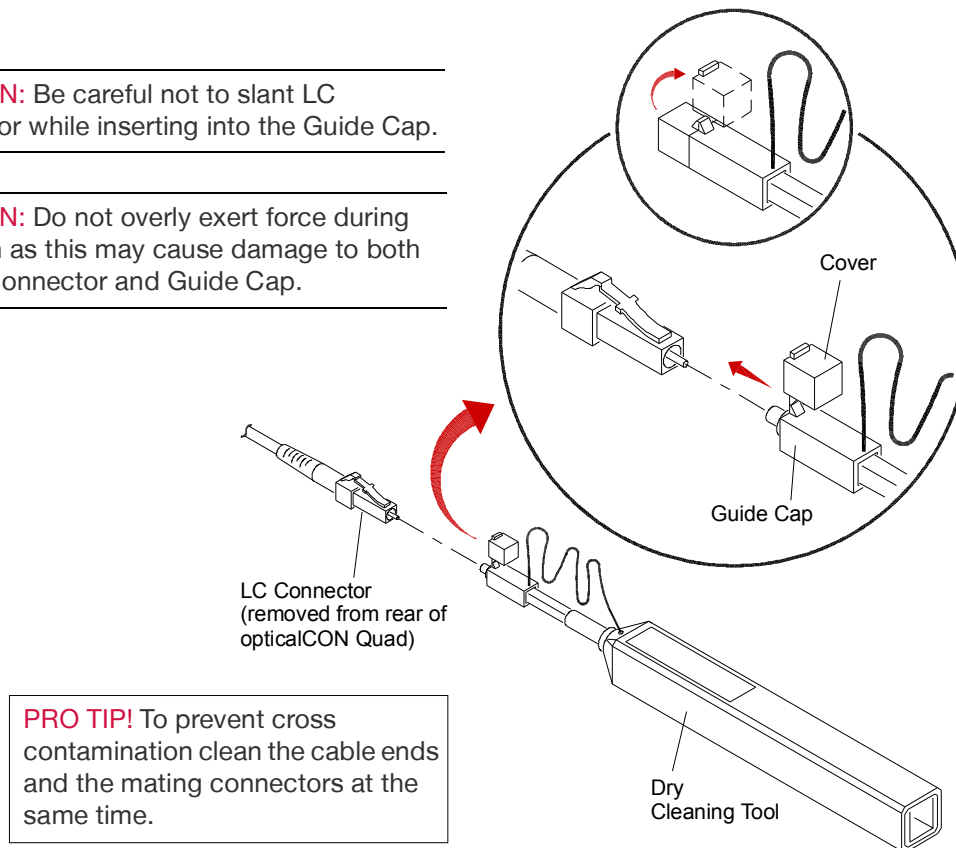
**Figure 29: Quad Chassis Connector Cleaning (Field)**

## Quad Cable Connector Cleaning

⚠️ **WARNING:** Laser radiation. Do not look directly into fiber optic cable connectors without eye protection! Turn off source or disconnect both ends of cable before performing maintenance.

**To clean quad cable connector:**

Step 1. Turn off source or disconnect <u>both</u> ends of the cable.

Step 2. Unscrew body of opticalCON connector while holding locking spring towards open face of connector (**Figure 30**).

Step 3. Open cover of Guide Cap.

Step 4. Insert fiber end into Guide Cap while observing cautions as shown in **Figure 30**.

Step 5. Push outer shell to start cleaning fiber end face. A "click" sound indicates the end of the cleaning process.

Step 6. Close Guide Cap cover.

Step 7. Re-assemble opticalCON connector.

When replacing the front shell, ratchet the rear shell until it clicks four (4) times. Turning it further will make it harder to disassemble during a future cleaning.
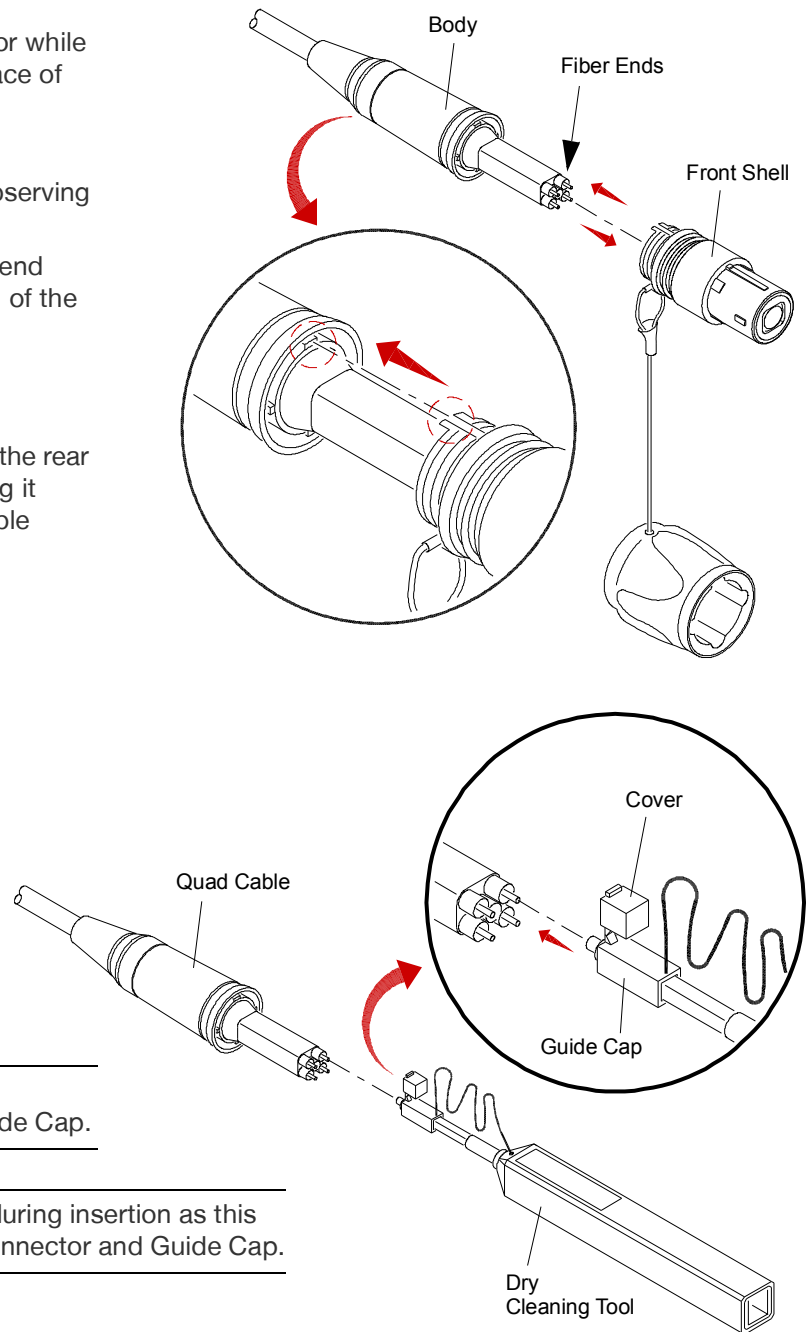


CAUTION: Be careful not to slant LC connector while inserting into the Guide Cap.

CAUTION: Do not overly exert force during insertion as this may cause damage to both the LC connector and Guide Cap.

**Figure 30: Quad Cable Connector Cleaning (Field)**

# Packing Equipment in Roadcase

Orientation and placement of the equipment in the roadcase is important. Always repack as shown in the following illustrations. (Note that the Truss Box Cable Bundle should be packed into the luminaire roadcase with the Truss Box.)

## GC RFS Packing
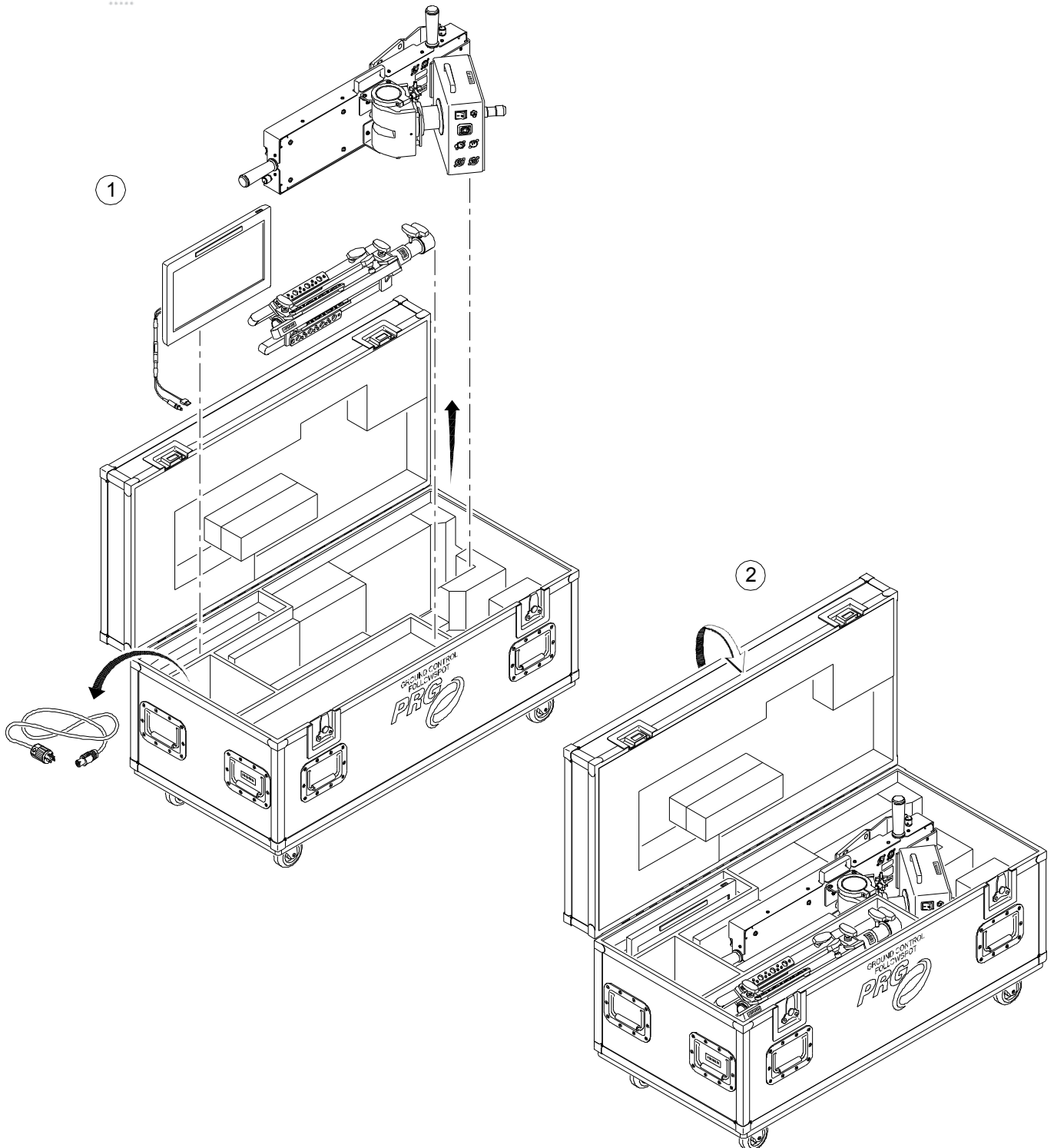


Figure 31:  Packing Equipment in GC RFS Roadcase

**GC Bad Boy Packing**
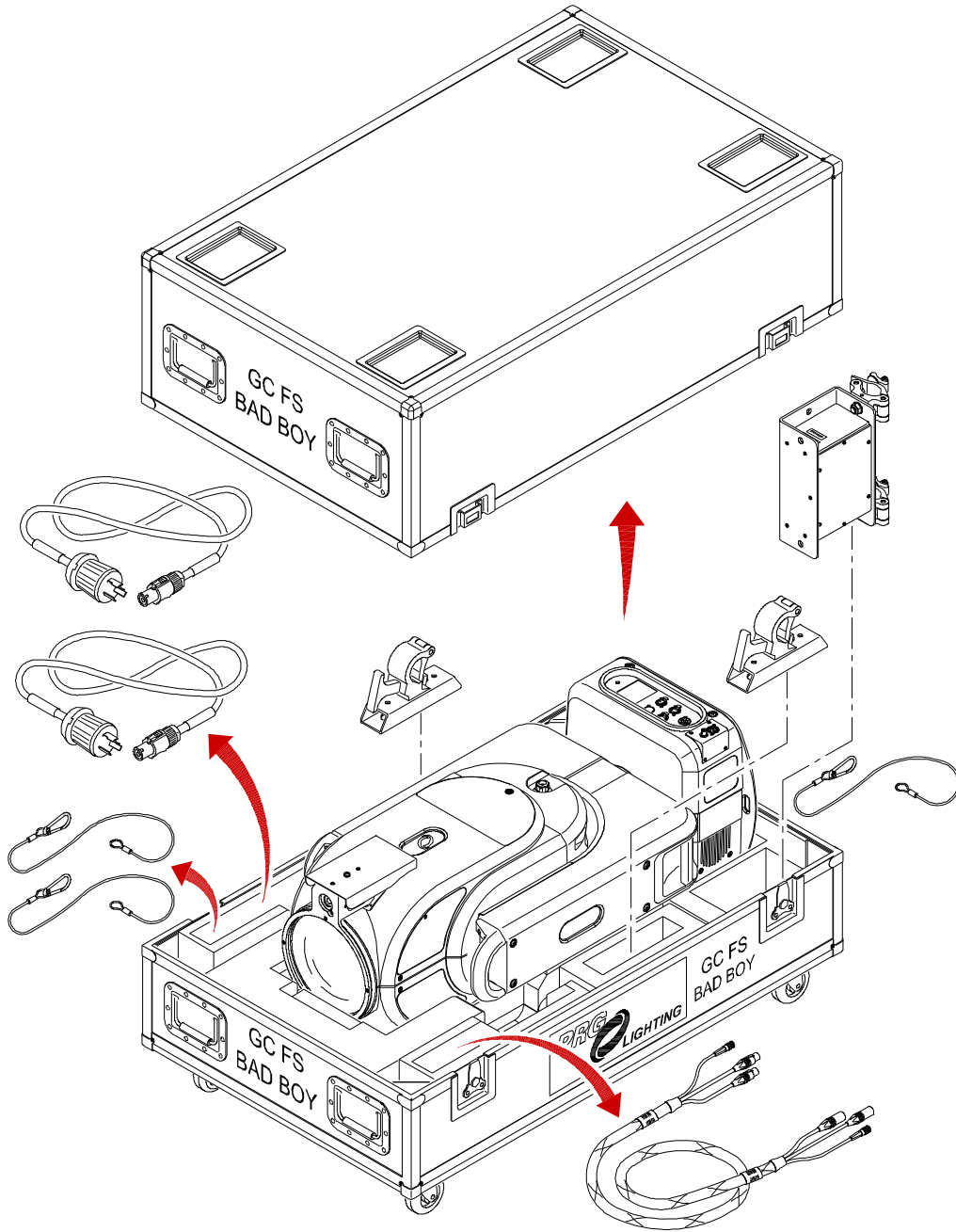


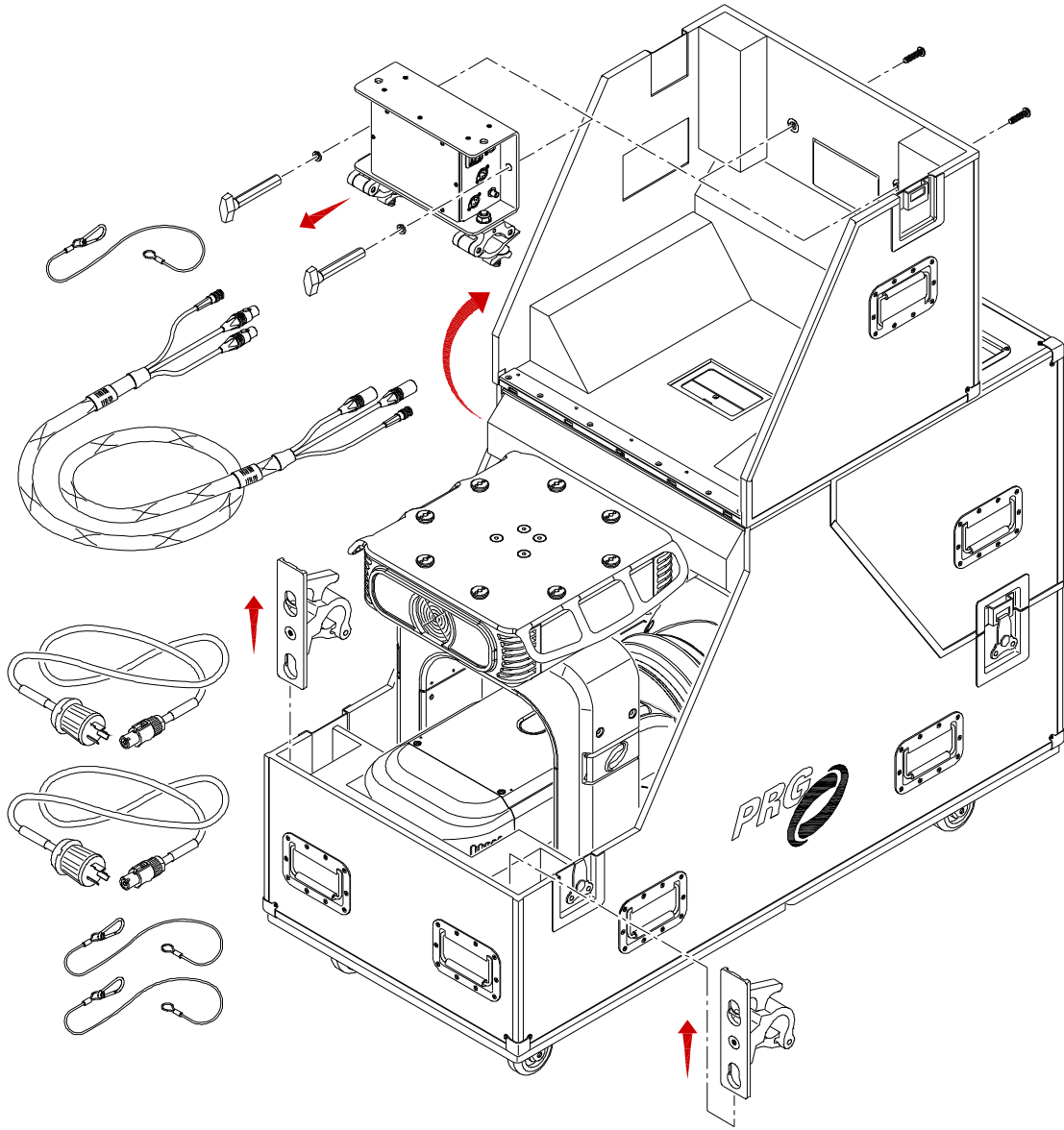Figure 32:  Packing Equipment in GC Bad Boy Roadcase

**GC Best Boy Packing**



Figure 33:  Packing Equipment in GC Best Boy Roadcase

# SPECIFICATIONS

## Technical Specifications

### GC Followspot Controller

+ 100-240v 50/60 Hz, 60 Watts
+ Operating Temperature: 0ºC to 40ºC
+ Neutrik® powerCON In and Thru
    - Neutrik® powerCON Thru: 10 Amps Maximum
+ On/Off Switch
+ XLR 5pin In and Thru
    - Accepts DMX512
+ Neutrik® opticalQUAD Fiber Optic Connector
    - Maximum distance of fiber: 2000 ft (609.6m)
+ BNC Connector
    - Output: HD-SDI 1080p Video
+ 15.6" High-Definition LED Monitor
    - Maximum Resolution: 1366 x 768 pixels
    - Contrast Ratio: 800:1
    - Brightness: 330 cd/m2
    - Aspect Ratio: 16:9
    - HDMI Input
    - Power Supply
        -- DC12v
        -- Power consumption in operation: 24W
        -- Power consumption in standby: 1W
    - Barrel Connector for Monitor Power
    - Monitor Weight 5.92 lbs. (2.60kg)
    - Monitor Dimensions: 15.5" L x 5.0" (W) x 12.0" (H) / 393.7mm (L) x 127mm (W) x 304.8mm (H)
+ Ranges: 350° Pan, 270° Tilt
+ Controller mounts via 1-1/8" Spud into a Junior Receiver on the on Slider Stand
+ Slider Stand
    - Junior (1.125") Receiver
    - Collapsed height of Stand: 25" (635mm)
    - Maximum Height of stand: 46" (1168.4mm)
    - Footprint: 37" (939.8mm)
    - Double, Rocky Mountain Leg
+ Weight with Slider Stand: 54 lbs. (24.49kg)
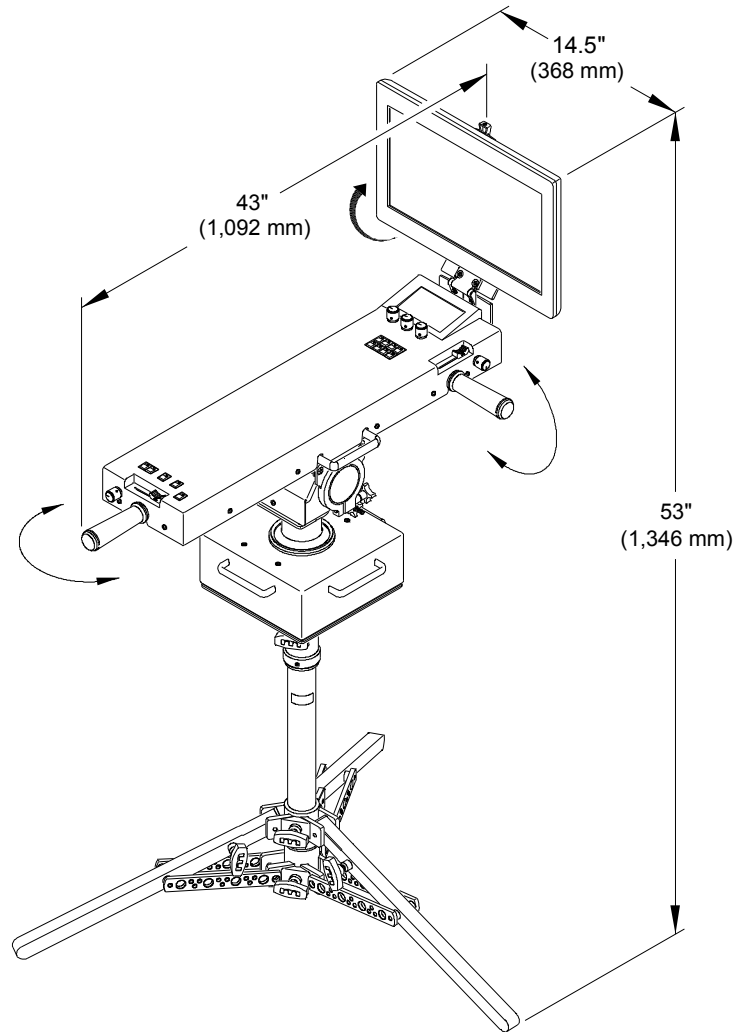


**Figure 34: GC Followspot Controller Dimensions**

## GC Truss Box

- + 100-240v 50/60 Hz, 40 Watts
- + Operating Temperature: 0ºC to 40ºC
- + Neutrik® powerCON In
- + Neutrik® opticalQUAD Fiber Optic Connector
    - Maximum distance of fiber: 2000 ft (609.6m)
- + BNC Connector
    - Input HD-SDI 1080p video from fixture
- + XLR 5-pin Female
    - DMX Output to Fixture
- + XLR 4-pin Female
    - Camera Power and Control to Fixture
- + 6.5" (165mm) holes for hanging hook hardware
- + Weight: 9 lbs. (4kg)
- + Dimensions: 11.50" (D) x 4.38" (W) x 6.60" (H) / 292.1mm (D) x 111.2mm (W) x 167.6 mm (H)

## GC Luminaire Camera System

- + Sensor
    - Progressive CMOS
    - 16Λ Progressive Scan
    - 1920 (H) x 1080 (V)
    - Minimum Illumination: 0.2Lux (Day), 0.1Lux (Night)
    - Horizontal Resolution: 1000TVL
- + Optics
    - F4.0 20mm
    - 5x Optical Zoom + 12x Digital Zoom = 60x
    - Auto Focus
    - Angle of View 64.2 Degrees (WIDE) 13.8 degree (TELE)
- + Functions
    - Exposure: Auto/DMX
    - White Balance: 3000K-8000K
    - Day Night System
    - Electronic Shutter NTSC 1/30- 1/30000, PAL 1/25- 1/30000
    - Target Reticle
- + Video Output
    - HD-SDI 1920 x1080 pixels
- + DMX Control
- + Operating Temperature: -10ºC to 50ºC
- + Power Input: 12VDC
- + Power Consumption: 6W
- + Weight: 0.6 lbs. (0.27kg)



**Figure 35: Truss Box Dimensions**

## GC 4-Way Switch

+ 100-240 VAC 50/60 Hz, .5 amps / thru max of 9.5 amps, total 10 amps
+ Operating Temperature: 0°C to 40°C
+ Neutrik® opticalQUAD Fiber Optic Connector
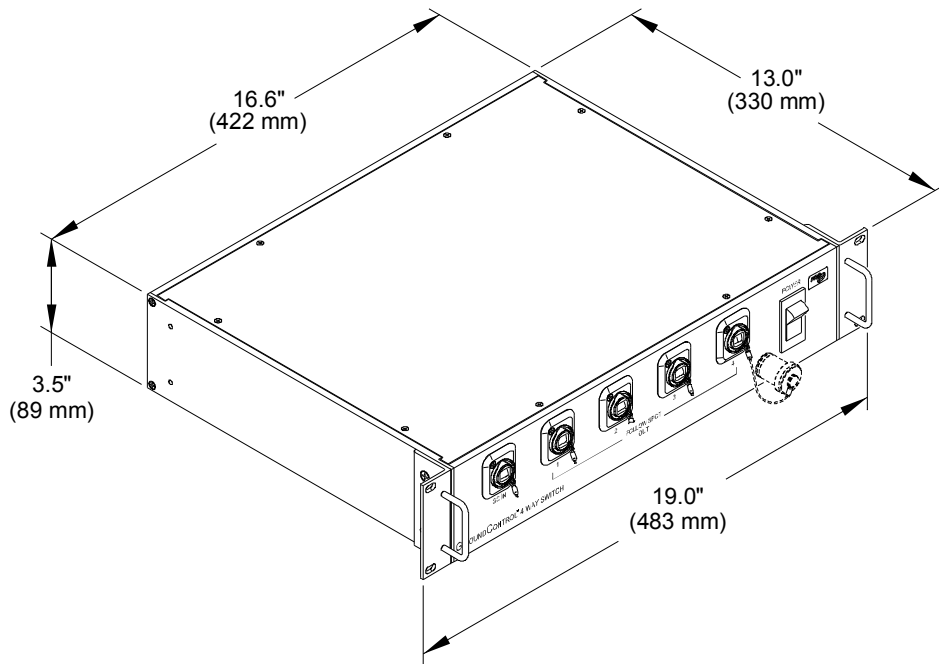    - Maximum distance of fiber: 1800 ft (548.64m)
+ Weight: 11.3 lbs. (5.13kg)



Figure 36: 4-Way Switch Dimensions

## GC Bad Boy Remote Followspot Luminaire

| | |
|---|---|
| SOURCE: | Philips MSR Gold™ 1500W FastFit Lamp. Can be set to levels 900W, 1200W, or 1500W. |
| OUTPUT: | 48,000 lumens |
| OPTICAL EFFICIENCY: | 40% |
| REFLECTOR: | Precision glass reflector with dichroic cold mirror coating. |
| OPERATING TEMP: | -20° to 120°F (-29° to 49°C) |
| COOLING: | Forced air. |
| CONTROL: | Compatible with all PRG consoles and a wide variety of DMX512 and Art-Net consoles. An internal Ethernet switch allows for daisy-chaining fixtures |
| ON-BOARD CONTROL: | Built-in LCD display with touchscreen featuring menu system control. |
| ZOOM RANGE: | Standard Mode - 8:1 from narrow spot of 7° to wide flood of 56° / Ultra Narrow Mode - 5.5° to 8° |
| ZOOM CONTROL: | Four (4) groups of lenses — each independently controlled for accuracy while maintaining focus during zoom changes |
| BEAM SIZE CONTROL: | In addition to the zoom optics, a mechanical iris provides continuous beam size control for both rapid changes and smooth timed beam angle changes. |
| EDGE CONTROL: | Maintains gobo focus and allows gobo morphing. |
| STROBE: | Servo-powered, lightning fast strobe. |
| FROST: | Variable frost for smooth diffusion. |
| CMY COLOR: | CMY color system featuring three (3) crossfading color wheels of Cyan, Magenta, and Yellow. |

COLOR CORRECTION: (1) CTO wheel with seven color correction filters, and one (1) CTB wheel with seven color correction filters.

ROTATING GOBOS: One (1) indexable, rotating gobo wheel with seven (7) gobos. Gobos are individually calibrated so the unit will automatically index the orientation of each gobo regardless of placement.

PAN & TILT: Three-phase, high-speed servo motors.

RANGE: Pan - 540°, Tilt - 270°

MAX VELOCITY: 4.1 seconds for 540° of pan and 3.2 seconds for 270° of tilt.

ACCURACY: 0.2° resolution.

INTENSITY: Full-field dimming from 0 to 100% with accurate slow-speed control and fast bumps.

CAMERA: On-board, HD-SDI camera featuring optical zoom, targeting reticle, night-vision mode, and video output of 1920 x1080 pixels.

POSITIONING: Can be mounted in any orientation.

SPACING: Hangs on 30 inch (762 mm) centers.
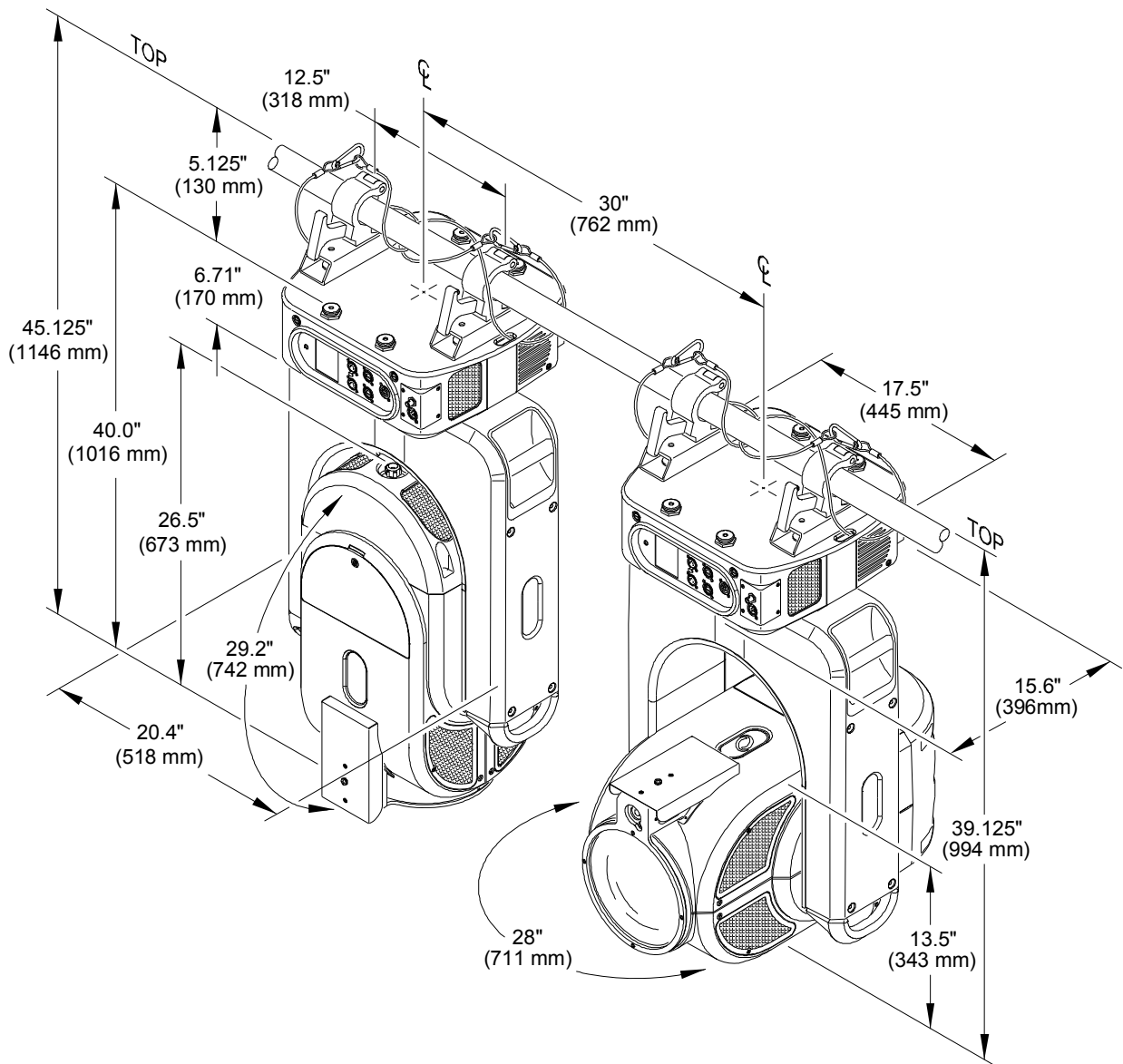
WEIGHT: 167 lbs (75.8 kg) with clamps and rails



Figure 37: GC Bad Boy Hanging Configuration and Dimensions

## GC Best Boy Remote Followspot Luminaire

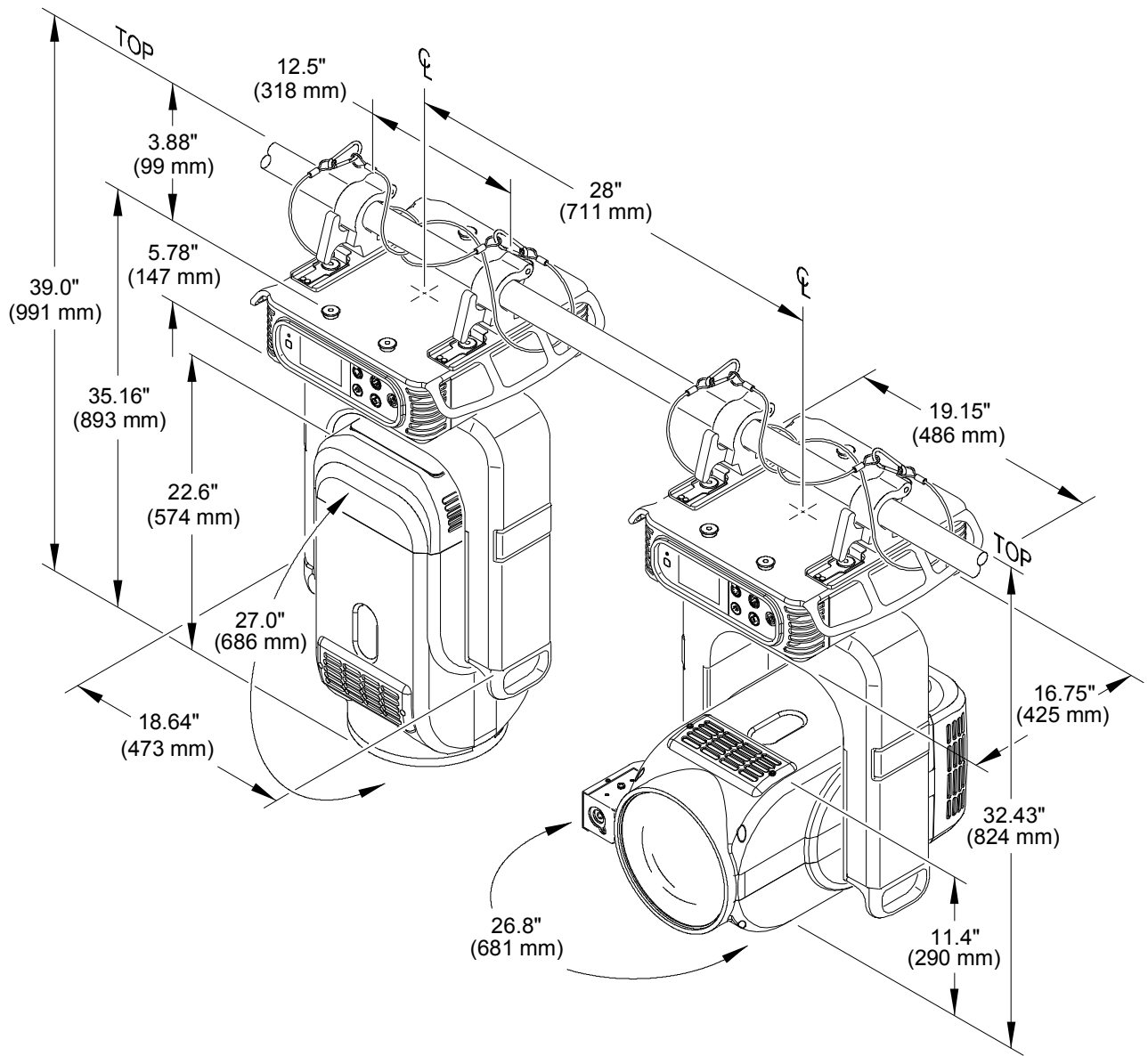| | |
|---|---|
| SOURCE: | Osram SHARXS HTI 1500W/D7/60 lamp |
| OUTPUT: | 20,000 lumens |
| INPUT CURRENT: | Minimum 200V, Maximum 270V.<br>0.5 Amps at 208V, 8.75 Amps at 240V<br>Auto-sensing voltage input range 170V to 270V |
| REFLECTOR: | Precision glass reflector with cold mirror coating. |
| ZOOM RANGE: | 8:1 from a tight spot of 8° to a very wide flood of 64° maintaining focus throughout. |
| BEAM SIZE CONTROL: | In addition to the zoom optics, a mechanical iris provides continuous beam size control for both rapid changes and smooth, timed beam angle changes. |
| FRAMING: | Four-blade framing system featuring four independent blades mounted in two planes. Each blade can be tilted +/- 30° and the entire frame system can be rotated +/- 60° for a total travel of 120°. |
| DIMMING: | Gray-scale glass dimmer for full-field dimming from 0% to 100% with accurate slow-speed control and fast bumps. |
| STROBE: | Servo-powered, lightning fast strobe wheel. |
| EFFECTS: | One (1) multiplying four-facet prism, two (2) glass effects, and variable frost. |
| COLOR: | CMY color system featuring three (3) crossfading color wheels of Cyan, Magenta, and Yellow, plus one (1) designer wheel with seven (7) user-changeable color filters. |
| COLOR TEMP CONTROL: | Adjustable color temperature wheel, range from 3,000K all the way up to 7,500K. Includes an integrated minus green filter. |
| ROTATING GOBOS: | Two (2) indexable, rotating gobo wheels with six (6) gobos per wheel. Gobos are individually calibrated so the unit will automatically index the orientation of each gobo regardless of initial placement. Both gobo wheels accept PRG Moiré Gobos™ for advanced gobo rotator effects. |
| OPERATING TEMP: | 0° to 120°F (18° to 49°C) |
| CONTROL: | Compatible with all PRG consoles and a wide variety of DMX512, Art-Net, and sACN consoles. |
| DMX CHANNELS: | 45 DMX512 channels required per unit. (36 DMX512 channels with Framing disabled.) |
| ETHERNET BYPASS: | A relay allows Ethernet signals to pass through daisy-chained luminaires even if power is removed. |
| ON-BOARD CONTROL: | Built-in LCD touchscreen display allows for on-board fixture control and feedback. On-board battery power allows for the fixture address and configurations to be set without having to apply AC power to the luminaire. |
| PAN & TILT: | Three-phase, high-speed servomotors. Brakes are applied when off. |
| RANGE: | Pan - 615°, Tilt - 260° |
| CAMERA: | On-board, HD-SDI camera featuring optical zoom, targeting reticle, night-vision mode, and video output of 1920 x1080 pixels. |
| POSITIONING: | Can be mounted in any orientation. |
| SPACING: | Hangs on 28 inch (711 mm) centers. |
| WEIGHT: | 109 lbs (49.44 kg) without hooks. |

Figure 38:  GC Best Boy Hanging Configuration and Dimensions

## Quad Fiber Optic Cables

Neutrik® opticalCON ADVANCED connection system:

+ Based on LC-Duplex connectors, but eliminates its weakness and guarantees a dust-protected, rugged connection.
+ Includes a lockable, water-proof metal cap (designed especially for outdoor applications) and a rubber guard.
+ Ergonomically designed cable strain relief improves the cable protection and water resistance in long-term use.
+ Includes a dual sheath with a galvanized steel armor layer and additional heavy packing with Kevlar Aramid fibers.
+ Suitable for extreme duty and 4-way applications.
+ Robust and flexible, easy to coil, and kink free.
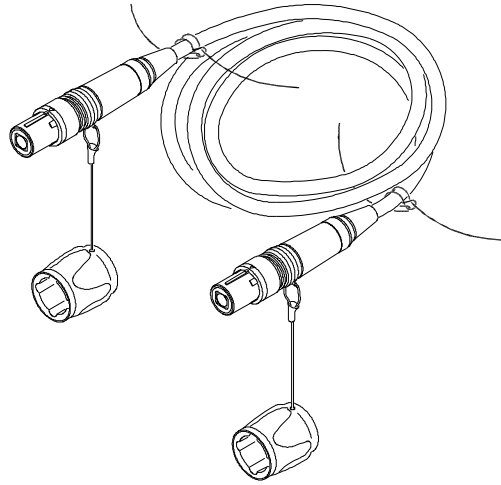
Figure 39:  opticalCON Fiber Optic Cable

## Case Dimensions and Weights

### GC Followspot Controller Roadcase

LOADED WEIGHT: 170 lbs (77.1 kg) + weight of fiber cable *

    * Fiber cable weight will vary depending on length.

22.5"
(572 mm)

45"
(1143 mm)

19.3"
(490 mm)

24.3"
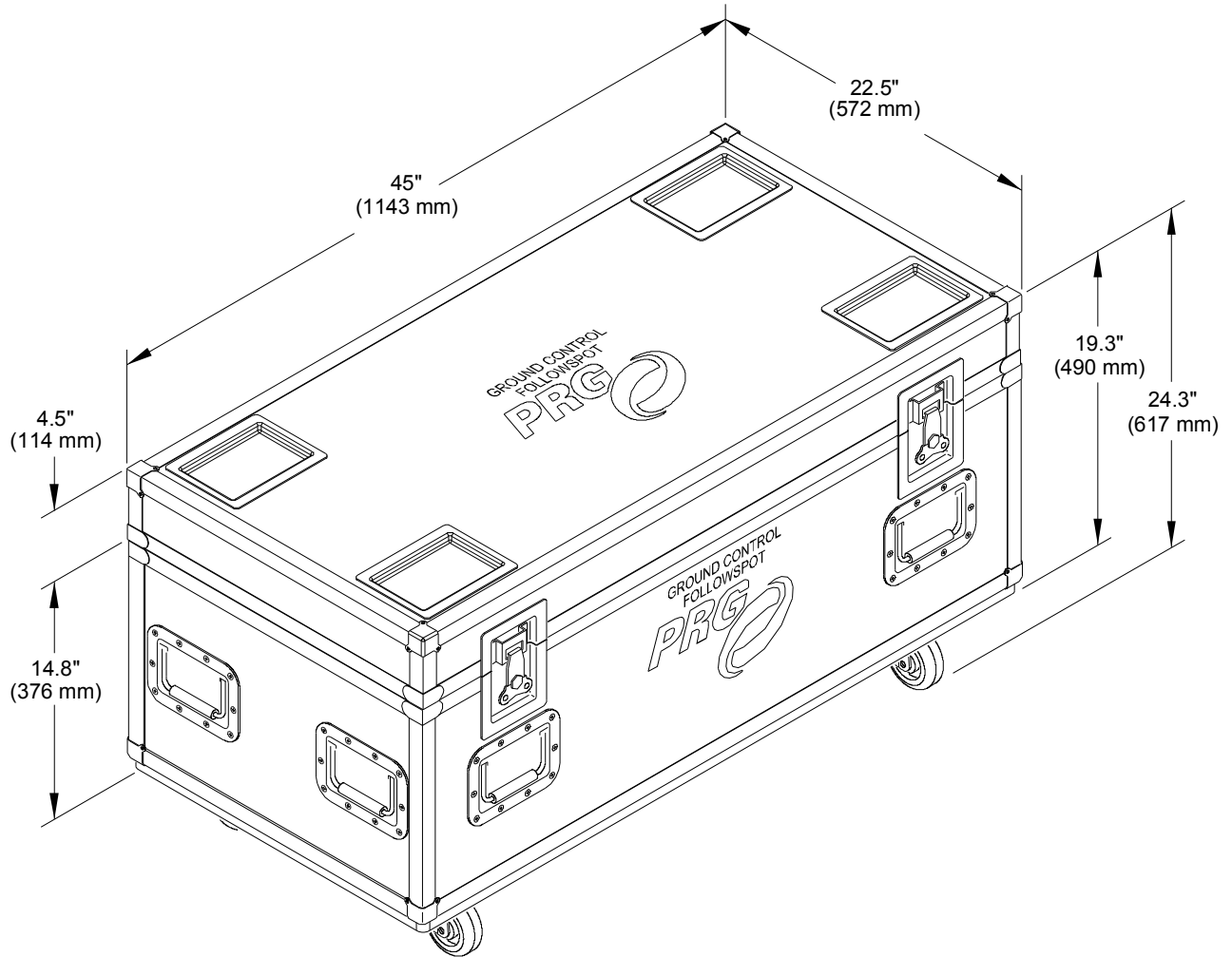(617 mm)

4.5"
(114 mm)

14.8"
(376 mm)

Figure 40: GC Followspot Controller Roadcase Dimensions

## GC Bad Boy Roadcase
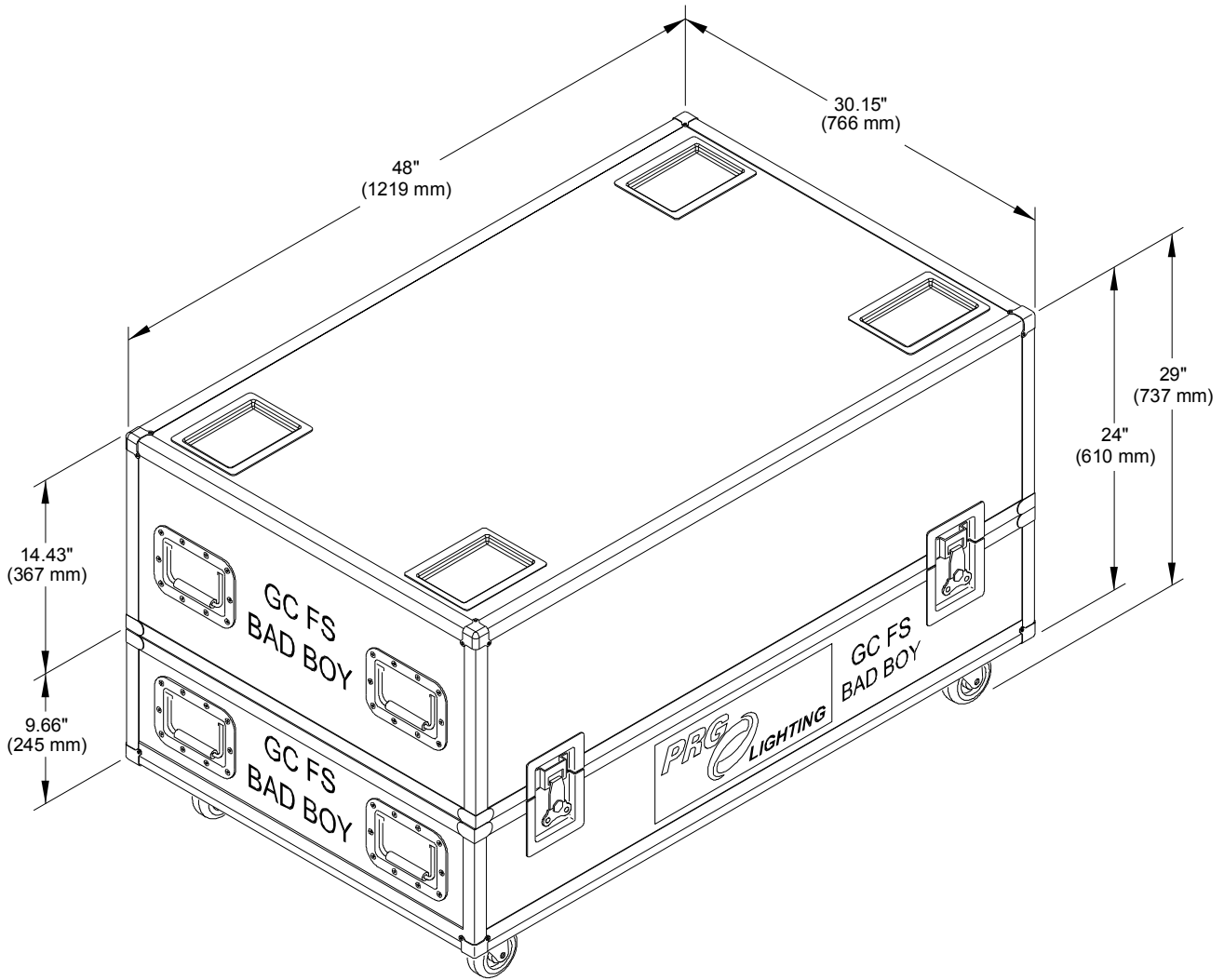
LOADED WEIGHT: 350 lbs. (158.8 kg)



Figure 41:  GC Bad Boy Roadcase Dimensions

## GC Best Boy Roadcase

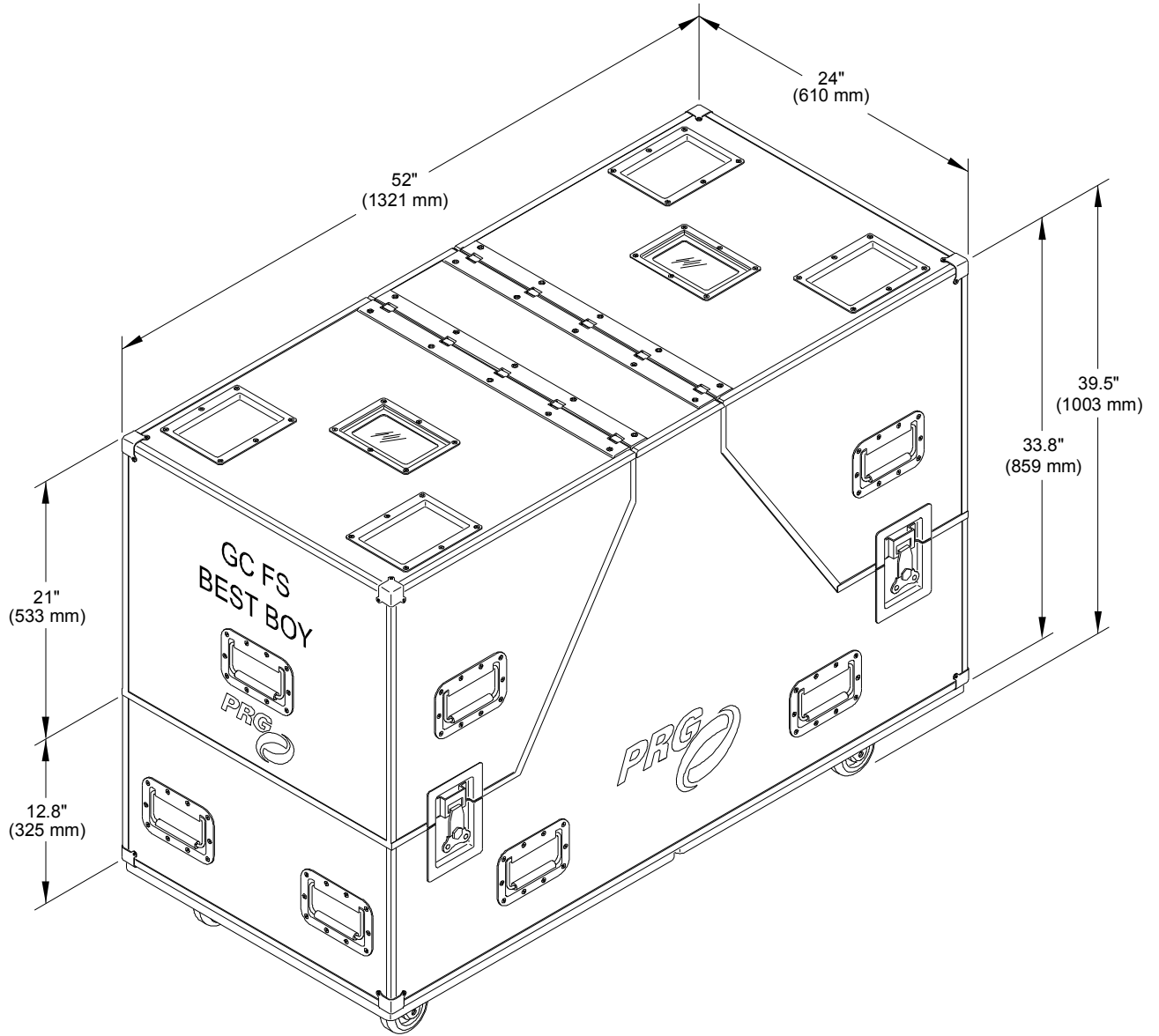LOADED WEIGHT: 416 lbs (188.7 kg)



Figure 42: GC Best Boy Roadcase Dimensions

**Notes**

GroundControl™ Remote Followspot System™ User Manual

Version as of: May 9, 2016

PRG part number: 02.9833.0001 A

**PRG**

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